

# The Rosette Gazette

Volume 13, Issue 1

Newsletter of the Rose City Astronomers

January, 2001



## JANUARY INFORMATION FAIR

Monday, January 15th, 7:30 PM, DMSI Auditorium

### In This Issue:

1 General Meeting  
New Members

2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
YRCA

3 Moonwalk

4 Weather SIG  
Photo the Leonids

5 Observing Sites  
Cosmology SIG  
Eclipse Photo

6 Making a Mirror-2

7 MESSIER  
MARATHON

8 (Continued)

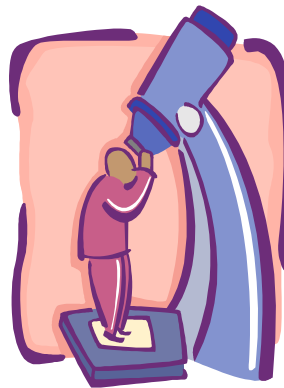
9 Board Minutes  
Classified Ads

10 Calendar/Events

It's time again for the annual Rose city Astronomers INFORMATION FAIR where there are many more answers than there are questions.

There are more answers for those with questions regarding **membership services**, privileges, and benefits with the RCA, and you will be able to sign up or renew your membership that evening. If your resolution for the new year is to begin a new **observing program**, have we got a program for you! We have more answers for **beginning programs, binocular programs, Messier programs, deep sky programs, Herschel I and II, solar and observing**. We have more answers for **youths** interested in these programs as well. For tracking your program swing by the **sales table** booth and pick up on of the great 2001 calendars.

If you were fascinated with and wanted to know more about the dynamics of the Earth's atmosphere and weather, you would find more answers at the **Weather Special Interest Group (SIG)** booth. If you had thoughts about the origin of the universe, you may want to drop by the **Cosmology/Astrophysics SIG**.



Get more answers from the experts at the **telescope making** booth. Learn of the workshop facilities, location, and schedule. While you're at it you may want to ask about the homemade and manufactured scopes in the **telescope library** and check one out.

Most frequently asked question: Where's the party?

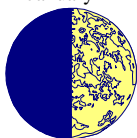
Answer: Stop by the star parties booth for a complete list.

For those who prefer seeking their own answers, you may find certainty of this from one of the more than 400 books in the **club library**. **See you the 15th!**

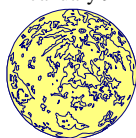

**WELCOME NEW MEMBERS!**

Steven Conner  
 Derick Cogle  
 James Farley  
 Helen Saling  
 Kirk Spence

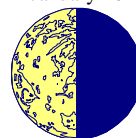
January 2



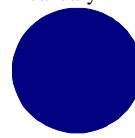
January 9



January 16



January 24



Club Officers			
President	Peter Abrahams	(503) 699-1056	telscope@europa.com
VP Members	Doug Huston	(503) 629-8809	geometer31415@aol.com
VP Observing	Scott Turner	(503) 788-6484	kings@phoenixdsl.com
VP Community Affairs	Norm Trost	(503) 668-7979	normt@europa.com
VP, Communications	Matt Brewster	(503) 774-0360	brewster@teleport.com
Treasurer	Vern Weiss	(503) 236-1059	vernlw@teleport.com
Secretary	Ron Forrester	(503) 504-8071	rjf@skyhackers.org
Sales Director	Sameer Ruiwale	(503) 617-0736	sameer_ruiwale@hotmail.com
Editor	Candace Pratt	(503) 296-6758	candace@europa.com
Web Master	Dareth Murray	(503) 762-4377	dareth@teleport.com
Library Director	Jan Keiski	(503) 293-3281	jikeiski@juno.com
Telescope Librarian	Brian Richardson	(503) 625-7373	brian_shelly@earthlink.net
Alcor, Historian	Dale Fenske	(503) 256-1840	fenskedf@juno.com
Media Director	TBD		
Special Interest Groups	Scott Fitzpatrick	(503) 669-8243	
Youth Director	Margaret McCrea	(503) 232-7636	mags@europa.com
Light Pollution Rep.	Bob McGown	(503) 244-0078	mcgown@teleport.com
New Member Programs	Carol Huston	(503) 629-8809	StarsCarol@aol.com
Magazine Subscriptions	Johan Meijer	(503) 777-0706	johanm@www.com



**President's Message**  
By Peter Abrahams

I'd guess that most all of our members are old enough to remember when Kubrick's '2001: A Space Odyssey' was released. At the time, I was not aware of amateur astronomy and didn't read science fiction; but like many people who saw the movie, I felt that my horizons had been expanded. It is now 2001, and the space exploration program hasn't developed into the manned spaceflight missions to the outer solar system shown in the movie. But we are seeing images of the sun that were totally unimaginable a few years ago, and we are learning about Mars and its past from close up images and geological exploration, and using the Space Telescope we are seeing planetary nebulae in beautiful detail & viewing the very distant universe (though not yet understanding what we're seeing at these unfathomable distances).

No doubt today's wildest science fiction is a pale & shallow imitation of the universe that will be revealed by tomorrow's science. Meanwhile, the outer space I see in my telescope is pretty impressive. Who would have thought when '2001' was written, that I'd own a 16 inch telescope in 2001, and that anyone could buy a new one for \$1200?

The RCA has some end of the year gratitude to express: Thanks to Vern Weiss for volunteering to be treasurer. Thanks very much to Jane Walpole for being treasurer for the past few years. Thanks to whoever volunteers to be media director, the only empty board position. If you enjoy working with the newspapers, TV & radio stations, or wish to expand your resume to include outreach & advertisement programs -- please contact me.

George LaBelle donated a 90mm ETX telescope & many accessories to the scope library, for which we're grateful. This increases our scope library to 8 working instruments, plus the 10 x 70 binoculars. Brian Richardson has been assisted by John Hansen, and many

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The Young Rose City Astronomers



RCA sponsors three groups of kids activities: Elementary ages

6 - 9), Junior (ages 10 - 13), and Young Rose City Astronomers (ages 14 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

thanks are due to both of them. Brian needs one more pair of hands to help him at general meetings with check in & check out of telescopes. We'll be very thankful to the RCA member who volunteers for this. Thanks to all the other RCA members, & especially the board for running this complex organization.

And thanks for dark nebulae, spiral galaxies, solar prominences, Jupiter, Saturn, and spiral galaxy M31 in Andromeda.

# TAKING A MOONWALK, Part II

By Dale Fenske

Moonwalk, part one can be seen accessing our web page [www.omsi-rca.org](http://www.omsi-rca.org), and see side notes on observing the Moon.

## Shadows:

Observing the moon close to the terminator the area on the moon between complete darkness and light allows minute features to be discerned. Here, the objects look exaggerated or distorted because the shadows do not give an accurate model of the obstruction. For instance, if you were on the moon, observing Mt Hood under the same circumstances, Mt. Hood's shadow would be very elongated and thin and look similar to a tall, skinny, pointed sewing needle. This obviously is not the actual shape of Mt Hood. When we observe the lunar mountains from earth, their shadows usually appear much taller, steeper and sharper than they really are. This affect makes the Strait Wall or Rupes Recta look like a giant cliff, when it is actually only a hill with a gradual incline of only 7 degrees.

## Directions:

The moon used to have the same East-West direction as our view of the sky around it. When astronauts landed on the moon they saw the sun rise in the moon's West. This is opposite earth's sunrise directions, so the lunar "Direction Authorities" reversed the moon's East-West directions. Now when astronauts stand on the moon, the directions are earthlike and they see the sun rising in the East. But from our earth based viewing vantage the moon seems backwards and the moon's Eastern side sets on earth's Western horizon.

## Planning:

Many have given the moon a rudimentary gaze and thought it was a spectacular object. But because they did not plan their trip to the moon and fully realize what was there, they quickly lost interest. Before taking your tour of the moon in real time, plan your lunar itinerary with a map. This can almost be any lunar map, since most show the basic lunar features. This saves valuable viewing time and also



Actual Relative Sizes

sets goals in your observing session.

The moon is 2000 miles in diameter. It is about the size of the United States (See the Moon Graphic). The Sea of Crisis, Mare Crisium, (the round dark spot on the upper right side of the Moon Graphic) is approximately the size of Oregon. The craters Plato and Copernicus are 60 miles in diameter and their sizes would stretch from Portland to Hood River. The small crater called Thebit L, the smallest crater visible in the Thebit crater chain (close to the strait wall) is about the size of Crater Lake.

A quick binocular tour of the moon, just hitting just the highlights of the moon should include;

The seas: Mare Crisium (the little bear of Mare Crisium), Fecunditatis, Frigoris, Humor, Nectaris, Nubium, Serenitatis, Tranquillitatis and Vaporum.

The mountain ranges: the Alps, Apennines, Caucas, Pyrenees, Strait Range, and the mountain peaks Piton and Pico.

The craters: Tycho and Copernicus with their rays, bright Aristarchus, the comet crater Messier and craters with common names like Picard, Billy, Catharina, Mitchell, Davy, Linne and Walter.

It can be pointed out that the very center of the moon is Sinus Medii, which means Central Bay.

No tour is complete without pointing out mankind's landing on the moon. Man has landed on the Moon only six times; twice in Mare Tranquillitatis, twice at the

Intersection of Mare Nubium, Mare Humor and Oceanus Procellarum, once in Mare Imbrium by the Apennines and once in the Southern Highlands West of Mare Nectaris.

**Telescope adventures-** Under proper lighting these outstanding features are fascinating sights:

The Cobra Head- Herodotus- (North West side of Oceanus Procellarum, around 3<sup>rd</sup> quarter)

The Beehive- Crater Kraft with craterlets surrounding it like a swarm of bees. (North end of Oceanus Procellarum, around 3<sup>rd</sup> quarter)

- The Domes- Hortensius- area above or North of Hortensius which features domes with little craterlets at their summit. (Mare Insularum, around 3<sup>rd</sup> quarter)
- The Ghost Crater- Stadius- a large, circular, filled crater that is outlined by chains of small craterlets.(beside Copernicus, after 1<sup>st</sup> quarter)
- The Trench- The Alpine Valley- in the center of the Alpine Range (around 1<sup>st</sup> quarter)
- The Serpentine Ridge or Dorsa Smirnov. (South of Posidonius, before 1<sup>st</sup> quarter)
- The Hyperbola Ridges- Rima Cauchy and Rupes Cauchy form a striking feature around crater Cauchy (North east area of Mare Tranquillitatis, before 1<sup>st</sup> quarter)
- The Pyramid- Proclus and its rays (To the West of Mare Crisium, before 1<sup>st</sup> quarter)
- The Flying Eagle - Yerkes- made up of the filled crater and its surroundings. (Inside on the West of Mare Crisium, around 1<sup>st</sup> quarter)
- The Little Bear- The whole of Mare Crisium looks like a cute little bear cub snuggled in a log. The bear's eyes are craters Pierce and Picard, the nose is the flying eagle with crater Yerkes (around 1<sup>st</sup> quarter)

## Keyhole craters:

- Torricelli - (between Mare Nectaris and Mare Tranquillitatis, around 1<sup>st</sup> quarter)

(Continued on page 8)

# Photographing Leonids at Ecola State Park

By Bob McGown

On November 17, the peak date of the 2000 Leonid meteor shower, John Foster, David Tever and I thought we would take an excursion to the coast to observe the meteor shower and photograph some of the unusual gnarly trees by moonlight. Perhaps we would be lucky enough to catch a meteor in the frame. Last year, John photographed the rare moment when 5 simultaneous Leonids filled his frame with bright meteors. Two were fireballs. The brightest was approximately as bright as the Full Moon, and left a lingering smoke trail that some observers followed for up to 50 minutes.

With the hope that we would be able to catch some more bright meteors on film, John Foster and I photographed throughout the evening at Ecola State Park near Cannon Beach. When we pulled into the parking area, on the headland 600' above the ocean, an elk herd was grazing at the State park picnic area and wandering through our observing site. We set up our camera tripods and scopes. Soon the caretakers of Ecola, John and Sally, came down to our set-up and observed. After we gave a tour of the Messier objects to the caretakers, it was time to hike the winding trails and photograph the night sky. From the vantage point of the ridge line we noticed that the waves were quite bright, considering the moon had not yet risen. On some of my nighttime adventures, I had walked among bioluminescent plankton on the beach. Could this be ocean waves exciting the bioluminescent plankton or red tide on the beach?

The Leonid meteors continued to flash with two large -3 fireballs a few seconds apart. Most of the meteors headed directly east, with some leaving luminous trails. The skies were dark, with a limiting magnitude of about 6.5. The radiant was near the horizon, so we weren't seeing as many meteors as simultaneous observers on the East Coast, where the radiant was high in the morning sky. Still, I estimate that we saw 35-45 meteors/hour, peaking around midnight. With a large correction for radiant elevation, these rates compare well with the peak zenithal hourly rate values of about 400 that were reported from other locations. The zenithal hourly rate, or ZHR, is an attempt to standardize observations and estimate the actual strength of meteor



activity from observations obtained under imperfect conditions.

John, David and I hiked the winding paths under the rising Moon as we photographed the twisted trees against the celestial landscape. We had hoped to photograph the Tillamook Rock lighthouse with the C5. It was barely in view from Ecola through a 7-power monocular at night. The lighthouse kind of looked like a Messier object against the western ocean horizon.

At about midnight, the Moon began to rise. The eastern sky glowed and a halo rose before the Moon. Above this glowing halo was an anti-halo with Moon dogs coming off the corners. It looked like some kind of cosmic celestial symbol. The Moon continued to rise, and eventually the halo faded as the Moon cleared the eastern horizon. As we continued to observe, the stars began to twinkle.

After a short 2-hour nap on the windy point, we headed home, anticipating a safe drive. Little did we know. Just as we crossed the pass, two large Roosevelt elk dashed in front of the car, causing me to severely skid and swerve to barely miss them. About a mile down the road, we pulled into the gas station by our old Strassel Road observing site to be greeted by a dozen elk hunters. We kept secret the location of the elk herd, so they were safe for another season.



LEFT: Michael Blackburn, President of the Boise Astronomical Society took this picture Christmas morning of the partial solar eclipse. Canon S10 handheld at the 25mm eyepiece of mt 10" Coultter

## ASTROPHYSICS / COSMOLOGY SIG

TIME: 7:00 PM

DATE: January 18, 2001

PLACE: Portland State University  
Science Integration Institute  
Rm 287, Cramer Hall

TOPIC: Hazardous Impacts, Sam Kimpton,  
Rocks from Space, Richard Norton

## Remote Weather Conditions at Observing Sites

I am a recent arrival to both observational astronomy and the RCA, having just finished making my first scope (a 6" f/6 newt). Trying to escape urban light pollution I quickly learned that the upper Larch Mountain site was a great compromise between dark[er] skies and close proximity to Portland.

But as summer was coming to an end, I also quickly learned that conditions on Larch were somewhat unpredictable. This resulted in a number of trips up which ended in frustration with wind or dew problems.

A crazy idea then occurred to me (as I am sure it has to many an RCA member) -- why not find some way to report weather conditions at Larch such that I could tell before I leave what the conditions are. The most valuable data would be temperature, wind speed and humidity, all relatively easy to obtain with inexpensive equipment. After my posting on the mailing list several people suggested still or live video feeds to get an idea of cloud cover.

The problem then becomes how to get the data to my home (and yours) where I can easily check the conditions before contemplating a trip up. In the case of temperature, wind speed, and humidity we are only talking about a handful of bits to be transmitted back to 'town'. Still and live video increase the necessary data rate quite a bit, but the same ideas apply.

There were a couple of ideas discussed on getting the data back to down to 'town':

- See if there is any traditional phone service near by and relay to where a modem could transmit back to a computer in town
- Use a cell phone/modem
- Use packet radio (tcp/ip over HAM), problems being the relative short-range line of sight (we cannot rely on atmospheric skip), such that we'd have to make use of some repeater stations.

All of these have some cost/performance tradeoffs which are tough to deal with in the confines of a non-profit organization like the RCA. The actual equipment for gathering the data is probably quite cheap and/or could be homebrewed, save video.

Another quite excellent suggestion was to use the RCA's shiny new non-profit status to try and convince an organization like KATU news to donate (tax deductible) the equipment and/or transmission infrastructure. This was just an idea and to date has no RCA board sanction or involvement (just want to make that clear). Much work would remain to be done if this were to be seriously pursued.

The vision of sitting down at our computer to check current Larch conditions from our favorite browser remains the territory of but a few of us on the mailing list. One reason for this article is to see if there is a wider interest in designing and implementing such a plan.

If others are interested, I would ask that you email me at 'rjf@skyhackers.org'. If enough people are interested, I will be happy to setup an email list where we can discuss the details of such an endeavor.

Ron Forrester



# How to Make a Mirror — Part 2

Ron Forrester rjf@skyhackers.org

Now that you have everything you need, you're all set to make a mirror, right? So the next decision you need to make basically governs how long your telescope will be as well as the maximum magnification you can expect (all other things being perfect) -- that decision is what focal length you want to make the mirror.

Simplistically, the job of a telescope mirror is to focus light hitting it to a point somewhere in the telescope assembly. The distance the light travels after hitting the mirror and coming to a focus (focal point) is called the focal length. When making a mirror, you shorten the focal length by deepening the concavity you make while grinding -- to lengthen the focal length you make more shallow the concavity made with grinding.

Focal lengths are expressed in terms of multiples of the mirror diameter. So for instance, the focal length of an 8" f/7 mirror is 8" multiplied by 7 (f/7), or 56". The focal length for a 8" f/5 mirror is 40". The relationship to magnification is focal length in millimeters divided by focal length of a particular eyepiece in millimeters. So for instance, a common 'high' power eyepiece has a 7mm focal length, giving a magnification of 1400mm (56" times 25.4mm/inch) divided by 7mm, or 203x. For the f/5, the magnification with the same eyepiece would be 1016mm/7mm or 145x. If you are interested in planetary and lunar viewing, a long focal length gives you much more useable magnification (assuming perfect seeing conditions). For wide field nebula and cluster viewing, you can often do better with a shorter focal length.

You can see that the decision on which focal length to use can greatly affect your overall scope size, as well as useable magnification. Note also that making short focal length mirrors (less than f/6) can be quite difficult for the inexperienced. Since this is your first mirror, a compromise is probably wise and I would suggest an 8" f/7. The OTA (optical tube assembly) will end up being around 45" to 50" long, making it quite portable. Additionally, grinding and figuring an f/7 should be relatively straight forward for the beginner.

In addition to focal length, there is one other useful metric to understand before we go on: Radius of Curvature. If you imagine a sphere whose edge exactly etches out an arc of glass from your mirror, the radius of that sphere is called the Radius of Curvature. It is quite simple to calculate -- it's just the focal length times 2. So for our 8" f/7, we will end up with an ROC of 112".

The question now is how do we figure out how deep to grind to reach the desired focal length. The value in question is called the Sagitta. The formula for Sagitta is:

$$S = R - \sqrt{R^2 - r^2}$$

where S is sagitta, R is radius of curvature, and r is the radius of your mirror. So for our project, we can plug in the following numbers:

$$S = 112 - \sqrt{112^2 - 4^2}$$

$$S = .071"$$

This means the center of your mirror must be about 71 thousandths of an inch deep. Here is an excellent webpage devoted to online telescope making calculators <http://www.atmpage.com/calc.html>.

At this point it isn't necessary to measure this distance with great accuracy, so all that is needed is a straight edge and something about the same thickness as your sagitta value - generally you can find a drill bit about the right thickness, or take a caliper around the house measuring different things like pins or needles, etc. I will describe measuring the sagitta later on in this article.

Lets get started. On top of your grinding stand you will need three wooden cleats to hold your tool in place while grinding. Place the tool in the center of your grinding surface and arrange the cleats 120° from each other butted up against the edge of the tool and screw them in to the top of the stand. Make sure the cleats are less than 1/2 the thickness of the mirror, 1/4" on a 1" thick mirror is perfect. See *figure 1*.

You will first need to bevel the outer edge of both the tool and the mirror. For an 8" mirror you want at least a 1/32" bevel, and a 1/16" bevel would be even better. To do this take one of the diamond hones you purchased and at a 45° angle to the edge of the glass stroke the hone against the edge. Do this all the way around until you have a nice 45° bevel on both the tool and mirror.

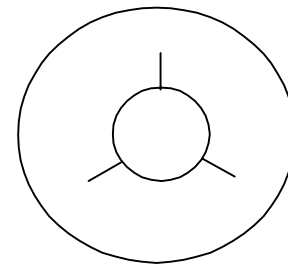


Figure 1

Next you will need your spray bottle of filtered water, and the 80 grit carbo which came with your kit (or you bought separately). Spray the top surface of the tool to get it completely wet. Now sprinkle enough 80 grit to uniformly cover the face of the tool one or two particles deep, spreading it around with your fingers.

(Continued on page 8)

# 15th ANNUAL MESSIER MARATHON

The 15th Annual Messier Marathon is just around the corner with this year's event scheduled for Friday, March 23 through Sunday, March 25, 2001.

Last year's program was a big success with a large number of RCA families participating.

Come and observe under Central Oregon's clear (keep your fingers crossed), dark skies and enjoy all of the amenities of warm beds, prepared food, and activities at Kah-Nee-Ta Resort. And, once again, the Messier Marathon will highlight the festivities. For those in the club who many be new to the organization, RCA has been kicking off its star party season every March for 14 years at Kah-Nee-Ta with a Messier Marathon. This event offers a good opportunity to get to know your fellow observers as well as offering a host of other activities in which the whole family can participate.

And, what is a Messier Marathon, you ask? Well, the "Messier List" contains 110 of the best-known objects in the night sky. During mid-to-late March, given certain conditions, nearly all of the 110 objects can be seen in one night (from dusk until dawn). An organized blitz to find all 110 objects in one night is called a Messier Marathon.

During our past 14 functions, the weather has been pretty good to us; we have never failed to obtain at least a portion of one night's clear skies for observing, which is nothing short of amazing during Spring in the Northwest. In 1997, we had the added attraction of Comet Hale-Bopp making a glorious early morning appearance, to the delight of all observers. Over the years, the event has become a two-night function, with



a Saturday evening banquet as a prelude to the Messier Marathon Star Party. The event is very popular with families since it is one of the few that affords a warm bed and hot shower, not to mention a heated swimming pool, great food, a giant fireplace, all of the activities available at Kah-Nee-Ta, and much more.

(Did you know that the spa facility at Kah-Nee-Ta is rated one of the five best in the country?) You don't have to do a Messier Marathon to participate. Some participants come just to spend their time observing their favorite objects, work on their observing programs, or mingle with other astronomers. Others come to tackle the Marathon. You don't need a telescope to participate either; other members are enthusiastic to share their views. Also, if you don't have a telescope, consider checking out one of the scopes from the telescope library. It's a good opportunity to get some early-in-the-observing-season assistance at a fun event.

Here are the details for this year's party: **LODGING:** Rooms will rent for \$75 per night, single or double, plus \$15 per extra person up to a maximum of four per room. Children under 18 are free when occupying the same room as their parents. This represents a 50% savings over regular rates.

To register for a room, you should call Kah-Nee-Ta directly at 1-800-554-4786 to make your reservation,

mentioning that you are with the RCA star party. RCA has reserved a certain number of rooms at the special rate that will be held until March 1, so please make your reservations as soon as possible.

**BANQUET:** The Saturday evening banquet will feature a roast chicken dinner for adults for \$20 per person (which includes gratuity), and barbecued chicken and fries for children 12 and under for \$9.00 (which includes gratuity).

**ACTIVITIES:** Information packets will be available when you sign in at Kah-Nee-Ta (ask for one at the front desk). They will include a Messier Marathon guideline plus directions to the observing site. A social room will be set up upstairs on Saturday from 11:00 AM till 4:00 PM.

Participants are encouraged to bring pictures, inventions, observation notes, and tall tales to share with others. **EVENT REGISTRATION:** There is no general registration or registration fee to attend this event. However, participants will need to register and prepay for the banquet. We will have a table set up for event information and banquet registration at the February and March general meetings. Carol Huston will be available to answer any questions about this activity at the general meetings, by calling 503-629-8809, or e-mail at StarsCarol@aol.com. Carol is looking for an assistant or two to help out with the pre-planning. Contact her to volunteer!

Start off your observing season with RCA by attending the 2001 Messier Marathon. We look forward to seeing you there!!!

Carol Huston  
Phone: (503) 813-6562

**(Continued from Page 6—Making a Mirror, Part 2)**

Now comes the first grinding stroke, called the 'chordal stroke'. With this stroke you grind the center of the mirror against the edge of the tool. The length of the stroke is about  $\frac{1}{2}$  of the diameter of the mirror (see *figure 2*). The line traces the path of the center of the mirror as you do the stroke. Once you have completed 10-12 strokes in this manner, turn the mirror a small amount ( $\frac{1}{4}$  to  $\frac{1}{3}$  of a turn) and walk around the grinding stand a similar distance, repeating the stroke along a new chord.

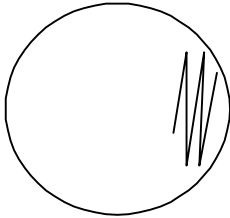


Figure 2

It is important that during this stroke you put a lot of pressure on the mirror as you do the stroke. You will hear loud grinding sound as the pressure and the grit begin to remove glass. Remember to vary the length of your stroke slightly each time, and don't count the number of strokes you do each time, you want to vary this as well. Also vary the amount you turn the mirror, and the distance you walk around the stand each time. Be very careful not to let the mirror slap down on the tool at any time, as you can seriously chip the mirror or tool.

After a couple of minutes, the 'biting' sound of the 80 grit will begin to soften and you will see a grayish paste forming. This period of time is called a 'wet', that is, from the time you first apply some grit until you decide it's time to apply more. Carefully lift the mirror from the tool, rewet the tool with your spray bottle and reapply some more grit. Some people will clean the tool and the mirror after each wet, but during this stage it's wasteful of both time and

grit, since even after a full wet there remains some grit which will aid in the grinding. Repeat this process again for at least another 5 to 10 wets.

Now take the mirror and carefully immerse it in the bucket washing it with one of the sponges. Do the same with the tool. Looking at the mirror you should see extreme scratches in the center zone of the glass. On the tool, you will see the scratches on the very edge of the glass all the way around. You can see you are slowly making the mirror concave and the tool convex. Take a moment to clean the grinding stand with a sponge and water and tidy up the area a little.

If you were to continue until you had removed .071" of glass from the center, you would end up eventually overshooting your sagitta significantly, thus resulting in a much shortened focal length. Generally you should shoot for about 80% of the sagitta before you can call this rough grinding stage complete. To measure this, take your straight edge and lay it across the center of the mirror (the straight edge must reach from one side of the mirror to the other). Now try and place your measuring device (drill bit, feeler gauge, needle, etc) in between the straight edge and the center of the mirror. Remember, you are shooting for about 80% of the depth, so the object should not quite fit in the space created between the straight edge and the center of the mirror.

Once you are satisfied you have reached the correct depth, you are ready to move on to finish rough grinding and fine grinding, both of which use the same stroke, one that is different than that which we have used thus far. We will start from there next month! Remember, grind more and worry less!

---

**Continued from page 3—Taking a Moonwalk)**

- Fauth- (directly South of Copernicus, after 1<sup>st</sup> quarter)
- The Sword of Cleomedes- Rupes Recta- Straight wall including mountains to the South (right after 1<sup>st</sup> quarter).
- The Descending Crater Chain- Thebit, Thebit A, Thebit L. There is even a dinky crater in Thebit L (beside the straight wall, right after 1<sup>st</sup> quarter).
- The Goblin- Crater Flamsteed and surrounds (South west side of Oceanus Procellarum, around 3<sup>rd</sup> quarter)
- The Great Rille System- Hippalus and surrounds- a major Rille bisects the crater Hippalus. (East side of Mare Humorum, around 3<sup>rd</sup> quarter)
- The Targets-Hosiodus A and Marth-Small, double ringed craters ( in Southern edge of Mare Nubium, around 3<sup>rd</sup> quarter).

- The Plateau-Wargentini- a crater filled to the brim with basaltic lava. (South of Mare Humorum, after 3<sup>rd</sup> quarter)

The list could continue forever, but this short expedition should give you a taste of interesting features located around the moon. You do not need to travel to a dark sky location, have low horizons or own a giant telescope. The winter moon is now high and bright in the sky. Even if horizons are not the best, you can usually see the moon from your back yard. A modest telescope is adequate to find all these objects, in most instances it is easier to use. Do not let cold weather deter you, observe anyway. When viewing the moon, a short observing session is all it takes to give the satisfying feeling of accomplishment since most objects are easily found. So use whatever observing tools you have and go out, observe and have fun with the moon.





**BOARD  
MEETING  
MINUTES**  
*Carol Huston*

**MINUTES  
December 4, 2000 @ 7:30 PM  
Parker Room**

Present: Doug Huston, Jane Walpole, Norm Trost, Bob McGown,, Matt Brewster, Dale Fenske, Candace Pratt, Peter Abrahams, Jim Girard, Ron Forrester, Scott Turner, Jan Keiski, Brian Richardson, Carol Huston

Treasurer Report - J. Walpole: Several checks that were mailed to her from Johan for magazine subscriptions never arrived in her mailbox. Johan will wait for 6 weeks to see if the checks have arrived and if they haven't, contact the check submitters and request that they reissue the checks. RCA has approximately \$15,716 in bank.

Programs – M. Brewster: Everything is set for December meeting. Volunteers need to be here early to set up. January's meeting on SIGs has been organized and set up.

Star Parties – S. Turner: Scott is talking with members of other astronomy groups in Salem and Eugene to set up joint star parties for 2001 (perhaps May or June). Silver Falls State Park might be another potential site.

Membership: D. Huston: RCA has 351 member families as of December.

Library – J. Keiski: Jan gave the library report.

IDA – B. McGown: Bob couldn't connect with the IDA folks for the light pollution conference this weekend so he didn't go. Bob has a light pollution slide show worked up that he could give as a presentation. He will be speaking to community colleges regarding light pollution. D. Fenske proposed that we support IDA further by promoting individual memberships to the organization as well as our group RCA membership.

YRCA: Peter reported that the younger kids haven't been showing up so they are

going to combine groups with the older group. It was suggested that the kids' meetings be held during the same time as the general meeting so that the kids could remain interested during that time. Community Affairs – N. Trost: He has gotten some slide shows from John Cart. Candace Pratt has been developing programs for our use in giving presentations to different age groups. He will be off and running with these in January. Candace wrote a series of lesson plans for Mt. Hood Planetarium -- 10 different topics that are astronomy projects for NW kids that comply with State of Oregon fifth-grade curriculum. OMSI Liaison -- Peter: Science of Toys Show on Thanksgiving weekend. He has volunteered his time to OMSI for several days for that event.

Next board meeting is the second Monday in January, rather than the first Monday.

Solar Filter -- Peter: Brian needs some assistance with checking the equipment and checking out all of the accessories in the amount of time he has during a general meeting. Candace Pratt made a motion that the solar filter and scope come under the management of Brian Richardson as part of the telescope library. Motion passed. Brian will work with Dale to develop a set of training materials and a guide for the solar scope since it is somewhat complex to operate. Ron suggested that people that check out this scope be required to show it to the public as well as their own viewing. It was noted that Mark Seibold has done an outstanding job of using this equipment to show the public.

Phone Line: December 1-15: Dale Fenske. December 16-31: Candace Pratt. January 1-15: Norm Trost. January 16-31: Matt Brewster.

Nominations for Treasurer: The board needs to review the membership list and develop a list of candidates and make personal phone contact to request participation for this important role. This situation shows the need for the board to do some succession planning for some key positions.

Carol Huston reviewed a proposed policy for handling annual maintenance of records and legal board requirements associated with board turnover and the continuance of RCA's Articles of Incorporation and 501(c)3 status. Copy (modified to include edits by the board) is attached to these minutes.

***Please note the 2001  
RCA Board of  
Directors will take  
office on January  
1st. The new board  
is listed on page 2.***

**CLASSIFIED ADS**



**FOR SALE:** Celestron Firstscope 80. Brand new, was OSP 2000 door prize, used only once. Scope features: 80mm diameter refractor 400mm focal length, making it a very short and portable tube. Provides very wide fields of view with supplied 25mm 1 1/4" high quality SMA eyepiece, 16X mag. Accessories include 6x30 finderscope, 1 1/4" star diagonal, adjustable rigid wood tripod and equatorial mount with slow motion controls. This is a high-quality starter scope valued at more than \$300. It is far superior to less expensive department store brands and will retain its value for years to come (provided you treat it nicely). I'm offering it at \$275, or trade for one of Uncle Al's eyepiece products (that's Televue y'know.)  
Rob Brown  
home: 503-244-1394  
work: 503-443-3280

JANUARY 2001						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

FEBRUARY 2001						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

### January

Jan. 8	Mon.	Board Meeting	OMSI Parker	7:00 PM
Jan. 13	Sat.	TM Workshop	Tech. Marine Srvc.	10:30 AM
Jan. 15	Mon.	Young/Jr./Elem. YRCA	OMSI Audi.	6:30 PM
<b>Jan. 15</b>	<b>Mon.</b>	<b>General Meeting</b>	<b>OMSI</b>	<b>7:30 PM</b>
Jan. 17	Weds.	TM Workshop	Tech. Marine Srvc.	6:00 PM
Jan. 18	Thur.	Cosmology SIG	PSU	7:00 PM
Jan. 20	Sat.	TM Workshop	Tech. Marine Srvc.	10:30 AM
Jan. 31	Weds.	Weather SIG	Colonial Office	7:00 PM

### February

Feb. 3	Sat.	TM Workshop	Tech. Marine Srvc.	10:30 AM
Feb..5	Mon.	Board Meeting	OMSI Parker	7:00 PM
Feb. 10	Sat.	TM Workshop	Tech. Marine Srvc.	10:30 AM
Feb. 19	Mon.	Young/Jr./Elem. YRCA	OMSI Audi.	6:30 PM
<b>Feb. 19</b>	<b>Mon.</b>	<b>General Meeting</b>	<b>OMSI</b>	<b>7:30 PM</b>
Feb. 21	Weds.	TM Workshop	Tech. Marine Srvc.	6:00 PM
Feb. 22	Thur.	Cosmology SIG	PSU	7:00 PM
Feb. 28	Weds.	Weather SIG	Colonial Office	7:00 PM

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-omsi.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-omsi.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

BULK RATE  
 US POSTAGE  
 PAID  
 PORTLAND, OR  
 PERMIT NO. 3012

# The Rosette Gazette

Volume 13, Issue 2

Newsletter of the Rose City Astronomers

February, 2001



## The Evolving Universe

### In This Issue:

1 General Meeting  
New Members

2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
YRCA

3 Everyday Strange  
and Exotic  
Kah-nee-ta Party

4 Weather SIG  
January Eclipse

5 RCA Gallery  
Cosmology SIG  
Cool Fun Facts

6 Making a Mirror-3

7 Board Minutes  
Classified Ads

8 Calendar/Events

Special Insert: 2001  
RCA Star Party  
Schedule

Examining the structure of the Milky Way galaxy and our evolving understanding of the universe will be the topic of the featured presentation at the February General Meeting. Dr. Beverly Lynds will reflect on numerous astronomical discoveries that have made working as an astronomer over the past half-century a rewarding and exciting career.



Specific topics Dr. Lynds will highlight include discoveries of white dwarfs, neutron stars, and black holes.

Dr. Lynds received her Ph.D. in Astronomy from the University of California Berkeley. Her career focused primarily on optical observations of the Interstellar Medium. In 1999, Dr. Lynds was Adjunct Faculty Associate, Dept. of Physics at Portland State University.

During her distinguished career, she worked at the University of California Berkeley, the National Radio Astronomy Observatory, the University of Arizona, and Kitt Peak National Observatory. She has been visiting professor at Cal Poly Pomona and Colorado College.

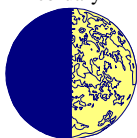
r. Lynds is co-author of an elementary astronomy textbook and served for many years as a Shapley Lecturer for the American Astronomical Society.

The February General Meeting of the RCA will Monday, February 19 in the OMSI Auditorium at 7:30. Please join us beginning at 7:00 to meet with other members and view exhibits.

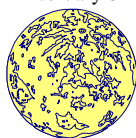
### WELCOME NEW MEMBERS!

Bruce and Kevin Alber  
Cheri Anderson  
Padriac Ansbro  
Albert Baker  
Steve Bintliff  
Jill Bonzer and Art Douglas  
Richard Brock  
Steve Burns  
Gary Daniele  
Rufus Day  
Christopher Duniphin  
Larry Godsey  
Frank Hartley  
Carlos Mejia  
Donald and Bernard Miller  
Larry and Lonnie Swenson

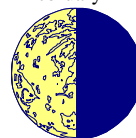
February 1



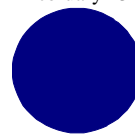
February 8



February 14



February 23



Club Officers			
President	Peter Abrahams	(503) 699-1056	telescope@europa.com
VP Members	Doug Huston	(503) 629-8809	geometer31415@aol.com
VP Observing	Scott Turner	(503) 788-6484	kings@phoenixdsl.com
VP Community Affairs	Norm Trost	(503) 668-7979	normt@europa.com
VP, Communications	Matt Brewster	(503) 774-0360	brewster@teleport.com
Treasurer	Vern Weiss	(503) 236-1059	vernlw@teleport.com
Secretary	Ron Forrester	(503) 504-8071	rjf@skyhackers.org
Sales Director	Sameer Ruiwale	(503) 617-0736	sameer_ruiwale@hotmail.com
Editor	Candace Pratt	(503) 296-6758	candace@europa.com
Web Master	Dareth Murray	(503) 762-4377	dareth@teleport.com
Library Director	Jan Keiski	(503) 293-3281	jikeiski@juno.com
Telescope Librarian	Brian Richardson	(503) 625-7373	brian_shelly@earthlink.net
Alcor, Historian	Dale Fenske	(503) 256-1840	fenskedf@juno.com
Media Director	TBD		
Special Interest Groups	Scott Fitzpatrick	(503) 669-8243	
Youth Director	Margaret McCrea	(503) 232-7636	mags@europa.com
Light Pollution Rep.	Bob McGown	(503) 244-0078	mcgown@teleport.com
New Member Programs	Carol Huston	(503) 629-8809	StarsCarol@aol.com
Magazine Subscriptions	Johan Meijer	(503) 777-0706	johanm@www.com



**President's  
Message**  
By  
Peter Abrahams

The history of the RCA is still pretty short, about 10 years; but we grew out of other groups such as the Portland Astronomical Society. The PAS had skilled telescope makers in the 1960s, most notably Del Wiseman, and no doubt many of their projects still survive. There were active (and small) organizations in Portland in the 1930s, involved in telescope making and observing. The RCA has a board position of 'Historian', currently Dale Fenske, and a President who is very involved in the history of astronomy and instruments. We are actively seeking any documentation on astronomy in Portland & the area -- newspaper articles, old newsletters, photos, or any other paper; and if the original is valuable to you, a good photocopy is as useful.

We know just a little about some very interesting people & places: Harold

Haggart in Oregon City, 1940s - 1960s, a very skilled instrument builder, produced a few commercial Maksutov variants, and had an outstanding telescope at his observatory. Robert Millard, west hills of Portland, 1930s, had a beautiful small observatory with a 4 inch Bausch & Lomb refractor. There was a four inch 1880 Alvan Clark telescope in Portland, owned by Allen Otto and sold in the late 1980s. Lewis & Clark has an observatory with a beautifully built Newtonian made by a staff machinist.

The University of Portland includes the Merle Starr Observatory, built in 1952 by physics professor Starr. The telescope is a split ring equatorial similar to Palomar, donated by amateur astronomer A.E. McIntosh, who had used it in his observatory on Council Crest. The twenty inch primary has a cellular back and is reported to be a prototype for the 200 inch at Palomar, cast by Corning in 1929. The maker of this massive steel telescope, and the mirror fabricator, are not known.

Elsewhere in Oregon & southern Washington, a five inch Alvan Clark telescope was for sale in Medford in the

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The Young Rose City Astronomers



RCA sponsors three groups of kids activities:  
Elementary ages

6 - 9), Junior (ages 10 - 13), and Young Rose City Astronomers (ages 14 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

1940s. J. Hugh Pruett in Eugene had an observatory in the 1950s with a four inch refractor and a ten inch reflector. The Brown Foundation in Walla Walla, Washington, had a large vehicle mounted refractor and toured the Northwest, providing observing sessions and displays including a meteorite collection. The Goldendale Observatory was built by volunteers, most of whom were from Portland (if I understand correctly). If you have any information on these or other details of the history of astronomy in the Northwest, please contact me.



# The Everyday Strange and Exotic

By Doug Huston

The alarm goes off, we get up and go to work. At the end of the day we come home, maybe play with our children, then go to bed and the cycle starts all over again. Sounds a little mundane, doesn't it? Well, if you just look a little deeper, you'll find that some of the things we experience regularly are really the product of some strange and exotic relationships in the physical world.



## Fighting the traffic.

Many of us have to deal with congested roads on the way to and from work. One of my personal pet peeves is what I call the "Accordion Effect." The traffic will squeeze down, then expand again with no apparent reason. What's really happening here?

Well, it turns out that freeway traffic obeys the Continuity Equation of Fluid Dynamics. This equation is a first-order, partial differential equation and is an extremely important relationship in Fluid Dynamics. Partial differential equations have an interesting property in that variations in key parameters and discontinuities in their solutions can propagate through the solutions.

What this translates into is this: If someone in the traffic stream should slow down for whatever reason, he/she will cause an increase in the density of the stream. Because of the nature of the Continuity Equation and partial differential equations in general, this change in density propagates back up the traffic. So, at some point, probably some distance away from the initial disturbance in the traffic flow, you will encounter an increase in traffic density – a squeeze down. Once it propagates back away from you, the traffic will open up again.

Maybe understanding what's happening in this situation will help you cope. It hasn't lessened the irritation for me though!

## Playing in the sink.

The next time you go to the kitchen sink, turn the faucet on and just let the water run for a few seconds. If the water is hitting the bottom of the sink you should see a roughly circular area

where the water runs away from the point of impact. The outer edge of this circular area should be a wave that is pretty much fixed in position. This wave is an example of an exotic phenomenon physicists call a "soliton." (I showed this to Carol and she thought it was really cool – she says it's best if you move the breakfast dishes out of the way first.)

Solitons represent a class of solutions to certain types of non-linear, partial differential equations. As such, they belong to the branch of physics known as Non-Linear Dynamics, or more commonly, Chaos Theory. Given a partial differential equation involving both time and space, a solution of that equation that is localized in space, has a fixed velocity (could be 0), and has a permanent form (or at least exhibits some kind of coherence) is a soliton. Solitons are also found as solutions to equations in quantum mechanics and general relativity.

There are many other examples of trivial phenomena that have non-trivial descriptions. The science of soap films and soap bubbles, for example, has many unanswered questions. In fact, it sometimes seems our most commonplace experiences have the most exotic explanations.

## 15th Annual Messier Marathon Star Party at Kah-nee-ta Resort

The 15th Annual Messier Marathon is just around the corner with this year's event scheduled for Friday, March 23 through Sunday, March 25, 2001.

**LODGING:** Rooms will rent for \$75 per night, single or double, plus \$15 per extra person up to a maximum of four per room. Children under 18 are free when occupying the same room as their parents.

To register for a room, you should call Kah-Nee-Ta directly at 1-800-554-4786 to make your reservation, mentioning that you are with the RCA star party. RCA has reserved rooms at the special rate that will be held until March 1, so act soon.

**BANQUET:** The Saturday evening banquet will feature a roast chicken dinner for adults for \$20 per person (which includes gratuity), and barbecued chicken and fries for children 12 and under for \$9.00 (which includes gratuity).

**ACTIVITIES:** Information packets will be available when you sign in at Kah-Nee-Ta (ask for one at the front desk). They will include a Messier Marathon guideline plus directions to the observing site. A social room will be set up upstairs on Saturday from 11:00 AM till 4:00 PM.

Participants are encouraged to bring pictures, inventions, observation notes, and tall tales to share with others. **EVENT REGISTRATION:** There is no general registration or registration fee to attend this event. However, participants will need to register and prepay for the banquet.

Carol Huston will be available to answer any questions about this activity at the general meetings, by calling 503-629-8809, or e-mail at StarsCarol@aol.com. Carol is looking for an assistant or two to help out with the pre-planning. Contact her to volunteer!



(Continued from Page 6—Mirror Making)

you are about to, put the mirror on bottom and use the same technique with the tool on top. This will shallow out the sphere again while still achieving the desired result. You may get to a point where you are swapping mirror on top (MOT) and tool on top (TOT) every few wets to prevent your sagitta from being too deep or too shallow as you finish rough grinding.

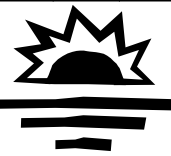
Assuming you have reached a uniform grayness and achieved your desired sagitta, you are ready for more of the same, only with smaller and smaller grit. At this point, our goal is to use the next smaller grit size to remove the pits left by the current grit. We are ready to move to 120 grit (or 180 if that's what the kit came with). But first, let's discuss cleanliness.

It's this point in the game where we start getting really, really careful about keeping the area and tools clean. Before we move to 120, we must rid the entire area of every last particle of 80 grit. Anything that can be hosed off, the stand, the bucket, the spray bottle, etc, should be. Toss any sponges or cloths you used into a plastic bag marked with "80 grit", to be used on your next mirror. A single stray particle of 80 grit between the glass will require you to start over at 120. Imagine being all the way down to 220 grit and getting a big scratch across the mirror, undoing hours of work. I often change my clothes and shower between grits as well. At least wash your hands well, paying attention to under your fingernails, a favorite hiding place for grit.

Once you have thoroughly cleaned the area, you are ready to begin with 120 grit doing exactly the same things we have been doing. Now swapping between MOT and TOT is essential to keep your sagitta constant. Swap every 5 wets, making sure to end on an even interval (i.e. note if you started MOT and make sure to end after 5 wets with TOT). Keep the randomness in the process as discussed above.

Again, your goal is to remove the previous grits pits. A magnifying glass is essential to check for uniform pit size. Occasionally you will see good uniformity, but will find a few larger pits scattered about. Take a Sharpie (permanent marker) and press the tip into the pit to mark it black. Resume grinding for a wet or 2. Check to see if the pit is gone. Often a few larger pits will remain because the grit particles aren't all the exact same size. Move on to the next grit if this is the case after working at it for a while.

Continue this way as you progress down through the various grits, 120, 180, 220, 280, (depending on your kit), cleaning everything well between grits. Next time we'll start with fine grinding, for which we use a new substance, Aluminum Oxide (A.O.), a soft white powder. Until then, grind more and worry less.



**The  
Weather SIG**

Date: Wednesday, February 28, 2001  
Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219  
Time: 7:00 pm

*Come rain or shine . . .*

## January 9, 2001 Lunar Eclipse

By Dale Fenske

I was delighted to receive news from my wife's Italian cousin regarding the February 9<sup>th</sup> total lunar eclipse. Luciano Paoli lives in St. Orsola Terme, Italy, which is located in a mountainous valley in Northern Italy near the Austrian border and close to Trento. This valley has little light pollution. From this location, they were able to view the eclipse, while we were unable to see it. So, even though they were new to astronomy, I asked them to report their impressions to me so I could share them with you.

This is the report given by Luciano and his sons David and Samuel.

***"I have assisted my boys in photographing the eclipsed moon. We went out on a small hill by our house. The moon became more and more dark. It was so dark, it became difficult to track in the sky. It was a chestnut brown color when fully eclipsed.***

***Questo fenomeno naturale era decisamente magnifico!***

***(This natural phenomenon was decidedly magnificent.)***

***(Mi emozionano sempre questi eventi.)***

***(These events always excite me.)***

***Ciao, Luciano e David e Samuel."***

## RCA Photo Gallery

Below: Saturn photographed by Glenn Graham on January 16, 2001. 5 photos taken with a 12" LX200 and a 3x barlow. A MaxIm/DL was used to combine and stack the images and to do some light processing.



**ASTROPHYSICS / COSMOLOGY SIG**

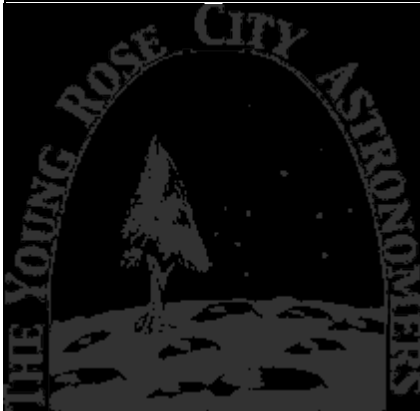
TIME: 7:00 PM

DATE: February 22, 2001

PLACE: 3237 S.E. 87th

TOPIC: A tour of the Swayze Telescope  
Optical Shop by Steve Swayze

Refreshments served-b.y.o.r.



## COOL FUN FACTS

### *What are the most common objects in the Solar System?*

The most abundant, substantial objects in the Solar System are the comets of the Oort Cloud, a roughly spherical shell that begins at three times the distance of Pluto's orbit and extends about halfway to the nearest stars. According to current estimates, there are about six trillion comets in the Oort Cloud.

From the distance of the Oort cloud, the sun is a bright star, about as bright as Venus looks from Earth. The temperature there is only four degrees Kelvin, which is about as cold as gets in the natural universe.

Once in a while, an Oort comet falls into the inner solar system. These rare visitors are interesting to science because they represent a sample of conditions as they were in the earliest stages of formation of the solar system.

More about the Oort Cloud:

- [http://www.windows.umich.edu/cgi-bin/tour\\_def/comets/Oort\\_cloud.html](http://www.windows.umich.edu/cgi-bin/tour_def/comets/Oort_cloud.html)
- [http://zebu.uoregon.edu/~js/glossary/oort\\_cloud.html](http://zebu.uoregon.edu/~js/glossary/oort_cloud.html)
- <http://www.amsci.org/amsci/issues/sciobs97/cloud.html>
- <http://www-hpcc.astro.washington.edu/mirrors/nineplanets/kboc.html>

Another Cool Fact about comets:

<http://features.LearningKingdom.com/fact/archive/1999/02/08.html>

Comet is a Cool Word:

<http://features.LearningKingdom.com/word/archive/1999/02/08.html>

# How to Make a Mirror — Part 3

By Ron Forrester - [rjf@skyhackers.org](mailto:rjf@skyhackers.org)

far from side to side you move.

Let's start out with a little preventative maintenance. As rough grinding progresses, we slowly wear down the bevel we carefully made on the tool and mirror. It is very important to keep this bevel maintained through rough and fine grinding, as it greatly reduces the possibility of chipping the edge of the tool and/or mirror. So take a moment now to go back over the edges with the diamond hone and get that nice 1/16" bevel back.

At this point you should be right around 80% of your desired sagitta, which means you are ready to move on to the next step, which involves a new stroke. This new stroke is often called the "W Stroke", since the center of the mirror traces out an extended W across the tool. See figure 1. Note that we are still using the 80 grit through this next stage.

The length forward/backward stroke should be around 1/3 of the diameter (D) of the mirror. For the side to side distance, 1/6D to 1/8D is best. These distances indicate how far the center of the mirror should travel from the center of the tool. So with our 8" mirror, 1/3D would be about 2.5" back and forth, and 1" to 1.3" side to side.

However, from this point on, a randomness to your stroke becomes very important. The law of averages will be on your side helping you achieve the spherical surface if you include randomness in your stroke. This is counterintuitive to many people (it was to me) who think that achieving the perfect mirror consists of a set of very precise movements. It's quite the opposite. Without a randomness in your stroke during finish rough and fine grinding, you have no hope of getting to a nice sphere.

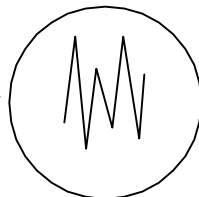


Figure 1

Fortunately, humans are anything but perfect, so it turns out to be pretty easy to get the randomness necessary:

- Don't count strokes. You want between 10 and 15 (one stroke is once forward then back). Vary it within that range.
- Vary the length of the stroke in both directions, sometimes moving 1/3D, sometimes less, sometimes more. I tend to vary between 1/4D and 1/2D, but I only occasionally go to the extremes – perhaps one in 15 strokes I will hit 1/4D or 1/2D, with the rest being randomly distributed between. It's easier than it sounds, just 'listen' for any regularity in your stroke and work to remove it.
- By the same token, vary by small amounts how

Just as with the initial rough stroke we used, after the 10-15 strokes we want to turn the mirror slightly, then walk around the stand in the opposite direction (superstition, but hey, it works), and resume the stroke. It is also important to vary how far you turn the mirror and how far you walk around the stand. I usually vary between 1/6 and 1/4 of the circumference. Just make sure you vary it.

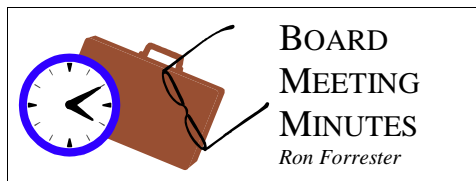
Continue with the same 'wet' strategy we used in initial rough grinding. As you hear/see the grit begin to lose it's bite, sprinkle some more on and add a little water from the spray bottle. Use a reasonable amount of pressure during these wets, but perhaps not quite as much as during the initial rough grinding.

What we are doing at this point is broadening the depression we made in the mirror during initial rough grinding. If you took a close look at the mirror after reaching your 80% sagitta point, you saw that the center of the mirror was much more worn than the outside. At this point we are causing that depression to work it's way all the way out to the edge of the mirror. Conversely, the tool was worn much more on the edge, and we are now slowly grinding away the center. This will slowly work the two pieces of glass into very nearly opposite shapes. Be sure and keep an eye on your bevel, stopping every 5-10 wets to renew it if necessary. I cannot stress this enough – you don't want to chip the edge of your mirror. Although it makes little difference (assuming it's small) in how the mirror will perform in the end, it will never-the-less take years off your life (grin).

What you are looking for at this point is for the mirror to become completely and uniformly ground across the entire surface, all the way out to where the bevel starts. If you look at the surface with a good magnifying glass, you will notice numerous tiny pits across the entire mirror face. At 80 grit you will find quite a variation in the size of the pits, but you want a good average. With the face of the mirror dry, the gray frosted color should be completely uniform when holding the mirror at arms length. If you find unusually large pits, or large variations in the color of the mirror face, continue with rough grinding. It's better to do a little too much than not enough.

During this stage you may want to measure your sagitta to check your progress. If you overshoot your sagitta, or feel

(Continued on Page 4)



Board Meeting of the Rose City Astronomers, Monday, January 8, 2001

Present: Norm Trost, Bob McGown,, Matt Brewster, Peter Abrahams, Jim Girard, Ron Forrester, Scott Turner, Jan Keiski, Carol Huston, Sameer Ruiwale, Vern Weiss, Dareth Murray, Scott Fitzpatrick

Treasurer Report – V. Weiss: The subscription checks (Approximately \$300) never arrived. RCA has approximately \$14,964 in the bank.

Programs – M. Brewster: January's meeting on SIGs is a go. Beverly Lynds is set to speak at the February meeting on Career's in Astronomy. Candace is booked for March to discuss the Messier planetarium program. Jim Girard will do April on CCD Imaging.

Star Parties – S. Turner: Scott brought the final 2001 Star Party schedule (looks great!). May 26<sup>th</sup> is set for the joint star party with RCA and clubs in Salem and Eugene, initial location is Pine Mtn.

Membership -- C. Huston: RCA has 357 member families as of January, 2001.

New Members -- C. Huston: We talked about making more clear that the general meetings start at 7:30pm, but doors open at 7pm. Dareth to update the web, any new tri-folds or business cards will reflect this as well.

Sales – S. Ruiwale: Contacted a local supplier of Lens Pens, and will get an initial shipment to sell at the general meetings.

SIGs – S. Fitzpatrick: Provided a list of known (and rumored) SIGs: weather, deepsky, imaging, Amateur

Telescope Making, Kids (YRCA), Solar, Sidewalk Astronomy, Computer, Planetary/Lunar, Double Stars. Some of these are past SIGs, and not currently active.

Library – J. Keiski: Jan reports library status as nominal.

IDA – B. McGown: Bob reports we are losing the battle to mercury vapor lamps in the suburbs – adding switches to them so they can be turned off would be of great help. He will be doing a slideshow @ Clackamas on light pollution problems.

YRCA: January (SIG) meeting will include a table for the YRCA. The new plan of involving the YRCA members in activity during the general meeting will be put to trial in subsequent meetings.

Community Affairs – N. Trost: Slides are due to come in for Candaces program.

OMSI Liaison – Holiday party went well, estimated attendance of 100.

Web – D. Murray: Will update the calendar (star parties) and list of offices when information is final.

Phone Line: January 1-15: Norm Trost. January 16-31: Matt Brewster. Feb. 1-15: Dareth. Feb. 15-28: Bob McGown.

Still searching for a Media Director. Officers should keep notes on what the job entails, tips, etc, for those who follow in their footsteps.

According to By-Laws, we need three filled Director positions on the Board. We need to visit this and make sure we are compliant. Next meeting will involve the Director issue, as well as reviewing the Articles and 501C3 requirements.

**WANTED:**



**PHOTOGRAPHER!**

Let's put more photos in the RCA newsletter. If you have a digital camera and attend many of the RCA functions, consider offering to take photos for the Gazette. It would be nice to have photos of speakers at General Meetings, star party memories, etc. Email Candace at [candace@europa.com](mailto:candace@europa.com)

**CLASSIFIED ADS**



FOR SALE: Pelican Case model 1550 with dividers, perfect condition. Carry-on size. Inside Dimensions: 19x14x8 inches, \$90. Reply to: Greg Babcock at [gregb@iccom.com](mailto:gregb@iccom.com)

FOR SALE: Celestron 102HD. In excellent condition plus Meade Barlow Lense. Asking \$575.00 and would consider a trade for spotting scope of equal quality. Dennis Hucke Home: 503-492-2361 Cell: 503-799-7520, Email Work: [dennish@cleanpak.com](mailto:dennish@cleanpak.com) Email Home: [dennish@integrityonline.com](mailto:dennish@integrityonline.com)

FOR SALE: Meade Pictor 216xt CCD camera. Asking \$500 (\$695 new) with all the original pieces and box. So, if you have wanted to try CCD imaging and autoguiding, and you want 16 bit images so you can learn some image processing—call. Glenn Graham (503) 579-1141 or [sueandglenn@msn.com](mailto:sueandglenn@msn.com)

FEBRUARY 2001						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

MARCH 2001						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

### February

Feb. 3	Sat.	TM Workshop	Tech. Marine Srvc. 10:30 AM
Feb..5	Mon.	Board Meeting	OMSI Parker 7:00 PM
Feb. 10	Sat.	TM Workshop	Tech. Marine Srvc. 10:30 AM
Feb. 19	Mon.	Young/Jr./Elem. YRCA	OMSI Audi. 6:30 PM
<b>Feb. 19</b>	<b>Mon.</b>	<b>General Meeting</b>	<b>OMSI 7:30 PM</b>
Feb. 21	Weds.	TM Workshop	Tech. Marine Srvc.6:00 PM
Feb. 22	Thur.	Cosmology SIG	PSU 7:00 PM
Feb. 28	Weds.	Weather SIG	Colonial Office 7:00 PM

### March

Mar. 5	Mon.	Board Meeting	OMSI Parker 7:00 PM
Mar. 10	Sat.	TM Workshop	Tech. Marine Srvc. 10:30 AM
Mar. 14	Weds.	TM Workshop	Tech. Marine Srvc. 6:00 PM
Mar. 17	Sat.	Vernal Equinox Star Party	OMSI Dusk
Mar. 19.	Mon.	Young/Jr./Elem. YRCA	OMSI Audi. 6:30 PM
<b>Mar. 19</b>	<b>Mon.</b>	<b>General Meeting</b>	<b>OMSI 7:30 PM</b>
Mar. 21	Weds.	TM Workshop	Tech. Marine Srvc. 6:00 PM
Mar. 23-25		Kah-nee-ta Star Party	Warm Springs, Oregon
Mar. 28	Weds.	Weather SIG	Colonial Office 7:00 PM

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-omsi.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-omsi.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012



# The Rosette Gazette

Volume 13, Issue 3

Newsletter of the Rose City Astronomers

March, 2001



## NEBULAE FOR ALL TIME

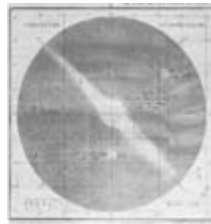
### In This Issue:

- 1 General Meeting  
New Members
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
YRCA
- 3 Observer's Corner
- 4 Weather SIG  
March at OMSI  
Optics Workshop
- 5 Cool Fun Facts  
Cosmology SIG
- 6 Making a Mirror-4
- 7 Black Holes
- 8 Photo Gallery
- 9 Board Minutes  
Classified Ads
- 10 Calendar/Events

Charles Messier was known to his 18th century colleagues as the world's leading comet authority and the "ferret of comets." He observed over 50 comets during his lifetime.

To modern day amateur astronomers, we recognize Messier's greatness as the first astronomer to catalogue over 100 deep sky objects.

Each year, March is a particularly celebrated month, for it is during this month that one has the chance of observing all 110 Messier catalogue objects in a single evening!



Messier's drawing of M31

This month's RCA General Meeting will be held on Monday, March 19th at 7:30 PM in the OMSI Murdock Planetarium. The program will feature a planetarium show designed specifically for the RCA to look at the life of Charles Messier as well as the magnificent deep sky objects he observed over 200 years ago.

This program will be held the Monday

prior to the Kah-nee-ta Messier Marathon Star Party, March 23-25th at the resort in Central Oregon. Join us at OMSI on Monday, March 19th!

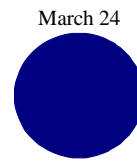
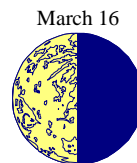
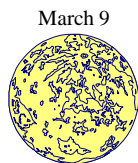
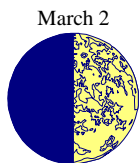


Charles Messier

### Kah-Nee-Ta Messier Marathon Star Party, March 23-25th

This is the final announcement for the Kick-Off Star Party of the RCA for the 2001 Season. For further information, see last month's newsletter, the RCA website, or contact Carol Huston at 503-629-8809. Join us at the Kah-nee-ta Resort for the star party!


  
**WELCOME NEW MEMBERS!**
  
 Michael Bowlin  
 Victor Bruhn  
 Jeff Cooley  
 Mark Dakins  
 Bob Dunn  
 Amanda Forsythe  
 Michael Greger  
 Phil Murray



Club Officers			
President	Peter Abrahams	(503) 699-1056	telescope@europa.com
VP Members	Doug Huston	(503) 629-8809	geometer31415@aol.com
VP Observing	Scott Turner	(503) 788-6484	kings@phoenixdsl.com
VP Community Affairs	Norm Trost	(503) 668-7979	normt@europa.com
VP, Communications	Matt Brewster	(503) 774-0360	brewster@teleport.com
Treasurer	Vern Weiss	(503) 236-1059	vernlw@earthlink.net
Secretary	Ron Forrester	(503) 504-8071	rjf@skyhackers.org
Sales Director	Sameer Ruiwale	(503) 617-0736	sameer_ruiwale@hotmail.com
Editor	Candace Pratt	(503) 296-6758	candace@europa.com
Web Master	Dareth Murray	(503) 762-4377	dareth@teleport.com
Library Director	Jan Keiski	(503) 293-3281	jikeiski@juno.com
Telescope Librarian	Brian Richardson	(503) 625-7373	brian_shelly@earthlink.net
Alcor, Historian	Dale Fenske	(503) 256-1840	fenskedf@juno.com
Media Director	Glenn Graham	(503) 579-1141	sueandglenn@msn.com
Special Interest Groups	Scott Fitzpatrick	(503) 669-8243	
Youth Director	Margaret McCrea	(503) 232-7636	mags@europa.com
Light Pollution Rep.	Bob McGown	(503) 244-0078	mcgown@teleport.com
New Member Programs	Carol Huston	(503) 629-8809	StarsCarol@aol.com
Magazine Subscriptions	Johan Meijer	(503) 777-0706	johanm@www.com



**President's  
Message**  
By  
Peter Abrahams

## THE RCA TELESCOPE LIBRARY

The RCA has owned a telescope collection for some years now, and now that we're a 501-C-3 organization, donations will probably be increasing. Most of the telescopes will be dedicated to our telescope library, run by Brian Richardson and John Hansen. However, we currently have 7 telescopes and a binocular in circulation, and when they are returned at a meeting, it is clear that about 8 is as many as can be handled in these circumstances -- the equipment must be checked for completeness and condition; and an inexperienced user needs to be instructed in use.

If we cannot increase the size of our telescope library, we have the luxury of considering what we should do with some of our equipment. The current list of equipment owned by RCA and circulating in the library is: 12 inch Dobsonian by Dethloff; three, 8 inch Dobsonians; two, 8 inch SCTs; Meade

ETX; Fujinon 10 x 70 binoculars; Daystar Hydrogen alpha filter set up for an SCT. Remember that you must be a member for three months before you can borrow equipment. The hydrogen alpha filter is only available to those who have demonstrated proficiency in its use, and is usually booked far in advance; the board has not formulated a precise loan policy for the filter, but it is too valuable and delicate to be available to any & all members.

The current list of equipment in storage or repair is: 12 inch Sky Designs Newtonian, very heavy, on wheels but not useable as a library telescope, in repair. Four, 8 inch Dobsonians, some ready to go and some need fixing; one has a Swayze mirror and one a Banich mirror. 5 inch refractor objective, probably very high quality, new telescope under construction, will probably be a folded design and possibly wheelchair accessible. 8 inch SCT, barely functioning. 8 inch Classical Cassegrain, needs spider & mirror cell. 6 inch Newtonian, Russian, and equatorial head that runs off 220 V 50 hz current. Tasco computerized mount for small telescope. 76 mm refractor. 10 inch Coulter mirror.

One or more telescopes will be kept at OMSI for display at OMSI events and use by the YRCA at meetings. The dobs with very high quality mirrors need to be discussed by the board. The other

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The Young Rose City Astronomers



RCA sponsors three groups of kids activities: Elementary ages

6 - 9), Junior (ages 10 - 13), and Young Rose City Astronomers (ages 14 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

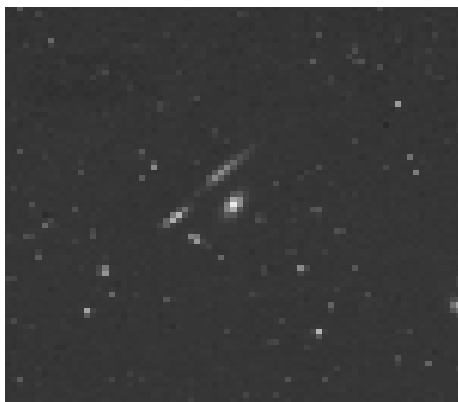
equipment should not be in storage and needs to be used. We are considering a separate 'library' with very long term check-out. The telescope making workshops could be integrated with the library; either to repair the scopes or to provide a better venue for their loan & return.

We are also considering selling some equipment, but we need to get expert advice on our non-profit status. Members who are interested in repairing a telescope and using it for a long term, possibly a year or more, can contact me.

**Deep Sky**

The 100 Hickson galaxy groups probably sound as exotic and inaccessible as the latest image of the Hubble Space Telescope. Truthfully, some of these compact galaxy groups are out of reach for most amateur's scopes, but a surprising number can be enjoyed with direct vision.

**Hickson 61** for example. Also known as "the box", it is a small group of four galaxies in close proximity to each other. They are all NGC galaxies and the faintest glows at magnitude 13.3 which is



Hickson 61

within reach of a 12" scope under a dark sky. The brightest is magnitude 12.2. Probably visible in an 8" scope.

So why the nickname "the box"? The group is made up of three edge-on galaxies, two of which are lined up end to end and the third is perpendicular to them. The fourth galaxy is actually the "A" component, NGC 4169 and it's a SO spiral. It completes the rectangle of galaxies, and "the box".

I've seen images of this group for years and just recently plotted it

on my Sky Atlas 2000. To my surprise, it's in Coma Berenices and practically overhead for the next few months. The photos make it seem so obvious, but then most photos of anything celestial are that way, so I didn't know what to expect. But the first view was startling – pow! – there they were, just as advertised. The box shape was immediately apparent, each component worthy of a close look on its own. The two end to end edge-on galaxies were the most prominent feature at first glance, but working the view a little and making sure I cupped the eyepiece with my hands to insure no extraneous light leaked in, all four galaxies were equally seen.

To back off a bit, yes, this was through my 20" scope in a dark sky, so what I saw would be different than what a 8" scope would show. However, it was too obvious not to be seen in much smaller apertures, and it might surprise those willing to give it a try. About three quarters of a degree southeast of NGC 4136 (an 11.0 magnitude galaxy), Hickson 61 is relatively easy to find.

**Hickson 61, compact galaxy group. NGC 4169, 4173, 4174 and 4175. Mags. 12.2 to 13.3: surface brightness' 11.5 to 14.3. SA 2000 chart 7, UA pg. 107.**

**Solar System**

A brighter target is **Mars**. Growing rapidly in apparent size as we catch up to our ruddy neighbor, this month Mars reaches about 10 arc seconds in diameter, a good size to start observing.

Although small, in moments of steady seeing you'll be able make out the higher contrast features. Be aware that Mars will be just

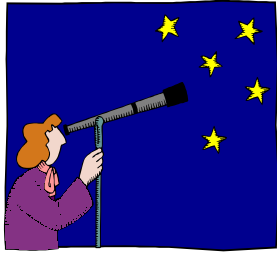


Mars Sketch

north of Antares in Scorpius, so the seeing probably won't be all that steady. And this is what makes this opposition season of Mars relatively unfavorable for us in the Northern Hemisphere – it will stay low in our southern sky. The place to be is south of the equator this time.

Ah, but that's the way it goes, and good for our friends down under for a change. We will still have some great views here up north, but practicing seeing Mars is important if you really want to see much the detail. Mars is small object even when it's at its closest to Earth; at best this year it will be about the apparent size of Saturn's globe. The surface and cloud features of Mars are almost all low contrast and generally need color filters to boost the contrast enough to be seen well.

Mars will test your observing patience. Practice now and the views will seem all the sharper when Mars spans a relatively large 20.8 arc seconds when it is nearest to Earth on June 21<sup>st</sup>.



# MARCH AT OMSI

Spring officially begins with the vernal equinox on Tuesday, March 20 at 5:31 am PST. On Saturday evening, March 17, OMSI and Rose City Astronomers will celebrate the vernal equinox and the beginning of spring with a free Star Party!

Join us as we gaze at the spring sky at OMSI's east parking lot, located on 1945 SE Water Ave, starting at 7:30 pm. From beginners to experts of all ages, here's your opportunity to view the stars, and other objects up-close and personal through telescopes. Viewing highlights includes the Orion Nebula, Beehive star cluster, and more!



**The  
Weather SIG**

Date: Wednesday, March 28, 2001  
Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219  
Time: 7:00 pm

*Come rain or shine . . .*

For possible weather cancellation, call (503) 797-4610 on March 17 after 3:00 PM to get the latest information.

## The 10th Annual Telescope Optics Workshop

MIRROR FIGURING AND TESTING is the theme for this year's Telescope Optics Workshop held March 31 through April 1, 2001 in Bellingham, Washington at Western Washington University.

This is the year to bring your unfinished mirror projects for figuring and testing. We have assembled a staff of experienced mirror makers that will assist you with figuring, testing, and interpreting test results. We will have over 15 work stations available for your use along with a variety of test equipment and test methods. Bring your mirrors for testing and figuring.

There has been much talk recently about microflexing mirrors, changing the shape of the optical surface by physically bending the substrate. Alan Adler is the man that has accomplished this task and will be presenting his methods and demonstrating the results at the workshop. In addition, Mr. Adler will be discussing thermal stabilization within the optical path and methods used to eliminate thermal imaging problems.

Mr. Jim Burroughs has been a long term participant at the workshop and this year he will be demonstrating the Hartman test. George Watters returns this year for another talk on

innovative telescope designs. His talk on "Stars to Protozoa" will cover a new multi purpose telescope design.

Mel Bartels is the mirror making class instructor this year. This advanced class will be figuring and testing 16" f/5 mirrors with the intent that participants will leave with a finished mirror surface along with the expertise gained when working on such a large mirror. This class is sold out.

Chuck Smith and Carl Zambuto will be returning to help mirror makers with their mirror projects.

**BRING YOUR FULLY POLISHED MIRRORS** to figure and test at the workshop. Make sure your mirrors are fully polished and ready for the figuring and testing process.

The workshop staff will be discussing Spotting/Finder/Widefield telescopes..... the largest gathering of spotting/finder scopes ever assembled.

....We ask that you bring your finished and unfinished projects for display and discussion.

Kreig McBride and Workshop Staff  
[www.wwu.edu/~skywise/optics.html](http://www.wwu.edu/~skywise/optics.html)





## From the Sales Director: Sameer Ruiwale



Beginning at the March 19th General Meeting, we will be selling 'LensPens.' We will be purchasing them from a local distributor who has volunteered to attend the March Meeting to demonstrate its use and answer any questions you may have. Be sure to stop by the SALES TABLE and meet Chris Perri from LensPen!

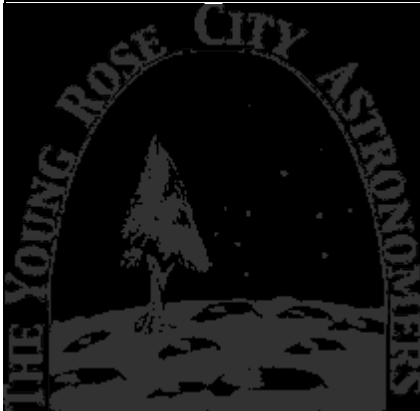
## ASTROPHYSICS / COSMOLOGY SIG

TIME: 7:00 PM

DATE: Thursday, March 22, 2001

PLACE: Linus Pauling House, 3941 S.E. Hawthorne Blvd.

TOPIC: Cosmology of Double Stars  
—Vern Weiss



## COOL FUN FACTS

### *What are the most common objects in the Solar System?*

Once in a while, an Oort comet falls into the inner solar system. These rare visitors are interesting to science because they represent a sample of conditions as they were in the earliest stages of formation of the solar system.

The most abundant, substantial objects in the Solar System are the comets of the Oort Cloud, a roughly spherical shell that begins at three times the distance of Pluto's orbit and extends about halfway to the nearest stars. According to current estimates, there are about six trillion comets in the Oort Cloud.

From the distance of the Oort cloud, the sun is a bright star, about as bright as Venus looks from Earth. The temperature there is only four degrees Kelvin, which is about as cold as gets in the natural universe.

More about the Oort Cloud:

[http://www.windows.umich.edu/cgi-bin/tour\\_def/comets/Oort\\_cloud.html](http://www.windows.umich.edu/cgi-bin/tour_def/comets/Oort_cloud.html)

[http://zebu.uoregon.edu/~js/glossary/oort\\_cloud.html](http://zebu.uoregon.edu/~js/glossary/oort_cloud.html)

<http://www.amsci.org/amsci/issues/sciobs97/cloud.html>

<http://www-hpcc.astro.washington.edu/mirrors/nineplanets/kboc.html>

Another Cool Fact about comets:

<http://features.LearningKingdom.com/fact/archive/1999/02/08.html>

Comet is a Cool Word:

<http://features.LearningKingdom.com/word/archive/1999/02/08.html>



# How to Make a Mirror — Part 4

*By Ron Forrester*

We finished off last time with rough grinding, and are now ready to leave that brutish task behind. At this point we should have a pretty decent sphere whose sagitta (and hence focal length) is very nearly what we set out for.

The days of setting a ruler across and sticking various things under to measure our sagitta are over. It's time enlist the help of a very good friend in this matter—light. Recall that the purpose of this mirror is to focus light to a point in space, the distance to that point being the focal length.

Get a standard flashlight, a white poster board or construction paper, and a spray bottle of water with a drop or two of dish soap added. In a dark room, prop the white paper up against something like the edge of a couch. Place the flashlight such that the face is even with the front of the paper, shining away from the paper. Now wet the full face of the mirror with the water bottle.

Our goal is to reflect the light onto the paper, as focused as possible. We want to take the mirror, move back from the paper by approximately the ROC (radius of curvature, i.e. twice the focal length), and try and reflect the light from the flashlight onto the white paper. Move the mirror back and forth until you get the most focused spot possible. Measure the distance, divide by two, and that is your current focal length. For our 8" f/8, the distance divided by two should be about 64". It will vary, so don't be surprised. Unless it is way off, there is nothing to worry about.

In the case of the measured focal length being wildly off, for instance 40" instead of 64", do the test again to double check. If it's still off, go back to the ruler/drill-bit test and see if your sagitta confirms the result. If you are still wildly off, you'll need to return to 80 grit and grind with mirror on top to deepen the sagitta, or tool on top to make it more shallow. If, however, you are only slightly off target, we can make some fine adjustments during fine grinding.

Before continuing, take a moment to renew the bevel on both the tool and the mirror. If you put a good one on both this is likely the last time you'll have to. Lets also take a few minutes to clean the area thoroughly. Hose down all tools, the stand, and wash your hands completely, paying special attention to under the nails.

Aluminum Oxide (AO) normally comes in sizes measured in microns. A typical progression is 25, 20, 15, and 9. Some people go as low as 5 and 3 micron, but I don't personally recommend it. The opportunity for introducing scratches at such small particle sizes is much too high. Stopping at 9 micron just means a little extra polishing effort later.

Fine grinding with AO is really no different than what you have been doing with the carbide grit. We'll use the same W stroke

and introduce the same random variations to our stroke and rotations.

The AO is a fine enough power that you may want to pre-mix water with it before applying it. Put a few tablespoons into a clean baby food jar and mix a little filtered water in until you have something about the consistency of a thick-ish milk. It should flow readily, but not be watery. Take an unused paint brush and brush some mixture across the face of the mirror and begin your W stroke.

The sound made when grinding with AO is akin to a 'singing', a kind of a high pitched tone made as you push the glass back and forth. As before, listen to the sound to know when to start the next wet. With AO, I wash the tool and mirror in the bucket between each wet. The mirror will begin to take on a smooth frosty look as you proceed. I like to swap MOT and TOT every 5 wets to keep the focal length as constant as possible.

After a good 10 wets, check your focal length using the flashlight test. Make sure to wet the mirror down with the slightly soapy water to get a good reflection. Also examine the mirror with a magnifying glass to see if you have removed all the pits from the last carbide wet. This first AO wet often takes the longest due to the grit size difference compared to the last carbide grit. Stick with it and make sure the mirror is absolutely uniform in grayness before moving to 20 micron AO. Don't allow any unusually large pits to remain.

When you are satisfied with the progress at 25 micron, clean everything again—discard the paint brush and any towels and sponges you used. Thoroughly hose down the stand and bucket. Clean your hands, and start again with the 20 micron AO. Use a new baby food jar, paint brush, towels and sponges.

Continue this procedure down through 9 micron AO. Make sure at each step, before you go on, that the mirror is completely uniform in grayness. In the next step, polishing, you will not be able to appreciably affect the existence of pits or other defects in the mirror. You must be sure they are all removed during fine grinding.

A few things to keep in mind—make sure throughout that you continue the random variations in stroke and rotation. This is the magic that makes generating a sphere almost a given—in fact, it's virtually guaranteed by following the few basic rules, despite being somewhat counterintuitive.

Next time we'll start discussing the polishing procedure. This is normally the most intimidating part of making a mirror, but it doesn't have to be. We'll cover a number of topics over a couple of articles in preparation for polishing and eventually figuring your mirror. Feel free to read ahead in the recommended books and go for it. We're close now, and you'll be looking at the night sky in no time (you **have** finished the mount, right?).

# Black Holes

By Rebecca Boyd, Young Rose City Astronomers

## I. Introduction

Black holes are one of the galaxy's most mysterious objects. What lies inside the event horizon of a black hole? Perhaps we will never know. However, we can still theorize about what goes on inside a black hole. Maybe some day, we will find a way to know what goes on inside, and be able to satisfy our curiosity.

## II. Basic Black holes

### A. The Theory

A black hole is a massive star that has collapsed to an infinitely dense point in the universe. The object is so dense that its escape velocity is greater than the speed of light. The distance light can travel away from the singularity point, before falling back, is called the event horizon. Anything entering this area appears to be swallowed up and never let out again.

### B. The Original Idea

German astronomer Karl Schwarzschild "discovered" black holes in 1916 due to Einstein's theory of relativity. Based on that theory, space-time around a black hole would be altered. For example, if you were to watch someone approach the event horizon of a black hole, it would appear as if they were slowing down. As he reached the event horizon, it would look as if he had stopped, would begin to turn reddish and then slowly fade out of view.

If you yourself were looking away from the singularity as you are about to fall into a black hole, your view would seem the same after you crossed the event horizon as it was before you had passed it. This is because light crossing the event horizon remains unaltered except for the fact that it cannot return.

### C. Formation

One reason for the existence of black holes could be just the natural course of evolution. As stars use up the nuclear fuel inside their cores, the radiation flowing outward is no match for the gravity pulling itself inward. If the mass of the core is greater than 1.7 solar masses, then the formation of a black hole is imminent.

### D. Evidence

In 1994, the Hubble Space Telescope was used to find the first convincing evidence that black holes do exist. Hubble measured the acceleration of gases around the M 87 galaxy. It found that an object of 2.5 billion to 3.5 billion solar masses must be within the galaxy. In 1995 two more were found, and both had accretion disks circling where scientists thought the black hole should be. In 1997, the Hubble Space Telescope was used again to search for black holes and found that nearly every galaxy it found had a large black hole within its grasp.

## III. Entropy with Black holes

In 1970, Stephen Hawking began to research black holes. Hawking realized that the surface area of the event horizon of a black hole could only increase in area or stay the same size with the passage of time. For example, if two black holes merge, the surface area of the new black hole would be larger than the sum of the two original black holes. If this were true, black holes would eventually swallow up every thing in the universe because nothing could ever escape a black hole. He also noticed that there were parallels between the laws of thermodynamics and black hole properties. The second law of thermodynamics states that entropy must increase with time. As stated above the same is true for a black hole. But whatever goes in to a black hole can't be seen, and the only thing you can know about a black hole is its mass, rotation and electrical charge. If one were to drop something with much disorder into a black hole, the entropy of the currently observable universe would have been decreased. Nevertheless, we would not have done enough work

to justify the apparent lack of entropy that accompanies in a black hole. But trying to provide an exception to this law of thermodynamics just made things more complicated than they already were. So, people turned to the thought that black holes might actually give off radiation, either now or in the future. The more entropy you have, the less information you have. So a black hole might be considered the ultimate in the case of entropy. If you took two glasses of water, one hot, one cold, and poured them together, the water molecules would mix together, hot molecules slowing down and cold molecules speeding up. This makes it very difficult to separate them again. But if you were to put that glass into a passing black hole, the cup of water

would be mixing with all the other mass that had fallen past the event horizon earlier. You would be adding mass and entropy. So as you increase the entropy of a black hole, you are increasing its surface area as well.

## IV. Seeing Black Holes

The thought that black holes have entropy had a big effect. It meant that they would have to have heat. If they had heat it would mean they would have to radiate. Stephen Hawking believed that rotating black holes could emit particles by amplifying certain wavelengths. A black hole that was not rotating could not do this. But then we found that black holes really are warm, even if they do not rotate. Saying that it has heat means it loses particles. So over time, if it has no steady stream of matter flowing into it, a black hole will not be able to keep space-time wrapped up. By the time it reaches that stage, it will explode. So now, black holes can no longer take over the universe. According to relativity, the particles just inside the event horizon of a black hole cannot cross into the outside world. But with quantum physics in the picture, the position

(Continued on Page 8)



## RCA Photo Gallery



Above left: Photo taken by Mark Seibold of RCA members observing the Leonids meteors at Tyghe Ridge.



Above right: Mark Seibold took this picture at the 2000 Kah-nee-ta Messier Marathon last March. Note the North American Nebula in the upper center of the photo.

(Continued from Page 7—Black Holes)

of a particle is inexact. Most of the time a particle will stay intact, but on rare occasions, it may take a small quantum hop. This hop would take it outside of the event horizon. In other words, particles are continually annihilating one another, but every so often one manages to break away before it can be destroyed by its counterpart. Thus, the particles escape. Black holes are only a few degrees above Kelvin, and the bigger it gets the cooler it becomes and vice versa. Since it is cool, that means that there is not very much radiation escaping. So black holes last a long time.

### V. Wormholes

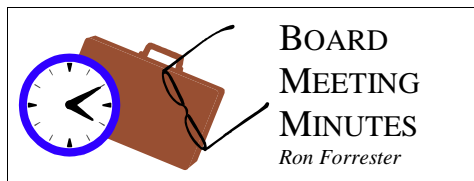
Wormholes are another aspect of black holes. If you were to go to a two-dimensional universe, and you had two

black holes at different points, a single black hole would be an infinite hole. Now imagine that these two points are connected, they would no longer be infinite but would leave a tunnel. Because the beings in this land are two-dimensional they would be unable to comprehend the shape of the actual tube. In our three-dimensional universe, it is nearly impossible for our mind to comprehend a respective tunnel like that. Wormholes would take a lot of energy to warp space-time; hence they may have formed in the early universe. To travel through a wormhole, first you would have to find one. Since we believe that they were formed in the early universe, many of them may have already dissipated. That means that there are fewer of them out there and only more difficult to find. Now you have to worry about getting through without being infinitely stretched. That would not do

you any good. You would also have to consider the possibility that it might fold back to where it came from, with you in it. And that is not even mentioning where in the world you might end up.

### V. Summary

What will we do with all of these theories about all the possibilities surrounding black holes? Most likely it will just help our curiosity for the moment, but some time in the future we might use this knowledge for the betterment of the human species. If you told a man one thousand years ago to stand on the moon, he would have no idea on how to go about doing that. But now, that seems common knowledge to us. Imagine what we will know in the next thousand years.



Board Meeting of the Rose City Astronomers, Monday, February 5, 2001

**Present:** Scott Turner., Peter Abrahams, Dareth Murray, Carol Huston, Doug Huston, Glenn Graham, Matt Brewster, Ron Forrester, Norm Trost, Vern Weiss, Sameer Ruiwale, Jan Keiski, Scott Fitzpatrick., Bob McGown, Dale Fenske.

**Treasurer - Vern:** Issue was that our assets were too high by the specified amount, this in the year 1998/1999. Magazine money has to be reported as revenue. Vern handed out budget summary report for 7/1/2000 through 6/30/2001. Also handed out a transaction detail report, 6/1/2000 to 2/2/2001. A letter with the amended 1999 CT-12 form has been sent to Dana Marsha, who has said the issue will be closed when she receives it. Please name and date on bill and the account to be charged. If you personally spend money and don't have receipts, write down in detail what it is and you can still be reimbursed. We have a "sweep" account which has \$300, it will be closed with money be transferred to main account. Current bank balance is 15,176.30.

**Programming - Matt:** This month is Beverly Lynds, astronomer of 40 years. Month after is planetarium show which Candace authored. April is Jim Girard, CCD imaging, with help from Richard Barry. September, Ken Crosswell is putting out another book, so he will be speaking that month. Sam Kimpton in the works. Lens Pen rep. may show up to talk before the general meeting to explain/pitch the product.

**Star Parties - Scott:** Scott displayed topo maps of the Vernonia site, looks like a very good west-side potential. Nothing official, but scouting sites continues. Star Party schedule in the newsletter looks good. Coldwater site may be gated due to vandalism/shooting, etc. Kah-nee-tah is all set, one volunteer has stepped forward to help. There will be sign posted down at the entrances which thanks the Warm Spring Indians for the use of the site. Call for volunteers regarding the Salamanders

to Stars Wetland Event.

**Sales - Sameer:** January Sales were great, all of the Calendars were sold.

**New Members - Carol:** Biggest month in a year -- 18 new members from January meeting, and 6 renewals.

**Library - Jan:** Nominal.

**Light Pollution - Bob:** Keep light pollution list active with info about projects, etc. Bob giving a talk at PSU this Thursday. Bob Gent would be willing to cut the check to the printer, RCA or whomever for observers guide.

**SIG's - Scott:** Nominal.

**AL - Dale:** Safari in Zambia for the 2001 Eclipse.

**Membership - Doug:** 379 current members.

**Editor - All:** Location of Cosmology SIG wrong in current Gazette.

**YRCA:** Nominal

**Community Affairs - Norm:** Slides from the AL catalog, reducing booklet to 3x5 cards, pilot testing this month, hopefully. Slide set for Candaces' High-5 have been sent out to production.

**OMSI - Peter:** Home schooling day was interesting, Bruce Swazye showed up to help.

**Webmaster - Dareth:** Doing well. Carol provided new membership information page. To get list of all email addresses on the list. Some address will be those of non-members, we'll make it clear that you must be a member to be on the list.

**Telescope Library - Peter:** Four 8" Dob's were found that haven't been in the regular scope checkout line-up. Need to find out what we should do with them. We'll consider keeping one for use by the YRCA during general meetings, and to fix up.

**Magazine:** Nominal

**Hancock - Glenn:** Very enthusiastic about previous encounters, hopefully by the end of the week we'll have the key dates for needed volunteers. 3-4 volunteers could have free room and board in exchange for the volunteer work. No prices discussed yet.

**Phone Line:** Scott for March 1-15, Dale for March 15-31. Scott finds a deal for ~\$10 a month for a voice mail box, Scott

to provide information.

Motion was made to name Glenn Graham to be Media Director . Motion was unanimously approved. Media director is not to get lots of new members necessarily, if it happens, great.

- Copies of 2001 Board of directors handed out by Carol.

- Details of contractual agreement for the Observation Guide need to be kept.

- Clarify rules for YRCA fundraiser.

- Guide to non-profits is available for 1 month periods.

- We need to have an Annual meeting, where elections are held, members raise questions, etc. Be more explicit to members that this is the meeting to do this kind of thing.

- Need to update the names on the Articles of Incorporation.

- Astronomy Day is coming up.

- Letter from Sky&Tel for posters, etc.

## CLASSIFIED ADS



**FOR SALE:** Meade LX200 7inch Maksutov-Cassegrain Includes: OTA, tripod, 1.25" star diagonal, 8x50 finder, power supply and cords, 26mm Super Plossl eyepiece, owner's manual, packing case. Everything you need; it's ready to go and works fine. New from Meade: \$2795 plus \$125 shipping. \$2295 and will deliver within 125 miles  
Dick Hodgson  
(503) 292-4093  
rahmd@home.com

**FOR SALE:** Three year old Orion Skyview Deluxe 4.5 EQ Reflector complete with tripod and two 1.25 inch eyepieces: 25 mm (36X) and 9mm (100X) and Orion EZ Finder. Includes all manuals. \$275 or best offer. Herb  
(503) 771-1402.

MARCH 2001						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

APRIL 2001						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

### March

Mar. 5	Mon.	Board Meeting	OMSI Parker	7:00 PM
Mar. 10	Sat.	TM Workshop	Tech. Marine Srvc.	10:30 AM
Mar. 14	Wed.	TM Workshop	Tech. Marine Srvc.	6:00 PM
Mar. 17	Sat.	Vernal Equinox Star Party	OMSI	Dusk
Mar. 19.	Mon.	Young/Jr./Elem. YRCA	OMSI Audi.	6:30 PM
<b>Mar. 19</b>	<b>Mon.</b>	<b>General Meeting</b>	<b>OMSI</b>	<b>7:30 PM</b>
Mar. 22	Thurs.	Astro/Cosmology SIG	Linus Pauling House	7:00 PM
Mar. 21	Weds.	TM Workshop	Tech. Marine Srvc.	6:00 PM
Mar. 23-25		Kah-nee-ta Star Party	Warm Springs, Oregon	
Mar. 28	Weds.	Weather SIG	Colonial Office	7:00 PM
Mar. 31-Apr. 1		OPTICS WORKSHOP	Bellingham, WA	

### April

Apr. 2	Mon.	Board Meeting	OMSI Parker	7:00 PM
Apr. 7	Sat.	TM Workshop	Tech. Marine Srvc.	10:30 AM
Apr. 11	Weds.	TM Workshop	Tech. Marine Srvc.	6:00 PM
Apr. 16	Mon.	Young/Jr./Elem. YRCA	OMSI Audi.	6:30 PM
<b>Apr. 16</b>	<b>Mon.</b>	<b>General Meeting</b>	<b>OMSI</b>	<b>7:30 PM</b>
Apr. 18	Weds.	TM Workshop	Tech. Marine Srvc.	6:00 PM
Apr. 19	Thurs.	Astro/Cosmology SIG	Linus Pauling House	7:00 PM
Apr. 25	Weds.	Weather SIG	Colonial Office	7:00 PM
Apr. 28		ASTRONOMY CELEBRATION	OMSI	All day

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-oms.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-oms.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012



# The Rosette Gazette

Volume 13, Issue 4

Newsletter of the Rose City Astronomers

April, 2001



## The ABC's of CCD's: A Non-Technical Look at the Art and Science of CCD Imaging For the Amateur Astronomer

Richard Berry & Jim Girard

The last ten years has seen an almost explosive growth in the use of CCD cameras by the amateur astronomer. Fueled by the development of newer, lower cost CCD chips for use in non-astronomical commercial products; the ever-increasing computing power available at lower costs on the home PC; and better and lower cost commercially available telescope mounts, CCD's have become an every day fact of life for many amateur astronomers. The Internet has also played a major role in the dissemination of information, allowing both an avenue to exchange ideas and solutions to problems, as well as providing a forum to publish one's efforts.

The focus of the program will be to introduce, in a non-technical way, the use of this 'tool' to the average amateur. From the 'art' perspective, images are being produced now that weren't even being dreamed of 15 years ago. An amateur, armed with a medium level camera like SBIG's ST-7 or even a home-made camera like the Cookbook 245, and an eight inch telescope on a decent mount, can produce remarkable results both in b/w and color.

From a 'science' perspective, CCD's have allowed the amateur back into the game, providing them with a tool to make significant contributions to the scientific community, even from the average suburban back yard. These may take place in the areas of variable star observing, double star work, comet hunting, supernova patrol work, asteroid hunting, planetary surveys, and so on.

Richard Berry is a former editor of Astronomy

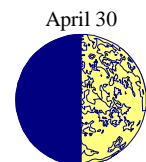
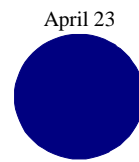
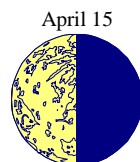
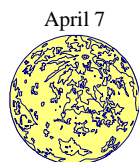
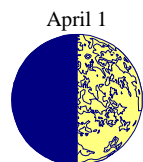
Magazine, and has written extensively about the use of CCD cameras by the amateur. He is the author of a number of books, including the early "Introduction to Astronomical Image Processing" (1991) as well as "The CCD Camera Cookbook." (1994) His latest offering to the imaging community, co-written with Jim Burnell, is "The Handbook of Astronomical Image Processing", which, along with the included software "AIP4WIN", is quickly becoming the definitive work in this area.

Jim Girard has been active in the RCA for more than ten years, and is co-chair of "Imaging the Sky", a yearly conference started in 1995 to serve the interests of the national and international amateur imaging community. He is also a member of the ARGO cooperative observatory, a small group of Northwest amateurs interested primarily in CCD imaging.

### In This Issue:

- 1 General Meeting  
New Members
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions
- 3 Young RCA  
NEW Members  
Kah-nee-ta
- 4 Weather SIG  
April at OMSI
- 5 Physics of Every-  
day Things  
Cosmology SIG
- 6 OSP 2001!
- 7 Pine Mtn. Observ-  
atory  
Looking at Seeing
- 8 Photo Gallery
- 9 Board Minutes  
Classified Ads
- 10 Calendar/Events


  
**WELCOME NEW MEMBERS!**
  
 Martin Alvey  
 Matt Arnash  
 Nicki Eybel  
 James Gillam  
 John Hingson IV  
 Sid Johnson  
 Cheryl Klein  
 Kurt Kreitzer  
 Jett Lemon  
 Jeff Martin  
 Deborah Reyes  
 Charles Taylor  
 Terry Ulvinen



Club Officers			
President	Peter Abrahams	(503) 699-1056	telscope@europa.com
VP Members	Doug Huston	(503) 629-8809	geometer31415@aol.com
VP Observing	Scott Turner	(503) 788-6484	scottturner@telocity.com
VP Community Affairs	Norm Trost	(503) 668-7979	normt@europa.com
VP, Communications	Matt Brewster	(503) 774-0360	brewster@teleport.com
Treasurer	Vern Weiss	(503) 236-1059	vernlw@earthlink.net
Secretary	Ron Forrester	(503) 504-8071	rjf@skyhackers.org
Sales Director	Sameer Ruiwale	(503) 617-0736	sameer_ruiwale@hotmail.com
Editor	Candace Pratt	(503) 296-6758	candace@europa.com
Web Master	Dareth Murray	(503) 762-4377	dareth@teleport.com
Library Director	Jan Keiski	(503) 293-3281	jikeiski@juno.com
Telescope Librarian	Brian Richardson	(503) 625-7373	brian_shelly@earthlink.net
Alcor, Historian	Dale Fenske	(503) 256-1840	fenskedf@juno.com
Media Director	Glenn Graham	(503) 579-1141	sueandglenn@msn.com
Special Interest Groups	Scott Fitzpatrick	(503) 669-8243	
Youth Director	Margaret McCrea	(503) 232-7636	mags@europa.com
Light Pollution Rep.	Bob McGown	(503) 244-0078	mcgown@teleport.com
New Member Programs	Carol Huston	(503) 629-8809	StarsCarol@aol.com
Magazine Subscriptions	Johan Meijer	(503) 777-0706	johanm@www.com

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

members who live in dark sites for use of their property; and work with the parks department. RCA members who know of good, accessible public sites; or who own property that we might be able to use, are asked to contact a board member.



can fit into their facility. It now appears very unlikely that this site would be one that we can use on a 'drop-in' basis, and probably it would be for scheduled public star parties only -- but that decision is up to the future manager.

The board has not pursued purchase of land because of the expenses and because there has never been a committed group of members willing to follow through with such a complicated procedure. In the past decade & in response to increasing light pollution, amateur astronomy has moved towards mobile observing and away from fixed observatories. However, the board is willing to work with any group of members who feel that an RCA observing site is a priority.

### Will There Be an RCA Observing Site?

The Oregon State Parks organization has proposed a new park in the Banks - Vernonia area. It is still in the proposal stage, and the land is privately owned, but public hearings have been held & planning has begun. I have submitted written guidelines for astronomical use of a park, and with Jim Girard have attended two of these hearings. Enough input has been provided that they are including 'stargazing' in their list of uses, and 'shielded lighting' in their list of equipment. We are now in a waiting game, and if the park is approved, it will be over a year before a manager is appointed and we learn how the RCA

RCA members sometimes voice their opinions that a permanent, dedicated RCA observing site is a desirable goal or a priority. There are certainly many benefits to be had -- a nearby site in a dark area that RCA members could use at any time, would solve many of our problems at Larch & Goat, would assist our public outreach programs, and could unify the RCA into a more cohesive social group. The board is aware of the problems with our current sites; especially having to tell new members or the public that our observing events occur at sites (such as Larch or Goat) that are not really safe enough to visit alone at night. Our current approach is to continue searching for sites accessible to public roads; solicit

These members would need to be aware of the funds to be raised, and especially the long term demands on volunteer time that owning property would bring. This is not a project that we can begin in the hopes that volunteers will appear as momentum is gained. If you feel that you have the time & commitment to join a committee for pursuing the purchase of an observing site for the RCA, please contact myself or another board member.

## The Young Rose City Astronomers

Children ages 4-12 are welcome to join in fun and educational activities while their grownups attend the monthly general RCA meetings! Activities will be hands-on and will cover a variety of Observational Astronomy topics. Kids should bring their enthusiasm and their ideas, as materials will always be provided for kids to do their own projects, as well as projects provided by the RCA kids teacher(s).

The kids' meeting takes place in the adjoining cafeteria at OMSI - the door is always marked. The meeting lasts from 7:00 p.m. until 9:00 p.m. (we begin and end our meeting at the same times as the general meeting). Parents, please drop off children just prior to the



general meeting and pick up your child as soon as possible after your meeting. Also, please let your child know that they should not go back and forth between the general meeting and the kids meeting. If you have any questions, please e-mail the Children's Meeting Organizer, Jennifer at [jenny@theforrest.org](mailto:jenny@theforrest.org).

## ATTENTION NEW MEMBERS

Now that you've joined this club, you are overwhelmed with the number of people, questions about equipment, and general confusion about how to get started in your hobby.

***Have we got the answer for you!*** A new member indoctrination will be held on Monday, April 16, at 6:00 PM at OMSI, right before the April general meeting.

Topics to be covered are:

- \* Club resources and how to access them
- \* How to prepare for and participate in star parties
- \* Helpful tips on how to get started with your astronomy program
- \* Introduction to observing programs
- \* Generic review of equipment
- \* Volunteer opportunities with RCA
- \* Your issues and questions
- \* Q & A

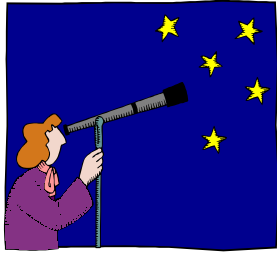
Bring your new member packet for reference. Please RSVP your attendance by calling Carol Huston at (503) 629-8809 with the number of attendees (or contacting via email at [StarsCarol@aol.com](mailto:StarsCarol@aol.com)). This informal info session will be geared to helping you make the most out of your participation in RCA, so any advance questions and topics you want considered can also be noted at the time of your RSVP. We hope to see you there!



Above: What Astronomers Do on a Rainy Star Party Evening! . . .

The Kah-nee-ta Star Party held March 23-25th was enjoyed by more than 150 Rose City Astronomers. Friday evening was clear and starry until about 1:30 a.m. Over 70 Messier deep-sky objects were reportedly observed by an RCA member!

During the day on Saturday, members gathered in a conference room and gazed over star charts and talked about astronomy projects. Over 50 members attended the banquet and later shared the company of members near the Kah-nee-ta fireplace as the clouds turned to rain.



## APRIL AT OMSI



# ASTRONOMY CELEBRATION

Visitors at the Oregon Museum of Science and Industry will be star-struck on April 28 as they learn about the latest from outer planets, meteorites, constellations, universe and telescopes during Astronomy Day 2001. Astronomy Day is a world-wide event designed to promote public awareness and interest in astronomy and space science. On Saturday evening, April 28, OMSI and Rose City Astronomers will celebrate Astronomy Day with a free Star Party! Join us as we gaze at the spring sky at OMSI's east parking lot, located on 1945 SE Water Ave, starting at 7:30 pm. From beginners to experts of all ages, here's your opportunity to view the stars, and other objects up-close and personal through telescopes. Viewing highlights includes the Moon, Orion Nebula, Beehive star cluster, and more! For possible weather cancellation, call (503) 797-4610 on April 28 after 3:00 PM to get the latest information.

### Where in the Universe is Carmen Sandiego?! II

Our customers value the theater's unique surroundings, technology, and environment as a planetarium facility and in meeting OMSI's vital educational function. Integrated within OMSI's mission, the M. J. Murdock Planetarium offers a variety of educational and entertaining multi-media presentations on astronomy and space science. Whenever possible, the planetarium presents topics that are timely - either events in the sky, or a particular museum theme.

During the summer of 2000, Where in the Universe is Carmen Sandiego!? was featured as our matinee astronomy show in the planetarium. Unlike any show we have ever done, it involves the audience in several clue-seeking adventures throughout the solar system in order to capture Carmen Sandiego, who stole the ring of Saturn. What makes this show successful is not only the popularity of Carmen characters, but also the interaction between the audience, the presenter and video.



### The Weather SIG

Date: Wednesday, April 25, 2001  
Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219  
Time: 7:00 pm  
*Come rain or shine . . .*

Premiering on April 28, 2001, is the sequel, Where in the Universe is Carmen Sandiego!? II. Carmen escapes from prison, develops warp drive, and goes after the giant black hole at the galaxy's core. The talent from the first show are all back for Carmen II including Tony Award winner Lynne Thipen as The Chief; the singing group Rockapella; and Tony, Oscar, Emmy and Grammy Award winner Rita Moreno as Carmen. In addition, all the audience-engaging factors that also helped make the first Carmen show such a hit are incorporated again in the sequel. The show includes high levels of audience involvement and interactivity, top rated 3-D computer animation from people whose credits include Lucasfilms and the best planetarium animators throughout North America (from such places as Vancouver, Calgary, Houston and Salt Lake City), with additional astronomical animations from Toronto and London. Lasers will also be inserted for special effects as we travel through space searching for Carmen. In short, never has a larger and more talented team been assembled to create a planetarium show.

Besides the Where in the Universe is Carmen Sandiego!? II, we now offer Pacific NW Sky as a live interactive show on the current night sky. For the first 20 minutes of the show, the basic moon phases and constellations are identified for the whole year. The remaining 15 minutes will contain live presentations on the visible planets, interesting deep sky objects and current topics in space science. This will offer the audience the latest information on events in the universe today.

The ultimate measure of the planetarium's success will not only be how well it teaches facts and ideas about the universe, but also its acceptance as a contributing member of Portland's cultural community. It will come when the M. J. Murdock Planetarium is thought of not only as the place to learn the sky, but also the place to experience a unique environment which blends art, science, fantasy and fun.



# The Physics of Everyday Things

By Doug Huston

## What makes sharp things sharp?

Experienced cooks will tell you that having a good set of sharp knives in your kitchen will save you a lot of effort. The physics of sharpness supplies the explanation for this.

To penetrate the surface of an object requires you to exert a certain amount of pressure. Pressure is defined as the amount of force applied divided by the area over which it is applied. You can see this in the units of pressure, which are normally pounds per square inch. In symbolic terms then: Pressure =  $P$  and Force divided by Area =  $F/A$ , so we can write  $P=F/A$ .

What happens if, for a given force, we decrease the area over which it is applied? Let's look and see. If the initial area is 2 square inches, we get  $P=F/2$ ; if we decrease the area to 1 square inch, we get  $P=F/1$ ; if we decrease the area to  $1/2$  square inch, we get  $P=F/1/2$  which, after inverting and multiplying, gives  $P=2F$ . So, as you can see, for a given amount of force, decreasing the area over which it is applied causes the resulting pressure to go up. In fact, it can be shown mathematically that as the surface area approaches 0, the resulting pressure felt approaches infinity.

Now, take a look at the cutting edge of a sharp knife – it is very thin. This is the physics of sharpness: minimize the area over which the cutting force is applied to greatly increase the pressure felt for a given force.

## A Watched Pot



You fill a pot with water, put it on the stove, turn on the heat and eventually it boils. Now, put a thermometer in the water and turn the stove up. You'll find that no matter how high you turn up the stove, the water temperature remains constant. What's happening?

First, a little background. All matter exists in one of three phases: solid, liquid or gas. There can be "sub-phases" within a given phase. For example, in the solid phase, some materials can exist in either a crystalline or glass sub-phase. These sub-phases, and in fact all the phases of matter are determined by the type of order in which the atoms arrange themselves.

The act of boiling water involves making what physicists call a phase transition: in this case, from the liquid phase of water to

## ASTROPHYSICS / COSMOLOGY SIG

TIME: 7:00 PM

DATE: Thursday, April 19, 2001

PLACE: Linus Pauling House, 3941 S.E. Hawthorne Blvd.

TOPIC: Super String Theory, Duane Ray Ph.D.

READING: The Eloquent Universe

the gaseous phase. To do this, you have to add energy to the water. Initially, the energy you add goes in to increasing the kinetic energy of the molecules of the water. This increase in molecular kinetic energy is seen as a temperature increase. Physicists call this type of energy "sensible heat" since it causes a temperature change in the water, which can be sensed by a thermometer. At some point however, the atoms in the water are moving as much as they can within the structure of the

substance you are heating and any additional energy you add goes into breaking the inter-molecular attractions between the water molecules. This is the phase transition, when the water turns into steam. A thermometer in the water can not sense this phase transition energy since a thermometer measures the average kinetic energy of the molecules and that's not increasing. This type of heat is called by physicists "latent heat" since a thermometer can't measure it. Increasing the amount of energy you add to the water will just increase the rate at which these inter-molecular bonds are broken (the rate of steam formation) but won't increase the temperature of the steam.

The amount of energy involved in making this water-steam phase transition is much, much higher than the amount of energy required to get to the transition (boiling) point. This is one reason water is such an effective fire-fighting agent. Spraying water on a burning substance heats the water to the boiling point, then the tremendous amount of latent heat needed to flash this water to steam cools the fuel below its ignition point and the fire goes out.

All science begins with a question. As one of my college physics professors once said, "Never accept anything at face value." Einstein once remarked, "Common sense is merely the accumulation of old prejudices." When you look at the everyday – ask why is this like this. Some surprising discoveries await.

# OREGON STAR PARTY, AUGUST 16-19th

*By Chuck and Judy Dethloff*

It may only be April when you read this, but it will soon be mid August and time to head off to the Oregon Star Party. Most details are worked out and the entry form is now available on our web site at <http://oregonstarparty.org>. Thanks to Jim Girard for doing a great job again with our entry form.

We have added a new option this year in that you can register on line and pay with PayPal. This allows for attendees to use credit cards (via PayPal) if they choose to do so. We hope this is a helpful service as it does cost OSP a small amount on each transaction. Still that fee is much less than if we were to set OSP up to take credit cards direct. That latter option has been explored and does not seem feasible due to the higher costs. For those not familiar with PayPal's service, please visit their web page <http://www.paypal.com>. Setting this up took a good bit of effort, thanks to Lars Hedbor for setting up these pages. Also a big thanks to Dareth Murray for her great efforts with our web pages overall.

The entry form is available on the web as a PDF file for those wishing to just print it out and send in registration via snail mail. Even if you register and pay with PayPal, you still need to print out the entry form which has the schedule, directions, guidelines, etc.. The hard copy mailing will occur later in the spring at its normal time if you would rather wait for that. If so, look for it in your mailbox sometime in May.

We will have a great slate of speakers again in 2001 thanks to the efforts of Candace Pratt. She has done a great job of filling the schedule with a balance of topics. Included on the speakers schedule are club members: Dan Gerhards, Howard Banich, Bruce Swayze, Carol Huston, Dave Sandage, Michael Rasmussen, Mel Bartels, Glenn Graham, Michael



Photo by Mark Siebold—"Rob's Tree" - 1995

Cole and Richard Berry. Richard will be one of our keynote speakers along with noted astrophysicists Shane and Michelle Larson from the University of Montana. Please check the entry form schedule for topics and times.

Other activities include H-alpha viewing of the sun with Mark Seibold, youth activities coordinated by Margaret McCrea, the 4th annual rover races with Dan Petersen and Bob McGown's popular meteorite hunt. Club members Jim Reilly and Rick Letherer will do sky identification programs at dusk. And Gene Dietzen is on the hunt for some great door prizes and we will again have a swap meet.

Many thanks to all of you that have already volunteered your time to coordinate activities or give talks! Those that attended last years rained out star party, can attest to how nice it was to have a full speakers schedule and activities to enjoy. Hopefully the weather will cooperate this year!

## SEE YOU AT OSP 2001!



# Public Visitors' Season begins at Pine Mountain Observatory



Beginning the weekend of May 25th, the Pine Mountain Observatory near Bend, OR will resume public observing sessions. We are always looking for Tour-Guides. If you are interested in volunteering to help staff the facility, including the large telescopes, please attend one or more training sessions, in April and May. You don't have to have any prior experience with telescopes or the sky, just enthusiasm to share your interest in the sky with the general public. We are open for tours Friday and Saturday nights Memorial Day weekend through end of September (and open on Sunday nights during the three "holiday" weekends of summer). If you become a Tour-Guide, we'd like

you to come up at least two or three weekends during the summer, we have weekly "sign-up" via E-mail.

There's a Forest Service Campground adjacent, and also usually room in the Astronomers' Quarters. We need folks to be "meeter-greeters", run portable telescopes outdoors, operate the large telescopes, staff the gift shop, and do the nightly lecture. Crowds thin out by midnight, so you have opportunities then to conduct your own observing program on the 15" or 24" telescope. We welcome high-school and college students to apply. Familiarity with the sky, and knowledge of Right Ascension and Declination will help you advance more quickly to becoming certified to operate the large telescopes. Training will be Saturdays, April 14th and 28th, and May 5th and 19th, rain or shine (but not snow nor thunderstorms), 1-5 PM, at Pine Mountain Observatory, with evening sessions those dates if the sky is clear. (If the weather is really yucky Saturday morning, probably not worth driving over...check my phone for a message on go-no-go.) For more info, contact Rick Kang, rkang@efn.org, or 541-683-1381.

---

## Weather SIG Looks at Seeing

*By Ron Thorkildson*

Not all clear night skies are created equal. This realization normally comes early to budding stargazers who have taken ownership of their first telescope. The image of Saturn through the eyepiece may appear clear, sharp and rock-steady one evening, but degrade into a fuzzy, "swimming" blob of light that just can't be focused the next. Why the difference? Let's start by ruling out some possible causes. It is a good instrument. The curve of the objective mirror is well within design tolerances and the optical system is accurately collimated. In addition, we've eliminated such things as the scope not being at thermal equilibrium and viewing targets too close to the horizon. So, what's left? In all likelihood, the observed difference in image quality is the result of an atmospheric phenomenon called "seeing".

For a little more than a year now, RCA's weather SIG has spent much of its time investigating seeing. There is a significant amount of literature to suggest that if seeing quality can be sufficiently linked to specific meteorological parameters, then it should be possible to forecast seeing conditions using available weather data. Although not yet completed, the following scheme attempts to accomplish this objective.

Simply put, poor seeing is caused by atmospheric turbulence. It can occur in three main regions within the telescope viewing path, each of which is associated with different mechanisms of turbulence generation. From the highest to the lowest altitudes, these regions are the free atmosphere (above the boundary layer), the boundary layer (from the surface to as high as about 3,000 feet--where the ground exerts an influence), and the area in and around the immediate observing site. It is also

customary to group weather features by their size and extent of influence. An extratropical (non-tropical) storm, for example, can grow to 1,000 miles or more, while a thunderstorm seldom exceeds a diameter of about 10 miles. In meteorology, these scales are defined (roughly) as the macro-scale (greater than 300 miles), the meso-scale (10-300 miles) and the micro-scale (less than 10 miles). The task now is to identify which weather processes that are known to cause turbulence operate in each of these scale "zones".

### MACRO-SCALE

#### Jet stream

One of the major causes of turbulence is the strong wind (speeds sometimes exceeding 300 mph) and steep temperature gradients found in the vicinity of the jet stream at an altitude of 30,000-40,000 feet. As wind velocities quickly drop off at increasing distances from the jet's core, eddies are generated that mix air parcels of different temperatures. Extreme levels of turbulence are often found in these regions. In his article *How to Predict Seeing* (January 2000 issue of *Sky and Telescope* magazine), Eric J. Douglass found that seeing improved significantly when the jet stream was located at increasingly greater distances from his observing site. We propose implementing a similar grading system. A 300mb or 500mb upper air chart will probably be used to for this evaluation.

#### Cold front

A weather front exists at the interface of two air masses of different temperatures and/or moisture content. We call this boundary a cold front when the colder air is advancing toward the warmer air. Since it is more dense, the cold air undercuts

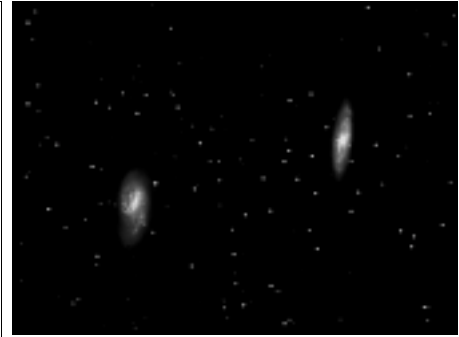
(Continued on Page 8)

## RCA Photo Gallery



Left: Dave Haworth. M 63. Fastar Celestron C-8 Schmidt-Cassegrain telescope with Fastar lens accessory and SBIG ST-237 CCD Camera. Image time: 64 - 30 seconds images stacked together. Image taken 3/22/0.

Right: Dave Haworth. M65/M66. Celestron C-8 with Fastar lens accessory and SBIG ST-237 CCD Camera on Losmandy G-11 mount, unguided, no PEC. Image time: 15 minutes imaging time made of 30 - 30 sec. images stacked.



### (Continued from Page 7—Weather SIG)

warm air, forcing it aloft. Because of this vertical lifting, and because cold air is susceptible to convection, the turbulence in the vicinity of a cold front is usually great. Not surprisingly, then, Douglass also noticed a correlation between the proximity of a cold front and seeing quality. Weather fronts are normally depicted on surface weather charts.

#### **Thermal instability**

Instability is a term used to describe the tendency for the air to undergo vertical motion. An unstable atmosphere encourages air to rise initially, then fall after undergoing adiabatic cooling. This tends to result in the generation of convective currents of air. Strong surface heating and cold temperatures aloft will produce the greatest levels of instability. Conversely, a stable atmosphere tends to discourage vertical air motion. Atmospheric processes that tend to cause cooling at the surface and warming aloft (thermal inversion) produce highly stable air that is largely free of this type of turbulence. A stability index needs to be developed to measure this effect.

#### **MESO-SCALE**

##### **Surface Pressure Gradient**

Winds at the ground normally blow in response to broad-scale pressure patterns (important exceptions to this rule include thunderstorm downdrafts, tornadoes and the local effects of unequal surface heating). Once it is set into motion, air becomes susceptible to certain kinds of turbulence. While in theory it is true that extremely stable moving air can be turbulent-free (laminar flow), such conditions rarely, if ever, occur outside the laboratory. The assumption here is that higher wind velocities tend to result in higher levels of turbulence. Using a surface weather chart, the key here is to determine the pressure gradient within, say, a 300-mile radius of the observing site.

##### **Terrain Roughness**

At the lowest level of the atmosphere the horizontal movement of air is impeded by the ground. This frictional drag introduces a form of mechanical turbulence into the boundary layer of the atmosphere. A relatively smooth, uncluttered ground will produce low levels of turbulence, while a rough ground with high relief will disturb the air to a greater degree. A scale developed by wind engineers will be utilized here.

#### **MICRO-SCALE**

##### **Site Terrain**

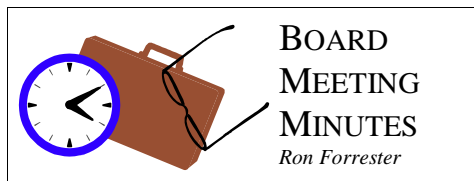
The type of terrain that surrounds an observing site may cause movements of air that degrade the quality of seeing. If there are uneven ground features nearby (such as the steep slopes of a mountain or hill, gorges or gullies), then nocturnal drainage may generate moving currents of relatively dense air that can adversely impact image quality.

##### **Ground Type**

The type of ground cover immediately surrounding an observing site will often impact the quality of seeing. If the ground is allowed to heat up during the daylight hours by absorbing the sun's short-wave radiation, that stored heat will be reradiated back into space during the night, causing micro-scale turbulence in the process. Black asphalt is an extreme example of this effect. Surfaces that either dissipate or reflect sunlight minimize this effect. Natural ground cover such as grass or leafy shrubs tends to distribute the sun's energy in ways that keep the temperature of these surfaces relatively cool.

In its most usable form, this tool for predicting seeing consists of a set of tables that attempts to grade each of the seven potential causes of turbulence by assigning numerical values based on the magnitude of its occurrence. To save space these tables have not been included in this article. They can, however, along with a brief introduction, be found on RCA's web page (<http://www.rca-omsi.org/rca/seeing.htm>). I want to thank Dareth Murray, our web master, for posting this information.

Although this project is still unfinished, we of the weather SIG feel it is far enough along to go out to the club for review. If you have any interest at all in this subject, please take a look at what we've done. Does the overall plan make sense to you? Is it missing some aspect of turbulence we haven't thought of? Perhaps some of the turbulence sources we have identified will turn out to be of little importance. What we need now is feedback. Any and all comments or suggestions are welcome. For those of you who have signed on to RCA's e-mail list, go ahead and post your responses to the list. Or you can reply to my e-mail address: [rthorkildson@bpa.gov](mailto:rthorkildson@bpa.gov). My telephone number is (503) 230-4168. Let's hear from you.



## March 5, 2001 @ 7:00 PM

**Present:** Scott Turner, Peter Abrahams, Dareth Murray, Carol Huston, Doug Huston, Matt Brewster, Ron Forrester, Norm Trost, Vern Weiss (w/Ginny Pitts), Sameer Ruiwale, Jan Keiski, Scott Fitzpatrick, Bob McGown, Dale Fenske, Candace Pratt.

**Treasurer** - Vern: Need to provide treasurer with funds, and statement as soon as possible, by following board meeting. Possibly provide deposit books for all fund taking board members so that monies can be deposited as soon as possible. Next month budget requests are due from each group. Each dept will get its own income/balance statement each month, as well as year to date. Met with a CPA specializing in Non-Profits. Answered many questions. After looking at our reports, a review would be about \$1000-\$1500. Do not like Quicken for various reasons. Multi-ledger looks to be straightforward to pass on (training, etc) to subsequent treasurer's. Club needs to purchase a copy for the club.

Motion made to purchase Windows version of Multi-ledger at approximately \$210 for a copy. Candace seconds motion. Vote: Unanimous, Vern authorized to purchase and reimburse himself.

**Programming** - Matt: Planetarium show from Candace, with Doug narrating. Request for an observers program with info on herschel 1, 2, and messier, one person for each. Needs to be a prepared talk within a specified amount of time, possible open date of August general meeting. Plan on it being a members, but keep open idea of an OSP speaker doing it. May meeting is Todd Duncan, talking on light, quantum aspects. Make clear to speakers that there are generally 10 new people at each meeting, and to make sure not to be too technical. Looking forward, Sept. is Ken Crosswell, JPL, Nov is Dean Kettleon. Dec is potluck. In the future April could be International Dark Sky month for the general meeting?

**Star Parties** - Scott: Kah-ne-tah in a couple of weeks. March 17th OMSI star party. April 28th, OMSI star party in the evening.

**Sales** - Sameer: For March meeting, tables need to be setup outside since next meeting is a planetarium. Collected: \$417 Nov, Dec \$760, Jan \$345. Try to get a few Telrad's in stock?

**New Members** - Carol: 10 new members. Putting together a new members presentation,

an hour before the meeting? Cover postage for postcards to new members announcing the presentation time, etc. Write a brief report listing what you would do at one of these presentations. Start April? Presentation would be about an hour, how to get started, resources available from the club. Peter should ask how many are first time attendee's so members can recognize the new people present. Redo the table setup in the back to make membership flow a little more smoothly to allow Carol to spend more time talking to the new members. Stress Rosette Gazette at each meeting.

**Library** - Jan: Voyage to the planets was donated by Rob King. Extra collimation videos on the way.

**Light Pollution** - Bob: Presentation at View Acres school, spend the day there. Audiences are mixed ages, making presentations challenging. Have an IDA table banner with our logo and IDA logo?

**SIG's** - Scott: Nominal

**AL** - Dale: Currently paying \$16 for a line and number, \$12.75 for voicemail. Feb 25th was on KGW news, and quoted in the Feb. 11 Columbian.

**Membership** - Doug: 389 current members.

**Editor**-Candace: Recertified list in January. Please feed Candace as many article ideas as possible.

**YRCA** - Ron: Jenny can't do March meeting.

**Community Affairs** - Norm: Talking to 3 different school districts. One wants a young kids star party in April or May. Slides are coming around really well. Beverly Lynds willing review anything Norm comes up with. Hope to have done a presentation by next board meeting.

**OMSI** - Peter: Jim Todd has a new office. March 17th party. Astronomy day in April. Need to find out what OMSI is doing for Astronomy Day and determine our roll, find a someone to take the lead on any participation. Need to prepare ourselves well ahead of time if we want to make Astronomy a big event, i.e. in November of the year before.

**Webmaster** - Dareth: Glenn Grahm sent updates for personal page. Members can have personal pages off our site.

**Telescope Library** - Peter: assess telescopes in storage at OMSI but not part of telescope library.

**Magazine:** Nominal

**Phone Line:** Scott March 1-15, Dale March 15-31. April 1-15 Scott F. April 15-30 Dareth

**Miscellaneous:** OMSI liaison in charge of Astronomy Day, Happy Halloween, Solstice,

etc. OMSI liaison has been by default the president. April board meeting will discuss possibly creating a new board position dedicated to this function, any non-OMSI events go to Community Affairs to be delgated with a record being kept of our involvments.

- Star Party information table at each meeting.
- Discovery Store in Pioneer place selling decent equipment, took them some of our business cards.
- We need a by-laws and articles of incorporation review.

### Kah-ne-tah:

- Scott setup flashers at Kah-nee-tah -- 135 people registered.
- Signs will be posted thanking the people of Warm Springs for hosting the star party.

Washington Park Site: See President's Message.

## CLASSIFIED ADS



**FOR SALE:** Coulter Optical, Odyssey 2, 17.5" f/4.5. \$1000. 503-658-2068  
Cindy and Harry Todd

**FOR SALE:** 12.5" Dob. Solid tube, good mirror, Ebony star and teflon, QSP 99% secondary coating, JMI focuser, telrad, flocked paper lining, 12V fans.  
\$850. Rick Olson. rmojr@northwest.com  
503-638-2042

**FOR SALE:** 1 year old 18" Starmaster scope with Zambuto 1.6" thick Pyrex mirror Sky Commander Digital Setting Circles Secondary heater . FeatherTouch Two Speed Focuser -- The best out there. Star step ladder and stool - Telrad Finder. Homemade and nicely done if I may say so! (Starmaster has a 7-9 month waiting period and the price as listed would be \$6315.) Immediate delivery at \$5050. Contact: Office: dtriplett@symantec.com  
Home: dtriplett2@home.com  
Day: 503-690-4762; Eve: 503-848-0613  
Dennis Triplet

**FOR SALE:** Celestron Firstscope 80EQ complete with original optics and equatorial mount tripod plus solar filter. Excellent condition/original packaging. \$400.  
Contact Steven Steinbock 503-280-0634 or crabmoon69@aol.com

APRIL 2001						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

MAY 2001						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

### April

Apr. 2	Mon.	Board Meeting	OMSI Parker	7:00 PM
Apr. 7	Sat.	TM Workshop	Tech. Marine Srvc.	10:30 AM
Apr. 11	Weds.	TM Workshop	Tech. Marine Srvc.	6:30 PM
Apr. 16	Mon.	Young/Jr./Elem. YRCA	OMSI Cafeteria	7:00 PM
<b>Apr. 16</b>	<b>Mon.</b>	<b>General Meeting</b>	<b>OMSI Auditorium</b>	<b>7:30 PM</b>
Apr. 19	Thurs	Astro/Cosmology SIG	Linus Pauling House	7:00 PM
Apr. 25	Weds.	Weather SIG	Colonial Office	7:00 PM
Apr. 28		ASTRONOMY CELEBRATION	OMSI Star Party	Dusk

### May

May 5	Sat.	TM Workshop	Tech. Marine Srvc.	10:30 AM
May 7	Mon.	Board Meeting	OMSI Parker	7:00 PM
May 9	Weds.	TM Workshop	Tech. Marine Srvc.	6:30 PM
May 16	Weds.	TM Workshop	Tech. Marine Srvc.	6:30 PM
May 16-18		Dark Sky Star Party	Camp Hancock, Fossil, OR	
May 21	Mon.	Young RCA	OMSI Cafeteria	7:00 PM
<b>May 21</b>	<b>Mon.</b>	<b>General Meeting</b>	<b>OMSI Auditorium</b>	<b>7:30 PM</b>
May 24	Thurs.	Astro/Cosmology SIG	Linus Pauling House	7:00 PM
May 30	Weds.	Weather SIG	Colonial Office	7:00 PM

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-oms.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-oms.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012



# The Rosette Gazette

Volume 13, Issue 5

Newsletter of the Rose City Astronomers

May, 2001



## QUANTUM PHYSICS ON A COSMIC SCALE

### In This Issue:

- 1 General Meeting  
New Members
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
Young RCA
- 3 Observer's Corner
- 4 Weather SIG  
Messier Menagerie
- 5 Camp Hancock SP  
Cosmology SIG
- 6 Camp Hancock  
Registration
- 7 Lunar Longitude  
Solar Maximum
- 8 Photo Gallery
- 9 Board Minutes  
Classified Ads
- 10 Calendar/Events

Cosmology and quantum physics are two topics that stretch our common sense understanding of reality. Observations of distant galaxies and quasars force us to think about distances and times far beyond ordinary experience, and quantum physics reveals a microscopic world where events apparently don't become real until they are observed. When these two topics are combined into one discussion, the result will make you wonder whether reality is what it seems to be.

Come join us on **May 21st at 7:30 PM in OMSI's Auditorium** for the General Meeting of the Rose City Astronomers as we introduce Dr. Todd Duncan: Center for Science Education, Portland State University.

In his talk Dr. Duncan will discuss, in conceptual terms, what quantum mechanics has to say about the light traveling to us from a distant quasar. Does a photon from the quasar follow a definite path through space? Can we change the billion-year history of a photon by changing how we choose to measure it here on Earth? He'll highlight a few of the apparent paradoxes, and then invite discussion about how we might make sense of them.

Todd Duncan received his Ph.D. in astrophysics from the University of

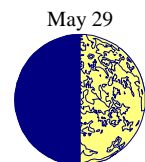
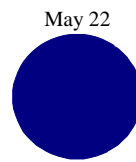
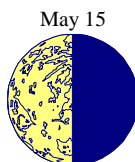
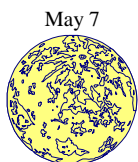
Chicago and a master's degree in physics from Cambridge University. He is currently an assistant professor of science education at Portland State University and president of the Science Integration Institute, a nonprofit organization dedicated to helping people incorporate insights from science into their personal worldviews. The institute offers informal workshops for non-specialists on such popular science topics as cosmology, relativity, and quantum physics.

Please feel free to come early to the OMSI Auditorium as many members begin gathering around 7:00 PM to share stories and talk about the spring skies!

SEE YOU MAY 21st :-)

**WELCOME NEW MEMBERS!**

Charles Bailey  
Linda Brandt  
Patrick Hanrahan  
Gloria and Alan Koch  
Paul Liddell  
Ryan Marquardt  
Ann Peterson  
Clarence Rainwater  
Martin and Cindy Rockwell  
Mike Sutherland





Club Officers			
President	Peter Abrahams	(503) 699-1056	telescope@europa.com
VP Members	Doug Huston	(503) 629-8809	geometer31415@aol.com
VP Observing	Scott Turner	(503) 788-6484	scottturner@telocity.com
VP Community Affairs	Norm Trost	(503) 668-7979	normt@europa.com
VP, Communications	Matt Brewster	(503) 774-0360	brewster@teleport.com
Treasurer	Vern Weiss	(503) 236-1059	vernlw@earthlink.net
Secretary	Ron Forrester	(503) 504-8071	rjf@skyhackers.org
Sales Director	Sameer Ruiwale	(503) 617-0736	sameer_ruiwale@hotmail.com
Editor	Candace Pratt	(503) 296-6758	candace@europa.com
Web Master	Dareth Murray	(503) 762-4377	dareth@teleport.com
Library Director	Jan Keiski	(503) 293-3281	jikeiski@juno.com
Telescope Librarian	Brian Richardson	(503) 625-7373	brian_shelly@earthlink.net
Alcor, Historian	Dale Fenske	(503) 256-1840	fenskedf@juno.com
Media Director	Glenn Graham	(503) 579-1141	sueandglenn@msn.com
Special Interest Groups	Scott Fitzpatrick	(503) 669-8243	
Youth Director	Margaret McCrea	(503) 232-7636	mags@europa.com
Light Pollution Rep.	Bob McGown	(503) 244-0078	telescope@qwest.net
New Member Programs	Carol Huston	(503) 629-8809	StarsCarol@aol.com
Magazine Subscriptions	Johan Meijer	(503) 777-0706	johanm@www.com



The RCA phone line occasionally receives inquiries concerning the businesses that sell star names. Sometimes these questions are from people who are considering such a purchase, and some are from those who have received a name as a gift, or in memory of a loved one. We try to be considerate of people, as it seems harsh to tell someone that their husband's anniversary gift is worthless or that the person purchasing a family memorial has been hoodwinked.

Furthermore, some people (including some RCA members) have bought names in fun and feel that the certificate is worth what they paid for it. Star names can be a fun gift when they are given in fun, but the problem is that the businesses do not sell them

as a fun gesture with only symbolic meaning. They sell them as a legitimate title that will be used by astronomers. For this reason, it is appropriate that in 1998, the New York City Department of Consumer Affairs sent a notice of violation to the International Star Registry, for engaging in 'deceptive trade practice'.

Among professional and amateur astronomers, historians, cartographers, and others who have the need to refer to a particular star, the naming of stars is not a trivial issue. It is important that there be only one name for each star that is named. The International Astronomical Union is the only organization that can name craters, moons, asteroids, planets, stars, nebulae, and galaxies. Things are chaotic enough in space without multiple names for objects.

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The "Kids" of Rose City Astronomers



Children ages 4-12 are welcome to join in fun and educational activities while their grownups attend the monthly general RCA meetings. The kids' meeting takes place in the adjoining cafeteria at OMSI from 7:00 to 9:00 PM - the door is always marked. If you have any questions, please e-mail Jennifer at [jenny@theforrest.org](mailto:jenny@theforrest.org).

**The Young Rose City Astronomers** (ages 13 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

# See you at a Star Party this spring!!

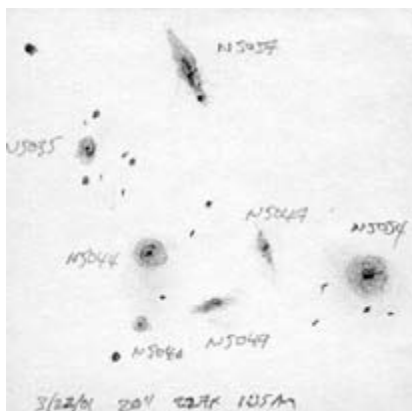
Deep Sky

An unexpected observing joy is chancing across a grouping of several objects in a single field of view. Over the years I've lucked into several wonderful gatherings when my chart indicated only one or two objects were present. Most recently I came across a group of seven galaxies where my Sky Atlas 2000 chart had only three marked. Uranometria shows there are several more galaxies just outside a medium power fov (as well as fainter ones inside) so this is a fun area to spend time poking through.

The most conspicuous galaxy in this group, at least to my eye, is **NGC 5054**. I remember it mainly because it also happens to be last object I observed to complete the Herschel 400 list several years ago. At the time I didn't really appreciate this rich group because I was waiting for 5054 to rise just high enough above the eastern horizon to detect it. My patience was worn pretty thin with having this one object standing in the way of completing the H400 list for almost two months, so I wasn't in the mood to wait until it was nearing the meridian in a dark sky. Too bad, there's a lesson there...

Anyway, the Herschel II list includes two galaxies, **NGC 5037** and **5044**, which are immediately to the west of 5054. I was looking forward to going back to this part of the sky under more favorable – and relaxed – conditions and atone for the regretful haste of my first visit. I finally returned on a beautifully clear March night, which happened to coincide with my first try at a new way of drawing at the eyepiece. More on that later.

An easy star hop about 5 degrees south, southwest of Spica brought me to the right spot and I immediately saw there were more than just three galaxies here. In a moment I could see 7 with direct vision. Checking on-line images of the area there are several more fainter galaxies lurking in the group, perhaps observable in an even darker sky than I had in March. The faintest galaxy in my sketch is magnitude 13.0 (**NGC 5049**).



This sketch (made at the eyepiece) shows in a relative way how each galaxy appeared to me that night. North is approximately toward the bottom left hand corner of the sketch. Limiting magnitude was about 6.0 and the seeing was about 5 out of 10 so conditions were not ideal. But then any clear night in March is excellent so I'm not complaining. However, it does mean I can get an even better look under darker and steadier conditions with my 20" – and someone with a smaller scope might see what I have in my sketch.

Something to remember about a sketch of deep sky objects is that they invariably have more contrast than you'll see looking at the real thing through a scope, so give yourself a few minutes of really looking before deciding you've seen all that's there.

Better yet, make your own sketch.

Speaking of sketches... Chuck Dethloff has been experimenting with hand held slide viewers for a few months and by the end of March had a couple of prototypes ready to try. He put a layer of red cellophane and a cut-to-size sheet of quality drawing paper on the evenly illuminated screen of the viewer to dim its otherwise bright light. The overall brightness of the back illuminated paper was just enough to see what I was drawing. The paper had to be cut into 2.5" squares and is held on the viewer by corner clips.

The main benefit of back illumination of the drawing paper are that no shadows are cast by the pencil. Plus, the level of light needed to see what I was drawing was low enough to keep my dark adaptation mostly intact. Not having to grip a flashlight between my teeth was nice too. Chuck is working on larger sizes so stay tuned for future updates. Meanwhile, I'm enjoying drawing at the eyepiece a lot more!

**NGC 5054, SA spiral galaxy. Magnitude 10.9, SB 13.6, size 4.8 x 2.8. RA 13 hours, 17 minutes, Declination -16 degrees, 38 minutes. SA 2000 chart 14, UA page 285...**

Solar System

**Mars** is here, no more waiting. We're in the first part of the best observing season for Mars in 13 years. Sure, you'll have be awake in the early morning hours before dawn to see it, but the show really starts this month. The apparent size of Mars globe increases from about 14 arc seconds to 19 arc seconds during May.

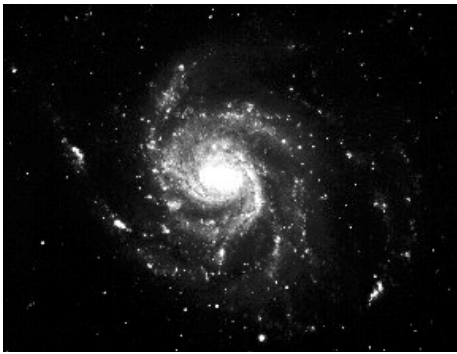
(Continued on page 6)

# Messier Menagerie- May 2001

By Dr. Rick Letherer, "starry-eyed" Astronomer

If space permits and I remaining the good graces of the Editor, I will provide you with a monthly list of my favorite deep sky objects with an emphasis on Messier's list. This month is the official end of spring as we prepare for the start of summer with all the glories of the Milky Way star clouds. There is a lot to choose from, but I will limit my list to ten favorites.

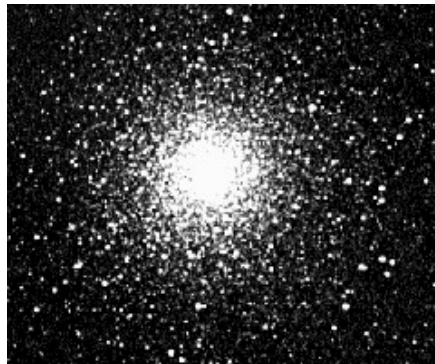
M101: This spiral galaxy in Ursa Major is rather difficult to find star-hopping; there are no major stellar landmarks to guide us. This is a faint, but large enough galaxy to be worth the effort. It has a star-like nucleus in averted vision. Rack your focuser in and out to help see the faint spiral arms.



M101 in Ursa Major

find under the dipper's handle, there is a double galaxy as a bonus. Don't ear extra magnification on M51 to get more spiral detail; it is bright enough not to be washed out by higher power.

M9, M10, M12, M14, M107: All of these globular clusters in Ophiuchus present a rogue's gallery of variety in size, resolution, and brightness. My favorite is M10, which is surprisingly bright, or a globular and will show you a nice variety of dim and bright members, which are easy to resolve.



M10 in Ophiuchus



## The Weather SIG

Date: Wednesday, May 30, 2001

Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219

Time: 7:00 pm

*Come rain or shine . . .*

Compare M10 with the dim, dense M107 for a nice contrast.

M13: This is a real nice way to end your globular survey with a spectacular view. This is the superman of the northern hemisphere of globular clusters: bright, large, easy to resolve, and a feast after straining on the dim globulars above.

M92: This globular is pretty. Some charts call this cluster hard to resolve, but my log notes refute this: "beautiful and easy to resolve...with a brilliant center and a sparkly surrounding wreath of stars".

NGC-6210 Obviously NOT a Messier object, this planetary nebula is suggested as dessert for the above menu. I've never seen the 12<sup>th</sup> magnitude central star. This is a rather typical "fuzzy-star" planetary that eludes detection until subjected high power search. See if your scope and eyes can detect the blue-green tint mentioned in the literature. If you have a nebula filter, try it on low power first.

Have fun. Ed. willing, there will be more next month.

*\* \*May your nights be filled with clear skies and wide horizons. \* \* \**

# Camp Hancock Dark Sky Star Party

Scott Turner, VP Observing

The Camp Hancock star party is scheduled for May 18 and 19 (Friday and Saturday night). For those of you who not yet experienced this place, allow me to introduce you to Camp Hancock Field Station located near Clarno, Oregon. Camp Hancock is an OMSI sponsored field station for the promotion of science education. The Camp is located the John Day river in NE Oregon. Directions can be found on the RCA's Web site at: <http://www.rca-oms.org/rca/index.htm> Or see your February 2001 Gazette with the RCA 2001 Star Party schedule.

CAMP HANCOCK  
Rose City Astronomers  
2001 Spring Star Party

May 18-19 2001

### To RSVP:

Send an Attendance Form and a check to Larry Deal (address below). Registration is not considered complete until both a check and a registration form is received.

This year, Larry Deal has generously offered to coordinate the registration of this event. Please inform Larry Deal as soon as possible if you have special diet needs or have any relevant medical issues that need special attention.

### Lodging:

Lodging Options are on a first come basis (there is plenty of space):

- Large (14 bunk) A-frame cabins
- Small (3 bunk) A-frame cabins
- Tipi (5 bunk) with wood frame door
- Limited RV parking (with limited electricity and water hookups)
- Tent areas

**Cost for lodging is \$13 per night per person for cabins and \$7 per night for tent or RV parking.**

### Meals

Camp Hancock offers breakfast, lunch, and dinner for our event (no breakfast or lunch on Friday and no dinner on Sunday). Meals need to be ordered and paid for in advance if possible by May 4th. (Call Larry Deal at (503) 816-2364 if you need an extension. We are possibly allowed an extension until the 11th.) Late meal orders may not be available.

## ASTROPHYSICS / COSMOLOGY SIG

TIME: 7:00 PM

DATE: May 24, 2001

TOPIC: The Right to a Discovery, Bruce Frazer

PLACE: Linus Pauling House, 3941 S.E. Hawthorne Blvd.

Prices for meals are:

- Breakfast \$3.75
- Lunch \$3.50
- Dinner \$4.75

### Rules, Rules, Rules:

- Guidelines (Per Camp Hancock administration):
- Need to order all meals two weeks in advance  
Checks need to be received by May 4, 2001  
(Possible extension till 5/11)
- Camp stoves only, no open fires.
- Last minute sign-ups may not be able to order meals (but will be able to get lodging accommodations)
- NO PETS (this has been an issue in the past, please respect the Camp's rules)
- No Bicycles (insurance/safety rule)
- Children must be monitored at all times
- No camping on the surrounding park service land
- The Staff housing area is off limits to guests.

Larry will need to receive an RSVP and check by May 4<sup>th</sup>

Send Registration Form to:

Larry Deal  
6230 SW Chestnut Ave.  
Beaverton, OR 97005

ldeal@wy-east.com (if you have questions)  
(503) 816-2364

~~~~~  
See Registration Form on Page 6 . . . .

**Observer's Corner** (Continued from Page 3)

Nineteen arc seconds sounds tiny, but this is the largest Mars has appeared to us since 1988, and actually looks a bit larger than the globe of Saturn right now. We'll be at our closest to Mars on June 21 when it spans 20.8 arc seconds.

One of the unexpected treats of this Mars apparition is that we'll see both the north and south polar caps simultaneously – the Martian equator will bisect the planet from our point of view. Pretty cool, we usually get a look at one polar region or the other.

An interesting observing opportunity I just came across is to look for the Lagoon Nebula (M8) near Mars in mid May. Should be able to get them both in the same wide power fov, but the nebula will be washed out by the brightness of Mars, then about magnitude -1.4. Or will it? Clean, well-collimated optics might provide a surprising view.

My best general advice for observing Mars is to look often and for at least 5 minutes at a time. It takes practice to see

subtle detail on the surface and the different types of cloud formations. Don't let the computer generated images of Mars in the May issue of Sky & Telescope mislead you, they give an unfortunately unrealistic idea of what you'll see through a scope. Too bad though, it would be awesome to see all that detail so easily!

So what I'm getting around to suggesting is to start looking *now* so when Mars appears its largest in June your eyes will be ready for it.

For those seeking rare game, this is an ideal time to have a go at the moons of Mars. Apparently domesticated asteroids, **Phobos** and **Deimos** are small, faint, and somewhere around 11th and 12<sup>th</sup> magnitude respectively. The June issue of Sky & Telescope has a helpful article (written by our sharp-eyed friend, S.J. O'Meara) showing when to look and what to expect. Here again, clean, well-collimated optics get you in the hunt, but the low position of Mars in our sky lessen our chances at getting steady seeing. However, this year is almost as good as it gets for us here in the northern hemisphere, so good luck to anyone (like me!) wanting a look at these two elusive moons.

**Camp Hancock Spring 2001  
Registration Form**

Name: \_\_\_\_\_ Phone Number: \_\_\_\_\_ E-mail (optional): \_\_\_\_\_

**Lodging:**

Friday night cabin lodging; \$13 x \_\_\_\_\_ persons, subtotal \$\_\_\_\_\_.

Saturday night cabin lodging; \$13 x \_\_\_\_\_ persons, subtotal \$\_\_\_\_\_.

Friday night Tent or RV lodging; \$7 x \_\_\_\_\_ tents/RV's, subtotal \$\_\_\_\_\_.

Saturday night Tent or RV lodging; \$7 x \_\_\_\_\_ tents/RV's, subtotal \$\_\_\_\_\_.

**Meals:**

Friday Dinner, \$4.75 x \_\_\_\_\_ persons, subtotal \$\_\_\_\_\_.

Saturday Breakfast, \$3.75 x \_\_\_\_\_ persons, subtotal \$\_\_\_\_\_.

Saturday Lunch, \$3.50 x \_\_\_\_\_ persons, subtotal \$\_\_\_\_\_.

Saturday Dinner, \$4.75 x \_\_\_\_\_ persons, subtotal \$\_\_\_\_\_.

Sunday Breakfast, \$3.75 x \_\_\_\_\_ persons, subtotal \$\_\_\_\_\_.

Sunday Lunch, \$3.50 x \_\_\_\_\_ persons, subtotal \$\_\_\_\_\_.

**Total enclosed**

**\$\_\_\_\_\_.**



# Lunar Longitude

By Robert McGown

Historically, the Earth's prime meridian has been moved several times, as navigational and cartographic advances led to changes in our perception of geography. At one time, most nations had their own prime meridian. In 1884, the Greenwich meridian was finally adopted as the universal prime meridian. As we look ahead to future space endeavors, while still maintaining ground-based observatories, the system of measuring longitude on the Moon seems confusing and outdated. Perhaps it is time to change the lunar coordinate system.

Currently, lunar or selenographic longitude is based on a central meridian in the center of the side visible from Earth. Longitude is measured east and west from this meridian, so that the edges of the visible disc are at approximately 90°W and 90°E (with some areas concealed or revealed due to libration). These are lunar globe coordinates, so east and west on the Moon are reversed from east and west in the sky. Prior to 1961, the convention was to treat east and west as with celestial coordinates. Our changing observational perspective led to this change, as the Moon went from being a detached world in the sky, only half of which was visible, to a globe that we might visit and explore. We propose that our perspective has changed again, and that the lunar prime meridian should be placed at what is now 90°W.

First, moving the central meridian would allow us to eliminate confusion regarding east and west. Longitude would be numbered continuously from 0° – 360°, with longitudes 0° through 180° encompassing the Earth-facing

half of the Moon. This numbering is logical both for earthbound observers (who will no longer confuse lunar and celestial coordinates) and for astronauts. When features in libration zones and polar areas are referred to by their coordinates, it will be easier to mentally place these features on their correct limb.

A continuous longitude system will be of great benefit to lay persons like amateur astronomers and the media. For example, since most of the lunar maria are on the near side, all will have near-side longitudes (0° – 180°). Likewise, the heavily cratered features of the far side will all have longitudes greater than 180°, so the two very different faces are separated from each other. Currently, the central meridian and 180° bisect these faces, based on an artificial, arbitrary designation of east and west. Sometimes, positive and negative longitudes are used in place of east and west, but these start from the same central meridian and are also confusing. Coincidentally, the new prime meridian will be at the leading edge of the Moon's orbit around Earth, another baseline.

Implementing the new system should not create much difficulty. The major lines of longitude would still run through the same features; only the numbering would change. Current maps would still be useful if relabeled. It would be wise to update the lunar coordinate system now, before the establishment of permanent settlements on the Moon. With a new, intuitive system in place, we can clarify the confusing issue of lunar longitude for generations of astronomers and selenographers to come.

## Solar Maximum Promises further Aurora Spectaculars

By John Buting, RCA member emeritus, Santa Fe, NM

Some people thought there had been an explosion at Los Alamos National Laboratories. Others feared an early outbreak of yet another huge forest fire, or worse yet, the end of the world. What occurred in Santa Fe's night sky on March 30th however, was nothing more than a truly marvelous rendition of the aurora borealis, the Northern Lights.

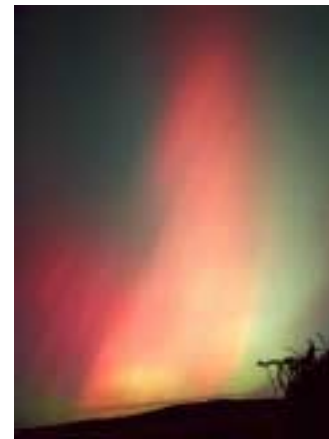


Photo by Mike Blackburn, Boise Astronomical Society

It wasn't unusual for so few people to make the connection here because under normal circumstances auroras are very rare in the Southwest. But these are not normal circumstances and this was hardly an ordinary aurora. The March 30 event, and others that may follow, was due to increased sunspot activity on the surface of the sun, a common occurrence during what astronomers refer to as the solar maximum.

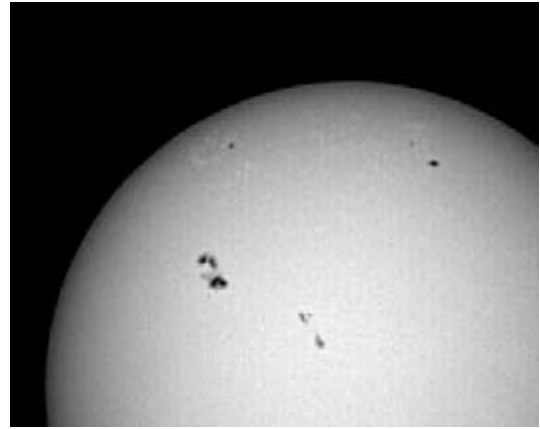
The sun is currently at the peak of its eleven-year cycle, when numerous surface storms and solar flares push huge clouds of energized particles toward Earth. The effects on our planet can be quite dramatic,  
(Continued on Page 8)

## RCA Photo Gallery



Left: Photo by Michael Cole. Film used—PPF400 with 750mm camera lens. Witch Head Nebula in Eridanus (IC 2118). Photographed in AZ, February 2001. Composite of two 1 hour exposures FCT150 at F5.

Right: Photo by Glenn Graham from home in Beaverton. C-5 mounted on tripod with STV unit. Photo taken April 6, 2001 during what he called a “4 min. photo session to capture the sunspots.”



everything from radio interference, to satellite blackouts, power grid failures, and of course, brilliant auroras.

The news media first began circulating ominous reports about the possible doomsday scenarios that would result from this solar maximum as early as mid 1999. There was certainly some cause for concern. During the last solar maximum in 1989, a blast from the sun wiped out power to 6 million Canadians for over 9 hours on a frigid late winter night. It didn't take long for engineers to pinpoint a solar eruption as the cause.

Satellite and communications breakdowns are a big concern this time as well. It is believed this 2000-2001 solar maximum could be the most powerful since the late 1950's, when the most intense solar storm on record occurred. But back then there were few satellites, whereas today the heavens are filled with them. The communications industry is much more vulnerable to catastrophe than was the case back in the fifties.

We've been pretty lucky so far. In the past few weeks since the great aurora of March 30, several solar flares as big as any in the past half-century have exploded from the sun. Fortunately, their path has taken them away from us, but any of these outbursts could have caused extensive disruptions on Earth.

The solar maximum increases aurora displays because an increase in sunspots, or solar storms, always results in enhanced auroras, and sunspot activity is at its peak during the solar maximums. Auroras occur when energized particles are directed toward Earth after eruptions on the sun. The particles take several days to reach Earth, where they are deflected by our planet's magnetic field. This usually limits auroras to the polar

regions, where magnetic activity is concentrated. But during periods of solar maximum our magnetosphere extends further from the poles, allowing people even as far south as Mexico to witness the Northern Lights.

Auroras have fascinated mankind since the dawn of civilization. The sixth century Chinese described auroras as fire dragons in the sky, and early American Indians believed they were the spirits of the dead lighting torches to guide new arrivals. Today Japanese newlyweds often honeymoon in Alaska, as it is believed that the consummation of one's marriage under the Northern Lights ensures happiness, prosperity, and healthy children.

Those who experienced the aurora of March 30 will never forget it. At its peak around 11:15 PM, a huge red curtain waved across the northern sky, extending as high as 90 degrees, and as wide as 150 degrees. The event was mostly over by 12:30 AM, but oh what a show!

If you missed it you can still take heart. The solar maximum could continue to produce magnificent auroras for at least the next year. There is an excellent website, <http://www.spaceweather.com> that monitors solar activity and forecasts auroras. Watch it closely as you just might get another change to be mesmerized by the dancing colors of the Northern Lights.

*John Buting is a lifelong amateur astronomer and a member of several dark-sky advocacy groups. In 1999, the RCA made John a lifetime emeritus member for his outstanding contributions to the club and its programs. John moved to Santa Fe in 1998 after 20 years in Portland.*



**April 2, 2001 @ 7:00 PM  
Parker Room, OMSI**

Present: Dareth Murray, Vern Weiss, Peter Abrahams, Doug Huston, Carol Huston, Ron Forrester, Scott Turner, Bob McGown, Ginny Pitts, Dale Fenske, Jan Keiski, Scott Fitzpatrick

Treasurer - Vern: \$16190.39 current balance, approaching maximum amount we want to have. Need monthly detailed reports of sales, to be handed in at the subsequent board meeting. Vern and Peter are signers on our 2 accounts at Wells Fargo. Budget balances do not carry over to the following year.

Programming - Matt: Jim and Richard Berry on the "ABC's of CCD" for April.

Star Parties - Scott: Astronomy Day, April 28 in the parking lot. Hancock is on May 18-20th, same weekend as the Prineville star party, will get info to Candace for Gazette on both.

Sales - Sameer:

New Members - Carol: New member meeting before the general meeting for the April meeting, @ 6pm, announcement in the April gazette -- RSVP's requested. Sent out postcards to the 30 or so new members from the last 3 meetings.

Library - Jan: 2 new copies of the collimation video are on their way.

Light Pollution - Bob: Need more brochures, perhaps a personalized one mentioning the RCA. Working to arrange a meeting with AARP, the "Stay Alive at 55" program.

SIG's - Scott/Peter: Nominal

AL - Dale: Updated the new member roster.

Membership - Doug: 400 current member

families.

Editor-Candace: Nominal

YRCA - Ron: Jenny sending monthly log web content to Dareth.

Community Affairs - Norm: Busy, but Nominal

OMSI - Peter: Nominal

Webmaster - Dareth: Moon Atlas to be posted on the site, from a retired local astronomy professor Maurice Stewart.

Telescope Library: All scopes are currently out. Proposal to purchase a good scope to mate to the solar scope permanently. Peter will do the foot work to find the most appropriate scope to use for this, including posting to Astromart to find any used deals.

Magazine: Nominal

Phone Line: April 1-15, Scott F. April 15-30 Dareth, May 1-15 Ron

**Astronomy Day:**

Carol has put together some ideas for presentations and activities. RCA will be at OMSI for the 7pm Star Party.

**Kahneetah:**

150 people attending; 50 at the banquet Friday night was decent viewing - Aurora was spotted Signs posted at viewing field really made things go smoothly Program was really well received -- Messier Madness

**Update the articles of Incorporation**

Carol moved that Peter, Dale, and Vern be the officers listed on articles of incorporation, seconded by Scott Turner, unanimously passed. Any changes must be submitted with \$15.

**Budget:**

Fiscal year starts in July.

**Proposals:**

Community Affairs requesting budget of \$250 to be spent for presentation materials.

Candace requesting \$400 per month, total \$4800 for the next 12 months, Plus

\$450 for non-Gazette printing expenses (brochures, handouts, calendars, etc.). Web requesting \$0 for this year Treasurer requesting \$200 for the year Doug, Membership, requests \$500, broken \$50 new member packets, \$400 for badges, \$50 for new member programs Dale: \$400 for the phone, AL dues are \$1500 Jan, Library, \$500 materials, \$400 for scanning hardware/software Bob, Dark sky: IDA banner \$125, \$125 misc expenses Bob, Cosmology SIG: \$175 for an overhead, \$75 for misc expenses Scott, Star Parties: \$100 Scott, Telescope Library: Purchase a binocular mount, equipment upgrades, \$800 Board Administration, \$100 Board Generic Printing, \$60 Misc. Legal Fee's, \$100 Insurance, \$500 Winter Social, \$250 Matt, Programs, \$1750 Budget titles can change and new items added, but we cannot remove budget items with money against them.

**Miscellaneous:**

Look into possibly getting an informational line which people could call to hear the latest about SIG meetings/YRCA meeting, etc, as well as star party cancellation notices. 50 47mm lenses were donated, 13 were sold for \$15 each.

CLASSIFIED ADS



Have Astro "stuff" to sell?  
Place your ad free here each month! Email to candace at: [candace@europa.com](mailto:candace@europa.com) or call 503-296-6758.

| MAY 2001 |     |     |     |     |     |     |
|----------|-----|-----|-----|-----|-----|-----|
| Sun      | Mon | Tue | Wed | Thu | Fri | Sat |
|          |     | 1   | 2   | 3   | 4   | 5   |
| 6        | 7   | 8   | 9   | 10  | 11  | 12  |
| 13       | 14  | 15  | 16  | 17  | 18  | 19  |
| 20       | 21  | 22  | 23  | 24  | 25  | 26  |
| 27       | 28  | 29  | 30  | 31  |     |     |

| JUNE 2001 |     |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|-----|
| Sun       | Mon | Tue | Wed | Thu | Fri | Sat |
|           |     |     |     |     | 1   | 2   |
| 3         | 4   | 5   | 6   | 7   | 8   | 9   |
| 10        | 11  | 12  | 13  | 14  | 15  | 16  |
| 17        | 18  | 19  | 20  | 21  | 22  | 23  |
| 24        | 25  | 26  | 27  | 28  | 29  | 30  |

**May**

|               |             |                        |                          |                |
|---------------|-------------|------------------------|--------------------------|----------------|
| May 5         | Sat.        | TM Workshop            | Tech. Marine Srvc.       | 10:30 AM       |
| May 7         | Mon.        | Board Meeting          | OMSI Parker              | 7:00 PM        |
| May 16-18     |             | Dark Sky Star Party    | Camp Hancock, Fossil, OR |                |
| May 21        | Mon.        | Young RCA (ages 13-18) | OMSI Cafeteria           | 6:30 PM        |
| May 21        | Mon.        | RCA Kids (ages 4-12)   | OMSI Cafeteria           | 7:00 PM        |
| <b>May 21</b> | <b>Mon.</b> | <b>General Meeting</b> | <b>OMSI Auditorium</b>   | <b>7:30 PM</b> |
| May 24        | Thurs.      | Astro/Cosmology SIG    | Linus Pauling House      | 7:00 PM        |
| May 30        | Weds.       | Weather SIG            | Colonial Office          | 7:00 PM        |

**June**

|                |             |                                              |                        |                |
|----------------|-------------|----------------------------------------------|------------------------|----------------|
| June 2         | Sat.        | TM Workshop                                  | Tech. Marine Srvc.     | 10:30 AM       |
| June 4         | Mon.        | Board Meeting                                | OMSI Parker            | 7:00 PM        |
| June 16        | Sat.        | Larch Mtn. Star Party                        | LOCAL Star Party       | Dusk           |
| June 18        | Mon.        | YRCA (ages 13-18)                            | OMSI Cafeteria         | 6:30 PM        |
| June 18        | Mon.        | RCA Kids (ages 4-12)                         | OMSI Cafeteria         | 7:00 PM        |
| <b>June 18</b> | <b>Mon.</b> | <b>General Meeting</b>                       | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| June 21        | Thurs.      | Astro/Cosmology SIG                          | Linus Pauling House    | 7:00 PM        |
| June 23        | Sat.        | Klondike Star Party                          | Dark Sky Star Party    | Dusk           |
| June 27        | Weds.       | Weather SIG                                  | Colonial Office        | 7:00 PM        |
| June 30        | Sat.        | OMSI Summer Solstice Star Party—West Parking |                        | Dusk           |

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-omsi.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

**RCA CLUB INFORMATION**  
 Message Line: (503) 255-2016  
 Web Site: <http://www.rca-omsi.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012



# The Rosette Gazette

Volume 13, Issue 6

Newsletter of the Rose City Astronomers

June, 2001



## NEAR EARTH ASTEROID RENDEZVOUS (NEAR – Shoemaker)

### In This Issue:

- 1 General Meeting  
New Members
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
Young RCA
- 3 Observing on Mt.  
Haleakala
- 4 Weather SIG  
Steens Star Party
- 5 June at OMSI  
Cosmology SIG
- 6 Aperture Fever  
DUES DUE
- 7 H-B AstroAtlas
- 8 OSP Volunteers  
OSP Rover Races
- 9 Board Minutes  
Classified Ads
- 10 Calendar/Events

Built and managed by the Johns Hopkins University Applied Physics Laboratory, Laurel, MD, the NEAR-Shoemaker was



the exciting findings of the NEAR-Shoemaker mission.



Final Eros Images: NEAR-Shoemaker's image of asteroid 433 Eros taken from a range of 700 meters (2,300 feet). The image is 33 meters (108 feet) across. The large, oblong rock casting a big shadow measures 4.3 meters (14 feet) across.

the first spacecraft launched in NASA's Discovery Program of low-cost, small-scale planetary missions. NEAR-Shoemaker became the first spacecraft to orbit and

descend to an asteroid on February 12, 2001. The car-sized spacecraft gathered 10 times more data during its orbit than originally planned, and completed all the mission's science goals.

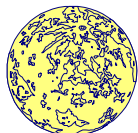
Join us Monday, June 18th in the OMSI Auditorium at 7:30 PM for our June RCA General Meeting. Mr Cermak will share

Greg Cermak is a Software Engineer and instructor in Portland. He has more than 20 years experience in software development, engineering, training and public speaking. His interests include reading, history, technology, bicycling and robotic exploration of the solar system. He is a Solar System Ambassador for the NASA Jet Propulsion Laboratory (JPL).

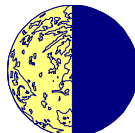
### WELCOME NEW MEMBERS!

- Emily Bequette
- Judy Emminger
- Tom Field
- Bob Greenlee
- Mike Hagen
- Melanie Raies
- Jim Reilly
- Harvey Smythe

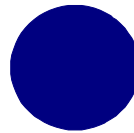
June 5



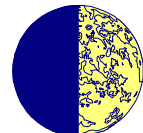
June 13



June 21



June 27





| Club Officers           |                   |                |                            |
|-------------------------|-------------------|----------------|----------------------------|
| President               | Peter Abrahams    | (503) 699-1056 | telescope@europa.com       |
| VP Members              | Doug Huston       | (503) 629-8809 | geometer31415@aol.com      |
| VP Observing            | Scott Turner      | (503) 788-6484 | kings11@qwest.net          |
| VP Community Affairs    | Norm Trost        | (503) 668-7979 | normt@europa.com           |
| VP, Communications      | Matt Brewster     | (503) 774-0360 | brewster@teleport.com      |
| Treasurer               | Vern Weiss        | (503) 236-1059 | vernlw@earthlink.net       |
| Secretary               | Ron Forrester     | (503) 504-8071 | rjf@skyhackers.org         |
| Sales Director          | Sameer Ruiwale    | (503) 617-0736 | sameer_ruiwale@hotmail.com |
| Editor                  | Candace Pratt     | (503) 296-6758 | candace@europa.com         |
| Web Master              | Dareth Murray     | (503) 762-4377 | dareth@easystreet.com      |
| Library Director        | Jan Keiski        | (503) 293-3281 | jikeiski@juno.com          |
| Telescope Librarian     | Brian Richardson  | (503) 625-7373 | brian_shelly@earthlink.net |
| Alcor, Historian        | Dale Fenske       | (503) 256-1840 | fenskedf@juno.com          |
| Media Director          | Glenn Graham      | (503) 579-1141 | sueandglenn@msn.com        |
| Special Interest Groups | Scott Fitzpatrick | (503) 669-8243 |                            |
| Youth Director          | Margaret McCrea   | (503) 232-7636 | mags@europa.com            |
| Light Pollution Rep.    | Bob McGown        | (503) 244-0078 | telescope@qwest.net        |
| New Member Programs     | Carol Huston      | (503) 629-8809 | StarsCarol@aol.com         |
| Magazine Subscriptions  | Johan Meijer      | (503) 777-0706 | johanm@www.com             |



## President's Message

By Peter Abrahams

### The Telescope Making Workshop

The RCA telescope making workshop is one of the most accomplished of our special interest groups. Some of the interesting telescopes and optics that RCA members have constructed (in & out of the workshop) include: ultralightweight large dobsonians; 'suitcase scopes' for travel; the 'string scope' with tensioned cord replacing some of the trusses; a Houghton camera; a binocular Newtonian; a 40 inch dob and a 30 inch dob; equatorial platforms for dobs; computer control systems; ceramic mirrors with cellular backs; and kilns for melting glass blanks. The workshop is where many of these ideas were born, and where many telescopes were created, including several of the telescopes in the RCA library. It is also the place for beginners to get answers about purchasing, operating & maintaining a telescope.

For the past half year, the TM workshop

has been meeting at a manufacturing facility owned by member Dan Gray. This is an ideal situation, compared to our earlier small & inadequate sites, and is centrally located on Swan Island. Furthermore, TM on a national level is thriving, due to the internet. Unfortunately, participation in our local workshop has been lacking. We seem to be in a time when there are only a few beginning telescope makers, and the experienced builders have their own facilities. For this reason, evening meetings have been cancelled, but Saturday meetings continue and are extended into the summer for the first time. With some interest & participation, this workshop will continue and thrive -- but it will require some increased interest from members. The current schedule: Saturdays June 2; July 7; Aug. 4. About 10:00 AM to 3:00 PM. John DeLacy and Jim Girard will alternate months as coordinators. Directions: Technical Marine Service: From I-5, Swan Island Exit (northbound #303), head west after you get off the freeway. From I-5 northbound, stay to left - go west on N. Going, past Interstate, down hill to Swan Island. Get in the right lane and at the bottom of the hill follow the signs to Mocks

## RCA

### Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

### The "Kids" of Rose City Astronomers



Children ages 4-12 are welcome to join in fun and educational activities while their grownups attend the monthly general RCA meetings. The kids' meeting takes place in the adjoining cafeteria at OMSI from 7:00 to 9:00 PM - the door is always marked. If you have any questions, please e-mail Jennifer at jenny@theforrest.org.

**The Young Rose City Astronomers** (ages 13 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

Landing and veer to the right onto Basin Ave. 1 to 2 miles on Basin to Leverman traffic signal); turn right and go over the bridge to the first street on the right, which is N. Cutter Circle. Turn right and go to the end of the block to 6040 N. Cutter Circle (Suite 302). TMS is in the first building as you turn in the driveway & is signed. Parking and entry for the workshop is in the back of the building.

# Maui Observing – Mt. Haleakala Style

By Carol Huston

What can you say about observing at 10,000 feet altitude in paradise? Well, the first word that comes to mind is SPECTACULAR. The second word, however, is COLD. Be prepared for the cold, and the deep sky views will reward you with memories to last forever. My benchmark rating of a No. 10 sky (for seeing and transparency conditions) is from the site at the top of Mt. Haleakala (hall-ay-AH-kuh-luh).

Mt. Haleakala is the volcanic peak that formed Maui's southern half and, at 10,023 feet, is Maui's highest point. Accessible by a paved highway system going south out of Kahului, Mt Haleakala is about a 40 mile drive from the airport. The direction is well marked by signs, and the last ten miles or so is a series of switchback roads that end at the summit in a large flat parking lot. If you see clouds, don't despair. Generally, the tradewinds keep a cloud layer at about the 6000-foot level, so you drive through the clouds and come out on top of them.

At the summit, there is a shelter and restrooms. Further down at the southeast end, there is a kiosk that overlooks the 30-square mile Haleakala Crater. This crater is a collection of hills, hummocks, and tuff cones covered with various colors of volcanic rock. A popular tourist activity is to come up to the crater before daybreak (an EARLY morning exercise) and watch the sun rise through the cloud layers over the crater. As an observer, I prefer to come up mid afternoon and watch the sun set through the clouds the opposite direction, and then set up my telescope and look at the stars. From this vantage point, the highest on Maui, you can look down over the islands of Lanai, Kahoolawe, Molokini, and Molokai in the west. You can also see the coastline and the northern Maui areas from here: beautiful scenery that just can't be described.

There is an interesting set of observatory-like looking buildings that share the summit called Science City that you can see a short distance away. This is a

government (military) and private installation geared towards tracking satellites and making laser distance measurements. These facilities are closed to the public (solidly fenced off), and I have never actually seen any signs of life around them.

**Logistics:** Observing from the top of Mt. Haleakala is a challenging but rewarding experience. The flat paved parking lot makes a great place to set up a telescope or binoculars, and most of the other people clear out as darkness descends. There is usually a pretty stiff breeze. This breeze, combined with the altitude and temperature, make observing in the tropics a cold-weather activity. Come prepared for that. On my Maui trips, I usually bring a whole set of clothes that are only worn at the top of Haleakala for this purpose: warm shoes or hiking boots, thick socks, layered pants and long-sleeved shirts, my warmest jacket with hood, a hat, gloves, and scarf. I wouldn't try to come up here and observe without any of that. (It is colder up here than observing in Oregon at high altitude in the spring or fall.) Unfortunately, when you leave your sea-level tropical condo earlier in the day, it seems inconceivable that you are going to be needing warm clothes – but take my word for it. One year, I brought up a big blanket to wrap up in, thinking it would be good enough. NOT!!! Enough said about the cold – but you get my point here.

**Timing:** A word about timing: Hawaii doesn't go on daylight savings time. Check out the sunset time for the dates you are there, but in April, the sun sets shortly after 6:00 PM, which seems very early to what we are used to. Be prepared to get up there no later than 5:15 to watch the sun setting through the clouds – you really won't want to miss that. Allowing for a two-hour drive from Kahului, that means leaving there around 3:15. If you are staying in Kaanapali (which is about one hour from Kahului), you need to leave there at 2:15 to make it. You probably will want to view the crater, which takes another 45 minutes or so (leave time from Kaanapali is now 1:30).

You will be driving through the Upcountry area to reach Mt. Haleakala which offers some great activities in its own right: tropical gardens, the Makawao art galleries; the Pukalani Country Club luncheon and coconut cream pie; a winery further around the highway on the west side; a park visitors' center, plus many scenic overlooks along the way. You can see that you can build a whole day's activity into a sunset viewing session on Mt. Haleakala if you leave early enough. However, it is easy to miss the sunset if you don't leave early enough or keep your eye on the time.

**Observing:** Working on the Messier observing program or the binocular Messier list from this site is a real treat. I personally like to work on some type of observing program so have developed for myself a Southern Skies Observing Program that contains all of the deep sky objects shown on Tirion's Bright Star Atlas. This set of charts shows all of the stars with a visual magnitude of 6.5 or brighter, all of the Messier objects, and some of the brightest deep sky objects in sky (though dimmer than magnitude 6.5). This magnitude range makes this atlas a great accompaniment to a small telescope or binoculars. In addition, it is the perfect size for travelling and packing: thin, compact, and easy to use in the field.

At about 20 degrees north latitude, Maui offers the observer a glimpse of the Southern Hemisphere objects that elude most of us in the more northern locales. The summit of Haleakala extends your southerly observing reach, but a lot of these objects are observable at sea-level too. Depending upon the time of year (and time of night), you can see Omega Centauri, Centaurus A, the Southern Cross in Crux with its Jewel Box Cluster, Eta Carinae, and many more of the favorite Southern Sky deep sky objects. All of these objects are accessible to small telescopes and binocular viewing, a plus when travelling. The tail of Scorpius and the center of Sagittarius are at about 45 degrees in the sky, making them optimum targets for viewing. The bottom loop of the tail of Scorpius contains

(Continued on Page 6)

# Steens Mountain Observing Trip

By Chuck Dethloff


One of Oregon's neatest natural treasures is located in the secluded southeastern corner of our state. Steens Mountain is the former home of the Oregon Star Party and is a place that I have visited a dozen or more times since the late 1980's. I believe that there are no darker or more transparent skies to be found anywhere in the United States and really look forward to each visit.

This year I will make the trek down in early mid October and once again invite other RCA members to join along. I expect only a small group of individuals might be interested in joining me in October. To avoid the need to file for a permit, we need to limit the total size of our group to under 20. Please contact me at [telmor@teleport.com](mailto:telmor@teleport.com) or phone (503) 357-6163 to let me know if you plan to join me in October. This will allow me to keep in contact and provide directions, weather forecasts, local information, etc. This article is intended to be an introductory article only and not intended to thoroughly cover all important details for the sake of brevity.

The exact dates that I visit Steens will depend upon the weather. The observing window that I have blocked off in my schedule will run from October 12 through October 22<sup>nd</sup>. I will only cancel my trip if the weather is bad that entire window. Those that cannot leave flexibility in their schedules are free to go whenever they desire but should not expect any official RCA greeters to be there if I am not there. Others may also choose to visit Steens in July, August or September if that works better. I have chosen to visit Steens in October because the timing is likely to favor fall foliage at its prime.

Steens Mountain is one of the largest continuous fault block mountains in the country, stretching nearly 60 miles in length from Riddle Mountain to the north to Alvord Peak and Long Hollow to the south. At 9700 feet of elevation, it is the highest you can drive anywhere in Oregon. The Alvord desert to the east of Steens is a mile in elevation lower than the summit and only 3 horizontal miles away. Spectacular gorges have been carved out of Steens by glaciers adding to the scenery. Please visit some of the web pages listed below for more detailed information and photographs. Nearly 1/2 million people visit Steens each year according to BLM statistics. There is not a more remote area to be found in the contiguous US and the average daytime visibility rates amongst the best to be found as well. Old timers talk of seeing mountain peaks in California, Nevada, Idaho and Washington as well as in Oregon. I have picked out various peaks including Lookout Mountain at the east end of the Ochoco's, as well as the Strawberry Mountains and the Wallowa Mountains to the north using my *Oregon Gazetteer* for confirmation.

Our base camp will be at Fish Lake Campground, located 18 miles from Frenchglen at a little over 7000 feet of elevation. We will set up scopes either in the campground or in a little dry lake bed about 1/4 mile away from the west loop of the campground that I call the "fishbowl". The campground has several loops and we should have no problem with camping space, camping in the nearby observing site will be limited for environmental reasons. No motor homes or travel trailers will have access to the smaller observing area as there



**The  
Weather SIG**

Date: Wednesday, June 27, 2001  
Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219  
Time: 7:00 pm

*Come rain or shine . . .*

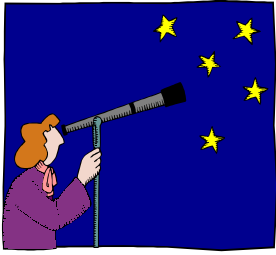
are a couple problematic rocks and one sharp curve that limit total vehicle length. It is also likely that some of us will choose one night to take our scopes up to the summit and view from 9700 feet!

This star party is not just for just experienced observers, but anyone joining me should have their own gear and observing agendas. I expect that those that come along will be serious about their viewing or photography regardless of experience level. Steens is close to a 400 mile trip from Portland and requires a full day to get there. So, I plan to take advantage of most every hour of possible viewing!

Temperatures in mid October will vary according to the current regional weather. Steens Mountain is a spot that can and does make its own weather. During one of the early August OSP's at Steens, we had snow on the ground and high temperatures only in the 40's. Fall tends to be a better time to avoid thunderstorms and the clouds common in late July and August. Though no place has ever given me more spectacular views of the summer Milky Way than Steens after a scrubbing August rain shower. Daytime highs can still be nice into mid October however, reaching the upper 60's on warm sunny days. Night time lows can range anywhere from the 30's to sub teens that time of year. Those coming should have plenty of warm winter clothes and be prepared for anything from the weather.

Vehicles should be in good working condition and your tires should have plenty of tread, along with at least one good spare. The road up from Frenchglen is washboard, the exact condition varies from year to year, but it is free of big rocks all the way up to the summit. One should expect it to take 45 minutes from Frenchglen to reach Fish Lake Campground, another 20 minutes to the summit. The entire Steens Mountain Loop is drivable by most passenger vehicles, though the back side coming down past an area known as the Rooster Combs is still very rugged and steep and should be avoided by vehicles with low ground clearances as there are a couple large rocks jutting up and the road can become slick when wet.

(Continued on Page 7)



# JUNE AT OMSI

## RCA/OMSI Summer Solstice Star Party

Join OMSI and Rose City Astronomers to celebrate the summer solstice with local astronomy experts at a FREE Star Party on June 30 starting at 9:30 p.m. in OMSI's East Parking Lot, located at 1945 SE Water Avenue. Peer through powerful telescopes to view stars, red planet Mars, nebulae, constellations and other fascinating aspects of the night sky. For possible cancellation due to weather, call 503/797-4610 on June 30.

## VIEW THE JUNE TOTAL SOLAR ECLIPSE AT OMSI

Total Solar Eclipse 2001 - Live via satellite event from Zambia.

At OMSI Murdock Planetarium

Eclipse: June 21, 6:00am (PDT)

Public Event: June 21, 6:00 am

Free Admission / First come, first serve basis.

Produced by the Exploratorium and NASA

With over 50 participating museums around the world A total solar eclipse will occur in southern and central Africa on June 21, 2001. Not visible at all from the United States, this first total solar eclipse of the new millennium will be brought live from Zambia to OMSI Murdock Planetarium and to the rest of the world by San Francisco's Exploratorium, via satellite connections. This event is made possible by the San Francisco Exploratorium with support from NASA, and features official endorsement by the National Society of Black Physicists.

See the broadcast in person at the OMSI Murdock Planetarium. Have the full experience of this celestial event at an early morning museum public gathering that begins at 6:00 am, leading up to the TIME eclipse.

An Exploratorium science museum team will be on the ground in Zambia, capturing video images of the

## ASTROPHYSICS / COSMOLOGY SIG

TIME: 7:00 PM

DATE: June 21 , 2001

TOPIC: "Extraterrestrial Agriculture" by Paul Schmidt  
"Solar Astronomy" by Tom Franzel

PLACE: Linus Pauling House, 3941 S.E.  
Hawthorne Blvd.

eclipse using specially equipped telescopes. These images will be broadcast to over 50 participating museums around the globe who are holding eclipse events based on the Exploratorium-originated live feed.

This year, the event will focus on the themes of solar maximum, habitability of space, and living with the Sun. A possible downlink from the International Space Station is planned and would include a conversation with astronauts Jim Voss and Susan Helms of the Expedition Two crew. The conversation with the astronauts will focus on how the sun affects life in space: how solar flares and Coronal Mass Ejections can produce radiation bursts that affect everything from communications with earth to the health and safety of the astronauts themselves.

The event will also feature scientists, including members of the National Society of Black Physicists (<http://www.nsbp.org> ) to engage and excite young people about space science and technology.

Among the over 50 museums participating: Museum of African American Technology Science Village (Oakland, CA); Museum of Science (Boston, MA), Maryland Science Center; Adler Planetarium (Chicago, IL); Strassenburgh Planetarium of the Rochester Museum & Science Center (NY); Sydney Observatory (Australia); The American Museum of Science and Energy, (Oak Ridge, TN); Cleveland Metroparks Zoo(OH); Exploradome (Paris, France); Computraining Centre (Dar Es Salaam, Tanzania); Bishop Museum (Honolulu HI).



(Continued from page 3)  
**Maui Observing**

several prominent open clusters/diffuse nebulae, a few of which were too low for Messier to catalog. The constellations directly below Scorpius are Corona Australis, Ara, and Norma. While containing a few bright deep sky objects, this area surprisingly isn't as rich as the Scorpius-Sagittarius region.

In April and the months around it, you can find Omega Centauri and the Southern Cross in the southern horizon. We found them from the lanai of our condo at sea level – though at midnight! To locate Omega Centauri, NGC 5139, you need to navigate south from the Libra-Virgo area. A trick I use to find it is to first locate Arcturus and then Spica (Arc to Arcturus and drive a spike to Spica). Almost equidistant down and slightly angled the opposite direction is Omega Centauri. (Check out Chart #6 in Tirion's Bright Star Atlas and see the pattern here.) I use this technique to determine if Omega Centauri is even within viewing reach, and then fine-tune the navigation with the chart. Under good viewing conditions, Omega Centauri is a naked-eye object (a fuzz ball), so if you even get close to the area, you can probably locate it.

Further south and a little to the west is the Southern Cross, Crux, with its beautiful open cluster called The Jewel Box. The January-February-March time-frame is probably more optimum for finding Eta Carinae. I haven't been there this time of year and haven't viewed Eta Carinae from Maui, but given the viewing conditions and location, it looks like it is possible. I think that the Large and Small Magellanic Clouds, along with the spectacular globular cluster of 47 Tucanae, are just a little bit too south to be viewed from here. I'd like to be proven otherwise though!

Combining observing sessions into my travel activities puts an added element of fun into each of my trips. Viewing from the summit of Mt. Haleakala is an experience not to be missed.

## AWS - Aperture Fever's Silent Partner

By Jim Reilly

Local amateur astronomers haven't seen much of me lately. That's partly because I've been suffering from AWS - Aperture Withdrawl Syndrome, the reverse ailment of Aperture Fever. What are these diseases, and how does one recover?

When one gets seriously addicted to late-night observing, Aperture Fever is inevitable - one simply must have a larger instrument to squeeze every detail from favorite planets, clusters and galaxies. I was clearly not immune, going from 10 inches to 14½ and finally to 22 inches. While those days with the 22 were glorious, they were also quite short - I knew that my family's history of back trouble would make a 130-pound telescope difficult to travel with. I sold the 22 a couple of years ago, leaving me with nothing larger than an 8" and plans for a lightweight 13". I had plenty of time to finish the new mirror and 'scope for the Mars opposition of 2001. But from out of nowhere, AWS struck me down.

The main symptom of AWS is a lack of motivation to observe through a (relatively) small telescope. After seeing objects any time I wished with large-aperture scope, what's the point in observing those same objects with an 8-incher? [An 8-inch telescope can show plenty of amazing sights, and no one should say otherwise; it's just never easy seeing less than before.] Even other projects like the 13-inch

became more tedious as other life issues begin to absorb the time that astronomy used to soak up. Three years after its purchase, that mirror-blank is still unfinished (it's almost done - but unlike horseshoes and hand grenades, close doesn't count). This is the third consecutive Martian opposition where an unfinished mirror sits in my garage during the prime viewing window. I find myself going to bed at 9:00 on clear nights, hardly giving the sky a second thought. Considering how deeply involved in observing I was a few short years ago, it's scary what AWS can do.

I think I am turning the corner this time though. Really! Once our garage/workshop is finished (we're putting in new workspaces and cabinets) and the dust settles, that 13-inch will finally receive its parabolizing strokes and a bright new finish. The half-completed tube will be mounted on that plywood circle that's been sitting in the corner, stained and lacquered, and ready for OSP '01. A new telescope always reawakens my interest in the sky, as familiar objects take on a new appearance and the magnitude limits are pushed to the limit for the new aperture. I'll get out my maps, Megastar printouts and atlases and see the universe!! Right after my bike trip to the beach, dayhikes to prepare for that week-long backpack trip in July, the family campout, and a few other projects... oh, oh. Man, this AWS is tough to break.



✂

**2001-2002 DUES RENEWAL**

**Your RCA membership is active through June 30, 2001.**

**Please renew your membership by July 1st for the year July 1, 2001 through June 30, 2002. You may renew your membership for \$24 at the June 18th RCA General Meeting or by mail. Send to: RCA Membership, OMSI, 1945 S.E. Water Ave., Portland, OR 97214. Make check payable to: RCA. Thank you for your support and participation.**



# The Herald-Bobroff AstroAtlas

By Michael Rasmussen

Why, one may ask, would an AstroAtlas require 12 full sky charts? Why have 3 series of charts that cover the whole sky? Why, in the same volume, can one find charts devoted to an area of the sky 2 degrees declination by 12 minutes RA, areas that can fit into a single wide field of view.

The Herald-Bobroff AstroAtlas (which I'll call the HBA) was designed and compiled by two observational astronomers. Peter Bobroff is a telescope maker and deep sky observer, with a special interest in deep sky observing. David Herald's interests concentrate on comets, occultations, and eclipses. He is also the author of Occult, software for predicting occultations, transits and eclipses. The HBA shows an effort to pack as much information as possible into one volume – and to do so in a useful, readable manner.

On first encounter what I liked about the HBA was the different views of the sky it provided. Full sky views allow one to quickly grasp the distribution of objects in the sky. From that overview the HBA drills down providing more detailed views of interesting regions. When a chart from a full sky series is not detailed enough, or too overcrowded, another chart is available providing the clear and open view. Having these different views in one 5 pound field guide is very useful.

It was after I got it home and started reading it that the real density, the actual richness of information became apparent. Reading the HBA is somewhat like viewing a deep sky object. The more time you spend viewing the HBA the more you can see in it. This is because the objects are plotted with symbols that describe them in detail. At first encounter the symbols are daunting. You look at a chart and see boxes, ellipses, circles, star dots with lines attached. After spending some time with the HBA and comparing it to familiar regions of the sky and known objects the symbols click into place. Ellipses become galaxies on the page. The other symbols mentally become their object type. After just a bit of time you can scan a chart and easily pick out the double stars and see

which objects are bright and which are faint. Soon you glance at a chart and perceive details like the morphology of a galaxy or the shape of a nebula.

The HBA provides a concise reference for observing sessions. It provides both the overview and detail needed for navigation. While the sun is up or the skies cloudy the book is a readable (think novel or guidebook) surrogate for the unavailable heavens.

Quantitatively the HBA consists of six series of charts. They range in view from full sky to detailed areas just a few degrees in size. The series are:

**A** – 12 full sky views limited to an object type or navigational aid for example galaxies, open clusters, globular clusters, bright nebula each have dedicated charts.

**B** – 3 series of large views (64 degrees declination by 6 hours RA. And polar regions to 45 degrees) based on the Yale Bright Star Catalogue featuring bright stars and non stellar objects. One series has the printing oriented for when you are facing north, one for when you are facing south making it convenient to read the labels on the charts while holding it up to the sky. The third B series charts show the magnitudes for all plotted stars.

**C** – the main series of charts covering the entire sky with 94 charts at a uniform scale. Stars to magnitude 9 and non stellar objects to magnitude 14 are plotted. Boundaries of the D series charts are shown for easy reference.

**D** – the C series charts sometimes get crowded. Chart C-52 has 7613 plotted stars. To give rich field areas of the sky their due the 42 D charts cover the poles, rich regions of the Milky Way, the area around Orion, the Pleiades, regions with many galaxies and the Magellanic clouds. Limiting magnitudes and scale vary for each represented region.

**E** – the Virgo cluster of galaxies, eta Carina and the Magellanic Clouds receive even more detailed views here. The four Virgo charts each cover a sky region of 9 degrees declination by 24 minutes RA.

**F** – the core of the Large Magellanic Cloud is detailed.

(Continued on Page 8)

(Continued from page 4)  
STEENS MOUNTAINS

Frenchglen is the nearest town (population 50) and it has only a few buildings and not much for supplies. There is a restaurant and hotel (Frenchglen Hotel, phone 541-493-2825) that has excellent food. Reservations are needed for dinners and should be made days ahead. Breakfast and lunch are served during specific times only but do not require reservations. In addition there are rooms for those who desire. Again make your reservations way ahead of time though as they are usually not available on short notice. Diesel and gas is normally available at Frenchglen.

Burns (population 5K) is an hours drive north of Frenchglen and will be a better choice for picking up any last minute supplies on the way down. Burns is also the closest location for any auto repairs and where a tow truck would have to come from if your vehicle breaks down. Same said for medical facilities, those with known health problems need to keep this in mind. Some may have problems with the altitude, though at 7000 feet we are not all that high and it should not make a problem for anyone not having known problems with higher elevation.

There are only basic amenities at Fish Lake Campground, those include running water at the east loop and pit toilets and fire pits in the campgrounds. There is a camp host and fees are charged to camp at the campground, specifically \$8 per night.

I have included various web page links below that will allow those that desire more information to research the area further. There are many more web sites up on Steens, a quick search on Yahoo yielded a couple pages of links re the area and current political topics.

<http://www.or.blm.gov/steens/>

[http://www.gorp.com/gorp/activity/byway/or\\_steen.htm](http://www.gorp.com/gorp/activity/byway/or_steen.htm)

<http://thriveonline.oxygen.com/fitness/go-guide/ss/cm/cmOR89.html>

<http://www.oregonphotos.com/pagethree-C.html>

# OSP 2001 ON-SITE VOLUNTEERS NEEDED

The 2001 Oregon Star Party is only two months away—August 16-19th at Indian Trail Spring near Prineville, Oregon. Jan Keiski has again volunteered to coordinate the registration tent. Volunteers are needed to assist throughout the Star Party. All shifts are two hours, with the exception of the evening 6 - 7:30 p.m. registration tent shift. If you have two-hours free and can sign up to help, see Jan at the June 18th RCA General Meeting, or please e-mail her with the dates and times you would like to work.

This is a great way to meet people, help out OSP and have lots of fun too! The times needed for volunteers include:  
August 15 - Wednesday, 4 - 6 p.m. Setup materials needed inside activities & registration tents; Placement of on-site signs.

August 17 & 18 - Thursday, Noon to 7:30 p.m.; Greeting and registering attendees as they arrive - includes prepaid and on-site registration, parking assistance; Shower truck duty - taking prepaid tickets from participants .

August 19 - Saturday, Noon to 3 p.m, same as the 17th and 18th. Saturday 4-5 p. m. Help with door prizes.

August 20 - Sunday, 10 a.m. to 12 p.m. Take down and assemble the on-site signs; pack up registration tent materials .

By Jan Keiski

---

## Announcing the Annual OSP Rover Races

I, Dan Petersen, Interplanetary Race Commissioner of the OSP Rover Races, invite one and all to the running of the rovers at the 2001 Oregon Star Party. This event was originally inspired by the landing of the Pathfinder spacecraft on the surface of Mars in 1997. The "Scientific" toy company made a toy "Sojourner" rover that we used in the first Rover Race. The tradition continues today. If you wish to enter the Rover Race you must be able to comply with the following rules and regulations.

### **The course:**

If you have been to the Indian Trail Springs site of the OSP you will note that if you remove the "Dammit" bushes the area looks startlingly like the surface of Mars, complete with fine red dust. The course is about 20 feet long and 18 inches wide. It makes several turns and there is one place where you have to drive in, bump the "Face on Mars" rock, then back out before continuing.



There are also several natural obstacles that will put a little challenge in the contest. No driver may set foot in the course but has to operate the rover from the side. The winner is the person with the fastest time in completing the course.

### **The "Classic" category:**

This category preserves the original essence and spirit of the Rover Races since the only vehicle used in this race is an unmodified "Scientific" toy rover. I know several of you who have one of these rovers enshrined in a place of honor in the back of the storage shed. Dust them off and bring 'em. Both the cable control and the radio controlled versions are legal in this category. The Interplanetary Race Commissioner will have at least a couple of "Scientific" rovers as "loaners". There will be an adult and a youth race. Youth refers to little kids generally under five years of age.

(Continued on Page 9)

---

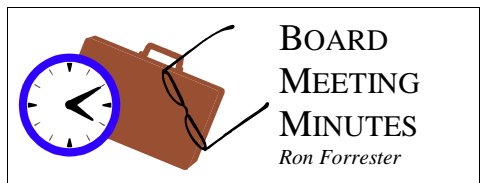
(Continued from Page 7)

### **H-B AstroAtlas**

Each chart is populated with a consistent set of detailed symbols for all objects. Double stars are indicated in a manner to show separation, position angle, companion magnitude and orbit between 1990 and 2030. Variable stars have their magnitude range and period indicated. Regular stars of sufficient brightness have their spectral class shown. Stars of magnitude 6.5 and brighter are labeled with their name. Non stellar objects are represented with unique symbols for each of the six classes of bright, dark and planetary nebula; open and globular clusters; and galaxies. The symbols cover features including visibility, color, shape, form, density and more. Examples of the symbols are squares for bright nebula, ellipses for galaxies, notched circles for clusters. The density of the line used to draw the object indicates its visibility – analogous to the larger dot representing brighter stars.

Feature summary of the HBA:

- One volume, 12x19 inches, 5 pounds
- 214 Charts with over 330,000 stars, 10,000 galaxies, 1,100 nebula, and 2,200 clusters shown.
- Full sky plotting of stars to magnitude 9 and non-stellar objects to magnitude 14
- Selected regions of the sky have stars plotted to magnitude 14 and non-stellar objects plotted to magnitude 15
- 6 series of charts, 3 series covering the full sky and 3 series providing more detailed views of selected regions of the sky such as galaxy rich areas, densely populated regions of the Milky Way, the Pleiades, the Magellanic clouds
- Adjacent charts overlap by 10% or more
- Chart symbols indicate object features such as galaxy and nebula visibility, star spectral class, position angle of double stars and galaxies, morphology of galaxies, concentration and brightness range of stars in clusters, and more
- Limiting magnitude charts for the entire sky



**BOARD  
MEETING  
MINUTES**  
*Ron Forrester*

**May 7, 2001 @ 7:00 PM  
Parker Room**

Present: Dareth Murray, Vern Weiss, Peter Abrahams, Ron Forrester, Scott Turner, Bob McGown, Jan Keiski, Scott Fitzpatrick, Ginny Pitts, Candace Pratt, Matt Brewster, Glenn Graham

Treasurer - Vern: Current bank balance is \$15,919.

Programming - Matt: Todd Duncan from PSU speaking for the May meeting. Greg Cermac from NEAR project for June. Richard Canfield of University of Montana speaking in July, Dr. Ken Crosswell in September, Paul Hodges of U of Washington in August. October might be Dark Sky's and observing (Herschel 1&2 and Messier).

Star Parties - Scott: Camp Hancock the 18<sup>th</sup>. Larch in June.

Sales - Sameer: Nominal

New Members - Carol: 15 new members at the new-member seminar before the April general meeting. Numerous requests for a repeat. Plan on doing it once a quarter, but NOT in the planetarium. Several people have emailed expressing appreciation for the seminar and commenting on how helpful it was.

Library - Jan: Will purchase the latest Richard Berry's CCD book for the library.

Light Pollution - Bob: Meeting Bill Hughes (retired lighting engineer) to get him involved and excited about Astronomy – going to write some papers about the various properties of outdoor lighting, such as light bounce. Bob and Yohann met with Steve Marsh (State Representative) who was excited about light pollution issues and working to find solutions.

SIG's - Scott: Cosmology SIG went well – Bob: May's speaker has bailed, alternate presentation being worked out; Telescope making meeting in June may not go off.

AL - Dale: Nominal

Membership - Doug: 413 members.

Editor-Candace: Nominal.

YRCA - Ron: Nominal

Community Affairs - Norm: Nominal

OMSI - Peter: Nominal

Webmaster - Dareth: Dr. Duncan info going up on the website.

Telescope Library: Doing very well, plenty of checkouts.

Magazine: Nominal

Phone Line: Changing to be a monthly; Ron May 1 to June 4th, Scott June 5th-July Meeting

Glenn: Hancock going well. Sending information to Candace for the Gazette.

**Budget:** Vern busily updated the budget proposal amounts as we went around the room.

**Phone Line:** Start working on getting a multi-box voicemail line to be used to allow the various activity coordinators (SIG, etc) to record up-to date information regarding cancellations, etc. Scott Turner to get cost information.

**OSP:** Big meeting went off, 2500 brochures in the mail. Keynote speakers: Richard Berry Saturday, U of Montana Shane Larson Thursday, Michelle Larson on Friday.

**Miscellaneous:** Peter found a good deal on a Solar Scope for \$1000 for everything, i.e. scope, mount with motorized drive, powermate Barlow. Motion made by Scott to purchase, Candace seconds, passed by unanimous vote.

Salem says club thanks for the donation of the two scopes.

Need to update the articles of incorporation with current officers – wait until august to do this since that is when it is due.

Continued from Page 8) ROVER RACES

**The "Unlimited" category:**

This category is for all of you who want to "roll your own" rover. The limitations are as follows: #1 - the rover must be able to fit on the course. Note that the course is as narrow as 18 inches. #2 - The rover must have a real solar panel or a reasonable facsimile affixed somewhere on the unit. By reasonable facsimile we mean something that looks sort of like a solar panel such as a piece of cardboard painted and lined to look like a solar panel. Use your imagination. #3 - The rover must have at least one wheel or caterpillar tread touching the ground. This of course means that someone could come in riding a unicycle and be wearing a sun helmet with a faux solar panel taped to the top. It fits all the criteria.....and it's been done!

Above all this is meant to be a fun event. Prizes will be given out to the winners. So time's a wastin'! Get that rover going and bring it out.

Best regards, Dan Petersen, Interplanetary Race Commissioner.

**CLASSIFIED ADS**

**For Sale: Celestron-Vixen astronomical telescope— Sky Scope D-114E. D = 114 m/m, F = 900 m/m Excellent condition, includes aluminum tripod. \$350. Also: carrying case for disassembled telescope: wood with aluminum frame = \$75. Call Chuck or Ann Sturm, Vancouver, 360-573-8809.**

| JUNE 2001 |     |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|-----|
| Sun       | Mon | Tue | Wed | Thu | Fri | Sat |
|           |     |     |     |     | 1   | 2   |
| 3         | 4   | 5   | 6   | 7   | 8   | 9   |
| 10        | 11  | 12  | 13  | 14  | 15  | 16  |
| 17        | 18  | 19  | 20  | 21  | 22  | 23  |
| 24        | 25  | 26  | 27  | 28  | 29  | 30  |

| JULY 2001 |     |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|-----|
| Sun       | Mon | Tue | Wed | Thu | Fri | Sat |
| 1         | 2   | 3   | 4   | 5   | 6   | 7   |
| 8         | 9   | 10  | 11  | 12  | 13  | 14  |
| 15        | 16  | 17  | 18  | 19  | 20  | 21  |
| 22        | 23  | 24  | 25  | 26  | 27  | 28  |
| 29        | 30  | 31  |     |     |     |     |

### June

|                |             |                                              |                        |                |
|----------------|-------------|----------------------------------------------|------------------------|----------------|
| June 2         | Sat.        | TM Workshop                                  | Tech. Marine Srvc.     | 10:30 AM       |
| June 4         | Mon.        | Board Meeting                                | OMSI Parker            | 7:00 PM        |
| June 16        | Sat.        | Larch Mtn. Star Party                        | LOCAL Star Party       | Dusk           |
| June 18        | Mon.        | YRCA (ages 13-18)                            | OMSI Cafeteria         | 6:30 PM        |
| June 18        | Mon.        | RCA Kids (ages 4-12)                         | OMSI Cafeteria         | 7:00 PM        |
| <b>June 18</b> | <b>Mon.</b> | <b>General Meeting</b>                       | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| June 21        | Thurs.      | Astro/Cosmology SIG                          | Linus Pauling House    | 7:00 PM        |
| June 23        | Sat.        | Klondike Star Party                          | Dark Sky Star Party    | Dusk           |
| June 27        | Weds.       | Weather SIG                                  | Colonial Office        | 7:00 PM        |
| June 30        | Sat.        | OMSI Summer Solstice Star Party—West Parking |                        | Dusk           |

### July

|                |             |                             |                        |                |
|----------------|-------------|-----------------------------|------------------------|----------------|
| July 7         | Sat.        | TM Workshop                 | Tech. Marine Srvc.     | 10:30 AM       |
| July 2         | Mon.        | Board Meeting               | OMSI Parker            | 7:00 PM        |
| July 14        | Sat.        | Larch Mtn. Star Party       | Local Star Party       | Dusk           |
| July 16        | Mon.        | YRCA (ages 13-18)           | OMSI Cafeteria         | 6:30 PM        |
| July 16        | Mon.        | RCA Kids (ages 4-12)        | OMSI Cafeteria         | 7:00 PM        |
| <b>July 16</b> | <b>Mon.</b> | <b>General Meeting</b>      | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| July 19        | Thurs.      | Astro/Cosmology SIG         | Linus Pauling House    | 7:00 PM        |
| July 19-22     |             | Table Mountain Star Party   | WA. State Star Party   |                |
| July 21        | Sat.        | Cold Water Ridge Star Party | Dark Site Star Party   | Dusk           |
| July 25        | Weds.       | Weather SIG                 | Colonial Office        | 7:00 PM        |
| July 28        | Sat.        | RCA/OMSI Lunar Viewing      | OMSI Parking Lot       | Dusk           |

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-oms.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-oms.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012

# The Rosette Gazette

Volume 13, Issue 7

Newsletter of the Rose City Astronomers

July, 2001



## OBSERVING IN THE PACIFIC NORTHWEST



### In This Issue:

- 1 General Meeting  
New Members  
DUES DUE
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
Young RCA
- 3 Observer's Corner
- 4 Weather SIG  
Messier Menagerie
- 5 July at OMSI  
Cosmology SIG  
Cool Fun Facts
- 6 Kepler's Other  
Equation
- 7 Continued
- 8 Equatorial Star  
Gazing
- 9 Board Minutes  
Classified Ads  
OSP Volunteers
- 10 Calendar/Events

**RCAers are Observers!** A vast majority of the 450 members enjoy getting out on those all-too-infrequent clear, dark nights to gaze at the skies' wonders with the naked eye, binoculars and telescopes.

Join us Monday, July 16th at 7:30 in the OMSI Auditorium when Dale Fenske, Howard Banich, Candace Pratt and Bob McGown present "Observing in the Pacific Northwest."

Many members are currently in the process of completing one of the many Astronomical League Observing

Programs. The presenters will review these programs such as Lunar Observing, Urban Observing, the Messier Program, the Herschel 400 and Herschel II Programs and the newest AL program—the Galaxy Cluster Program.

Tips on getting started on any of these programs will be shared as well as advanced observing ideas to get the most of your observing experiences. Equipment, observing aids, and observing locations in the NW will be discussed plus star charts, filters, computer programs and more!

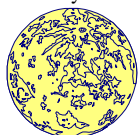
**2001-2002 DUES RENEWAL**

Your RCA membership is active through June 30, 2001. Please renew your membership for the year July 1, 2001 through June 30, 2002. You may renew your membership for \$24 at the July 16th RCA General Meeting or by mail. Send to: RCA Membership, OMSI, 1945 S.E. Water Ave., Portland, OR 97214. Make check payable to: RCA. Thank you for your support and participation.

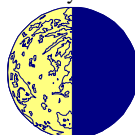
### WELCOME NEW MEMBERS!

- Erik Anderson
- David Back
- Stephen Barrs
- Greg Borque
- Jerry Braun
- Patton Echols
- Joseph & Amy Holden
- Sean League
- Chuck Nobles
- John P. Souza
- Christina Thompson

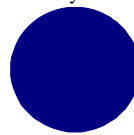
July 5



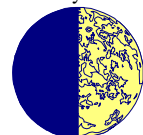
July 13



July 20



July 27





| Club Officers           |                   |                |                            |
|-------------------------|-------------------|----------------|----------------------------|
| President               | Peter Abrahams    | (503) 699-1056 | telescope@europa.com       |
| VP Members              | Doug Huston       | (503) 629-8809 | geometer31415@aol.com      |
| VP Observing            | Scott Turner      | (503) 788-6484 | kings11@qwest.net          |
| VP Community Affairs    | Norm Trost        | (503) 668-7979 | normt@europa.com           |
| VP, Communications      | Matt Brewster     | (503) 774-0360 | brewster@teleport.com      |
| Treasurer               | Vern Weiss        | (503) 236-1059 | vernlw@earthlink.net       |
| Secretary               | Ron Forrester     | (503) 504-8071 | rjf@skyhackers.org         |
| Sales Director          | Sameer Ruiwale    | (503) 617-0736 | sameer_ruiwale@hotmail.com |
| Editor                  | Candace Pratt     | (503) 296-6758 | candace@europa.com         |
| Web Master              | Dareth Murray     | (503) 762-4377 | dareth@easystreet.com      |
| Library Director        | Jan Keiski        | (503) 293-3281 | jikeiski@juno.com          |
| Telescope Librarian     | Brian Richardson  | (503) 625-7373 | brian_shelly@earthlink.net |
| Alcor, Historian        | Dale Fenske       | (503) 256-1840 | fenskedf@juno.com          |
| Media Director          | Glenn Graham      | (503) 579-1141 | sueandglenn@msn.com        |
| Special Interest Groups | Scott Fitzpatrick | (503) 669-8243 |                            |
| Youth Director          | Margaret McCrea   | (503) 232-7636 | mags@europa.com            |
| Light Pollution Rep.    | Bob McGown        | (503) 244-0078 | telescope@qwest.net        |
| New Member Programs     | Carol Huston      | (503) 629-8809 | StarsCarol@aol.com         |
| Magazine Subscriptions  | Johan Meijer      | (503) 777-0706 | johanm@www.com             |



## President's Message

By  
Peter Abrahams

Observing: impromptu and otherwise  
After a very long and wet winter and spring, we are having some really beautiful skies for stargazing; now we just need to coordinate new moons and weekends with the intermittent clear skies.

Table Mountain Star Party is held outside Ellensburg in central Washington, July 20-22 this year. I always have a great time at TMSP, but first-timers should know a few things. It is held at a reasonably dark site with truly spectacular mountain scenery (sunsets from Lion Rock are fantastic). However, the federal government owns the land and greatly restricts our temporary 'urban sprawl'. Vehicles are restricted to an area that is getting very tight as more people attend each year -- cars are lined up in tight rows.

If you camp in your vehicle, you will feel

crowded; and the same if you like to set up your scope by your car. However, you can pitch a tent away from the crowds, and it is easy to find a beautiful spot in the trees for your tent (but not always easy to find the tent in the dark). TMSP is more crowded and less dark than OSP, but there is an entirely different group of people there, and their knowledgebase and technical abilities are very impressive. I enjoy TMSP very much and haven't missed a year in a long time. Ellensburg is a very nice university town, too; though I haven't stopped in a few years. Since it is a 4 hour drive to Table, the RCA will be having a star party that same weekend, July 21, at Coldwater Ridge.

Concerning local observing sessions. The RCA's active observers like to meet for stargazing, and most events have to be impromptu, because of our fickle weather. We welcome all members to any spontaneous events, and are concerned that we don't become a 'high tech only' group; -- but email works far better than other methods of fast notification.

If you can get email and aren't on the email list, consider joining (via our web site). You can always filter or delete any

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The "Kids" of Rose City Astronomers



Children ages 4-12 are welcome to join in fun and educational activities while their grownups attend the monthly general RCA meetings. The kids' meeting takes place in the adjoining cafeteria at OMSI from 7:00 to 9:00 PM - the door is always marked. If you have any questions, please e-mail Jennifer at [jenny@theforrest.org](mailto:jenny@theforrest.org).

**The Young Rose City Astronomers** (ages 13 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

discussions you don't want to read, and only open mail marked 'observing this weekend'. While you're on line, check out the RCA web site; as there are frequent updates and additions.

<http://www.rca-oms.org/rca/index.htm>

## Observing Mars

On most nights this year Mars appears to have slipped behind a thin layer of undulating Vaseline. And on the nights of *really* unsteady seeing it has looked even worse. I have no doubt that others have had better luck, but so far I'll admit to being mostly disappointed. However, I'm still optimistic that fortune will smile on us a few times with steady skies before the summer is past and Mars has gone its way.

To be ready for Mars when our atmosphere does settle down requires a bit of preparation. Not a great deal, but the details of getting ready can make all the difference between seeing very little and seeing a great deal. I've mentioned some of these things in previous articles but now is a good time to get into the nuts and bolts a bit. If you already know this stuff, this is a good place to jump off to read the other fine articles in this month's Rosette Gazette.

There is one most important factor that in my experience, and in talking to others, that bears repeating and stressing. Mars is not ripe for easy pickings – you probably won't be able to walk up to a scope, peek in the eyepiece and see Mars decked out in all its glory. That's often true for seasoned observers as well, as experience isn't the only key. The eye takes a few moments to get used to the brightness of Mars image in the eyepiece, which near opposition this year is shining at magnitude  $-2.4$ . Mars remains brighter than  $-1.8$  all through July.

The other main factor is variable seeing conditions. Our atmosphere can go from a boiling mess to serene calm in a few moments, and if you happen not to be looking when the view sharpens up you'll have to wait

for the next calm moment. And that may come some other night.

So, the two easiest things you can do to improve the chance of seeing something on Mars is to let your eyesight become accustomed to the brightness of the image and to wait patiently for a moment of steady seeing. Here's some ways to help these two processes along.

### Filters

Use an eyepiece filter to knock down the brightness of Mars. There are several main options; a colored filter, a neutral density filter and an adjustable polarizing filter. Yes, I have all three kinds; you never really know which will work the best. All three screw into the barrel of your eyepieces.

A colored filter can enhance certain features, and on Mars the one best



filter to use is red. This will bring up the surface features which give the planet so much of its character. Other colors bring out different features, but red is the place to start.

A neutral density filter, sometimes known as a Moon Filter, reduces the amount of light that gets through your eyepiece and reduces glare.

A polarizing filter is similar, but it is two neutral density filters stacked in such a way that they can be rotated to

tune in the exact image brightness you like best.

A fourth option to cut down image brightness is to use an aperture mask, effectively reducing the light collecting area of your scope. This might also help sharpen your view as smaller scopes sometimes provide a steadier image when the atmosphere is burbling along on low boil. If you have a Newtonian scope, the mask would cover the entire front end of the tube and would have a round hole cut in it just big enough to fit between two of the spider vanes and the outer edge of the primary mirror. Cheap and easy to make.

For those that don't mind spending a small fortune, a binoviewer is an excellent way to cut down on glare, as each eye receives 50% of the brightness that a single eyepiece would. And observing with both eyes invariably produces a sharper, more satisfying view that is also more comfortable to observe. Beware of sticker shock though, as this is can be one of the more expensive accessories you can buy. Plus you need matching sets of eyepieces. Yikes!

### Comfort

Whether you're set with filters or not, you have to be looking when the view is sharp. The best way to do this is to look often and for extended periods. Nothing backbreaking, maybe 5 minutes at a time is all. Then take a short break and come back for more. Be comfortable enough to enjoy looking for at least twice as long as you intend to view. Sitting is great, can't be beat really, but that may mean an adjustable chair. Buying one is expensive, but less so than many eyepieces and making one can be a fun project. Either way an adjustable chair is worth its weight in aspirin.

Hunching over an eyepiece, with your  
(Continued on Page 8)

# Messier Menagerie - July 2001

By Dr. Rick Letherer, the "starry-eyed" Astronomer

*He, who through vast immensity can pierce,  
See worlds on worlds compose one Universe,  
Observe how system into system runs,  
What other planets circle other suns,  
What varied Being peoples every star,  
May tell why Heaven has made us as we are.*

Alexander Pope, *Essay on Man*

This month is probably the best for deep-sky observing in terms of variety and selection of objects. We observe deep into the heart of our Milky Way galaxy in summer. Myriad star clouds present as Sagittarius positions for easy observing at the South.

It's easy to find lots of interesting observations this month, but it's difficult to limit selections to a small list; Sagittarius alone has 15 Messier objects within its borders. Here's my best shot for a look at summers best.

M4: This globular is easy to find. It sits adjacent to the heart of the scorpion, west of Antares. M4 is larger than famous M13 in Hercules. It is almost as bright, but low enough in the Oregon southern sky that it appears less spectacular.


M80: This little globular is here time smaller and notably dimmer than M4 which makes for a good contrast of the two globulars. M4 and M80 are close enough to easily switch field back and forth for comparison. M80 is located between two bright blue stars and is so compact that it appears almost star like.

M7: This one got a "star" in my log, which denotes something special. The stars in this open cluster are bright and widely separated. The brightness permits color identifications of red, blue, and yellow. I would be tempted to call this the kaleidoscope cluster. TO bad this is locate so far into the southern horizon's haze.

M8: This emission nebula is divided into two bright streaks by a dark dust lane, for which the object is named: lagoon nebula. Open cluster NGC6530 has a fan shape similar to M103 in Cassiopeia and is superimposed on M8.

M17: Another emission nebula, it looks to me like a bright streak of haze with a hole at one end. Don't forget to practice averted vision when you inspect for detail in this Omega nebula.

M20: This emission nebula is called trifold because



## The Weather SIG

Date: Wednesday, July 25, 2001  
Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219  
Time: 7:00 pm

*Come rain or shine . . .*

of the three dust lanes that trisect it. The nebular haze is not difficult to locate, but I have found that the three dust lanes are very difficult to see in my 10 inch dobsonian. Don't let the long exposure photographs taint your real-time observations.

M11: This open cluster is striking with two or three bright central stars in the center and a gold/blue pair in the upper left field of my eyepiece. I don't really see the "wild duck" structure that gives this cluster its name, but I return to view it often in summer because it is so rich in stars.

M22: Even though this is a globular, it resolves easily into dozens of stars. Located close to the tip of the teapot lid in Sagittarius, it is bright and easy to find. I like to compare this globular to the open cluster M11 above.

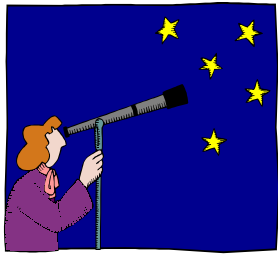
M55: This is another "star" in my log; something special. I know there are many showcase objects in Sagittarius that might overshadow this globular, but it really impresses me. It is easy to resolve a couple dozen stars against a hazy background glow. My log says

"Monster globular-awesome...best globular!" I think this object is under-rated just because it is dimmer than M13 and M22. Please take some time to really survey my favorite globular.

There are several great objects I have not listed here due to space limitations. Try these first to whet your appetite. May yours nights be filled with clear skies and wide horizons!



Mars visits Messier 20 and 8. Photo taken by Mike Cole 5/20/01 at 3:00 am at Camp Hancock, OR. FCT 150 at f5, PPF 400 120 x 20 min. Processed in photoshop. Mike's photo appeared as NASA's "Astro Photo of the Day" on June 15th. See it at <http://antwrp.gsfc.nasa.gov/apod/ap010615.html>



# JULY AT OMSI

Lunar Viewing Star Party - Saturday, July 28 See craters and highlands on the moon's surface through a variety of powerful telescopes at a FREE Lunar Viewing Star Party on July 28 beginning at 9:30 p.m. in OMSI's East Parking Lot, located at 1945 SE Water Avenue. For possible cancellation due to weather, call 503/797-4610 that evening. Tips for lunar viewing: On July 28, the near full moon will be in the ninth day of its single lunar cycle of 29.5 days around the Earth, and will be visible rising from the east beginning at 3:24 p.m.



The sun will be just less than 180 degrees to the west of

## ASTROPHYSICS / COSMOLOGY SIG

TIME: 7:00 PM

DATE: July 19 , 2001

TOPIC: "The use of Astrophysics in Metaphysics, The Italian View,"  
By Michael Meo

PLACE: Linus Pauling House, 3941 S.E.  
Hawthorne Blvd.

the moon, and this angle provides interesting shadow effects on the moon's surface. The gibbous moon will be visible for the evening and much of the morning, and will transit directly south during the few hours before midnight. This phase of the moon's cycle is the best viewing opportunity to see details of craters and highlands on the moon's surface.



## COOL FUN FACTS

### What moon of Jupiter has auroras?

Jupiter is not the only body in the Jovian system that has an atmosphere with auroral displays.

Brilliant, colorful auroras also happen over its moon Io. These are very exotic auroras, since they happen in a weird atmosphere of ionized sodium, oxygen, and sulfur dioxide.

The small, volcanic moon orbits close to Jupiter, in a belt of radiation so intense it could kill an unprotected human. In addition, there is a vast electric circuit between the moon and Jupiter, with a charge difference of some 400,000 volts. Io's auroras are among the most brilliant and colorful in the Solar

System. Because of the particle radiation and the huge electric current, Io's entire thin atmosphere is energized, causing it to emit a dazzling show of red, blue, and green lights.

More about Io's auroras:

[http://explorezone.com/archives/99\\_08/06\\_io\\_aurora.htm](http://explorezone.com/archives/99_08/06_io_aurora.htm)

<http://www.astronomynow.com/breaking/9908/05io/index.html>

Io is the most volcanic body in the Solar System:

<http://www.cool-fact.com/archive/1997/08/27.html>

Jupiter also has auroras:

<http://www.cool-fact.com/archive/1999/12/30.html>



# KEPLER'S OTHER EQUATION

By Phil Engstrom, Ph.D.

## Part I

Certainly one of the most remarkable achievements in mathematical astronomy was the discovery by Johannes Kepler early in the 17th century of his three laws of planetary motion. Briefly stated, these three laws are

1. Each planet moves along an elliptical orbit around the Sun which is located at the focal point of the orbit.
2. The radius vector describing the motion of the planet around the Sun sweeps out equal areas in equal periods of time.
3. The square of the period  $T$  of a planet is directly proportional to the cube of the semi-major axis of its orbit.

Each of these laws, when expressed mathematically, can be derived with elementary calculus from the inverse square law of attraction which expresses the gravitational attraction existing between the Sun and each of the planets.

There is a fourth equation --- simply called **Kepler's equation** -- which figures importantly in our understanding of how the planets move around the Sun and, correspondingly, how the Sun appears to move in an orbit around the Earth. While Kepler's three laws tell us much about a planet's motion and the shape of its orbit, they do not tell us the location of that planet in its orbit at a given time. It is in the determination of this important bit of information that Kepler's equation comes into play.

From Kepler's Second Law it is evident that a planet's speed along its orbital path depends on its distance from the Sun. If equal areas are to be swept out by the planet's position vector in equal time intervals, then the Earth, for example, must necessarily move more quickly at perihelion than at other places along its orbit. There is one (ideal) orbit along which a planet's speed is essentially uniform. If a planet moves along a circular orbit in ideal fashion (under the influence of the Sun alone), then the speed of the planet along that orbit will be everywhere the same. Furthermore, if we know its period, we can easily determine the planet's position at any time in the planet's year. So, for example, if the period  $T$  were exactly 1,000 days, then in each day the planet would traverse an arc of  $360/1,000 = 0.36$  degrees = 21.6 minutes when viewed from the Sun's position. By the same token, an observer on that planet would see the Sun advance through the same length of arc each day.

Consider also that two planets will have the same period if they have the same mass and have orbits with equal semi-major axes. Thus, if an appropriate link can be formed between these two instances --- that is, between the motion of a planet along an elliptical (non-circular) orbit and the motion of an ideal planet of the same mass but moving in a circular orbit --- we will be able to infer the position of the first planet at time  $t$  from the known position at the same moment of the second planet. Kepler's equation provides the important link here.

Before we proceed we must describe some relationships and set down some definitions. To do this, refer to Figure 1. This figure portrays two orbits and three possible planet positions. Of the orbits, one is circular and the other is elliptical and non-

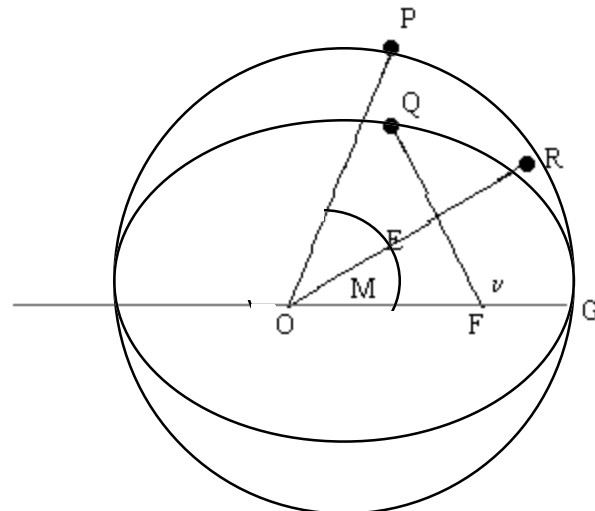


Figure 1: Mean, Eccentric and True Anomalies

circular. The point  $O$  is the center of the circle and the ellipse while  $F$  is the focal point of the ellipse. The two position vectors  $O'P$  and  $O'R$  describe the positions of the planets at  $P$  and  $R$  respectively. The third vector  $F'Q$  describes the position of the planet at  $Q$ . An important requirement here is that  $P$  and  $Q$  have the same  $x$ -coordinate value in a rectangular coordinate system imposed on the figure. Each of these three vectors forms an angle with respect to the major axis of the elliptical orbit. The angle  $M$  is called the **mean anomaly** since it refers to the position of a planet moving uniformly (at a mean velocity) along a circular orbit. The angle  $E$  is called the **eccentric anomaly**. And the angle  $\nu$  is the **true anomaly**. As we will see, it refers to the true or actual position of the planet in question.

We can now formulate our problem more precisely: Given a planet  $Q$  in motion in a elliptical orbit with focus at  $F$  and a fictitious planet  $R$  moving in a circular orbit whose diameter coincides with the major axis of the elliptical orbit, find the relationship between the mean and true anomalies  $M$  and  $\nu$ . Clearly, if we know this relationship, we can find the position of  $Q$  corresponding to any position of  $R$ .

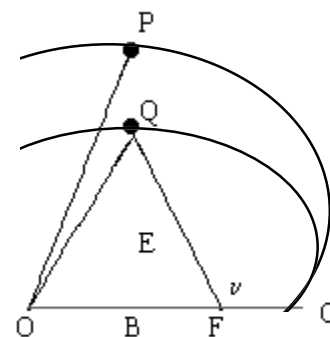


Figure 2: Circular and Elliptical Sectors Compared



As a first step here we find the relationship between the elliptical sector  $POG$  and the corresponding circular sector  $QOG$ . See Figure 2. Let  $\varepsilon$  denote the eccentricity of the elliptical orbit. Then it can be shown by a few simple calculations that the distance  $\overline{QB} = 1 - \varepsilon^2 PB$ . A consequence of this fact is that the area of the elliptical sector  $QOG$  has an analogous relationship to the area of the circular sector  $POG$ . That is,

$$\text{area } QOG = \sqrt{1 - \varepsilon^2} \text{ area } POG.$$

If the eccentric anomaly  $E$  is expressed in degrees and if  $a$  is the length of the semi-major axis  $\overline{OG}$ , then

$$\text{area } POG = \frac{E a^2 \pi}{360}$$

and we can write

$$\text{area } QOG = \frac{a^2 E \pi}{360} \sqrt{1 - \varepsilon^2}. \quad (1)$$

We also need the area swept out by the vector  $FQ$  --- that is, the area  $QFG$ . But this area is nothing more than the area  $QOG$  less the area of the triangle  $QOF$ . The base of this triangle has length  $\overline{OF} = a\varepsilon$ . Its height is given by  $1 - \varepsilon^2 a \sin E$ . It follows that

$$\text{area } \triangle QOF = \frac{a^2}{2} \sqrt{1 - \varepsilon^2} \varepsilon \sin E.$$

Subtracting the area of the triangle  $QOF$  from the area of the elliptical sector  $QOG$  gives us the area  $QFG$ .

$$\text{area } QFG = \frac{a^2}{2} \sqrt{1 - \varepsilon^2} \left( \frac{E \pi}{180} - \varepsilon \sin E \right). \quad (2)$$

Refer again to Figure 1 and picture the two planets  $Q$  and  $R$  moving simultaneously through  $G$ . That is, at time  $t = 0$  both planets are at  $G$ . Because the axis of the elliptical orbit and the diameter of the circular orbit are coincident, the periods of the two planets are equal. Thus, at a given time  $t > 0$  and according to Kepler's Second Law, each of the position vectors for the planets  $Q$  and  $R$  will sweep out the same fractional part  $t/T$  of the area contained within its respective orbit. Specifically, since  $R$  moves uniformly along its orbit,  $M = (t/T)360$  degrees.

The area of the circular sector  $ROG$  (Figure 1) is  $Ma^2 \pi / 360$  where  $M$  is given in degrees. Thus, recalling Kepler's Second Law and equations 1 and 2, we need  $M$  such that

$$\frac{a^2 M \pi}{360} \sqrt{1 - \varepsilon^2} = \frac{a^2}{2} \sqrt{1 - \varepsilon^2} \left( \frac{E \pi}{180} - \varepsilon \sin E \right)$$

or

$$M = E - \frac{180}{\pi} \varepsilon \sin E. \quad (3)$$

This is Kepler's equation. We could write

$$f(E) = E - \frac{180}{\pi} \varepsilon \sin E - M. \quad (4)$$

Then solving the equation becomes a matter of finding the zeros of the function  $f$ . Kepler's equation is transcendental and so cannot be solved by simple algebraic means. It may, however, be solved using Newton's method, a Taylor's expansion, or a suitable computer program.

Kepler's equation provides us with the relationship between the mean and eccentric anomalies  $M$  and  $E$  under the assumption that the planets  $Q$  and  $R$  both pass simultaneously through the perihelion point  $G$ . But the aim here is to find the relationship between the mean and true anomalies. So there remains the problem of finding the relationship between the eccentric and true anomalies  $E$  and  $v$ . With this relationship we can finally determine how  $M$  and  $v$  are related.

This relationship can be found by employing two familiar trigonometric relationships and a polar equation for the ellipse. We derive the polar equation first. Let  $r = \overline{FQ}$  be the length of the position vector for  $Q$  and observe that

$$r^2 = (a\sqrt{1 - \varepsilon^2} \sin E)^2 + (a\varepsilon - a \cos E)^2.$$

After some simplification we obtain

$$r = a(1 - \varepsilon \cos E) \quad (5)$$

The half-angle formula for the sine function may be written as

$$\left( \sin \frac{v}{2} \right)^2 = \frac{1 - \cos v}{2}.$$

Thus,

$$\begin{aligned} 2r \left( \sin \frac{v}{2} \right)^2 &= r(1 - \cos v) \\ &= r - r \cos v \\ &= a(1 - \varepsilon \cos E) - a(\cos E - \varepsilon) \\ &= a(1 - \varepsilon \cos E + \varepsilon - \cos E) \\ &= a(1 + \varepsilon)(1 - \cos E). \end{aligned}$$

In a similar way,

$$\begin{aligned} 2r \left( \cos \frac{v}{2} \right)^2 &= r(1 + \cos v) \\ &= a(1 - \varepsilon)(1 + \cos E). \end{aligned}$$

It quickly follows that

$$\left( \tan \frac{v}{2} \right)^2 = \frac{(1 + \varepsilon)(1 - \cos E)}{(1 - \varepsilon)(1 + \cos E)}$$

and

$$\tan \frac{v}{2} = \sqrt{\frac{1 + \varepsilon}{1 - \varepsilon}} \tan \frac{E}{2}$$

so that

$$\tan \frac{E}{2} = \sqrt{\frac{1 - \varepsilon}{1 + \varepsilon}} \tan \frac{v}{2}$$

and

$$E = 2 \arctan \left( \sqrt{\frac{1 - \varepsilon}{1 + \varepsilon}} \tan \frac{v}{2} \right). \quad (6)$$

If this representation for  $E$  provides its value in radians, we would need to multiply the result with  $180/\pi$  to find  $E$  in degrees. Equation 6 together with Equation 3 (Kepler's equation) allow us to express  $M$ , the mean anomaly, in terms of  $v$ , the true anomaly.

**Part II will be featured in the August issue.**

# Equatorial Star Gazing

By Maurice Bruce Stewart

When I was in the Galápagos at the beginning of June, I had a marvelous chance to view the sky from the equator. Because I was on the rolling deck of a ship, I did not attempt to use a telescope, but the views with my 10x binoculars were splendid. Only three of my seven nights were clear, but I used them to the max. The first of these was the night of the full moon. As I waited for night to fall, I noticed at once how different things appear in the Galápagos. At the equator, all the diurnal circles are perpendicular to the horizon so that the sun goes straight down in the least possible time. As a result, twilight is very brief in the Galápagos: only 1 hour and 15 minutes of astronomical twilight compared with 2 hours 32 minutes here in Portland. It gets dark really fast. Likewise, the moon comes straight up at right angles to the horizon.

The full moon looked very strange as it popped up over the horizon. When the full moon rises in Oregon in June you see Mare Crisium at the 12:45 position on the face of the moon [see Fig. 1], but at the equator, as the full moon rises you see Mare Crisium at the 11:15 position. The moon looks as if it had been

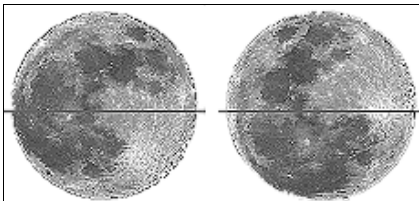


Figure 1. On the left is the rising full moon as seen from Portland. On the right is the rising full moon as seen from the Galápagos.

(Continued from page 3—Mars)

back, neck and legs aching and threatening to give out is not only uncomfortable, you just won't see as much as you could otherwise. There's nothing wrong with being comfy, this is a hobby after all. Think of observing like fishing – you wouldn't hunch uncomfortably over your rod waiting for a fish to come along, comfort is paramount. Same thing with observing.

Although Mars is too low this year to stand while observing, a good tip in general for standing observations is to have something sturdy to lean against.

And don't forget to dress warmly and have your favorite bug spray handy. It's summer, but it's still cold at night and the bugs seem to find us all the more delicious as midnight snacks.

Turbulence control

Beyond image brightness, color control and your general comfort as an observer there are considerations about your other equipment. Your telescope has to be close to same temperature as the night air to perform at its best, otherwise it's adding its own heat to the distortion of the image it's trying to produce. Hey, this is the atmosphere's

given a counterclockwise twist of 45°, which is just what I should have expected to happen when I traveled south through 45° of latitude. However, it is one thing to expect something and quite another to experience it.

This rotation through 45° affects the entire sky, of course. This rotation pushed the north celestial pole down into the murk of the northern horizon and twisted the celestial equator so that it passed straight up out of the east, over my head, and straight down into the west. In the west I was astonished to see Sirius just setting. In the east, Altair was just rising. Mars made a splendid show in the southeast and Antares stood almost directly above it, whereas here in Oregon Mars was rather more off to the left of Antares. All in all, it is very disorienting to see our familiar constellations twisted in the sky.

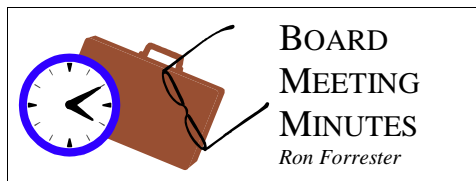
Because the celestial equator passed through my zenith, I had an excellent view of the southern sky. The fabulous Omega Centauri globular cluster, seen with difficulty low on the horizon even in the southern United States, was crossing my meridian at a very comfortable altitude of 42.5 degrees. Clearly visible to the naked eye, it appeared in my binoculars almost half the size of the full moon. It was simply astonishing. In fact, the whole southern Milky Way was astonishing. I had a good look at the Eta Carinae nebula. M7 was beautifully placed near the Cat's Eyes at the tail of the Scorpion. They are notable here in Oregon, but simply blazing at the equator.

job! Let your scope cool off for at least an hour before expecting the sharpest images. But don't let a warm scope stop you from looking, sometimes you'll get a sharp image out of a warm scope. It happens.

Where you set up is also important. Heat is given off by everything after the sun sets so you want to be in place where your line of sight to Mars is over an area that will cool rapidly. Parking lots, highways, power plants and rooftops will keep the air stirred up far longer than greenery and water. The higher your altitude the better off you're likely to be as well – less air to get stirred up and usually fewer heat sources too. In addition, a mountaintop is often out of the general turbulence created by airflow over terrain. These are some of the reasons major observatories are located on remote mountains.

All this aside, you can just plunk down your scope, aim it at Mars through air being diced and sliced by the heat of countless buildings, roads, automobiles and the current weather pattern and still get a great view. Possible, but not likely. However, the points I've outlined above will give you a better chance to see something like my sketch!

Good luck!



**BOARD  
MEETING  
MINUTES**  
*Ron Forrester*

**June 4, 2001 @ 7:00 PM  
Parker Room**

Present: Dareth Murray, Vern Weiss, Peter Abrahams, Ron Forrester, Scott Turner, Candace Pratt, Scott Fitzgerald, Ginny Pitts, Dale Fenske, Sameer Ruiwale, Bob McGown, Carol Huston, Doug Huston, Norm Trost.

Treasurer - Vern: \$17561 in the bank. Need inventories for the end of the year reporting.

Programming - Matt: Paul Hodge will be August. Carol, Dale, Candace, Bob to do Observing Programs, for the July meeting. September is Crosswell.

Star Parties - Scott: Hancock was fantastic, Larch is next on the 16<sup>th</sup>. The 23<sup>rd</sup> is Klondike, 30<sup>th</sup> is OMSI Solstice Star Party.

Sales - Sameer: Will provide report by end of month (end of fiscal year). \$441 for May. Good response to flashlights.

Membership - Doug: 423 Member Families, about 200 of which are online.

New Members - Carol: Have had requests for beginner astronomy workshop based on the new member orientation.

Library - Jan: Nominal

Light Pollution - Bob: Dareth and Bob went over the website and dug out the IDA link so that it is easy to get to. An IDA webpage will be put together. Stephine Wynczewski (sp?) got an ordinance passed in Troutdale for lighting.

SIG's - Scott: Next 3 months of TM workshop July 7<sup>th</sup>, Aug 4<sup>th</sup>, Sept 8<sup>th</sup>, Saturdays only, time sharing with John Delacy. Possible annual class with reasonable charge, and a flea market.

AL - Dale: Ballots for the AL officers were distributed. Two positions each with one nominee. \$1410 to renew our membership.

Editor-Candace: Nominal

YRCA - Ron: Nominal

Community Affairs - Norm: In April Margaret put on a presentation at a Girl Scouts conference and it was very well received. Gales Creek event to be planned for July.

OMSI - Peter: African Solar Eclipse, live 6am (eclipse starts) the 21<sup>st</sup> of June in the planetarium.

Webmaster - Dareth: New Gazette is up. Will post OMSI Solstice party notice.

Telescope Library: Nominal

Magazine: Nominal

Phone Line: Scott June 5th-July Meeting, Dareth July to August

Issues:

Solar Scope: Met Vic of Stellarvue, seemed like a great guy. Scope is \$734 including drive, plus \$250 for the PowerMate. Already voted for, going to purchase it.

Dollars for Do'ers: Scott Turner's company will occasionally give \$100-\$200 to a community organization. Recommendations: educational material.

Telephone Voice Mail System: Original reasoning was to notify of cancellations SIGs, star parties, etc. More research into our current system. Scott will check if the new system can be used with our current phone number.

**Budget:**

13 members were present to make a quorum for voting: Scott motions that the budget be accepted with admendments as discussed at the meeting, Seconded by Norm. Passed unanimously.



The 2001 Oregon Star Party is August 16-19th at Indian Trail Spring near Prineville, Oregon. Jan Keiski needs volunteers to assist throughout the Star Party. All shifts are two hours, with the exception of the evening 6 - 7:30 p.m. registration tent shift. If you have two-hours free and can sign up to help, see Jan at the July 16th RCA General Meeting, or please e-mail her with the dates and times you would like to work.

The times needed for volunteers include: August 15 - Weds., 4 - 6 p.m. **Setup Day.** Materials needed inside activities & registration tents; Placement of on-site signs.

August 16 & 17 - Thurs. & Fri. Noon to 7:30 p.m.: Greeting and registering attendees as they arrive - includes prepaid and on-site registration, parking assistance; Shower truck duty - taking prepaid tickets from participants .

August 18 - Sat. Noon to 3 pm, same as the 16th/17th. Sat. 4-5 p. m. Help with door prizes.

August 19 - Sun., 10 a.m. to 12 p.m. Take down and assemble the on-site signs; pack up registration tent materials .

**By Jan Keiski**

**CLASSIFIED ADS**

**FOR SALE:** Anyone interested in a good scope I have a Firstscope 80 EQ for sale. I have taken very good care of it and have enjoyed it very much, but I'm moving on to a Nexstar 114. It has all original pieces and boxes, and there is also a solar filter for it. I'm asking \$350.00 for it. You can contact me at [CRABMOON69@AOL.COM](mailto:CRABMOON69@AOL.COM) or Steven @ 503-280-0634.

| JULY 2001 |     |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|-----|
| Sun       | Mon | Tue | Wed | Thu | Fri | Sat |
| 1         | 2   | 3   | 4   | 5   | 6   | 7   |
| 8         | 9   | 10  | 11  | 12  | 13  | 14  |
| 15        | 16  | 17  | 18  | 19  | 20  | 21  |
| 22        | 23  | 24  | 25  | 26  | 27  | 28  |
| 29        | 30  | 31  |     |     |     |     |

| AUGUST 2001 |     |     |     |     |     |     |
|-------------|-----|-----|-----|-----|-----|-----|
| Sun         | Mon | Tue | Wed | Thu | Fri | Sat |
|             |     |     | 1   | 2   | 3   | 4   |
| 5           | 6   | 7   | 8   | 9   | 10  | 11  |
| 12          | 13  | 14  | 15  | 16  | 17  | 18  |
| 19          | 20  | 21  | 22  | 23  | 24  | 25  |
| 26          | 27  | 28  | 29  | 30  | 31  |     |

### July

|                |             |                                    |                        |                |
|----------------|-------------|------------------------------------|------------------------|----------------|
| July 2         | Mon.        | Board Meeting                      | OMSI Parker            | 7:00 PM        |
| July 7         | Sat.        | TM Workshop                        | Tech. Marine Srvc.     | 10:30 AM       |
| July 14        | Sat.        | Larch Mtn. Star Party              | Local Star Party       | Dusk           |
| July 16        | Mon.        | YRCA (ages 13-18)                  | OMSI Cafeteria         | 6:30 PM        |
| July 16        | Mon.        | RCA Kids (ages 4-12)               | OMSI Cafeteria         | 7:00 PM        |
| <b>July 16</b> | <b>Mon.</b> | <b>General Meeting</b>             | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| July 19        | Thurs.      | Astro/Cosmology SIG                | Linus Pauling House    | 7:00 PM        |
| July 19-22     |             | Table Mountain Star Party          | WA. State Star Party   |                |
| July 21        | Sat.        | <u>Cold Water Ridge Star Party</u> | <b>CANCELLED</b>       |                |
| July 25        | Weds.       | Weather SIG                        | Colonial Office        | 7:00 PM        |
| July 28        | Sat.        | RCA/OMSI Lunar Viewing             | OMSI Parking Lot       | Dusk           |

### August

|                |             |                               |                                     |                |
|----------------|-------------|-------------------------------|-------------------------------------|----------------|
| Aug. 4         | Sat.        | TM Workshop                   | Tech. Marine Srvc.                  | 10:30 AM       |
| Aug. 6         | Mon.        | Board Meeting                 | OMSI Parker                         | 7:00 PM        |
| Aug. 11        | Sat.        | Rooster Rock State Park       | Perseid Meteor Shower               | OMSI           |
| Aug 16-19      |             | 2001 Oregon Star Party        | Indian Trail Spring, Prineville, OR |                |
| Aug. 18        | Sat.        | White River Canyon Star Party | Local Star Party                    | Dusk           |
| Aug. 20        | Mon.        | YRCA (ages 13-18)             | OMSI Cafeteria                      | 6:30 PM        |
| Aug. 20        | Mon.        | RCA Kids (ages 4-12)          | OMSI Cafeteria                      | 7:00 PM        |
| <b>Aug. 20</b> | <b>Mon.</b> | <b>General Meeting</b>        | <b>OMSI Auditorium</b>              | <b>7:30 PM</b> |
| Aug. 23        | Thurs.      | Astro/Cosmology SIG           | Linus Pauling House                 | 7:00 PM        |
| Aug. 29        | Weds.       | Weather SIG                   | Colonial Office                     | 7:00 PM        |

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-oms.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-oms.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012

# The Rosette Gazette

Volume 13, Issue 8

Newsletter of the Rose City Astronomers

August, 2001



## OUR LOCAL GROUP OF GALAXIES



Dr. Paul Hodge, Professor of Astronomy at the University of Washington will be our guest speaker on Monday, August 20th at 7:30 PM in the OMSI Auditorium. Dr. Hodge's current research is concentrated on nearby galaxies, especially local group members and on the question of how they have evolved over their lifetimes.

Tololo Interamerican Observatory in Chili.

Dr. Hodge is Editor of the *Astronomical Journal*, which was founded 152 years ago in Cambridge, Massachusetts, at Harvard and which has been headquartered at the University of Washington's Astronomy Department since 1984. Dr. Hodge's most recent books include "*An Atlas of Local Group Galaxies*", and "*Higher Than Everest, an Adventurer's Guide to the Solar System*", and are both due out in 2001.

Please join us August 20th to hear Dr. Paul Hodge discuss galactic evolution.

### In This Issue:

- 1 General Meeting  
New Members  
DUES DUE
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
Young RCA
- 3 Observer's Corner
- 4 Weather SIG  
Messier Menagerie
- 5 July at OMSI  
Cosmology SIG  
Intelligent Life
- 6 Kepler's Other  
Equation
- 7 Library Corner  
OSP Update
- 8 The View  
Letter to the Editor
- 9 Board Minutes  
Classified Ads
- 10 Calendar/Events

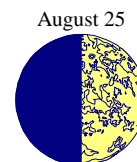
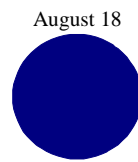
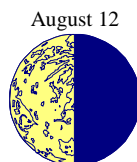
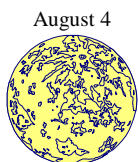
Most of this research is carried out on the Hubble space telescope, which he and his collaborators have used extensively to obtain images of galaxies and star clusters, and with observations taken with the Apache Point Observatory 3.5 meter telescope. Other observations in 2001 include scheduled nights on the 10 m telescope on Mauna Kea in Hawaii, and on the 1.5 m telescope at Cerro

**Final Notice**  
**2001-2002 DUES**

For members who have not renewed your membership—**this is your final newsletter and email bulletin board month.** RCA membership expired June 30, 2001. Please renew your membership for the year July 1, 2001 - June 30, 2002. You may renew your membership for \$24 at the Aug. 20th RCA General Meeting or by mail. Send to: RCA Membership, OMSI, 1945 S.E. Water Ave., Portland, OR 97214. Make check payable to: RCA. Thank you for your support and participation.

**WELCOME NEW MEMBERS!**

Rita DelRey  
Michael Johnson  
Todd Leen





| Club Officers           |                   |                |                            |
|-------------------------|-------------------|----------------|----------------------------|
| President               | Peter Abrahams    | (503) 699-1056 | telscope@europa.com        |
| VP Members              | Doug Huston       | (503) 629-8809 | geometer31415@aol.com      |
| VP Observing            | Scott Turner      | (503) 788-6484 | kings11@qwest.net          |
| VP Community Affairs    | Norm Trost        | (503) 668-7979 | normt@europa.com           |
| VP, Communications      | Matt Brewster     | (503) 774-0360 | brewster@teleport.com      |
| Treasurer               | Vern Weiss        | (503) 236-1059 | vernlw@earthlink.net       |
| Secretary               | Ron Forrester     | (503) 504-8071 | rjf@skyhackers.org         |
| Sales Director          | Sameer Ruiwale    | (503) 617-0736 | sameer_ruiwale@hotmail.com |
| Editor                  | Candace Pratt     | (503) 296-6758 | candace@europa.com         |
| Web Master              | Dareth Murray     | (503) 762-4377 | dareth@web-ster.com        |
| Library Director        | Jan Keiski        | (503) 293-3281 | jikeiski@juno.com          |
| Telescope Librarian     | Brian Richardson  | (503) 625-7373 | brian_shelly@earthlink.net |
| Alcor, Historian        | Dale Fenske       | (503) 256-1840 | fenskedf@juno.com          |
| Media Director          | Glenn Graham      | (503) 579-1141 | sueandglenn@msn.com        |
| Special Interest Groups | Scott Fitzpatrick | (503) 669-8243 |                            |
| Youth Director          | Margaret McCrea   | (503) 232-7636 | mags@europa.com            |
| Light Pollution Rep.    | Bob McGown        | (503) 244-0078 | telscope@qwest.net         |
| New Member Programs     | Carol Huston      | (503) 629-8809 | StarsCarol@aol.com         |
| Magazine Subscriptions  | Johan Meijer      | (503) 777-0706 | johanm@www.com             |



## President's Message

By  
Peter Abrahams

### The Mobile Astronomer

Traveling around the U.S. and around the globe provides many new opportunities for amateur astronomers. If you are lucky enough to visit the southern hemisphere, the Milky Way is an entirely different vista from there, with many more interesting objects. We have the small consolation of somewhat superior extragalactic viewing from the North.

If you can visit the southern states of the US, or cross the border into Mexico, many celestial objects will come into view that are not visible from our northern latitudes; the massive globular Omega Centauri is an example of an object that I have

never seen, that is visible from Arizona and Florida for part of the year. Traveling north from Oregon is not productive except to view the aurorae, which are praised by viewers but disliked by northerly astrophotographers. Destinations such as mountains, deserts, or the shores of lakes can offer far superior viewing to our terrain. And any distance between you and the city lights is worth the travel time.

It is not easy to travel with astronomical equipment. Many celestial sights are fine naked eye objects; and a hand held binocular is an excellent tool that fits in most luggage. There are several innovative 'travel telescopes' that have been made by RCA members. An eight inch Dobsonian has been made that collapses into a package a little larger than an eight inch cube. A thirteen inch travel scope by an RCA member can be taken on an airline. Among commercial scopes, only the 'Teleport' has such a design, not completely

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The "Kids" of Rose City Astronomers



Children ages 4-12 are welcome to join in fun and educational activities while their grownups attend the monthly general RCA meetings. The kids' meeting takes place in the adjoining cafeteria at OMSI from 7:00 to 9:00 PM - the door is always marked. If you have any questions, please e-mail Jennifer at jenny@theforrest.org.

The Young Rose City Astronomers (ages 13 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

miniaturized but very nicely made.

I hope RCA members are able to combine some travel plans with observing plans; and that they share their experiences with the group.



### Deep Sky Doubles-Part 1

The deep sky has innumerable objects to enjoy, and every so often two or more are arranged in the same wide-angle telescopic field of view. Vern Weiss and I have put together a list of "double objects" that meet the following criterion:

- They are in the same 2-degree field of view.
- They are different types of objects (i.e. globular cluster and planetary nebula).
- They are potentially visible in amateur size telescopes under truly dark skies.

This started as a discussion on the RCA email list with Vern's suggestion and now, after some work on both our parts, here it is. It is meant to be a fun way to dip your toe into deep sky observing, and is not at all exhaustive. Some of the "doubles" here are familiar as single objects but at closer look are at least doubles. Others are rather obscure, a few are challenge objects that will take you off the beaten path, and some may not be visible at all in your scope. All of which is part of the fun. And once you're off in the wilds of the universe, look around and see what other wonders you can find.

#### **NGC 404 galaxy and Beta Andromeda (Mirach)**

**Andromeda**  
RA 1hour, 09 minutes. Declination +35 degrees, 43 minutes.

A classic pair, 404 is a fairly large, round galaxy perched just off the north shoulder of the naked eye star Beta Andromadae. Evidently it has been reported as a comet many times, at least partly because of its unusual proximity to such a bright star. Clean optics will be needed to get a good view.

SA 2000 chart 4, UA page 91.

#### **M108 galaxy and M97 (Owl Nebula)**

**Ursa Major**  
RA 11hours, 15 minutes. Declination +55 degrees, 01 minutes.

Well known as a pair, these two make a great sight as a low power pair or alone with higher power. Look for condensation in the spiral arms of M108 and use a nebula filter on the Owl for best effect. SA 2000 chart 2, UA page 47.

#### **M52 open cluster and NGC7635 (Bubble Nebula) emission nebula**

**Cassiopeia**  
RA 23 hours, 24 minutes. Declination +61 degrees, 35 minutes.

M52 is a beautiful splash of stars while 7635 is faint and subtle. Try nebula filters on 7635 for the best view.

SA 2000 chart 3, UA page 34.

#### **NGC 7023 reflection nebula and NGC 7023 open cluster.**

**Cepheus**  
RA 21 hours. Declination +68 degrees, 10 minutes.

Out of the way in Cepheus, this intriguing pair is just off the Milky Way.

SA 2000 chart 3, UA page 33.

#### **E 356-4, the Fornax Dwarf Galaxy (mag. 8.1, surface brightness 13.2, size 12.0 z 10.2') and NGC 1049 galaxy (mag. 12.9, size 0.4')**

**Fornax**  
2 40 -34 27 No separation, NGC 1049 is in the galaxy.

The Fornax Dwarf will be tough because its light is spread out over a large area, and NGC 1049 is only a little easier because it's so small. Both are challenge objects.

SA 2000 chart 18, UA page 354.

#### **NGC 2395 open cluster and Abell 21 "Medusa Nebula"**

**Gemini**

RA 7 hours, 27 minutes. Declination +13 degrees, 35 minutes.

The Medusa is a large but very faint planetary nebula that will show itself only with an OIII (or similar) filter.

SA 2000 chart 12, UA page 184.

#### **Mu Orionis and Abell 12 Planetary Nebula**

**Orion**  
RA 6 hours 3 minutes. Declination +9 degrees 40 minutes.

Mu overlaps the planetary. Can be seen with a 13" scope with an O III filter - maybe with a smaller scope, but use lots of power.

SA 2000 chart 11, UA page 181.

#### **M42 and the Trapezium multiple star**

**Orion**  
RA 5 hours, 35 minutes. Declination -5 degrees, 27 minutes.

Probably the most famous "deep sky double", look also for the 5<sup>th</sup> and 6<sup>th</sup> stars in the Trapezium when the seeing is steady.

SA 2000 chart 11, UA page 225.

NGC 1981 open cluster and NGC 1977 reflection nebula

**Orion**  
RA 5 hours, 35 minutes, Declination -4 degrees, 26 minutes.

Just north of M42, this beautiful area is best appreciated with low power.

SA 2000 chart 11, UA 225.

#### **NGC 2237 (Rosette Nebula) and open cluster NGC 2244**

**Monoceros**  
RA 6 hours 32 minutes. Declination +4 degrees, 52 minutes.

Low power and a UHC or OIII filter bring out the nebulosity best. SA 2000 chart 11, UA page 227.

#### **NGC 2264 nebula and the Cone Nebula**

**Monoceros**  
RA 6 hours, 41 hours. Declination +9 hours, 53 minutes.

Part 2 will be featured in September.

# Messier Menagerie - August 2001

By Dr. Rick Letherer, the "starry-eyed" Astronomer

The last official full month of summer still gives us a diverse menu of Messier and other deep-sky objects to enjoy. We'll start with the summer triangle near the eye of the swan.

M29 This is a small open cluster, easy to find near gamma Cygnus. Even closer to gamma is NGC-6910, another open cluster slightly larger and equal in magnitude. I often wonder about Messier's process of cataloguing. Why did he list M29 and not NGC-6910. This is a very star-rich area of Milky Way.

M39 This open cluster is a challenge for star hoppers. I do best first locating with binoculars before using my self-made telrad I call RIPTIDE. M39 is very loose with 15-20 bright blue members and overflows my smallest magnification eyepiece of 25X. This is much brighter and nearly five times larger than M29.




**M27-Planetary  
Nebula in Vulpecula**

M27 I'll never forget my first observation of the dumbbell nebula; I kept thinking I was getting a reflection or smudge on my eyepiece and cleaned it twice before realizing what I was seeing. The double lobes or "ears" on this planetary are easy to discern since M27 is a zenith object. I have never seen the central magnitude 13 star.

M71 Compared to M55 (in July Messier Menagerie) this is ho-hum, but I like it because it is so easy to find. Located in the middle of the arrow, Sagitta, it is faint and hard to resolve.

M57 A beautiful smoke-ring in the sky. I usually look at this every time I have my scope out in summer and fall. I can see the oval shape and it is easy to locate between two close, bright stars: beta and gamma Lyra. I have never seen the 15th mag central star but can see the misty bubble in the center of the brighter surrounding ring. Compare the background inside and outside of the "ring" using averted vision.

M56 This is a dim little globular near Albireo. It is organized as an oval with fuzzy edges and there is a hint of resolution right at the edges of the globular. While in the neighborhood don't forget to enjoy the contrasty blue and topaz colors of the beautiful double star Albireo.



## The Weather SIG

Date: Wednesday, August 29, 2001

Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219

Time: 7:00 pm

*Come rain or shine . . .*

M15 This pretty globular is bright. It is easy to find by extending the omega-epsilon line on the south end of Pegasus. The center is bright with a diffuse outer halo. This is easy to resolve and reminds me that fall is close on the heels of summer.



**M15—Globular Cluster in Pegasus**

M72 A faint globular north of Capricorn. Not very exciting but interesting by comparison. Look for NGC-7009 the planetary "Saturn nebula" which glows in brilliant blue-green color in my 10" Dob.

M73 This "open cluster" is a neighbor to M72. It is actually an asterism of four stars. You should see an angular 90 degree presentation of linear stars with a bright central star. Here again I wonder what was in Chuck M.'s mind when he catalogued this. I would like to know his acuity measurements.

Enjoy the final views of the balmy summer sky. Nights are getting longer and soon chillier. I hope to provide you with a new list of fall viewing next month. May your nights be filled with clear skies and wide horizons!





## AUGUST AT OMSI

### **PERSEIDS METEOR SHOWER STAR PARTY**

The earth is soon to pass one of the most active meteor showers of the year, and the Oregon Museum of Science and Industry is inviting the public to view the spectacle in the Columbia Gorge on Saturday, August 11.

Co-hosted by OMSI, the Rose City Astronomers, Vancouver Sidewalk Astronomers and Oregon Parks and Recreation, the Perseids Meteor Shower Star Party will begin at 9 p.m. at Rooster Rock State Park, located 22 miles east of Portland on I-84 (east of Sandy River) at exit 325. The event is free to the public, however there is a parking charge of \$3 per vehicle or \$1.50 for OMSI and RCA Members. For possible cancellation due to weather, call 503/797-4610 that evening. For more information, call the OMSI

### **ASTROPHYSICS / COSMOLOGY SIG**

TIME: 7:00 PM

DATE: August 23 , 2001

TOPIC: "SETI —Part 3; Gary Beyl and Bob McGown

READING: Planetary Report—Planetary Society

PLACE: Linus Pauling House, 3941 S.E. Hawthorne Blvd.

Star Party Information Line at 503/797-4610; Rose City Astronomers Club at 503/255-2016; or Rooster Rock State Park at 503/695-2261.

### ***Intelligent Life in Other Worlds***

*By Maurice Bruce Stewart*

Physicist Enrico Fermi, said to be a firm believer in the existence of extra-terrestrials, was frustrated by the lack of firm evidence of their existence. Reasoning that advanced civilizations should by now have filled the Galaxy, Fermi came downstairs for lunch one afternoon at Los Alamos and blurted out his now-famous question, "Where are they?" "They are among us," it is reported that Hungarian-born physicist Leo Szilard responded, "but they call themselves Hungarians."

The obvious answer to Fermi's question is that no intelligent beings have shown up because there are no intelligent beings in other worlds. That is by far the most economical explanation. It is also, strangely, deeply dissatisfying to many people. A reason to expect intelligent beings in other worlds is that the same process produced them there that produced intelligent beings here in our world. That process is, of course, the natural selection of random variations in self-replicating entities. Nothing that we know of this process suggests any reason why it should not operate in other worlds just as well as here, where it certainly has produced intelligent beings such as the octopus, the dolphin, the chimpanzee, and

ourselves, among others. From what we know of what has happened here, it is also clear that if, somehow, the clock could be put back 4.5 billion years and the whole process run again, it is unlikely in the extreme that anything remotely like the living beings we see around us now would have arisen during the rerun. Too much depends on chance: chance both at the microscopic level as cosmic rays disrupt the genetic code, and chance at the macroscopic level as accidental collisions with asteroids, comets, and so forth, disrupt natural selection.

We should also notice carefully that we have not had great success communicating even with our very near relative, the chimpanzee, much less with the dolphin and the octopus. Although we seem eager to communicate with them, none of them shows any special interest in us. Why would it not be the same in other worlds? Why should we expect other intelligent beings to be interested in us? The only other intelligent beings with whom we are acquainted certainly not share our interest in communicating with other species.

People seeking intelligent life in other worlds seem fixated on the idea that the extra-terrestrials have our interest in technology and our eagerness to communicate. If you think about the famous cantina scene in Star Wars, you will see that although the entities there are

certainly bizarre looking, they are really just people in fancy outfits. Even Jabba the Hutt thinks that Carrie Fisher is sexy. No one thinks octopuses are sexy. Of course, the characters in Star Wars are like people. They have to be to hold our interest. Shakespeare would be hard pressed to keep an audience involved in a play starring an octopus and a dolphin entangled with a tribe of chimpanzees.

One of the ways we communicate is language, and it seems like the only candidate we know useful for crossing the vast distance of astronomical space. We certainly can say some things directly. "I am cold, tired, and wet." We understand utterances of this sort because of our bodily experience. But when we move away from the concrete to the abstract we leave the realm of direct utterance and enter the world of metaphor. Metaphors take their meaning from their referents, which are the kind of direct things we know about because of our bodily experience. We must expect that the beings in other worlds have different bodies than ours, more different than ours is from the octopus. We must expect them to use different senses, more different than our senses are from the bat and from the honey bee. Surely then, the metaphors which they use to discuss abstractions will be meaningless to us because we lack their bodily experience. We do not have their bodies and so we have no referents for their metaphors.

# KEPLER'S OTHER EQUATION

Part II

By Phil Engstrom

We will conclude this article with a sketch of a significant result obtainable from the above development. That result is the **Equation of Time**. Suppose for the moment we assume the Copernican point-of-view. That is, we regard the Earth as the center of our system and assume that the Sun moves along an orbit about the Earth. A moment's reflection will convince that the anomalies we've spoken of still have relevance. So, for example, an observer on the Sun would see the Earth advance across the sky against a background of the stars at the same rate that we observe the Sun advancing across the sky. While the orientation of the pertinent angles has changed, their values have not. The equations we've developed can be applied to observations of the Sun as it moves in an apparent orbit around the Earth.

Referring again to Figure 1, we now assume the earth to be fixed at  $O$ , the Sun to be at  $Q$  and a fictitious sun to be at  $R$ . The fictitious sun moves at a uniform speed in a circular orbit whereas the true sun moves in the plane of the ecliptic and along an elliptical orbit with eccentricity  $\epsilon = 0.017$ . We assume also that each of these suns crossed through the point  $G$  simultaneously.

We will need two equations to form the Equation of Time. The first is

$$u(v) = v - M(v) \quad (7)$$

where  $M(v)$  is obtained from Equation 3 by replacing  $E$  with its value in terms of  $v$  (See Equation 6). This equation is called the **equation of the center**. It expresses the difference between the position angles of the true and mean suns.

But according to convention, mean time is measured by a mean (also fictitious) sun moving at uniform speed along the celestial equator. Because the Earth is tilted at an angle of 23.44 degrees with respect to the plane of the ecliptic, it is necessary to introduce a second factor representing the difference between the

true longitude  $\lambda$  (measured along the ecliptic) and the right ascension  $\alpha$  (measured along the celestial equator) of the Sun.

The true longitude  $\lambda$  of the Sun is equal to the sum of the longitude of perihelion  $\varpi$  and the true anomaly  $v$ . Currently the value of  $\varpi$  is 102.9 degrees. So

$$\lambda = \varpi + v = 102.9 + v$$

The expression for the difference  $\alpha - \lambda$  is called **reduction to the equator**. We write

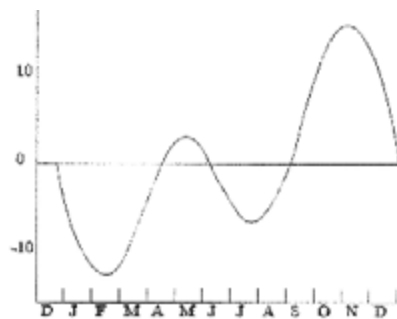
$$w(v) = \alpha - \lambda.$$

A familiar formula from spherical trigonometry expresses the relationship between  $\alpha$  and  $\lambda$ :

$$\tan \alpha = \frac{1 - (\tan \frac{\epsilon}{2})^2}{1 + (\tan \frac{\epsilon}{2})^2} \tan \lambda$$

where  $\epsilon$  is the obliquity of the ecliptic 23.44 degrees. It follows that

$$\alpha = \arctan \left( \frac{1 - (\tan \frac{\epsilon}{2})^2}{1 + (\tan \frac{\epsilon}{2})^2} \tan \lambda \right)$$



$$\alpha = \arctan(0.917 \tan(102.9 + v))$$

So

$$\begin{aligned} \omega(v) &= \alpha - \lambda \\ &= \arctan(0.917 \tan(102.9 + v)) - (102.9 + v). \end{aligned}$$

By combining this equation with Equation 7 we can write the Equation of Time:

$$\text{Equation of Time} = -\omega(v) - u(v). \quad (8)$$

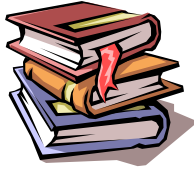
This equation expresses the difference between the right ascension of the mean sun and the right ascension of the (true) Sun or, symbolically,  $RAMS - RAS$ . The value is positive when the mean sun precedes the true sun and negative when it trails. The Equation of Time becomes zero on 16 April, 14 June, 2 September and 25 December. Extreme values occur around the dates 11 February (-14<sup>m</sup>.3), 14 May (3<sup>m</sup>.7), 26 July (-6<sup>m</sup>.4) and 3 November (16<sup>m</sup>.4). The graph of the Equation of Time is shown above in Figure 3. The horizontal scale shows months of the year; the vertical scale shows minutes of time.

Another graphical form of this equation -- called an analemma -- can be found on some globes. It has roughly the shape of the figure eight. Inscribed along its outline is a scale on which are indexed the days of the year. If a particular date is selected, the extent to which that point on the figure eight lies ahead of or behind the figure's centerline is the extent to which the mean sun precedes or lags behind the true sun.

For further reading:

1. Grossman, Nathaniel, *The Sheer Joy of Celestial Mechanics*, Birkhäuser, Boston, 1996.
2. Pollard, Harry, *Celestial Mechanics*, Mathematical Association of America, 1976.
3. Smart, W. M., *Spherical Astronomy*, Cambridge University Press, 1960.





## **The Alchemy of the Heavens: A Book Review** *By Donald Miller*

The book *The Alchemy of the Heavens* is an excellent modern history of the Milky Way. Written by Ken Croswell, it gives a wonderful insight into the research of our galaxy. In addition, he gives some ancient history to enrich the context of searching for meaning in the Milky Way. From Jacobus Kapteyn's universe to Frank Drake searching for extraterrestrial intelligence, the book takes the reader on a journey that spans the cosmos. This is a book for those literate in astronomy knowledge, as advanced terminology is used throughout.

The narrative traces two perspectives of the galactic model. One is that of Jacobus Kapteyn, who compiled a massive star catalogue of 454,875 stars from 1896 to 1900. In the time of Kapteyn, astronomers thought our galaxy was the whole universe. Through the relation of a star's mean parallax, proper motion, and apparent brightness Kapteyn determined the measurements of the galaxy. He arrived at a diameter of 55,000 light years, a thickness of 11,000 LY, and figured it contained 47.4 billion stars, and claimed the sun was near the center.

Another astronomer who more successfully conquered the galactic model was Harlow Shapely. He studied the distances to special stars called Cepheid variables. Harlow determined the distances to globular clusters to arrive at a model for the galaxy. He states that the diameter of our galaxy is 330,000 light-years and put the sun out from the center of the galaxy 65,000 light years. Shapely's estimates are

twice as large as the currently accepted value.

Ken Croswell acknowledged Walter Baade for devising the two stellar populations of stars. Population 1 Baade says lie in open star clusters in the galactic disk. Population 2 stars are RR Lyrae stars and cooler main-sequence stars which reside in the galactic halo and bulge. What is fascinating is that there is a relationship between the two populations of stars. Population 2 stars are older and metal poor. Of course Croswell mentions the Hertzsprung-Russel diagram which categorizes stars by luminosity (in solar units), absolute magnitude, and color (which indicates temperature).

The keystone in modern galactic research was founded when Edwin Hubble discovered that Andromeda was a galaxy completely separate from our own. This belittled the role of the Milky way in the universe. A captivating observation by Hubble was that of Cepheid variables that he could use to calculate the distance to Andromeda. V. M. Slipher made the interesting discovery that galaxies rotate, by looking at the spectra of Andromeda's light. He also found that Andromeda's spectra is blue shifted, which means it is moving towards us. This is rare among galaxies which usually are moving away.

The author points out that there are many types of matter that make up the galaxy. One kind is the matter we see, the stars themselves. The other type we can infer its existence because it obscures the light of other stars. This is dark matter which is composed of gas and dust and black holes. Interestingly enough black holes are super massive stars that imploded and become so dense that not even light can escape. Also amazing is the fact that black holes eat up mass from other stars

that orbit them. Imagine what a waste disposal that would be!

In the book, Ken Croswell discusses other interest subjects. He mentions the epic paper of Margaret Burbidge, Geoffery Burbidge, William Fowler, and Fred Hoyle. This 1957 epic piece delineated suggestions for the process of nucleosynthesis, or how the elements are derived from hydrogen. Also, Ken notes the efforts of Olin Eggen, Donald Lynden-Bell, and Alan Sandage, who sought the means by which the galaxy was formed. They studied the Hertzsprung-Russel diagrams of globular clusters to find out it was a free fall of gas clouds.

The search for extra terrestrial intelligence is one of the more modern pursuit of astronomers who study the Milky Way. On April 8, 1960 Frank Drake was using the 85 foot radio telescope at Green Bank, West Virginia to observe radio signals from the heavens. It is thought that extraterrestrials would send a regular repeating signal. On that day, Frank found such a signal coming from the direction of a star named Epsilon Eridani that pulsed 8 times a second. He was amazed at how easily he discovered evidence of extraterrestrial life! Now, to test the finding he used a smaller, less sensitive radio telescope. Disappointingly, it was found to be local, probably from a passing airplane.

*The Alchemy of the Heavens* is the book that will stand forever as the best book about the research associated with the Milky Way in the twentieth century. Ken Croswell does an excellent job of relating advanced astronomy knowledge to the amateur. This book should be recommended to everyone interested in the astronomy of the Milky Way.



## ***OREGON STAR PARTY—AUGUST 16-19 INDIAN TRAIL SPRING, CENTRAL OREGON***

The OSP is just a couple weeks away. The pre-registration deadline was July 31st. However, you can register on sight. For details, check out the website at <http://www.oregonstarparty.org>

# The View From Down Here

By Rob Brown

## “Alien Encounters”

As astronomers, amateur or otherwise, we all cringe when someone mistakenly uses the term “astrology.” See? Just reading it gives you the willies. Well, I certainly get riled up anyway. So, imagine what it’s like to have a heated discussion with an astrologer! This is an experience that I’ve had several times over the years, with outcomes of which I am not at all proud.

The most dismal occurrence happened one summer night on the shores of Lake Coeur d’Alene, Idaho, in 1991. Armed with my C-8 telescope, I was planning on entertaining my relatives and their neighbors during their Saturday night bonfire. This small community of maybe 7 families spends long summer months in their little cabins which can only be accessed from the water, a 30 minute boat ride from Coeur d’Alene. (Or a 2 hour near-death experience on a fire road.) They all know each other very, very well, I was the outsider despite the presence of my uncles and cousins. I began with showing a few of the big summer objects, you know the ones, and answering their questions. It was a typical OMSI moment, except the skies were nice and dark. Then, as most everyone took their seats by the fire, it happened.

“Haven’t you noticed how time is speeding up?”

At first I thought she must be a cosmologist. But soon I realized I was being probed for some sort of mystic knowledge that she felt I must possess, as though it comes with the purchase of the telescope. I tried to dance around the subject, but there was no getting away. Finally, unable to continue, I suggested that we get back to the subject of astronomy. No good. Then it got ugly. I’ll spare you the details, but she went away crying. I was greeted at the bonfire with a long round of vicious glares. How was I to know I had insulted the Queen Mother of the neighborhood? (hint: by the vicious glares)

While I’ve had several such “alien encounters” before and since, thankfully none have been so disastrous. But I’ve been having a regularly recurring encounter lately, one which happens in my

own driveway. I have a neighbor who is an Astrologer. (Yes, with a capital A).

She walks her dog, named Star by the way, every clear evening. One night she saw me with the telescope, and I asked her to have a look at the Moon. She was thrilled, clearly this was a first for her. She was full of all sorts of questions about telescopes and astronomy, then, you guessed it, IT happened. But this time, I was not going to let it get to me, and I was going to be a gentleman (she is a neighbor after all.) I let her do my horoscope, my kid’s horoscope, and my wife’s horoscope. She had some very specific visions about us, rare for an astrologer to go out on a limb like that. They were mostly wrong of course. But I let her have her fun.

A few months later, this Spring in fact, I showed her Mars in the telescope, fully prepared for the discussion that might transpire. She had never before seen it with or without a telescope, and couldn’t believe it really was red. While she was still overcome with amazement, I offered up the following:

“Did you know the reddish star just to the right of Mars is Antares? And that Antares means Rival of Mars? (anti = latin for opposed to, Ares = latin for Mars). And furthermore, Mars is headed right at Antares, it will be on a collision course (retrograde) until July 15<sup>th</sup> at which point Antares will win out and Mars will retreat (prograde).” I think she was completely overwhelmed with symbolism at this point, because instead of engaging me in a thorough analysis of the impending apocalypse, she just kept gawking and making exclamations about how astronomy must make a wonderful hobby.

Perhaps next time I’ll get another free horoscope. However, on one of our earlier meetings I told her I was not a Sagittarius, but actually an Ophiuchus. (Nov. 30, go look it up in a reputable ephemeris.) She seemed to take it well, not knowing there was a 13<sup>th</sup> zodiacal constellation.

I have been surprised and pleased that I could engage in these conversations without getting upset or compromising my own values. Chalk it up to maturity I guess. I’m sure I have more to learn, and I’m sure it will come in handy again someday, perhaps next time I’m at an OMSI star party. It’s certainly more fun than making enemies.



By Candace Pratt

## Letter from the Editor

After 15 years on the RCA Board, I have decided it is time to ‘be an active member off the board.’ Since the time we had two clubs in Portland, the Portland Astronomical Society and the OMSI Astronomers, I have served on the board and have enjoyed it immeasurably.

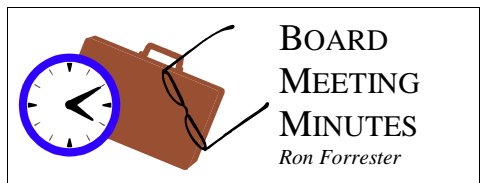
I would like to take a moment to describe the position and ask that anyone interested in being the 2002 RCA Rosette Gazette Editor, to please contact me or Peter. The Gazette is a team of contributing editors. Each month, individual members submit articles for inclusion in the Gazette.

It is the key function of Editor to maintain a team contributing editors. In addition to these contributions; events, activities, club

business, and upcoming functions need to be shared with the membership. Once articles are received, it takes me approximately 4 hours to edit and format the pages and prepare it for electronic sending to our printing company in Portland. This company prints and mails the newsletter to the membership. Doug Huston prepares the membership list, and the editor sends the update each month along with the Gazette.

If you are interested in the position I will be most happy to assist you for the first couple months. The Board will also provide you with Microsoft Publisher software to produce the newsletter. If you prefer a different publication software, that is fine as well. It needs to be compatible with Microsoft office programs such as Word, as all contributing editors are using Word. I will be traveling to Australia in October to observe the southern skies. I will not be available to do the

November newsletter. **Thanks to all of you for the wonderful support to our club.**



**July 2, 2001 @ 7:00 PM  
Parker Room**

Present: Peter Abrahams, Ron Forrester, Doug Houston, Carol Houston, Matt Brewster, Norm Trost, Scott Fitzgerald, Ginny Pitts, Dale Fenske, Jan Keiski, Vern Weiss, Bob McGown, Scott Turner, Dareth Murray

Treasurer - Vern: \$14,598 in the bank. Will provide Secretary with full set of year end fiscal documents for archiving. Ginny will be backing up for Vern in October, when he will be gone. Scott and Vern to look into getting an inventory of all saleable items at the next general meeting before the sales table is setup.

Programming - Matt: Howard, Dale, Candace, Bob to do Observing Programs, for the July meeting, Paul Hodge will be August, September is Ken Crosswell, October is Richard Canfield, November is Dean Kettleon, December is Potluck.

Star Parties - Scott: Cold Water Ridge cancelled on 21<sup>st</sup> of July and 15<sup>th</sup> of September, newsletter and web notifications have been sent, alternative parties will be scheduled. OMSI Star party was a reasonable success. Doug: Jackson Bottom star party had about 200 people, after some rain skys cleared.

Sales - Sameer: Nominal

Membership - Doug: 437 current members, 70 renewals at last meeting.

New Members - Carol: Nominal

Library - Jan: Library cart missing. Getting a mouse for the new laptop Larry Froberg donated (a very nice ThinkPad).

Light Pollution - Bob: Wrote up an IDA page for the RCA website.

SIG's - Scott: Nominal

AL - Dale: We need a better astronomical link on the webpage to the Astronomical League because after the observational talk at the general meeting there will be much interest in the viewing programs.

Editor-Candace: Nominal, although she will be stepping down as Editor come next year after 15 years of service to the RCA (thanks!!!).

YRCA - Ron: Nominal

Community Affairs - Norm: Meeting with Superintendent of Oregon Trails School District about setting up presentations for grammar schools, etc. Suggestion to invite schools to two big OMSI star parties. Phone line is full of requests from mostly scout groups for going to star parties. Need to encourage these groups to attend OMSI star parties to get Astronomy badge. Create a flyer advertising the appropriate star parties for groups.

OMSI - Peter: Nominal

Webmaster - Dareth: Nominal

Telescope Library: Nominal

Magazine: Nominal

Phone Line: Dareth to do July 2 to August meeting, Dale from August to September Meeting.

New Phone Line:

Motion made to keep current voice mail system, adding two new mailboxes one for schedule changes and one for Star parties. Carol seconds the motion. Passed unanimously.

Forming a nominating committee whose purpose is to contact people who are likely candidates for open positions.

Ginny Pitts volunteers from general membership

Ron Forrester, Carol Houston and Bob McGown from board, volunteer.

Possible topics for revising by-laws:

Nominating committee excluding president and VP's, Updated Quorum.

Open Positions in coming year:  
Newsletter Editor

**CLASSIFIED ADS**



**For Sale:** Celestron 11x80 Giant Binos. Nice pair. Has case, strap and caps. I will throw in my heavy duty L bracket with knob. (I made it out of 3/16 plate and powder coated it) My phone is 360-666-9105. Please call after 3 pm during weekdays and anytime on weekends. Chris Lindsay

**FOR SALE:** A GM11 Equatorial Head. No tripod. Excellent condition. Includes all pictured here... [http://synrgistic.com/webstore/classifieds\\_gfx/GM11.jpg](http://synrgistic.com/webstore/classifieds_gfx/GM11.jpg) Universal Dove tail has been shortened to reduce weight. Includes: Illuminated Polar Align Scope. Custom made case 11 pound counterweight. Asking: \$785. If interested contact me: Greg Babcock e-mail me at [gregb@iccom.com](mailto:gregb@iccom.com) or call 503-285-9768

**For Sale:** Meade 16 inch dobsonian, \$900. 'Starfinder' model, white sonotube, heavy laminate base. Used extensively but not damaged. Primary mirror is f4.5, full thickness; is very smooth - Ronchi tests very good, coatings in very good condition. Upgrades include bearings & 'dobmate' cover; telrad; plywood case for primary. This is a heavy, solidly built telescope; I can handle it with no problem but if you have a bad back, it is not for you. The optics are good enough to consider building a scope around them, or modifying the Meade mount for lighter weight. As sold, the telescope needed a Paracorr to reach focus with most eyepieces; I use coupling nuts to drop the primary & often do not use a Paracorr; but the Paracorr does improve performance. I also use a binoviewer and like having the primary up higher than most are; but I'm not sure why they sold it like this. Digital setting circles available for extra. New, these are \$1200. + shipping. You can see this in my garage near the southern end of Oswego, 2 miles north of the Stafford exit off I-205. Email me >>off the RCA list please<<, use mailto below, or phone 503-699-1056; if that's busy 636-2988 --Peter Abrahams

| AUGUST 2001 |     |     |     |     |     |     |
|-------------|-----|-----|-----|-----|-----|-----|
| Sun         | Mon | Tue | Wed | Thu | Fri | Sat |
|             |     |     | 1   | 2   | 3   | 4   |
| 5           | 6   | 7   | 8   | 9   | 10  | 11  |
| 12          | 13  | 14  | 15  | 16  | 17  | 18  |
| 19          | 20  | 21  | 22  | 23  | 24  | 25  |
| 26          | 27  | 28  | 29  | 30  | 31  |     |

| SEPTEMBER 2001 |     |     |     |     |     |     |
|----------------|-----|-----|-----|-----|-----|-----|
| Sun            | Mon | Tue | Wed | Thu | Fri | Sat |
|                |     |     |     |     |     | 1   |
| 2              | 3   | 4   | 5   | 6   | 7   | 8   |
| 9              | 10  | 11  | 12  | 13  | 14  | 15  |
| 16             | 17  | 18  | 19  | 20  | 21  | 22  |
| 23             | 24  | 25  | 26  | 27  | 28  | 29  |
| 30             |     |     |     |     |     |     |

### August

|                |             |                               |                                     |                |
|----------------|-------------|-------------------------------|-------------------------------------|----------------|
| Aug. 4         | Sat.        | TM Workshop                   | Tech. Marine Srvc.                  | 10:30 AM       |
| Aug. 6         | Mon.        | Board Meeting                 | OMSI Parker                         | 7:00 PM        |
| Aug. 11        | Sat.        | Rooster Rock State Park       | Perseid Meteor Shower               | OMSI           |
| Aug 16-19      |             | 2001 Oregon Star Party        | Indian Trail Spring, Prineville, OR |                |
| Aug. 18        | Sat.        | White River Canyon Star Party | Local Star Party                    | Dusk           |
| Aug. 20        | Mon.        | YRCA (ages 13-18)             | OMSI Cafeteria                      | 6:30 PM        |
| Aug. 20        | Mon.        | RCA Kids (ages 4-12)          | OMSI Cafeteria                      | 7:00 PM        |
| <b>Aug. 20</b> | <b>Mon.</b> | <b>General Meeting</b>        | <b>OMSI Auditorium</b>              | <b>7:30 PM</b> |
| Aug. 23        | Thurs.      | Astro/Cosmology SIG           | Linus Pauling House                 | 7:00 PM        |
| Aug. 29        | Weds.       | Weather SIG                   | Colonial Office                     | 7:00 PM        |

### September

|                 |             |                              |                        |                |
|-----------------|-------------|------------------------------|------------------------|----------------|
| Sept. 3         | Mon.        | Board Meeting                | OMSI Parker            | 7:00 PM        |
| Sept. 17        | Mon.        | YRCA (ages 13-18)            | OMSI Cafeteria         | 6:30 PM        |
| Sept. 17        | Mon.        | RCA Kids (ages 4-12)         | OMSI Cafeteria         | 7:00 PM        |
| <b>Sept. 17</b> | <b>Mon.</b> | <b>General Meeting</b>       | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| Sept. 20        | Thurs.      | Astro/Cosmology SIG          | Linus Pauling House    | 7:00 PM        |
| Sept. 22        | Sat.        | Autumnal Equinox Celebration | OMSI                   | Dusk           |
| Sept. 26        | Weds.       | Weather SIG                  | Colonial Office        | 7:00 PM        |

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-oms.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-oms.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012



# The Rosette Gazette

Volume 13, Issue 9

Newsletter of the Rose City Astronomers

September, 2001



## THE UNIVERSE AT MIDNIGHT

### In This Issue:

- 1 General Meeting  
RCA Work Party  
2002 Elections
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
Young RCA
- 3 Observer's Corner
- 4 Weather SIG  
John Dobson
- 5 September-OMSI  
Cosmology SIG  
Light Can't Be Seen
- 6 Messier Menagerie
- 7 Telrad Hunting  
Imaging Conf.  
Science Conf.
- 8 RCA Award  
OSP Photo Gallery
- 9 Board Minutes  
Classified Ads  
Mt. Bachelor Star  
Party
- 10 Calendar/Events

The universe's origin, evolution, and fate have long fascinated humanity, but until recently these subjects resided in astronomy's never-never land. The last ten years, however, have witnessed a stunning turnabout: an avalanche of new cosmological discoveries that illuminate the greatest questions of all. Dr. Ken Croswell will be our guest speaker at the September 17th General Meeting of the RCA at 7:30 pm at the OMSI Auditorium.

Dr. Croswell will join us to introduce his latest book, *The Universe at Midnight*. He will discuss the mammoth new telescopes on Earth, as well as the Hubble Space Telescope overhead that are probing the very frontiers of the universe. New findings including the "Great Attractor," a mass of galaxies 250 million light-years away that is trying to tug our Galaxy and thousands of others across the universe will be featured as well as the speeding up of the universe's expansion. Studies closer to home--right in the Milky Way--trigger debate on the mysterious dark matter that pervades the cosmos. As a result of these and other cosmological discoveries, we are finally beginning to SEE the universe at midnight, not merely imagine it.

*The Universe at Midnight* puts discoveries old and new into fresh perspective, explaining what the big bang, the Hubble constant, quintessence, and the cosmological constant really mean--and offering a brand new forecast for the universe's ultimate fate: the cosmos will expand forever, forever faster, until nearly all other galaxies slip out of sight. Here is your passport for an exhilarating nighttime flight to the edge of the cosmos.

Ken Croswell earned his Ph.D. in astronomy from Harvard University and is the author of several critically acclaimed books, including *The Alchemy of the Heavens*, *Planet Quest*, *Magnificent Universe*, and *See the Stars*. Please join us for the September general meeting as we again welcome Dr. Croswell as he stops in Portland during his national book promotion.

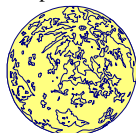
### OMSI PLANETARIUM RCA WORK PARTY

Each year RCA members help Jim Todd, Planetarium Manager, with a work day in the Planetarium. OMSI's sponsorship of our club is most appreciated, and we ask that you contribute a couple of hours on Saturday, September 8th from 9:00 AM to 4:00 PM. Pizza and punch will be served for lunch. **We need many, many members to help us on this day. Please stop by and help in the Planetarium.**

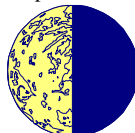
### ELECTIONS 2002 RCA Board Positions

*There are a number of positions open for the 2002 RCA Board of Directors including Editor, Telescope Librarian and Subscription coordinator. As of this printing, RCA members have stepped forward to volunteer for various duties. If you are interested in getting more involved in the RCA activities, please contact any Board member. THANKS!*

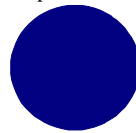
September 2



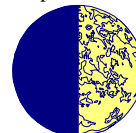
September 10



September 17



September 24





| Club Officers           |                   |                |                            |
|-------------------------|-------------------|----------------|----------------------------|
| President               | Peter Abrahams    | (503) 699-1056 | telscope@europa.com        |
| VP Members              | Doug Huston       | (503) 629-8809 | geometer31415@aol.com      |
| VP Observing            | Scott Turner      | (503) 788-6484 | kings11@qwest.net          |
| VP Community Affairs    | Norm Trost        | (503) 668-7979 | normt@europa.com           |
| VP, Communications      | Matt Brewster     | (503) 774-0360 | brewster@teleport.com      |
| Treasurer               | Vern Weiss        | (503) 236-1059 | vernlw@earthlink.net       |
| Secretary               | Ron Forrester     | (503) 504-8071 | rjf@skyhackers.org         |
| Sales Director          | Sameer Ruiwale    | (503) 617-0736 | sameer_ruiwale@hotmail.com |
| Editor                  | Candace Pratt     | (503) 296-6758 | candace@europa.com         |
| Web Master              | Dareth Murray     | (503) 762-4377 | dareth@web-ster.com        |
| Library Director        | Jan Keiski        | (503) 293-3281 | jikeiski@juno.com          |
| Telescope Librarian     | Brian Richardson  | (503) 625-7373 | brian_shelly@earthlink.net |
| Alcor, Historian        | Dale Fenske       | (503) 256-1840 | fenskedf@juno.com          |
| Media Director          | Glenn Graham      | (503) 579-1141 | sueandglenn@msn.com        |
| Special Interest Groups | Scott Fitzpatrick | (503) 669-8243 |                            |
| Youth Director          | Margaret McCrea   | (503) 232-7636 | mags@europa.com            |
| Light Pollution Rep.    | Bob McGown        | (503) 244-0078 | telscope@qwest.net         |
| New Member Programs     | Carol Huston      | (503) 629-8809 | StarsCarol@aol.com         |
| Magazine Subscriptions  | Johan Meijer      | (503) 777-0706 | johanm@www.com             |



## President's Message

By  
Peter Abrahams

volunteers before anything important had to be shut down, but sometimes it has been like pulling teeth. We dislike playing the persistent salesman, but we very much enjoy the input that new board members bring to the group. We look forward to your response.

## RCA Volunteers

As is highlighted elsewhere in this Gazette, we are in need of volunteers to help us run RCA functions. The positions of editor, telescope librarian, magazine subscription coordinator, and photocopyist are open for 2002. *Editor's note—update:* Already members are coming forward to volunteer for positions. Please contact any Board member to discuss any position.

In the past, we have always found

By the time you read this, we will have heard from Paul Hodge, one of the most eminent modern astronomers, at our August general meeting. In September, we will host Ken Crosswell, who has finished yet another book.

These programs are courtesy of our VP-Community Affairs, Matt Brewster.

Next time you see him, let him know if you profited from these lecturers.

Unfortunately, I will be in

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The "Kids" of Rose City Astronomers



### RCA Kids

Children ages 4-12 are welcome to join in fun and educational activities while their grownups attend the monthly general RCA meetings. The kids' meeting takes place in the adjoining cafeteria at OMSI from 7:30 p.m. to 9:00 p.m. If you have any questions, please e-mail Jennifer at [jenny@theforrest.org](mailto:jenny@theforrest.org).

**The Young Rose City Astronomers** (ages 13 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

Pittsburgh & points east during our September meeting. I hope you all get some good observing time while I'm back on the nether coast.

## Deep Sky Doubles-Part 2

*Editor's note: Enjoy Part 2 of Howard and Vern's favorite deep sky doubles!*

### **M46 OC and NGC 2438 planetary nebula - Puppis**

RA 7 hours 42 minutes. Declination -14 degrees, 49 minutes.

No separation, 2438 is in M46. 2438 is a surprisingly bright little doughnut hidden away in the splashy stars of M46. SA 2000 chart 12, UA page 274.

### **NGC 2467 open cluster and Sh 2-311 emission nebula**

#### **Puppis**

RA 7 hours, 53 minutes. Declination -26 degrees, 23 minutes.

Nebula shows best with OIII filter. Round and almost annular, it looks rather like a planetary nebula.

SA 2000 chart 19, UA page 320.

### **M44 (Praesepe or Beehive open cluster) and NGC's 2624, 2625, 2637, 2643 and 2647; all galaxies (magnitudes 13.6 to 14.9) - Cancer**

RA 8 hours, 41 minutes. Declination +19 degrees, 42 minutes.

These are tough to see because the brightness of the Beehive stars tends to overwhelm the faint galaxies. Use higher power to see them.

SA 2000 chart 6, UA page 141.

### **Regulus and Leo 1 Dwarf Galaxy (UGC 5470, magnitude 10.2, surface brightness 15.1, size 12 x 9.3) Leo**

RA 10 hours, 8.4 minutes. Declination +12 degrees, 18 minutes.

Leo I is about a half degree directly north of Regulus. Look also for IC 591, a 13 magnitude galaxy a quarter degree due west from Leo I.

SA 2000 chart 13, UA page 189.

### **M4 globular cluster and Antares Scorpis**

RA 16 hours, 23 minutes. Declination -26 degrees, 32 minutes.

Look also for 9<sup>th</sup> magnitude globular cluster NGC 6144 about a half-degree northwest of Antares.

SA 2000 chart 22, UA page 336.

### **M7 open cluster and NGC 6453 globular cluster Scorpis**

RA 17 hours, 54 minutes. Declination -34 degrees, 49 minutes.

Sep. 39'39" from center of M7

6453 is on the west, northwest edge of M7. Check out UA page 377, there are several more deep sky objects within M7's borders or very close by.

SA 2000 chart 22, UA page 377.

### **NGC 6445 planetary nebula and NGC 6440 globular cluster**

#### **Sagittarius**

RA 17 hours, 49 minutes. Declination -20 degrees, 01 minutes.

Planetary 6445 is about a quarter degree due north of the globular 6440. Due west a half degree are two dark nebula, B83a and B84.

SA 2000 chart 22, UA page 338.

### **NGC 6644 planetary nebula and NGC 6638 globular cluster**

#### **Sagittarius**

RA 18 hours, 33 minutes. Declination -25 degrees, 8 minutes.

6644 is small (3" diameter) and faint, look for a slight "out of focus" looking star. 6638 is about 2 degrees east, southeast of Kaus Borealis, (Lambda / 22 Sag), the star at the top of the Sagittarius teapot.

SA 2000 chart 22, UA page 340.

### **M22 globular cluster and NGC 6644 planetary nebula**

#### **Sagittarius**

RA 18 hours, 36 minutes. Declination -23 degrees, 54 minutes.

M22 is one of the great globulars and is a "must see" by itself. The planetary 6644 is about a degree and half southwest of M22, a bit more than half way toward Lambda / 22 Sagittari (top star in the teapot). You'll need high power to see this small planetary. More visible at low power, look for the small globular 6638 another half-degree to the southwest.

SA 2000 chart 22, UA page 340.

### **M22 and planetary nebula PK 009-07.1 Sagittarius**

RA 18 hours, 36 minutes, 23 seconds. Declination - 23 degrees, 55 minutes, 18 seconds.

This is true challenge object, perhaps on the edge of visual detection with the largest amateur scopes under pristine

skies. The planetary is 15<sup>th</sup> magnitude and 10" x 7" in size - and surrounded by a blizzard of M22's bright stars. Use higher powers. You really can't lose on this one; at the very least you'll get a detailed look at one of the finest globulars in the sky. SA 2000 chart 22, UA page 340 (not shown on either).

### **NGC 6822 (Barnard's Galaxy) and NGC 6818 planetary nebula**

#### **Sagittarius**

RA 19 hours, 45 minutes. Declination -14 degrees, 48 minutes.

A classic deep sky double. Dwarf galaxy 6822 is best seen at low power and the planetary 6818 best seen at high power. Off in the relatively star poor region of eastern Sagittarius, can be a challenging star hop.

SA 200 chart 22, UA page 297.

### **NGC 6520 open cluster and B86 dark nebula - Sagittarius**

RA 18 hours, 4 minutes. Declination -27 degrees, 54 minutes.

B86 is probably the most sharply defined and easy to observe dark nebula; it is a beautiful sight as it intertwines with the stars of the 6520. Easy to find just above the spout of the Sagittarius teapot.

SA 2000 chart 22, UA page 377.

### **NGC 6712 globular cluster and M26 open cluster**

#### **Scutum**

RA 18 hours, 53 minutes. Declination -08 degrees 42 minutes.

At the limit of the "2 degree rule" of this list, use your lowest power to fit both objects in the field of view. NGC 6712 is about 2 degrees northeast of M26. At higher power, look about a half degree southeast of 6712 for the 15<sup>th</sup> magnitude planetary IC 1295.

SA 2000 chart 16, UA page 295.

### **M71 globular cluster and H20 open cluster**

#### **Sagitta**

RA 19 hours, 54 minutes. Declination +18 degrees, 47 minutes.

This a beautiful star rich area at low and medium powers. M71 is a distinct blaze of stars while H20 is a sparse, more subtle grouping.

**(Continued on page 4)**

## John Dobson, the Man and the Legend

By Dareth Murray

I attended John Dobson's last lecture on July 25<sup>th</sup> at Western Oregon University and found his take on cosmology a refreshing and optimistic view compared with the dismal, depressing 'Big Bang' vision as presented in the June issue of *Time Magazine* entitled "How the Universe Will End." Knowing little about the subject, I can not testify to the soundness of Dobson's physics, but being an **eternal** optimist, I liked his 'recycled from the border of the universe' notion much more than the Big Bang version backing T.S. Eliot's 'ending with a whimper.' Entropy and the expansion of the universe send a chill down my spine, just thinking that the universe **may** end in heat death.




After an **intellectual lecture on the wonders of the universe this** Wednesday, John set up his scope in the parking lot of a supermarket in Independence, Oregon. Not away from the front door and the lights, as I thought he might, but right up there, near the doors. He asked everyone who came to shop if they would like to see the **Moon**. Those who did were astounded at how close the **first quarter crescent Moon** seemed - near enough to touch. Little kids, teenagers, 80-year-olds and everyone in between enjoyed their close-up **view** of the **crescent Moon in one of the many telescopes he had hand crafted**. John was a tireless and enthusiastic astronomic evangelist, never waning in his desire to show just one more person the wonders of the night sky.

A sparse audience had attended the Wednesday lecture but a full house greeted John on Friday, his free talk and official star party. I counted about 65 people, mostly local, but a few down from the Portland area.



Having just picked up the September issue of *Astronomy*, I showed John the article about his 85<sup>th</sup> birthday party in San Francisco celebrating over 50 years of sidewalk astronomy. Apparently he had forgotten or not known when they were going to publish and was quite bemused by his sudden 'fame.'

There were 18 scopes out in the parking lot when his talk ended, including John's original 40-year-old 18-inch 'Dob.' The sky was semi-cloudy, not the best of observing conditions, but a valiant try was given by all until about 11 p.m. For Dobson, observing was and should be the beginning of a lifelong journey that continues toward a deeper understanding of the cosmos. Whether you agree with his opinions on cosmology or not, you must admire the charismatic man, his contributions to amateur astronomy and his passion for taking it to the people. I came away from the whole experience with a renewed enthusiasm for observing.



### The Weather SIG

Date: Wednesday, September 26, 2001  
Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219  
Time: 7:00 pm

*Come rain or shine . . .*

(Continued from page 3—Deep Sky Doubles)

SA 2000 chart 16, UA page 162.

#### IC 5146 (Cocoon Nebula) and B168 dark nebula

##### Cygnus

RA 21 hours, 53 minutes. Declination +47 degrees, 16 minutes. Surprisingly, the dark nebula B168 is much easier to see than is the Cocoon Nebula, especially at low powers. The Cocoon is at the eastern end of B168; filters don't seem to help much to bring out the Cocoon.

SA 2000 chart 9, UA page 86.

#### NGC 6939 open cluster and NGC 6946 galaxy

##### Cepheus

RA 20 hours, 31 minutes. Declination +60 degrees, 38 minutes. A classic deep sky double. The extreme field of depth between a Milky Way open cluster and a distant galaxy is evident in the subtle spiral arms of 6946 (which a large scope will show quite well) versus the much brighter splash of 6939's stars. NGC 6939 is about a half-degree northwest of 6946. Medium powers are best on both objects.

SA 2000 chart 3, UA page 32.

#### IC 1396 open cluster and the Elephant Trunk Nebula

##### Cepheus

RA 21 hours, 39 minutes. +57 degrees, 30 minutes. No separation. Subtle and large are the keys to the sights here. Your lowest power will give the best view, especially of the dark nebulae. Also includes dark nebulae B160, B161, B162, B163 and B365. SA 2000 chart 3, UA page 57.

#### M15 globular cluster and PK65-27.1 (Ps 1) planetary nebula

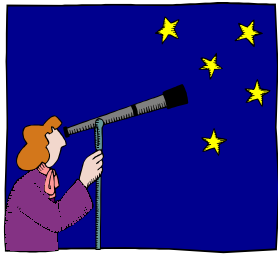
##### Pegasus

RA 21 hours, 30 minutes. Declination +12 degrees, 10 minutes. No separation.

At mag. 15.5, and lost in the sea of stars of M15, the planetary is beyond most telescopes. Exceptional seeing and higher powers are needed to spot the 3" diameter nebula. Definitely a challenge object, but this is also a win-win observation since M15 is a tremendous sight regardless.

SA 2000 chart 17, UA page 210.





## SEPTEMBER AT OMSI

### AUTUMN'S STARRY SKIES CELEBRATED AT FREE STAR PARTY

WHAT: Star gazers of all ages and levels can view a variety of celestial objects and learn from local astronomy experts at the FREE Autumnal Equinox Star Party on Saturday, September 22 at 7:30 p. m. at OMSI, presented by OMSI, Rose City Astronomers, and Vancouver Sidewalk Astronomers. Partygoers can view the planet Mars, Moon, star clusters, nebulae and other celestial objects up close through a variety of telescopes.

The autumnal equinox is the transition between the summer and winter solstices. On the day of the autumnal equinox, the sun is directly over the equator and both the north and south poles are equal distances from the sun, resulting in nearly 12 hours each of daylight and darkness.

---

### Light Cannot Be Seen

By *Maurice Bruce Stewart*  
(or anyone else)

The Greeks were fond of asking questions such as, "How can we know about things in the distance, beyond our reach?" The answer, of course, is that we see them. The Greeks developed a theory of how we see. In their ingenious theory, the eye sends out a kind of visual tentacle which delivers back to us the information which we usually call seeing. Seeing, by this account, is very like feeling. The last important thinker to adhere to this emission theory of vision was Leonardo da Vinci (1452-1519). By then the arguments given by Abu al-Hassan ibn al Haytham (c.965-1038) had convinced nearly everyone who cared that the reception theory of vision is superior. In the reception theory something travels from the distant object to our eye bringing us the necessary information. How could the Greeks have failed to notice this traveler? The answer is at once simple and profound: the messenger that brings us information of what is in remote places is an invisible messenger. Of course, it is invisible.

If we could see that messenger in the distance traveling toward us, then we would ask how we see that messenger. We would be trapped in an endless recursion. Unfortunately, most people call this messenger light, and then go on to speak of visible light. The kindest thing that can be said of the term visible light is that it is a very confusing way to talk about something which is invisible, necessarily invisible, as we have just come to understand.

The challenge for physical science is develop a theory of light, something that cannot be seen, even in principle much less in practice, and at the same time to be able to test that theory by making observations. We should, therefore, not be surprised that the photon is a very strange thing indeed. Although it is common to call photons particles, they are very peculiar particles, unlike anything that we have seen. Ordinary particles, such as grains of salt, can rest

### ASTROPHYSICS / COSMOLOGY SIG

TIME: 7:00 PM

DATE: September 20 , 2001

TOPIC: "Physics of Instellar Spaceflight",  
John Bloomer, AIAA

PLACE: Linus Pauling House, 3941 S.E.  
Hawthorne Blvd.

WHEN: Saturday, September 22, 7:30 p.m., weather permitting

WHERE: OMSI's east parking lot, 1945 SE Water Ave. For possible weather cancellation, the public can call 503/797-4610 after 3:00 p.m. on September 23 .

on the table and can travel at many various speeds. Photons, on the other hand, can never be at rest and can travel at just one speed, namely, 186,282 miles per second, the speed of light in vacuum. If you stop a photon from moving, say by putting an atom in its way, the photon simply vanishes. The energy and momentum previously possessed, if that is the right word, by the photon are transferred to the atom, but the photon itself is gone. After a hard day of looking and seeing, you may need to sleep, and your body may need to repair itself, but none of those repairs includes disposal of spent photons captured on your retina.

Since photons can exist only when traveling at the speed of light in vacuum, how are we to explain the well-known fact that light travels at other, slower, speeds when passing through matter? This question cannot be evaded. We see everything which we see because light travels through the vitreous humor in our eye before reaching our retina. As a photon enters the vitreous humor it soon encounters an atom. The photon ceases to exist and the atom is excited by the new energy and momentum it has acquired. Soon the excited atom sheds this excess energy and momentum by emitting a new photon, fortunately traveling in the correct direction. This new photon travels only a short distance before it too ceases to exist when it strikes another atom in the vitreous humor. And so, by a succession of fits and starts, a procession of photons makes its way to the retina. The many short delays between the extinction of one photon and the emission of a new photon result in the slower speed of the light through the vitreous humor even though all the individual traveling photons do in fact travel at the speed of light in vacuum. Some people like to think that when they see Arcturus, say, they are seeing old light, but this claim is clearly a muddle. First and foremost, it is a muddle because we never see light, ever. Light is not the kind of thing we can see. We see stars and pizzas and rhododendrons. Second it is muddle because the photon which reaches the retina was only very recently emitted by an atom in the vitreous humor.

# Messier Menagerie - September 2001

By Dr. Rick Letherer, the "starry-eyed" Astronomer

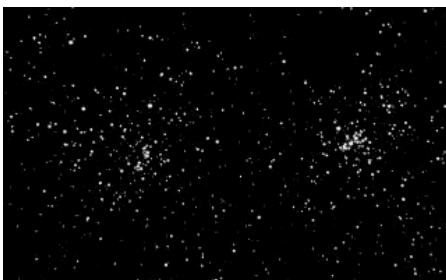
With the possible exception of Sagittarius, my favorite constellation is Cassiopeia. Fall is a time of splendor for this beautiful queen. Sagittarius may have greater diversity, but Cassiopeia is positioned high in the sky and cooler fall temperatures make viewing better than in mid-summer. Summer is fun for astronomers. Warm, dry, clear evenings offer chances to view into the heart of the Milky Way. As summer passes, the bittersweet memories of great observing sessions are quickly exchanged for the exciting views of the Queen. Cassiopeia rules the autumn universe bejeweled with a striking retinue of gem-like open clusters that are still indescribably exciting to observe; repeated observations just make her beauty more entrancing. Join me observing the queen of open clusters holding nightly court in the Northern Milky Way.

**M-103** This is the Queen's fan. It is a compact but bright cluster shaped like a triangular arrowhead. My observations give the apex star the lowest magnitude (brightest). Very sparkling and a unique shape.

**M-52** This is not an overly large cluster, but it is very dense. There is a pleasant mixture of magnitudes that draw attention. Look for the single bright, blue star near one border. See if you can observe the very faint bubble nebula nearby (see Observer's Corner, RCA Gazette August 2001)

**NGC-7789** Here is another of my diversions from Chuck Messiers list because this one intrigues me. I like the contrast the Universe offers astronomers. This cluster is huge by comparison to most. It is nearly triple the diameter of M-103, but all its members are faint. There are approximately five times more stars here than in M-52 so it is very rich. This combination of rich and dim can only be appreciated by observing long enough to get a sense of the number of stars in this field. Imagine the sky view from a planet encircling one of the stars in this cluster...boggles the mind!

**NGC-884 & NGC-869** The double cluster is one I always take a peek at when I'm in the court of Queen Cassiopeia. The two



NGC 884 and NGC 869—  
Double Cluster in Cassiopeia

clusters here are equivalent size and magnitude. Look for the differences in color and distribution between these clusters in the same field. One of the clusters has a circular ring of stars with one bright member that resembles a diamond ring. These twin clusters are a great

binocular target and also fun to locate naked eye.

**NGC-457** This one is great fun to show new observers. The two brightest members form the eyes of the "owl" cluster. The "eyes" are beautiful color contrasts. Make a note in your log of the colors for future reference. I like to call this the E.T. cluster and ask observers to see if they can see the end of E.T.'s lighted pointer finger. Check out his glowing heart. Very pretty. Chuck M. missed the boat by not including this one on his list.

**NGC-663, NGC-654, & NGC-659** This was an original find for me in a random sweep through Cassiopeia; I found it later perusing in Burnham's. It was an unforgettable experience to stumble upon these three clusters in one field. If you have never seen this I am very pleased to treat your eyes to the "triple-cluster". Each one of these jewels is different in size, resolution, and magnitude to make it a showpiece and earn a "star" in my observers log. The sizes vary in order listed from 11', 5', and 4' (' = arc minutes). Somehow viewing these three clusters in close proximity with the backdrop of rich Milky Way star clouds make this area of the sky seem very close and inviting as though standing on the deck of the starship Enterprise...boldly go!

**M-31** Our sister galaxy is just a next-door neighbor on the astronomical distance scale of the universe. This is a must see for first-time observers of the fall sky. When the photons from Andromeda left this billion-star whirling cloud, mammals were in the rapid-fire stage of development and man was at the precipice of existence. We humans view radiation from Andromeda that has been coursing through



M31/32/205—by Michael Cole

space longer than our species has existed. This galaxy is visible naked eye and is beautiful in binoculars. Be sure to look for the dark dust lanes visible in a telescope field and the two companion galaxies listed next. Andromeda is big; be careful not to over-magnify. Try approximately 50X in wide field.

**M-32 & NGC-205 (M-110)** These two galaxies are conspicuous only because of their proximity to the giant Andromeda and as a diminutive size comparison. Remember when you view these two ellipticals, that each galaxy contains millions of stars and is an enormous star factory and warehouse in its own right ... yet they are held in the inescapable grip of Andromeda gravity measuring nearly twice that of the Milky Way. Notice the elongated, lenticular shape of NGC-205 and the round, more typical shape of M-2.

Fall is my favorite observing time; temperate nights and clear skies offer a final opportunity to view the late summer skies before the winter rains block our view. Enjoy the Queen Cassiopeia as she travels through the autumn sky with her Milky Way veil trailing behind; enjoy the sights of the Queen's daughter, Andromeda who, as the princess of the night gently closes the skies of summer. May your nights be filled with clear skies and wide horizons!



# TELRAD-Hunting, Quick & Dirty

By Howard Knytych

Editor's Note: *Howard has completed over half of the Herschel 400 Observing Program. He uses a Telrad accessory to initially locate the deep-sky object's vicinity.*

My Sky Atlas 2000 came with a clear plastic sheet that included a handy overlay of a Telrad bullseye that I cut out and use all the time. It's on the same scale in the Sky Atlas as the actual Telrad image is superimposed on the sky. To find an object, I see what naked eye stars are in the vicinity. Next I locate them on the Star Atlas, and using the star nearest the object, simply line up the outer circle of the bullseye on that star, and "hop" the plastic Telrad overlay over to the object, carefully noting the direction and the area on the overlay in which the object finally falls. To note the direction, I use other nearby naked eye stars, and move the overlay in relation to those stars, so I end up with an algorithm like, "2 and a half Telrad hops from Vega in the direction of Deneb".

Once I've practiced it "on paper" a time or two, I duplicate that movement with the scope. After lining up the starting point star with the outer edge of the Telrad bullseye, I look at the opposite edge of the bullseye in the direction I'm going to move the scope, noting that blank point in space. Then keeping my eye fixed on that point, I move the scope in the desired direction a full Telrad diameter, until the trailing edge of the Telrad image, which was formerly on the starting point star, is now superimposed on the point in space I'm looking at. That constitutes a "Telrad hop". It sounds much more difficult than it really is. The only tricky part is keeping my eye fixated on a blank point in space as I'm moving the scope -- my eye naturally wants to move with the Telrad image.

After I get to the vicinity of the object, I use my finder scope if the object is bright enough, or I see if I've nailed the target object itself through the main eyepiece. If not, I sweep the area, sometimes using an "expanding square" method similar to a trick I learned in the Civil Air Patrol to search for downed aircraft. Starting from a known position, sweep up one field of view, then left a field of view, then down two fields, then right three, etc. Remember where your starting point was so you can get back to it. If you know you're in the vicinity, this can be a good method to "fine tune" the search.

These methods seemed pretty intuitive to me, and fast once I got the hang of it. I even assumed that's how anyone with a Telrad and a Sky Atlas would do it. During last year's Messier Marathon, I worked my way completely through about half the list, including the Virgo cluster, using this method, and as I said, I'm finding the Herschel objects this way.

## 7th Annual IMAGING the SKY 2001 Conference: Seminars on Technology & Techniques for Astronomical Digital Imaging

Friday, Saturday, November 2nd and 3rd  
Salem, Oregon, Willamette University  
Tokyo International University of America

-----  
Early registration (by September 30, 2001): \$54

Late Registration (by October 31, 2001): \$64

(Saturday lunch and ITS 2001 CD-ROM included with Early or Late Registration.) After October 31, registration at the door only: \$74 (but lunch not guaranteed and nominal charge for ITS 2001 CD-ROM)

To register: mail check, made out to ITS 2001, to: Jim Girard, ITS 2001 Registrar, P.O. Box 254, Beaverton, OR, 97075

- \* Selection and Operation of CCD Cameras.  
\* How to produce quality images.  
\* New technologies: software and hardware.  
\* How to enhance and analyze images.  
\* Lectures, workshops, panels, vendors.  
\* Informal information exchange with experts\*

Featured Speaker: Antonio Cidadao on Planetary Imaging, plus Richard Berry, John Brewster, Wayne Brown, James Burnell, Tom Carrico, Doug George, Jim Girard, Dave Haworth, Al Kelly, Dave Kenyon, Tom Krajci, Nick Liepins, Dale Mais, Roy Tucker, Ron Wadoski, Rob West, more.

INFO: Jim Girard, argo@teleport.com or Rick Kang, rkang@efn.org 541-683-1381. SEE <http://www.teleport.com/~argo/its/its2001.html> for all the details! Organizers: Mel Bartels, Richard Berry, Jim Girard, Dave Haworth, Rick Kang, Nick Liepins.

---

## 2001 SCIENCE INTEGRATION CONFERENCE

Dr. Todd Duncan, a past speaker of the RCA and astrophysicist, is promoting his forth-coming conference, the 2001 Science Integration Conference will be held on Saturday, September 15th, 9 am - 4:30 pm, room 1300 in the Capital Center (18624 NW Walker Rd., Beaverton, OR). The theme of the conference is "incorporating insights from science into our everyday lives." The morning session ("Worldviews Past and Present") will introduce the idea of using information from science to help us formulate our sense of our place in the universe. The afternoon session ("Cosmology: The Universe According to Modern Science") will describe what we know about the history and arrangement of the universe on the largest scales. The discussions will invite you to think about how you might better experience your own life within the context of that universe, with a greater awareness of how you and your actions connect to it.

Seating is limited, so pre-registration is recommended. Course fee for the all-day event is \$30 for pre-registration (received by Sept. 8) or \$45 at the door. For registration and more information, please visit

<http://www.scienceintegration.org>.

<http://www.scienceintegration.org/books.htm>

# ROSE CITY ASTRONOMERS RECEIVE AWARD FROM COLUMBIA GORGE PARTS DEPARTMENT

The Columbia Gorge Parks Department honored the Rose City Astronomers at the general meeting of July 16<sup>th</sup>. A beautiful wooden, lazer engraved plaque was presented to our president, Peter Abrahams by Kevin Price, the director of the parks department. See photo.

## AWARD PHOTO

During the past five years, the Rose City Astronomers and OMSI have hosted numerous public star parties. One of the best attended parties is The Perseid Meteor Watch star party at Rooster Rock State Park. This year, according to Kevin Price approximately 3200 people attended. The Rose City Astronomers were also out in

force with more than 60 telescopes. We can feel very proud of the part we play in entertaining and educating the public with celestial sights. We should be happy that others have shown that they really do appreciate our efforts.

This years Perseid Watch was a "great" star party. It was one of the best Perseid shows in years. 20 or 30 bright meteors thrilled the crowds. Jim Todd from OMSI announced over a loud speaker whenever the International Space Station or the Space Shuttle flew by. Bright iridium flares from passing satellites were also observed. Jim did a splendid job of pleasing the assembly with his descriptions of heavenly splendors. It was a beautiful night, warm and clear.

The only thing that marred this perfect star party was that it was over by 1:00 A.M. Suddenly, at 12:30 A.M you could smell moisture in the air. It was like a prophecy of doom. Dew formed on the telescopes. The 3<sup>rd</sup> quarter moon rose. It stayed

dark because it rose between intermittent clouds. But within fifteen minutes everything in the sky disappeared in a gray haze. It did not go away. The star party was over. All we can say now is, "It was a thrill a minute---it was great while it lasted—and a fun time was had by all".



UPDATE by Eldon Mardock He braved the gray skies and was rewarded handsomely.

Eldon says, "I use my Eldonlogy rule for weather".

"I keep a running mental record of the sky conditions about 2- 4 times a hour. I spent the time to have my scope set up so I figured a wait to see what the clouds were doing is appropriate. I mentally logged about how long it took from good to bad. It was fast, within an hour. Then I watched what happened for approximately another hour. Are the clouds becoming thicker or are holes appearing. By 2:00 AM, I started to notice a change in the sky. The overcast had big holes appearing, and by 3:10 - 3:25 AM the whole sky was completely clear, and it stayed clear and warm, with no wind. I never dawned a jacket the whole night. Even the mosquitoes were minimal."

"About 3:45 - 4:05 AM we saw about 3 meteor every two minutes. They were small and most of them coming straight down."

"We had outstanding views of Saturn. We observed; a sharp, dark division between the planet and its rings and six of its moons (maybe a seventh)."



LEFT: RCA member Dan Gray assisting the OSP Kids with Telescope Making activity. Over 100 kids attended OSP this year, with daily activities for all. Photo by Peter Abrahams.



## 2001 OSP PHOTO GALLERY

RIGHT: NGC 891, spiral galaxy in Cepheus. Photo by Michael Greger. Photo taken with a Nikon F2 at prime focus using a Celestron 9.25" SCT. Film used was Fuji Provia 400F, 120 minute exposure.



## PHOTO

LEFT: Bubble Nebula (NGC 7635) and M52. Photo by Michael Cole 8/17/01 at OSP. FCT 150 at f5. PPF 400 med. format single 60 min exposure.



LEFT: 2001 OSP Dust Devil on Sunday, August 19 as attendees are packing to go home! Photo by Michael Greger.

RIGHT: Thin, crescent moon at OSP 2001. Photo taken by Michael Greger with a Celestron 9.25" SCT and Kodak Elite Chrome 200. As Michael said, "The Earth's moon through the smoke."





| SEPTEMBER 2001 |     |     |     |     |     |     |
|----------------|-----|-----|-----|-----|-----|-----|
| Sun            | Mon | Tue | Wed | Thu | Fri | Sat |
|                |     |     |     |     |     | 1   |
| 2              | 3   | 4   | 5   | 6   | 7   | 8   |
| 9              | 10  | 11  | 12  | 13  | 14  | 15  |
| 16             | 17  | 18  | 19  | 20  | 21  | 22  |
| 23             | 24  | 25  | 26  | 27  | 28  | 29  |
| 30             |     |     |     |     |     |     |

| OCTOBER 2001 |     |     |     |     |     |     |
|--------------|-----|-----|-----|-----|-----|-----|
| Sun          | Mon | Tue | Wed | Thu | Fri | Sat |
|              | 1   | 2   | 3   | 4   | 5   | 6   |
| 7            | 8   | 9   | 10  | 11  | 12  | 13  |
| 14           | 15  | 16  | 17  | 18  | 19  | 20  |
| 21           | 22  | 23  | 24  | 25  | 26  | 27  |
| 28           | 29  | 30  | 31  |     |     |     |

### September

|                 |             |                              |                        |                |
|-----------------|-------------|------------------------------|------------------------|----------------|
| Sept. 10        | Mon.        | Board Meeting                | OMSI Parker            | 7:00 PM        |
| Sept. 15        | Sat.        | Local Star Party             | Larch Mountain         | Dusk           |
| Sept. 17        | Mon.        | YRCA (ages 13-18)            | OMSI Cafeteria         | 6:30 PM        |
| Sept. 17        | Mon.        | RCA Kids (ages 4-12)         | OMSI Cafeteria         | 7:00 PM        |
| <b>Sept. 17</b> | <b>Mon.</b> | <b>General Meeting</b>       | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| Sept. 20        | Thurs.      | Astro/Cosmology SIG          | Linus Pauling House    | 7:00 PM        |
| Sept. 22        | Sat.        | Autumnal Equinox Celebration | OMSI                   | 7:30 PM        |
| Sept. 26        | Weds.       | Weather SIG                  | Colonial Office        | 7:00 PM        |

### October

|                |             |                        |                        |                |
|----------------|-------------|------------------------|------------------------|----------------|
| Oct. 1         | Mon.        | Board Meeting          | OMSI Parker            | 7:00 PM        |
| Oct. 15        | Mon.        | YRCA (ages 13-18)      | OMSI Cafeteria         | 6:30 PM        |
| Oct. 15        | Mon.        | RCA Kids (ages 4-12)   | OMSI Cafeteria         | 7:00 PM        |
| <b>Oct. 15</b> | <b>Mon.</b> | <b>General Meeting</b> | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| Oct. 18        | Thurs.      | Astro/Cosmology SIG    | Linus Pauling House    | 7:00 PM        |
| Oct. 20        | Sat.        | Local Star Party       | Larch Mountain         | Dusk           |
| Oct. 31        | Weds.       | Weather SIG            | Colonial Office        | 7:00 PM        |

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-omsi.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-omsi.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012



# The Rosette Gazette

Volume 13, Issue 10

Newsletter of the Rose City Astronomers

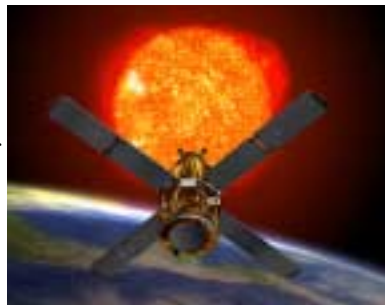
October, 2001



## SOLAR MAXIMUM: WHAT & WHY?

Solar activity in the form of sunspots, flares and coronal mass ejections, varies dramatically over roughly an eleven year period. Last year marked "Solar Max", but we can still expect solar events of both scientific and practical importance.

Dr. Richard Canfield, a Research Professor in the Physics Department of Montana State University, will discuss the origins and mechanisms of solar magnetic fields, flares and coronal eruptions, what we know and how we learned it. He is a Co-Investigator on the ISAS/NASA Yohkoh mission and the NASA High Energy Solar Spectroscopic Imager (HESSI) mission.



HESSI  
(High Energy Solar Spectroscopic Imager)

Dr. Canfield has contributed to the theory of radiation from astrophysical atmospheres and applied it to the Sun, stars, and active galactic nuclei. His work on solar flares has led to improved understanding of the origins and dynamics of the hot flare plasma. His work on

magnetic fields has led to better understanding of how observations of the outer solar atmosphere can be used to probe the nature of convective motions beneath the solar surface. His current interest in coronal magnetic fields has revealed two phenomena associated with regions that are the sources of Coronal Mass Ejections, namely X-ray sigmoids and H-alpha blue-shift events.

Please join us Monday, October 15th at 7:30 PM for the General Meeting of the Rose City Astronomers as Dr. Canfield has generously

offered to share his vast knowledge and experience in this most fascinating of astronomical objects, our Sun.

### In This Issue:

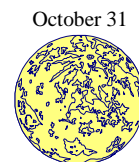
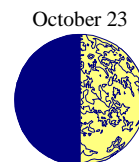
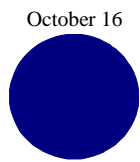
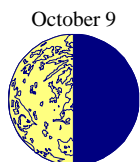
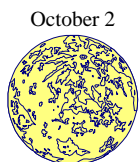
- 1 General Meeting  
RCA Work Party  
2002 Elections
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
Young RCA
- 3 Observer's Corner
- 4 Weather SIG  
It's the Law
- 5 Imaging Conference  
Cosmology SIG
- 6 LIGO
- 7 Telescopes are  
Shrinking
- 8 Cool Fun Facts  
RCA Photo Gallery
- 9 Board Minutes  
Classified Ads
- 10 Calendar/Events

**ELECTIONS 2002**  
**RCA Board of Directors**

The November 19th General Meeting will include the annual business meeting and election of officers. Please attend this meeting and participate in the election process. Thank you.

### WELCOME NEW MEMBERS!

- Ellen Bercovitz
- Ellen Cazier
- T.G. Doddathimmaiah
- Michael Freeman
- Chris Gatenbein
- Paul & Debra Hirschmann
- Neal Olson
- David Ricucci
- Robert Stites



| Club Officers           |                   |                |                            |
|-------------------------|-------------------|----------------|----------------------------|
| President               | Peter Abrahams    | (503) 699-1056 | telscope@europa.com        |
| VP Members              | Doug Huston       | (503) 629-8809 | geometer31415@aol.com      |
| VP Observing            | Scott Turner      | (503) 788-6484 | kings11@qwest.net          |
| VP Community Affairs    | Norm Trost        | (503) 668-7979 | normt@europa.com           |
| VP, Communications      | Matt Brewster     | (503) 774-0360 | brewster@teleport.com      |
| Treasurer               | Vern Weiss        | (503) 236-1059 | vernlw@earthlink.net       |
| Secretary               | Ron Forrester     | (503) 504-8071 | rjf@skyhackers.org         |
| Sales Director          | Sameer Ruiwale    | (503) 617-0736 | sameer_ruiwale@hotmail.com |
| Editor                  | Candace Pratt     | (503) 296-6758 | candace@europa.com         |
| Web Master              | Dareth Murray     | (503) 762-4377 | dareth@web-ster.com        |
| Library Director        | Jan Keiski        | (503) 293-3281 | jikeiski@juno.com          |
| Telescope Librarian     | Brian Richardson  | (503) 625-7373 | brian_shelly@earthlink.net |
| Alcor, Historian        | Dale Fenske       | (503) 256-1840 | fenskedf@juno.com          |
| Media Director          | Glenn Graham      | (503) 579-1141 | sueandglenn@msn.com        |
| Special Interest Groups | Scott Fitzpatrick | (503) 669-8243 |                            |
| Youth Director          | Margaret McCrea   | (503) 232-7636 | mags@europa.com            |
| Light Pollution Rep.    | Bob McGown        | (503) 244-0078 | telescope@qwest.net        |
| New Member Programs     | Carol Huston      | (503) 629-8809 | StarsCarol@aol.com         |
| Magazine Subscriptions  | Larry Godsey      | (503) 675-5217 | larrygodsey@att.net        |



President's  
Message

By  
Peter Abrahams

## RCA Autumn Highlights

I hope everybody had a great summer. I got some excellent views of a (washed out) Mars, saw Uranus as a big blue green dot, saw some planetary nebulae in wispy detail, got a new 16 inch scope, sold a 16 inch scope, met Paul Hodge -- and did things away from the RCA as well.

The Vernal Equinox will be upon us when you're reading this. Longer nights mean we can get some time under the stars before bedtime or before work. Unless it is raining, which we can expect at least some of the time.

Hopefully, RCA programs will provide opportunity for members to be engaged in astronomy even when observing is impossible, for there are lots of other avenues of exploration.

We'd appreciate it if you would write

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Johan Meijer, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The "Kids" of Rose City Astronomers



### RCA Kids

Children ages 4-12 are welcome to join in fun and educational activities while their grownups attend the monthly general RCA meetings. The kids' meeting takes place in the adjoining cafeteria at OMSI from 7:30 p.m. to 9:00 p.m. If you have any questions, please e-mail Jennifer at [jenny@theforrest.org](mailto:jenny@theforrest.org).

The **Young Rose City Astronomers** (ages 13 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

about your experiences related to astronomy for the Gazette, the web site, or the email list.



**Deep Sky**

Given recent events, the 2001 edition of the Oregon Star Party probably seems more distant than only a couple of months ago. But I think it's a good idea to remember the camaraderie, excellent observing and generally wonderful atmosphere of one of the finest star parties in the world. Of all that's still right with the world, our small corner of it is one of them.

The smoke that threatened to tarnish the otherwise pristine skies diminished every night, and was barely noticeable by the weekend. The air was steady enough to routinely use high powers on many objects, and transparent enough to show wonderful detail. Of all the beautiful objects I looked at I most enjoyed the Trifid Nebula. It is the object I think of first when remembering the OSP, and this year again it had me glued to the eyepiece.

Aside from the two main bright areas of nebulosity and the three (really four) ragged dark lanes tracing out their alluvial tapestry, the star normally seen as a double near the heart of the nebula showed itself as a beautiful quadruple star. This area is usually over exposed in images, which unfortunately hides this wonderful sight. Also too bad is that the southern location of the Trifid pulls it toward the southwest horizon so quickly.

Along with the Trifid, Saturn and oh, maybe 30 other deep sky

objects I particularly enjoyed participating in the joint observing program with the Argentine group GAMA. Three of my favorite observations from that program are below.

My sketches are the raw drawings made at the eyepiece, which convey what I saw better than a finished sketch probably could. The sketches bring across a true sense of my visual impressions, as I took about 15 minutes on average to make each one at the eyepiece. "Finishing" them seems superfluous.

The black-on-white version is a direct scan of my pencil sketch, and the white-on-black is a negative image created in the basic Paint program that comes with MS Windows. I particularly like the negative image as it gives the most realistic impression of what I saw.

To make these sketches I used Chuck Dethloff's nifty hand-held slide viewer converted to provide an even back-illumination, in red, to my drawing paper. In the few months I've been using Chuck's device I've found that it makes sketching at the eyepiece significantly easier and more enjoyable.

I'm sure everyone who participated in the joint observation program enjoyed themselves, and I hope the RCA is able to do this type of program again. Many thanks to Margaret McCrea for organizing the RCA portion of this effort. (Cont'd on page 5.)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>NGC 6229</b><br/> <b>Object type:</b> globular cluster<br/> <b>SA 2000 chart:</b> 8<br/> <b>UA page:</b> 80<br/> <b>Constellation:</b> Hercules<br/> <b>Observing location:</b> Indian Trail Springs (OSP)<br/> <b>Telescope:</b> 20" f/5<br/> <b>Magnification:</b> 261x to 413x<br/> <b>Time and Date:</b> 1:08am, Aug. 16-17, 2001<br/> <b>Seeing:</b> 7 - 8<br/> <b>Transparency:</b> 7.5<br/> <b>Temperature:</b> 65F<br/> <b>Limiting magnitude:</b> 6.4 (clear and less smoky)</p> | <p><b>Eyepiece description:</b><br/> A wonderful sight! This is a bright, fully resolved globular cluster, with its stars gradually concentrated toward its bright center, and remain fully resolved. There is only one relatively bright star near the globular's center, with all the rest being finely resolved</p> | <p><b>M82</b><br/> <b>Object type:</b> galaxy<br/> <b>SA 2000 chart:</b> 2<br/> <b>UA page:</b> 23<br/> <b>Constellation:</b> Ursa Major<br/> <b>Observing location:</b> Indian Trail Springs (OSP)<br/> <b>Telescope:</b> 20" f/5<br/> <b>Magnification:</b> 413x<br/> <b>Time and Date:</b> 11:52pm, Aug, 17-18, 2001<br/> <b>Seeing:</b> 7<br/> <b>Transparency:</b> 8.5<br/> <b>Temperature:</b> 50F<br/> <b>Limiting magnitude:</b> 6.4+ (clear &amp; less smoky)</p> | <p><b>Eyepiece description:</b><br/> A degree from M81, and easily together with it in the same 93x field of view. A dramatic edge on galaxy, M82 has perhaps the highest surface brightness of any galaxy in the northern sky. The amount of detail visible along its length is astounding - dark lanes</p> |
| <p>stardust that very gradually fades away into the dark background of space. The globular forms a striking triangle with two bright field stars, with a third, fainter star forming a flattened triangle with the two brighter stars. A lovely view to linger on for a while.</p>                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                        | <p>cut into the long cigar shape of the galaxy, especially near its center. The bright areas near the core also show mottling and are criss-crossed with fine dark lanes (seen best at higher powers). The long edge facing M81 is rather sharply defined - the major dark lanes cut into the galaxy from this direction. The far edge is slightly less defined. All in all a beautiful galaxy that is easy to linger on, and one I never tire of exploring.</p>           |                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                              |

# It's the Law

By Douglas S. Huston

We've all heard people refer to the "Laws of Physics." Often this is in the context, "You can't do that, it violates the Laws of Physics." But, what are these laws, how did they get to be laws and how do they affect us?

Physics is the most basic science. It is the science that seeks to discover the rules by which the universe operates. Physics uses the language of mathematics to give these rules a precise, concise formulation. It proceeds by way of what is known as the scientific method. The scientific method is classically described as having five parts: Observation – I notice a phenomenon that interests me, Hypothesis – I formulate what I think is the explanation for this phenomenon, Experiment – I devise and conduct an experiment to test my hypothesis, Conclusions – my hypothesis is either confirmed or disproved. If my original hypothesis is disproved, I can modify it to account for the parts it didn't cover and do another experiment if I want. Many scientists feel there is actually a sixth component to the scientific method, and it may be the most important: Independent Confirmation - any other physicist is free to replicate my experiment and independently confirm or refute my results.

Once a hypothesis has been confirmed by repeated experiments, it takes on the status of a Law of Physics. These laws are important because they allow us to make predictions about our world and show us how to manipulate the forces and materials of our universe.

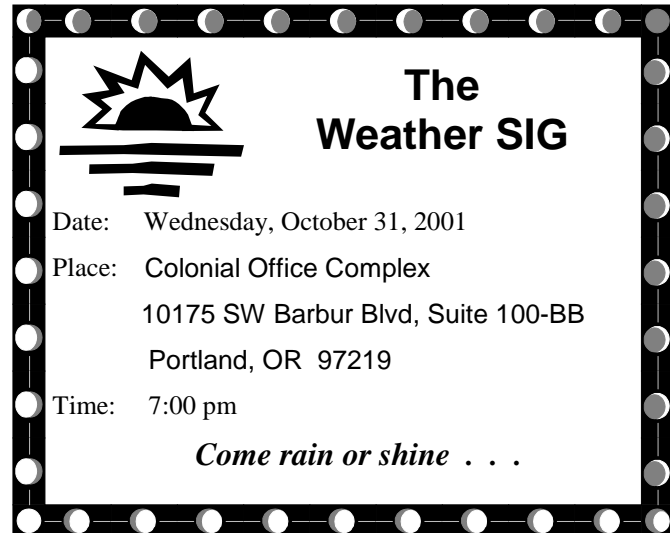
So, what are these Laws of Physics? Actually, there are many. Each branch of physics has its own group. However, there are some that have immediate, measurable and constant impact on our daily lives. Such as:

**Newton's Universal Law of Gravitation** – This law says that every object in the universe attracts every other object in the universe with a force proportional to the product of their masses and inversely proportional to the square of their distance from each other. This is the law that ordains the orbits of the planets, that keeps us stuck to the earth, and controls the flight of satellites.

**Newton's First Law of Motion** – This law says that any object will continue in its current state of motion unless acted upon by an outside force. This is the law that is operating when you come to a sudden stop in your car and feel yourself thrown forward as the car stops. It is the definition of inertia – objects have the property of resisting a change in their state of motion.

**Newton's Second Law of Motion** – This law says that if you apply a force to an object, it will accelerate in the direction of the force. This may well be the most important relationship in the universe. It is the basis of all our current engineering.

**Newton's Third Law of Motion** – In this law we learn about action/reaction. For every action, there is an equal and opposite reaction. This is the principle that makes rockets work. You accelerate the gases from the burning rocket fuel out the back end of the rocket and the reaction force pushes the rocket up into space.



**The First Law of Thermodynamics** – This is the law of conservation of energy. It states that energy can neither be created or destroyed. This is why we have to burn something to make our cars move, why we have to have power plants to make electricity. It's also why perpetual motion machines have never and will never work. An interesting implication of this law is that the universe was born with a given amount of energy available and we'll never get any more.

**The Second Law of Thermodynamics** – Every process increases the entropy of the universe overall. This statement is a little obscure, but what it really means is that no process is 100% efficient. Every thing you do converts energy from a useable form to an un-useable form. And, once energy is in an un-useable form, it can't be reclaimed. This is a very important principle. Combine it with the fact the First Law of Thermodynamics says we only have a fixed amount of energy and it implies that eventually all that energy will be used up. This is sometimes referred to as the "heat death" of the universe.

As astronomers, we make frequent use of a couple of the Laws of Optics.

**The Law of Reflection** - In this law we learn that the angle of reflection of a ray of light is equal to its angle of incidence. This is the law that gives the parabola its important property of reflecting all incident light to the same point and makes the Newtonian reflecting telescope possible.

**Snell's Law** - This law talks about the angles light rays make when they enter a material and are refracted. From the relationships in this law, we know how to shape the surfaces of lenses and what materials to use to make refracting telescopes work.

These then are some of the physical laws that govern our lives. Unlike human law, their effect is immediate, there is no appeal and everyone is treated exactly the same at their hands, everytime.



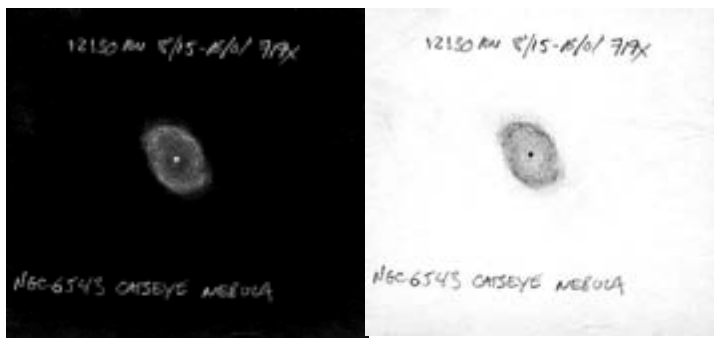
**NGC 6543**

**Object type:** planetary nebula (Cat's Eye Nebula)  
**SA 2000 chart:** 3  
**UA page:** 30  
**Constellation:** Draco  
**Observing location:** Indian Trail Springs (OSP)  
**Telescope:** 20" f/5  
**Magnification:** 719x  
**Time and Date:** 12:30am, Aug. 15-16, 2001  
**Seeing:** 6 - 7  
**Transparency:** 5 - 6  
**Temperature:** 67F  
**Limiting magnitude:** 6.0 (clear but smoky)

**Eyepiece description:**

This is a bright and beautiful planetary nebula. The low power view (93x to 261x) showed the oval nebula with its central star being easily visible, and displayed its electric green-blue color best. Increasing the power (ultimately up to 719x) made the central star more difficult to see. But that was made up for by the increasing detail seen in the nebula. Although 6543's overall shape

is oval, within that shape is a subtle helix; a two arm spiral shape which is also very slightly the brightest areas of this planetary. An excellent view I enjoyed sketching at 719x.



**ASTROPHYSICS / COSMOLOGY SIG**

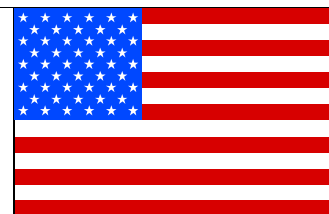
**TIME:** 7:00 PM

**DATE:** October 18, 2001

**TOPIC:** Alan Aspect Experiment (Quantum Mechanics—Matt Brewster

**PLACE:** Linus Pauling House, 3941 S.E. Hawthorne Blvd.

**From all of us  
 in the RCA, we  
 wish all  
 Americans  
 strength and best wishes in this  
 time of healing.**



**7th Annual  
 IMAGING the SKY 2001 Conference:  
 Seminars on Technology & Techniques for  
 Astronomical Digital Imaging**

Friday, Saturday, November 2nd and 3rd  
 Salem, Oregon, Willamette University  
 Tokyo International University of America

Early registration (by September 30, 2001): \$54  
 Late Registration (by October 31, 2001): \$64  
 (Saturday lunch and ITS 2001 CD-ROM included with Early or Late Registration.) After October 31, registration at the door only: \$74 (but lunch not guaranteed and nominal charge for ITS 2001 CD-ROM)

To register: mail check, made out to ITS 2001, to: Jim Girard, ITS 2001 Registrar, P.O. Box 254, Beaverton, OR, 97075

- \* Selection and Operation of CCD Cameras.
- \* How to produce quality images.
- \* New technologies: software and hardware.
- \* How to enhance and analyze images.
- \* Lectures, workshops, panels, vendors.
- \* Informal information exchange with experts\*

Featured Speaker: Antonio Cidadao on Planetary Imaging, plus Richard Berry, John Brewster, Wayne Brown, James Burnell, Tom Carrico, Doug George, Jim Girard, Dave Haworth, Al Kelly, Dave Kenyon, Tom Krajci, Nick Liepins, Dale Mais, Roy Tucker, Ron Wadoski, Rob West, more.

INFO: Jim Girard, argo@teleport.com or Rick Kang, rkang@efn.org 541-683-1381. SEE <http://www.teleport.com/~argo/its/its2001.html> for all the details! Organizers: Mel Bartels, Richard Berry, Jim Girard, Dave Haworth, Rick Kang, Nick Liepins.

# Searching for Ripples in the Fabric of Space-Time

By Robert McGown

Two years ago the Rose City Astronomer's cosmology group had the rare opportunity to tour LIGO, the Laser Interferometer Gravitational Observatory, on the Hanford Nuclear Reservation, as the optical train being constructed. A tour was given by Dr. Fred Raab and his colleagues. Two years later, on August 3rd, we were given a special tour by Michael Landry, Particle Physicist. Dareth Murry of cosmology sig, and I had the chance to observe the \$320 million gravity telescope in operation. LIGO is an instrument that looks for gravitational wave sources. Coincident to our visit, the gravity telescope was in a final phase engineering run, lasting about four days, which will set it up for a beta test this December to be run simultaneously with its sister instrument in Livingston, Louisiana. The Hanford and Livingston sites were chosen from 19 finalists by the National Science Foundation, from which the \$300 million project is funded.

The instrument is a modified Michelson interferometer which had been a 10-watt laser. In between mirrors the intensity of the beam will build up to be a power of approximately 30-50 watts. As a gravitational wave passes the distance between the two and one-half mile 'legs' it stretches the space between the mirrors and is measured on a quantum scale.



## Astronomical Gravitational Wave Targets

The engineering phases are designed to 'get the bugs' out of the system and get it ready for the first beta run. LIGO is looking for the wave signature of four sources:

1. Spiral binary neutron stars crashing together and dying
2. Periodic sources like pulsars
3. Burst sources such as super novae
4. Stochastic background gravitational waves from the Big Bang- as early as  $10^{-36}$  seconds after the Big Bang. This is the separation of gravity from the other forces.

Although the Hanford LIGO is capable of observations in the Virgo cluster, the LIGO team is attempting to attain observations of neutron binary spirals from the Milky Way. An interesting attribute of gravitational waves that they are possibly in the audible range of sound waves at 40-200 Hz. If you could hear one you also might be stretched like spaghetti. On the LIGO website is a recording of the predicted end of a binary black hole and neutron star as they spin down in their orbits. Then we booted up the computer to hear the sounds, the signature sign of Microsoft coming online tricked us into thinking that was the gravitational

wave sound! However the 'real' computer simulated sound is more like the low guttural sound with a resonance of a quarter spinning on a table. The sound speeds up and ends up so fast it suddenly 'whirrs' out with a sharp dull chirp and then there is complete silence.

## The Instrument

The mirrors that reflect the laser beams are the highest quality mirrors known. The 25 cm (10" mirror) have up to 40 coatings. At the ends of the two and one-half mile evacuated tube, the mirrors are hung on piano wire with little magnets and rubber that control the yaw and pitch & roll of the mirrors using quartz stand-offs. The mirrors are calibrated on an optical bench and then initially collimated in the LVEA - Large Vacuum Equipment Array. The handed collimation of the mirrors is done to the ten mirrors for initial measurements. Online the mirrors are collimated within a tolerance of 10 (-8)m. The laser light in the tube is monitored directly by a CCD camera, which detects random loose vibrations.

The Control Room was like a JPL satellite control center with approximately 12 workstations to project many images on monitors and a central wall display. There were numerous images of diffraction like grating end on - it was the imaging of the reflection path of the laser in the interferometer mirrors with the CCD camera. Electrical engineers at Cal Tech continue to build and modify the complex GW instrumentation. Besides all computer systems of instrumentation at the control room, there are complex arrays of other databases detecting and controlling the rest of the facility.

One of the questions we asked was if the recent Tacoma earthquake had affected the workflow or damaged any of the instruments. The answer was a resounding yes! The earthquake set the project back at least two months and several mirrors were damaged. Although the seismic waves from the Tacoma quake reached the LIGO site, the location of LIGO is in one of the lowest seismic regions in North America.

## Other Gravitational Wave Detectors

LIGO is an international collaborative effort with scientists in Italy, Britain, Germany, Japan and Australia. with other gravitational wave interferometers to detect the ripples in space time.

The 2km VIRGO Gravitational Wave Interferometer in Italy is nearly online and collaborating results with the other GW observatories. Control room test runs monitor the control actuator and the mirror residual motion.

An ambitious GW project on the drawing board is LISA, Laser Interferometer Space Antenna, an interferometry space satellite, like LIGO detecting gravity waves out in space. LISA has been slated by NASA to be launched in 2012-2015. The LISA mission will be in a configuration of 3 spacecraft flying in a equilateral triangle 5 million kilometers apart, one AU from the Sun. The 3 free flying spacecraft will act as a massive Michelson Interferometer. Space based LISA will overcome many of the limitations LIGO faces on Earth.



# Telescopes Are Shrinking

By Donald Miller

Sound the alarm for astronomers worldwide!

Actually, don't do that! While telescopes are shrinking, they are not shrinking in a way that allows more light gathering capability. The light gathering maxim remains, "a bigger objective means more light gathered." The objectives of telescopes continue to be made larger. So, what is shrinking? It is the length of modern telescopes that has been shrinking, not the aperture. The technique of polishing and grinding mirrors and lenses has advanced in the previous century to allow for shorter focal lengths. The design of telescopes has expanded to incorporate shorter telescopes. But the mystery remains- Why would astronomers want shorter telescopes?

Exactly why have the lengths of telescopes shrunk in the last century? The reason for shorter telescopes may be organized into three categories. First, the marketability of shorter telescopes is greater. Second, the optics of these shorter telescopes also offer advantages. Finally, the professional astronomer's demand for mammoth telescopes has brought on shorter, more compact designs.

**Marketability-** Why are shorter telescopes more marketable? A compact, portable telescope is much easier to use. The ease of use is important when considering to buy a telescope. The telescope that gets used most frequently is one that is the lightest and compact in design. The long tubes of Newtonian reflectors and standard refractors make for hard times. The eyepiece of a refractor comes very near the ground when the scope is pointed at the azimuth, making viewing difficult for a tall observer. The eyepiece of a reflector is hoisted into the air when the scope is pointed near the azimuth, making a ladder a necessity for even the tallest of observers. To solve this problem, reflectors and refractors may be made with mirrors and lenses with shorter focal lengths. It is the focal length that determines the length of the tube. Astronomers refer more often to the focal ratio than the focal length. The focal ratio is the diameter of the objective divided by the focal length, so it can be used to further discuss the length of telescopes. So, it is advantageous for telescope manufacturers to make shorter scopes with smaller f-ratios. Another way to make shorter telescopes is in their design, which takes form on the consumer market as the Schmidt-Cassegrains and the Maksutov-Cassegrains. These scopes employ both mirrors and lenses to form images. The design of these scopes permits light to enter through a large objective lens to a primary mirror. This lens on the front of the scope does not do any focusing, but does help keep stray light (say, from a streetlight) out of the telescope. The image of the primary mirror is then reflected back to a secondary mirror in the front of the scope. The purpose of the secondary mirror in these Cassegrain focus scopes is to bring the light back through a hole in the primary mirror. These telescopes are known for their excellent resolution and are also compact because the path the light takes is 'doubled up' in the tube. So, usability goes with marketability in the consumer marketplace.

**Optics-** What kind of advantages are offered by these scopes?

The wider field of view of the scopes with lower f-ratios not only aids the viewer in finding objects, but is useful for astrophotography. Having a telescope with a lower f-ratio is like having a camera lens that is able to open up its aperture to gather more light. While the objectives of such scopes may not be bigger than competing scopes, they do make exposure times shorter when making a picture. Obviously this is a priority in astrophotography, where the objects may be too dim to be seen without the aid of a telescope. Also, the lens-mirror scopes offer a focal reducer as an option. This is an extra lens for taking pictures that is placed where the eyepiece would normally go when viewing. The effect of this lens is to reduce the focal ratio of the telescope, say from an f-10 to a f-6.3. The burgeoning field of astrophotography has brought on a new revolution- the use of the amateur CCD. With the CCD on the market to amateur astronomers this places more demand on a scope with a lower f-ratio.

**Professionals-** Besides Astrophotography, why do professional astronomers want shorter telescopes? The reason professional astronomers want shorter telescopes is to make bigger objectives to gather more light. The reason the largest telescopes in the world have small f-ratios is because, if they were longer, they would be very difficult to build. The largest telescope of the 19th century is the 40-in refractor at the Yerkes Observatory in Wisconsin, completed in 1897. A 48-in objective was originally installed, but was found useless as it warped under its own weight. Aside from large converging lenses being very difficult to make, (the Yerkes refractor is still the largest refractor) these telescopes typically have large focal ratios. This makes for a very long tube which is awkward. So, reflectors make for better large-scale telescopes. The advantage to a mirror is that it may be supported on the non-reflective side. In making very large telescopes the problem becomes supporting the enormous weight of the primary mirror, while still being able to point the telescope. The Chretien design which has a hyperbolic primary as opposed to at different places in the sky. The equatorial mount was last used on the 200-inch Hale reflector atop Mt. Palomar. The most massive telescopes today, Keck, Gemini, VLT array to name a few use the simpler altazimuth design to minimize the weight of the scope. Aside from the mount, these modern telescopes employ a shorter f-ratio design. This is called the Richey-the parabolic primaries of traditional reflectors. The unique usage of a hyperbolic mirror shortens the f-ratio and yields a wider field of view. A special secondary, probably concave in form, must be used to bring the light rays to a focus. So, the advantage of a shorter telescope is evident in the largest, most modern telescopes which are made with 6-meter to 10-meter (216in - 360in) primary mirrors.

**Conclusion-** Telescopes have only been shrinking in a way that allows larger objectives or a more compact design. One reason is the enlightenment of telescope manufacturers to the need of the consumer for an easy-to-use scope. Another is the unique optical capabilities of such scopes with shorter f-ratios providing wider fields of view. Another reason for the increased demand of smaller f-ratios is the growing discipline of astrophotography. Finally, to construct the megalithic telescopes of the modern professionals, the shorter, lighter telescope design is a necessity.

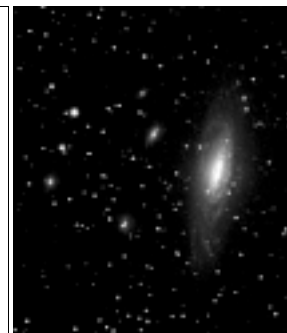


## RCA Photo Gallery



LEFT: This image, by RCA member Glenn Graham, of the occultation of Saturn, was taken on video with his 12" SCT and STV camera on September 10th. Portland time, the occultation by the last quarter moon began at 5:26 AM and reemerged from the dark side at 5:51 AM.

RIGHT: Image by David Haworth, August 24-25, 2001. Observation of Object: NGC7331 spiral galaxy, mag. 10.33. Other galaxies to the east are NGC 7340; NGC 7337; and NGC 7335. Observing Equipment: Celestron C-8 Schmidt-Cassegrain telescope with Fastar lens accessory and SBIG ST-237 CCD Camera. CCD image time: 61 - 30 seconds images stacked together; no guiding or PEC was used. Orion ShortTube 80 mm refractor telescope and Cookbook CB245 CCD Camera.



LEFT: OSP 2001. Photo taken by Bruce Johnson. Saturday, August 18, 2001 at Indian Trail Springs in the Ochoco Mountains of Central Oregon.

Approximately 800 amateur astronomers attended the 14th annual Oregon Star Party. Skies improved and cleared of smoke as the OSP progressed. A full three-day schedule included, lectures, swap meet, meteorite hunt, kids activities, sky identification programs and telescope walk-about.

Next year's Oregon Star Party will be August 8-11, 2002.



*Cool astronomy websites are a great benefit to beginner and advanced amateur astronomers. Here are a few. Feel free to add to the list!*

## COOL FUN FACTS

<http://antwrp.gsfc.nasa.gov/apod/astropix.html> Astronomy Picture of the Day

<http://spacelink.nasa.gov/.index.html> Aeronautics and Space Education Resource

<http://astron.berkeley.edu/~paul/> Paul Butler's home page (one of the famous planet-hunters)

<http://astron.berkeley.edu/~gmarcy/> Geoff Marcy's home page (the most famous planet-hunter)

<http://www.aspsky.org/> The Astronomical Society of the Pacific

<http://astron.berkeley.edu/home.html> UC Berkeley's Astro Dept.

<http://www.straightdope.com/index.html> Interesting questions/answers

<http://www.astronomynow.com/> Astronomy news

<http://spaceflightnow.com/index.html> Space news

<http://cfa-www.harvard.edu/sao-home.html> The Smithsonian Astrophysical Observatory

<http://space.mit.edu/> The MIT Center for Space Research

<http://phobos.caltech.edu/mirror/keck/index.html> Keck Observatory

<http://www.oregonl5.org/> The Oregon L5 Society

<http://www.spaceref.com/> Space news

<http://www.rdrop.com/users/marvin> Portland Robotics Club

<http://slashdot.org/> News for nerds

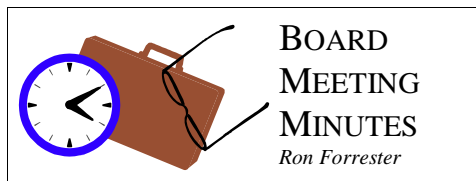
<http://www.nss.org/> National Space Society Website

<http://ngst.gsfc.nasa.gov/> Next Generation Space Telescope Page

<http://www.stsci.edu/> Space Telescope Science Institute Page

<http://www.aas.org/> American Astronomical Society Page





**Monday, September 17, 2001**

**Present:** Doug Houston, Carol Houston, Vern Weiss, Ron Forrester, Dareth Murray, Yohan Meyer, Jim Todd, Norm Trost, Matt Brewster, Scott Fitzgerald, Jan Keiski, Sameer Ruiwale, Scott Turner

**Candidate Members Present:** Regis Krug (Editor), Ginny Pitts (Assistant Treasurer), Larry Godsey (Magazine)

**Treasurer** - Vern: \$16,044 current balance. \$120 will be needed in November for the paid EasyStreet service. Vern will be out Sept. 17<sup>th</sup> to 27<sup>th</sup>. With Peter out as well, no one will be available to sign checks. Ginny can make deposits if needed.

**Programming** - Matt: Dean Kettleison cannot speak until next spring or summer – looking at George Taylor as replacement for the November meeting – he is the Oregon State Meteorologist. Want input on an IDA presentation for April or May of 2001, trying to contact Dave Crawford and Tim Hunter, co-founders of IDA, possibly a dinner before hand for people interested in getting involved in a watchdog IDA committee, working with local government, etc, on IDA issues – Matt to come up with initial plans, should be solidified by January if we plan on doing it.

December meeting will be holiday party – last year was low attendance due to poor weather – however, even with that, food was in short supply, should we make additional arrangements? Maybe add an introduction to new officers, goodbye to old ones, highlights from the year. Maybe a slide presentation where members can submit 2 slides and talk about them, or just keep it running during the evening without commentary. This years dinner may be in the Auditorium due to unavailability of the cafeteria. Need a notice in the Gazette with a plan for who brings what (a-f brings entrée's, etc). January is the info-fair meeting.

**Star Parties** - Scott: Larch is the replacement for Coldwater for the 15<sup>th</sup>. Dareth to put it on the web. OMSI Star Party the 22<sup>nd</sup>. Jim handed out the proposed OMSI star party for 2002 – Scott motions that we approve the schedule, Norm seconds, passed unanimously. A Tentative 2002 star party has been begun by Scott.

**Sales** - Sameer: Collected \$399, profit was

\$90, paperwork given to Vern. Sameer and Matt will attempt to sell Crowswell's book after the meeting – they will be autographed on the spot, selling for list price. \$1008 total cost, unsold books can be sent back. Sales needs to buy a cart.

**Membership** - Doug: With recent renewal deadline, membership down to 262.

**New Members** - Carol: Start putting some additional new membership material together, hoping to promote observing programs to new members more. Have an article about buying an inexpensive first telescope to add to the material (see 'Other Business' below).

**Library** - Jan: There are 4 or 5 people who are abusing the library privileges. 2 of these will lose their privileges immediately. Rob King has volunteered to look into making a tall rolling bookcase that folds together so that the books can be locked away (thanks Rob!!). With this investment in time/money the library will then be categorized by subject matter so that books are easier to find.

**Light Pollution** - Bob: Nominal  
**SIG's** - Scott: Nominal  
**AL** - Dale: Nominal  
**Editor** - Candace: Nominal

**YRCA** - Ron: Jenny was asked to be on the Board. Need details from Peter and Margaret.

**Community Affairs** - Norm: To meet Superintendent of schools for Sandy to sell our program for use in all the grammar schools, and try to get into Gresham as well. Had a call from a science teacher at a Hillsboro school about getting the solar scope.

**OMSI** - Peter: Nominal

**Webmaster** - Dareth: Going to work with Regis on getting more of the newsletter in HTML format.

**Telescope Library:** Nominal

**Magazine** - Yohan: Larry Godsey to take over, many thanks.

**Phone Line:** Sept. 10 to Oct. 1<sup>st</sup> is Matt, Oct 1<sup>st</sup> through November 5<sup>th</sup> Norm Trost. Email instructions to Board (Ron).

**Other Business:**  
 Board meeting schedule for 2002 – recommended that we do the first Monday, unless a holiday in which case it will be the following Monday. Vern motions to accept this, Norm seconds, passed unanimously.

Board recognizes the huge amount of effort and work Candace, Brian and Johan have put forth for the club. Our sincere gratitude for all the hard work!

New board member candidates: Brian's replacement is Jeff Henning, Regis Krug for Editor, Larry Godsey for Magazines.

Carol suggests the first part of the meeting be 7 to 10 activity updates by the pertinent board members, in order to keep an informal, cohesive community, and soothe and inform the new members. Carol makes a motion that on a trial basis we try this. Ron seconds, passed unanimously.


Jan will provide special name tags to denote board member status.

Motion made to tape each meeting for library archival, given permission by speaker(s) shown through a signature on a form to be kept by the secretary. Seconded by Dareth. Passed unanimously. Ron will create an initial form to be iterated over by the Board on the email list.

Registered Agent issue is tabled until next meeting. Vern moves, Scott seconds, passed unanimously.

Carol has a telescope buying packet for the holiday season telescope buying spree. Packets would be taken to some key local retailers to be included with the telescope just purchased. Carol to put the packet together, board members volunteer to distribute to the retailers.

CLASSIFIED ADS



INTERESTED? I am looking for a few RCA members interested in a usage arrangement for having access to my year-round dark sky 4-acre site in Central Oregon south of Prineville. Please contact Bruce Johnson at [bruce@oregonphotos.com](mailto:bruce@oregonphotos.com).

| OCTOBER 2001 |     |     |     |     |     |     |
|--------------|-----|-----|-----|-----|-----|-----|
| Sun          | Mon | Tue | Wed | Thu | Fri | Sat |
|              | 1   | 2   | 3   | 4   | 5   | 6   |
| 7            | 8   | 9   | 10  | 11  | 12  | 13  |
| 14           | 15  | 16  | 17  | 18  | 19  | 20  |
| 21           | 22  | 23  | 24  | 25  | 26  | 27  |
| 28           | 29  | 30  | 31  |     |     |     |

| NOVEMBER 2001 |     |     |     |     |     |     |
|---------------|-----|-----|-----|-----|-----|-----|
| Sun           | Mon | Tue | Wed | Thu | Fri | Sat |
|               |     |     |     | 1   | 2   | 3   |
| 4             | 5   | 6   | 7   | 8   | 9   | 10  |
| 11            | 12  | 13  | 14  | 15  | 16  | 17  |
| 18            | 19  | 20  | 21  | 22  | 23  | 24  |
| 25            | 26  | 27  | 28  | 29  | 30  |     |

### October

|                |             |                           |                        |                |
|----------------|-------------|---------------------------|------------------------|----------------|
| Oct. 1         | Mon.        | Board Meeting             | OMSI Parker            | 7:00 PM        |
| Oct. 6         | Sat.        | Telescope Making Workshop | Tech. Marine Srvc.     | 10-3           |
| Oct. 15        | Mon.        | YRCA (ages 13-18)         | OMSI Cafeteria         | 6:30 PM        |
| Oct. 15        | Mon.        | RCA Kids (ages 4-12)      | OMSI Cafeteria         | 7:00 PM        |
| <b>Oct. 15</b> | <b>Mon.</b> | <b>General Meeting</b>    | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| Oct. 18        | Thurs.      | Astro/Cosmology SIG       | Linus Pauling House    | 7:00 PM        |
| Oct. 20        | Sat.        | Local Star Party          | Larch Mountain         | Dusk           |
| Oct. 31        | Weds.       | Weather SIG               | Colonial Office        | 7:00 PM        |

### November

|                |             |                           |                        |                |
|----------------|-------------|---------------------------|------------------------|----------------|
| Nov. 5         | Mon.        | Board Meeting             | OMSI Parker            | 7:00 PM        |
| Nov. 10        | Sat.        | Telescope Making Workshop | Tech Marine Srvc.      | 10-3           |
| Nov. 19        | Mon.        | YRCA (ages 13-18)         | OMSI Cafeteria         | 6:30 PM        |
| Nov. 19        | Mon.        | RCA Kids (ages 4-12)      | OMSI Cafeteria         | 7:00 PM        |
| <b>Nov. 19</b> | <b>Mon.</b> | <b>General Meeting</b>    | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| Nov. 21        | Thurs.      | Astro/Cosmology SIG       | Linus Pauling House    | 7:00 PM        |
| Nov. 28        | Weds.       | Weather SIG               | Colonial Office        | 7:00 PM        |

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-omsi.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

### RCA CLUB INFORMATION

Message Line: (503) 255-2016

Web Site: <http://www.rca-omsi.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012

# The Rosette Gazette

Volume 13, Issue 11

Newsletter of the Rose City Astronomers

November, 2001



## Observing and Astro Imaging

### In This Issue:

- 1 General Meeting  
Leonids  
New Members
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
Young RCA
- 3 Observer's Corner
- 4 Weather SIG  
RCA 2002 Slate
- 5 How Come?  
Cosmology SIG
- 6 Deep Sky Tour
- 7 Member Awards  
Solar Observing
- 8 Cool Fun Facts  
RCA Photo Gallery
- 9 Board Minutes
- 10 Calendar/Events

For the November General Meeting we will have two presentations from active RCA members, Carol Huston and Richard Berry.

The Rose City Astronomers (RCA) is a club whose main activity is observing. For many years, the national Astronomical League (AL) has mentioned again and again that the RCA is one of the nation's most active amateur astronomy groups in completing the AL's observing programs.

As a member of RCA, you have the resources to develop your own observing skills with a whole club of members behind you participating in observing activities, supporting each other with guidelines, materials, and experience as you charge forth. *How do you get connected to this wonderful program?* At November's general meeting, **Carol Huston** will give a presentation on observing programs: how to choose one, how to begin one, how to proceed, how to get materials, and how to connect within the club to get advice and guidance.

Carol is the club's New Member Advisor, usually working with her husband Doug (VP of Membership) at the Membership Table at the monthly general meetings. In the past 11 years, Carol has held various other RCA board positions such as Club Secretary, VP of Membership, and VP of Star Parties. As an observer, Carol has completed several AL observing programs including the Messier Objects and Herschel 400. She co-authored, along with Candace Pratt, the AL's Herschel II book and program, researching and writing the many observing guides contained in that manual. She is developing a potential new program on Southern Hemisphere observing. During her years as an RCA observer, Carol has had the opportunity to observe with some of RCA's most skilled and experienced amateurs.

**Richard Berry**, an author on the subject of Astro-Imaging will then share with us perhaps the easiest way to capture night sky objects.

Photographers, computer-techies, and real-estate agents have discovered how great digital cameras are for recording the family vacation, adding pictures to real-estate ads, or just plain having fun shooting lots of pictures without paying for film and developing.

These same digital cameras are great for ASTRO-photography, too. While they cannot do everything, they're ideal for taking extraordinary pictures of the Moon, Sun, and planets. Best of all, its lots of fun and practically anyone can get good results the first time.

In his talk, Richard will describe the simple techniques that he has used for making Moon photos with a good quality but rather ordinary digital camera with several different telescopes. The minimum requirements are that the camera have autofocus, autoexposure, and an LCD display so that you see what the camera sees.

And for those who couldn't care less about techniques, Richard will show a bunch of Moon and Sun pictures he has taken, plus a series of pictures taken during the Saturn occultation in September.

Please join us for RCA's November general meeting and get the low-down on how you can participate in these fun, educational activities – observing programs, and astro imaging with digital cameras.

### Tips for Observing the 2001 Leonids

By Wes Stone

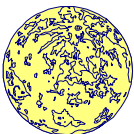
The Leonid meteor shower produced a spectacular fireball shower in 1998, a storm of several thousand meteors per hour in 1999, and several peaks of up to

*(Continued on page 9)*

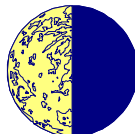
**WELCOME NEW MEMBERS!**

Dennis Anderson, Sandeep Bharathi  
Tom English, Robert Hamilton  
Brian Jarner, Larry Kibbee  
Anil Kumar, David Moore  
David Powell, Tammy Ross  
Joey Shapiro, Richard Vaughn

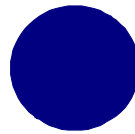
November 2



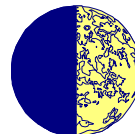
November 10



November 16



November 24



| Club Officers           |                   |                |                            |
|-------------------------|-------------------|----------------|----------------------------|
| President               | Peter Abrahams    | (503) 699-1056 | telscope@europa.com        |
| VP Members              | Doug Huston       | (503) 629-8809 | geometer31415@aol.com      |
| VP Observing            | Scott Turner      | (503) 788-6484 | kings11@qwest.net          |
| VP Community Affairs    | Norm Trost        | (503) 668-7979 | normt@europa.com           |
| VP, Communications      | Matt Brewster     | (503) 774-0360 | brewster@teleport.com      |
| Treasurer               | Vern Weiss        | (503) 236-1059 | vernlw@earthlink.net       |
| Secretary               | Ron Forrester     | (503) 504-8071 | rjf@skyhackers.org         |
| Sales Director          | Sameer Ruiwale    | (503) 617-0736 | sameer_ruiwale@hotmail.com |
| Editor                  | Candace Pratt     | (503) 296-6758 | candace@europa.com         |
| Web Master              | Dareth Murray     | (503) 762-4377 | dareth@web-ster.com        |
| Library Director        | Jan Keiski        | (503) 293-3281 | jikeiski@juno.com          |
| Telescope Librarian     | Brian Richardson  | (503) 625-7373 | brian_shelly@earthlink.net |
| Alcor, Historian        | Dale Fenske       | (503) 256-1840 | fenskedf@juno.com          |
| Media Director          | Glenn Graham      | (503) 579-1141 | sueandglenn@msn.com        |
| Special Interest Groups | Scott Fitzpatrick | (503) 669-8243 |                            |
| Youth Director          | Margaret McCrea   | (503) 232-7636 | mags@europa.com            |
| Light Pollution Rep.    | Bob McGown        | (503) 244-0078 | telscope@qwest.net         |
| New Member Programs     | Carol Huston      | (503) 629-8809 | StarsCarol@aol.com         |
| Magazine Subscriptions  | Larry Godsey      | (503) 675-5217 | larrygodsey@att.net        |



## President's Message

By  
Peter Abrahams

As you'll see in this issue of the Gazette, we have a slate of officers for your consideration. This means that a sufficient number of RCA members stepped up to volunteer for the chores involved in running the RCA. A group of our size and diverse activities requires a lot of maintenance; and in addition, we receive a large number of requests for assistance from the public - many of which are very time consuming. Thanks very much to all who help run the RCA.

Sometimes it seems like the sky is eternal and never-changing, but if I'm out at night and too lazy to haul equipment, I like to sit back and visualize all the phenomena that are in motion, or evolving, or exploding. The moon is receding by 3.8 centimeters a year. The surface of the sun is in constant and frenzied activity, with an occasional truly explosive event. The inner solar system is a racecourse for whizzing bits of rock and ice; and the

rings of Saturn must be like a condensed version of this demolition derby. Io is getting flexed and squeezed by Jupiter's gravity and is continually spouting geysers of exotic gas and liquid.

Many of the stars we see are doubles, orbiting each other at high speeds, and some are close enough to pull hot gases off each other. There are novas popping off regularly, spiced by the occasional supernova. Most of the billions of galaxies have a black hole at the center, orbited by incredibly high speed objects. And above all: in space, nothing is at rest, everything is in motion, at speeds that are unimaginable.

So, in times of stress and turmoil here on earth, just remember, we're wrapped in a nice cocoon of air and water, placed on a surface of fertile soil, safe from all the hazards of space: high energy rays from gamma to UV; high energy particles from solar protons to distant cosmic rays; solar flares; stellar explosions; rocks in orbit at very high speeds; and much more. It's dangerous out there!

## RCA

### Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newsstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Larry Godsey, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Larry until the magazine has processed the renewal.

### The "Kids" of Rose City Astronomers



#### RCA Kids

Children ages 4-12 are welcome to join in fun and educational activities while the grownups attend the monthly general RCA meetings. The kids' meeting takes place in the adjoining cafeteria at OMSI from 7:30 p.m. to 9:00 p.m. If you have any questions, please e-mail Jennifer at [jenny@theforrest.org](mailto:jenny@theforrest.org).

#### The Young Rose City Astronomers

(ages 13 - 18). This group meets from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.



Above: Photo taken Oct. 8th, 2001 by Glenn Graham from home in Portland.





### Steens Mountain

Imagine a pristine dark sky over an unspoiled mountain wilderness. Imagine October, about 5am in the morning, the sky still utterly dark. Imagine you're at Steens Mountain, observing from the Fishbowl area near Fish Lake at 7400 feet altitude. What would you see?

To the north, the Big Dipper is rolling up east of Polaris and is now almost halfway to its highest point. On the opposite side of Polaris, Cepheus is about halfway down to its lowest point. To the west, Cygnus and the summer Milky Way, which started the night at the zenith, is in the process of setting. To the south and to the east, and almost overhead is a sky one can only dream of most of the year.

Orion is on the meridian; Sirius with Canis Major in tow follows just to Orion's southeast. Higher up to the east, Procyon marks Canis Minor. Castor and Pollux are Gemini's brightest stars, which this year enjoy the company of a very bright Jupiter. Capella dominates Auriga as usual, and this year Saturn balances Aldebaran in Taurus. This position also puts Saturn pretty much at the most northern part of the ecliptic, and when on the meridian it is as high in our sky as it can get. Off to the west a bit is the Pleiades.



Above: Winter skies at Steens.

Trickling down from the zenith, through Cassiopeia, Perseus, Auriga, Monoceros and Puppis is the winter Milky Way. In this very dark sky it's a prominent but still subtle river of stars. We're looking away from the galactic center, through fewer stars, which is why the winter Milky Way is so much fainter than the central part we see in the Sagittarius area.

Even so, the stellar glory of the winter sky is unmatched from our latitude, particularly with the additions of Jupiter and Saturn. The black sky and steady atmosphere brings each star to a nearly unwavering, brilliant point of light.

Directly to the east, where dawn seems to be starting, is the Zodiacal Light. At its broad base it is considerably brighter than the Monoceros Milky Way. Tapering to a thin band of more subtle light, it angles up and toward the Milky Way, crossing it between Auriga and Orion. Continuing on, what is now the Zodiacal Band becomes thinner and fainter, but still quite visible. At about Pisces it suddenly broadens again into a large, oval diffuse glow – the Gegenschein. This is the plane of our Solar System – subtle, but definitely there.

A few shooting stars surprise and delight, and one very bright meteor through Cancer leaves a trail visible for at least five minutes.

Leaping over the eastern horizon is Leo, seemingly embedded within the base of the Zodiacal Light. A few thin, black clouds are now silhouetted against the glow. Cancer lies just ahead of Leo in the Zodiacal Light, with the obvious naked eye Beehive open cluster beckoning for attention. So now take a deep breath,



Above: Zodiacal Light at Steens.

relax and imagine everything above, all at once:

The winter Milky Way and the Zodiacal Light / Zodiacal Band make a huge, faint X spanning over half the sky. The brilliant stars of the winter sky are scattered about the X in a large oval, joined this year by even brighter Jupiter and Saturn, which are plainly seen placed along the Zodiacal Band. The Gegenschein punctuates the Zodiacal Band to the west. Just now on the eastern horizon brilliant Venus suddenly rises, embedded directly in the brightest part of the Zodiacal Light. A few minutes later the thinnest of crescent Moons rises just a few degrees to its north. The earthshine portion of the Moon commands as much attention as its very thin crescent. Another faint meteor flashes below Orion as dawn finally begins.

The temperature is 28 degrees Fahrenheit; a light frost covers everything facing up. There is the slightest easterly breeze, and suddenly a very dark and beautiful night that has lasted for almost 10 hours feels too short.

# 2002 RCA BOARD OF DIRECTORS SLATE OF OFFICERS

In accordance with our bylaws, the November General Meeting is the annual business meeting of our organization. As a 501-C-3 organization, a Club officer is required by law to report our activities and financial condition. This meeting also includes the election of officers for the following year. The vote will commence at the onset of the general meeting at 7:30 PM, Monday, November 15th in OMSI's Auditorium.

The slate of officers for 2002 RCA board of directors includes:

President: Peter Abrahams  
VP Members: Doug Huston  
VP Observing: Scott Turner  
VP Community Affairs: Norm Trost  
VP, Communications: Matt Brewster  
Treasurer: Vern Weiss  
Secretary: Ron Forrester  
Sales Director: Sameer Ruiwale  
Editor: Regis Krug  
Web Master: Dareth Murray  
Library Director: Jan Keiski  
Telescope Librarian: Jeff Henning  
Alcor, Historian: Dale Fenske  
Media Director: Glenn Graham  
Special Interest Groups: Scott Fitzpatrick  
Youth Director: Margaret McCrea  
Light Pollution Rep.: Bob McGown  
New Member Programs: Carol Huston  
Magazine Subscriptions: Larry Godsey

With your support, this group of volunteers will continue to offer the membership of the RCA a wide range of services and activities throughout 2002.

Many thanks to all those who assist the Board members in carrying out the many programs and projects we are involved in throughout the year.

Our organization also thanks Jim Todd, OMSI Planetarium Manager, for his continued support of our organization. We are able to conduct these activities in large part due to the generosity of Jim and OMSI.  
Thanks to ALL!



## The Weather SIG

Date: Wednesday, November 28, 2001

Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219

Time: 7:00 pm

### Letter to the Editor, from Ron Brown

Re: Telescopes are Shrinking, by Donald Miller, October 2001 issue of Gazette.

Mr. Miller's article last month contains several mis-statements regarding optics which I would like to correct.

The front lenses of Schmidt-Cassegrain and Maksutov-Cassegrain telescopes do not keep stray light out of the scope. These lenses, also known as corrector lenses or corrector plates, correct for the shape of the spherical primary mirror. Cassegrains without corrector lenses require parabolic or hyperbolic primary mirrors.

The largest telescopes in the world rarely operate at prime focus, but if they did, Mr. Miller would be right in saying they have small f-ratios. However, these scopes rely on their secondary mirrors to get the beam of light to a focus down on the instrument platform or behind the primary mirror, and the f-ratio can easily be in the range of 20 – 50. These are long focus scopes in short packages.

Richey-Cretien telescopes are basically Cassegrain-like, except they have hyperbolic primaries as Mr. Miller states. The design uses a convex secondary, not concave, specially designed for the primary. The optical design corrects for off-axis coma and field curvature, thereby allowing wider fields of view. The f-ratios are still comparatively high.

There are other minor errors, including the use of "azimuth" where "zenith" should have appeared, an incorrect conversion from meters to inches, and a statement that the equatorial mount was last used on the 200 inch Hale telescope (dedicated 1948). In fact: The Mayall 4 meter at Kitt Peak was built in the 1970s and uses a very similar mount to Hale's. I did like the main point that Mr. Miller is trying to make – that telescopes are "shrinking" even as they grow larger. It's a novel way to put it, and once the reader understands that Mr. Miller is really talking about the proportion of the telescope diameter to the physical length of the structure, his point comes across well. I hope my clarifications help those who are new to the subject understand more easily.

# HOW COME?

By Douglas S. Huston

When an airplane lifts off the ground, how come the earth doesn't suddenly whip by underneath to the east at 1000 mph? There are lots of questions like this and I think we've all wondered about them. Let's see what the answer is.

The answer to the airplane question points out a key aspect of physics when dealing with motion – your location and state of motion as an observer of a phenomenon will critically affect the answer you get. When you're sitting on the plane on the runway, looking out the window before takeoff, it appears to you that you are stationary. But, if we position ourselves out in space and stationary with respect to the Earth's rotation, we see something quite different. From this vantage point, we can see that the plane is actually rotating with the Earth. Given this condition, we can answer this question using Newton's First Law, which is sometimes known as the Law of Inertia. This law states that an object will keep its current state of motion unless acted on by an outside force. When the plane is sitting on the runway, although it appears stationary to observers on the plane, our observer out in space sees that it is actually rotating with the earth. So, unless the engines of the plane supply enough force to counteract that eastward rotational velocity, the plane will keep rotating to the east along with the earth even as it moves westward. To see this, let's call eastward velocities negative, and westward velocities positive. Given this, we can find the total velocity of the plane like this: Total Plane Velocity = 600mph + (-1000mph) = -400mph. So, we see that the plane is still actually moving east with the earth at 400mph.

In my work for the Oregon Office of Energy, I sometimes get calls from people who have an IDEA. Not long ago, a man called me and said he had solved the problem of our dependence on fossil fuels. He proposed to construct a car with an electric motor run from two battery banks. One battery bank would be powering the car, while the other battery bank would be charging from a generator turned by the rear axle of the car. When the first battery bank went dead, the configuration would automatically swap. Unfortunately, I had to tell him that his invention was not feasible since it violated the Second Law of Thermodynamics.

The Second Law of Thermodynamics says basically that you can never create a 100% efficient process; you will always lose some energy. In this case, due to friction in the mechanical portion of the charging system and electrical losses in the electrical portion of the charging system, the generator could not supply the same amount of energy to the charging battery as was being used by the on-line battery. So, when the first battery went dead, the second battery would be less than fully charged when it went on-line. The process would repeat itself with the first battery being charged less than the second battery was when the second battery went on-line, and so on. Eventually, both batteries would be dead. This system would extend the range of an electric car, but it wouldn't run forever.

If you take a mouse to the roof of your house, and drop it off, it will probably walk away uninjured after hitting the ground. However, if you were to fall that same distance, you would likely be severely injured. Why is that?

## ASTROPHYSICS / COSMOLOGY SIG

TIME: 7:00 PM

DATE: November 21, 2001

TOPIC: The Virgo Supercluster, Bob McGown  
The Evolving Universe,  
Malcomb Longair

PLACE: Linus Pauling House, 3941 S.E.  
Hawthorne Blvd.

The answer involves the ratio of surface area to weight. The mouse has a large surface area compared with its weight, whereas we humans have a small surface area compared with our weight. This fact affects this scenario in two ways. First, the amount of air resistance depends on the surface area to weight ratio of the falling object. Think of a feather falling and a brick of lead with the same surface area as the feather falling. So, the mouse will fall slightly more slowly than we would. Second, since the mouse has a larger relative surface area to spread the energy of the collision with the ground over, the energy at any point will be smaller resulting in less damage at that point.

Wait!!! Didn't Galileo show that two objects fall at the same rate regardless of their composition? Doesn't this contradict what was just said about the mouse falling more slowly? Actually, Galileo's experiment was a failure if you just look at the time it took the two objects he dropped to reach the ground. He dropped an iron ball and a wood ball of the same size from the same height, and, the iron ball actually hit the ground slightly ahead of the wood ball. This was due to the differing wind resistance felt by the two objects, which was due to their different surface area to weight ratios. In a VACCUUM, where there is no air resistance, a feather and a lead ball fall at exactly the same rate.

Galileo's experiment is still considered a success since it showed that the theory current at the time, which was put forth by the Greek philosopher Aristotle, was wrong. Aristotle said that objects fell at a rate directly proportional to their weight. In other words an object twice as heavy as some other object would fall twice as fast as the lighter object. In Galileo's experiment, the wood ball hit the ground only a fraction of a second after the iron ball, much more quickly than Aristotle's theory predicted.

The essence of science is answering questions. When you look at the world around you, don't just accept what you see. Always ask how come? Real treasures often lie just below the surface of the everyday.



## Deep Sky Tour at 7000' & Mars Society Biosphere Test

By Robert McGown

The adventure began with a snow cat ride from Timberline Lodge (Mt. Hood, Oregon) to Silcox Hut on May 12, 2001. Silcox is a WPA classic Cascadian structure sitting 7000' at the base of the Palmer ski lift. Four astronomy and space advocates—Gus Frederick, Dareth Murray, John Foster and myself—rendezvoused at the snow cat loading dock and saw a beautiful



Silcox Hut, Mt. Hood

solar iridescence as the Sun was eclipsed by a Noble Fir tree. While Dave Koch, one of the hut's caretakers, staged the snow cat, Gus Frederick of the Mars Society/L5

commenced to load the CEMSS

biosphere into the Thiokol all-terrain snow machine. CEMSS stands for "Controlled Ecological Mouse Life Support System." Gus rode in the co-pilot position, while the rest of us were packed in like a deck of cards between the 10" Dobsonian telescope and the rest of the gear. Dave steered the snow cat by pulling levers and headed toward the summit of the mountain on an even tack.

Upon arrival at Silcox Hut at 3:30pm, we unloaded the CEMSS and telescopic equipment on an icy terrace in front of the hut to simulate sub-freezing Martian like conditions at altitude. Gus moved the CEMSS unit, which is about the size of a medium-sized dog carrier, to a rocky moraine ridge below the hut's snow tunnel. As we learned later, shock cord and Kevlar tie-downs would have been helpful to stabilize the biosphere unit on the windy arete.

For the next four hours, with clipboard in hand, Gus monitored the silver and gold foil-insulated, electronically-controlled pumps, motors, and fans in the biosphere. On his laptop computer, Gus viewed the CEMSS data via a chart recorder program, using alligator clips to connect to the data acquisition module. Temperature sensors within the unit monitored solar mass and gain with the data acquisition sensor. The chart recorder software logged changes in the chilled mountain air, which ranged from 0°C to 16°C inside the insulated biosphere. Gus worked diligently on data acquisition until a sudden 45 km/hr gust of wind rocked the CEMSS unit, causing it to topple over. The warm water solar mass and Mt. Hood's sandy moraines made a mess inside the plant chamber. Gus and I spent an hour scrubbing down the biosphere. Gus spent the next hour downloading the information from the fan and thermostat, inside and out, into the data acquisition module. The complex CEMSS, constructed by Gus, is a contender for the Devon Island Mars Society experiments.

### The Deep Sky Session at 7000'

The persistent wind of the afternoon died down in time for the star party. Around sunset, we finished the cleanup of the CEMSS. We waited for the live washboard blues band (Richard Cranium and the Phoreheads) to start their gig at Silcox Hut and the lenticular clouds to settle. After the clouds parted, the star party began. John Foster, Dareth Murray and I scanned the Milky Way area for Messier and other deep sky objects. We entertained 20 guests of Silcox Hut, plus visiting climbers ascending the mountain. The first group of climbers that came up to our 10", f/4.5 Dobsonian included a man named Roger. He asked, "Hey, do you know Steve Swayze? I viewed Mars through his 40" telescope." We were quite amazed with the interest and enthusiasm for astronomy. Dave, the caretaker, enjoyed views of spring globular clusters. The birthday guest at the hut, Larry on his 50th, invited us in for the salmon dinner and birthday party happening.

For the first few hours we observed nebulas and spring globulars and then turned our attention to M51 (Whirlpool Galaxy), M44 (Owl Nebula), M108, M101 (a face-on galaxy that showed spiral structure), M104 (Sombrero Galaxy), NGC 6992 complex (Veil Nebula) and NGC 4565.

After viewing deep sky objects, with occasional sporadic meteors streaking overhead, we moved the telescope into the Silcox snow tunnel to view moonrise and attempt to detect the two faint moons of Mars. As always, the transparency of the mountain air at Silcox exceeded our expectations as an observing site.

### Mars

Mars, the Roman God of War, rose above the thick blanket of clouds covering the valley floor. The planet was in the constellation Sagittarius, next to the Lagoon Nebula. The nebula and the planet nearly fit in the same field of view through my wide-field 32mm (36x) eyepiece. Mars showed a slight polar hood and the dark feature Syrtis Major. In the neighboring constellation of Scorpius was Antares, the rival of Mars. Gus joined us briefly for an early morning session, to catch a glimpse of the blurry image of Mars.

Our main goal for the evening was to view Mars' moons, Phobos and Deimos. These tiny specks are 11<sup>th</sup> and 12<sup>th</sup> magnitude, easy enough for a 10" scope except for their proximity to the glare of Mars. I used a #58 green gel filter with a hole in it, placed over a clear skylight filter up to 120X.. This functioned like a partial occulting bar to cut the glare. By placing Mars behind the filter material, I hoped to see the moons in the unfiltered portion of the field of view. It challenged my patience to wait for moments of steady air and good seeing. At around 1:00 am, it was brutally cold as I positioned the filter on the 32mm eyepiece, two pinpoints of light immediately popped out next to Mars' disk. One was in line with the planet's equator; the other near the northeast limb. After viewing Mars through excellent transparency and various seeing conditions, it was an elating thrill to see the dim moons of Mars in this spectacular setting.



# The Sunny Side of Our Hobby



## RCA MEMBER AWARDS



As a new recognition of RCA members who complete one of the many observing programs offered by the Astronomical League, we will begin featuring those members who have been awarded a certificate of achievement. Dale Fenske, the RCA Alcor to the Astronomical League, has more information if you are interested in an observing program.

- Terry Ulvinin**  
#460, Binocular Messier
- Janninne Murriell**  
#1884, Messier Master
- Howard Banich**  
#20, Herschel II

*Editor's Note: For the past few years an RCA member has had a profound impact on the public across our nation. Mark Siebold has shown thousands of people in public gatherings our closest star, the sun, through the club's hydrogen-alpha solar filter, which we purchased through a fund raising campaign. Mark Seybold's efforts to give everyone a glimpse at our sun's magnificence, brings real joy to all. We thank you, Mark. Below is a letter from a local teacher.*

Greetings,

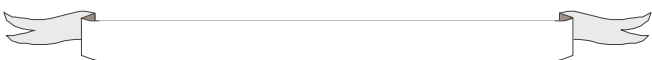
I would like to extend a big Thank You to Rose City Astronomers on behalf of myself, my 150 eighth grade students, and the entire staff of Poynter Middle School.



I would like to personally thank Norm for putting me in touch with Mark, and of course, Mark himself for spending so much time with my classes. All of my students and many coworkers were able to witness the splendor of the sun through your filtered telescope, and this opportunity really touched the imagination in many of us. I feel that some of these students really saw something beautiful in that image, were thrilled by watching solar flares move, and were awed at the prospect of the size and fury of a sun spot electromagnetic storm... This has been a treat. I thought this might be a lot to pull off as a first year science teacher, but I am glad I contacted RCA. My principal, office manager, custodians, science department, were all thrilled to take a peek at the sun, and are extending many kudos to me for organizing the event. I would like to extend those kudos to RCA for having this kind of equipment available to the public! You may have just created a few more young astronomers (I saw several students keen for more!). I hope we see you again in Hillsboro.

Sincerely,

Benno Lyon  
8th Grade Science  
Poynter Middle School  
Hillsboro, Oregon

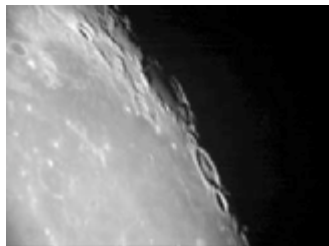


(Continued from page 6—Deep Sky Tour)

### The Moon

At 2:22am, I was looking at the terminator of the Moon using the modified green filter. As I swept the artificial terminator of the occulting filter across the disk of the gibbous Moon, the crater at 120X seemed to have a faint, flickering glow. Was this a Lunar Transient Phenomenon (LTP), or just an effect of the Earth's turbulent atmosphere?

We continued to observe into the sunrise, as more enthusiastic climbers greeted us. Meanwhile, Gus woke up early after a brief nap and began recording heat loss from the CEMSS biosphere. We were exhausted from the all-night vigil of a star party above the clouds but the memories of an amazing night of viewing were still vivid in our minds. This Mars Society test and deep sky viewing may be the most significant astronomical event at Silcox Hut since the *Cosmos 93*



Above: Lunar photo taken by RCA member Martin Rockwell.

*Symposium and Rose City Astronomer's Star Party.* During that gathering, astronomers including Wes Stone, John Foster, Brian Richardson and myself hosted a star party at Silcox Hut for the *Cosmos 93* participants. Speakers included John Dobson and Dr. Darkmatter.

# RCA Photo Gallery

Below: Pleiades (M45). Photo taken by Mike Cole, October 13, 2001 at Steen's Mountain, OR.



## COOL FUN FACTS

### DID YOU KNOW?

The Earth's surface gains 100's of tons of space matter and debris every day!

All Uranus' satellites are named after Shakespearean characters.

Space Shuttle: The External Tank (ET) is sprayed with a foam that turns orange (or rust colored) as a result of ultra-violet exposure (from the sun). This exposure also hardens the foam, improving its insulating properties.

Anthony Hopkins modeled his character, Hannibal Lecter, after the HAL-9000 of 2001: A Space Odyssey, saying that HAL was a cold machine that would not think twice about killing. He even based Hannibal's voice after HAL.

One of the things that Apollo mission did was deposit a cockroach

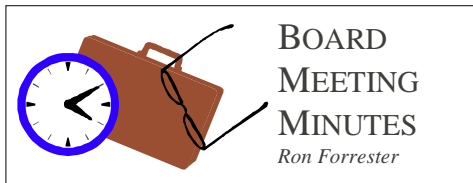
on the moon. During their outward flight, the astronauts noticed a cockroach in their spaceship, but when they returned, the craft was thoroughly inspected by NASA technicians and no trace of it was found. The only conclusion is that it crept out and was left behind.

If space debris already circling the globe continues to increase at its current rate, the chance that a space shuttle will collide with debris will increase to 1-in-10 flights by the year 2000.

Some of the objects visible in Hubble Space Telescope images are nearly four billion times fainter than the limits of human vision. [SJI Sky and Space]

Bill Gates has been heard saying that he wishes to become the first private citizen put into space. He is worth enough money to fund his own mission to Mars, many, many times.

In the movie '2001: A Space Odyssey', the monolith's dimensions are 1:4:9. If you don't immediately grasp the significance, 1,4,9 are the values of the first three squares in our counting system. Because of this, the scientists of the era determined that the formation of the monolith is impossible by natural forces, and thus concluded that it was carved by an outside intelligence.



Present: Vern Weiss, Doug Huston, Carol Huston, Peter Abrahams, Dareth Murray, Dale Fenske, Ron Forrester, Ginny Pitts, Jan Keiski, Scott Fitzgerald, Bob McGown, Sameer Ruiwale, Larry Godsey

Treasurer - Vern: \$15,916 balance.

Programming - Matt: Dr. Richard Canfield set to talk for October.

Star Parties - Scott: Last scheduled star party for 2001 is Oct. 25<sup>th</sup> at Larch. Still working on 2002 star party schedule.

Sales - Sameer: \$140 for September Sales

New Members - Carol: Packet for new telescope owners, about 10 pages. Jan to help put the finishing touches on it. Will be looking for people to help distribute to local vendors for handing out when a new telescope is purchased.

Library - Jan: Larry getting closer to library index on web. Lots of books checked out last meeting.

Light Pollution - Bob: The Northwest Group is talking about having a small IDA conference in Portland, \$20/person. Woody Sullivan may attend. Possible location of Haggard Observatory, sometime in April, 2002. Will target utilities to try and get representatives, i.e. PGE, Pacific Power.

SIG's - Scott: Cosmology SIG was interesting, good presentation.

AL - Dale: Membership is updated.

Membership - Doug: 294 current members.

Editor-Candace: Nominal – Printer may be dropping groups of members when mailing out. Talk to Candace to see how the printer handles this. Peter to make general announcement regarding this – contact if not getting it.

YRCA - Ron: Carol motioned to make Jenny Youth Director. The motion was seconded by Ron. Motion carried unanimously. Let's rename group to JRCA (Junior RCA). Margaret will continue to lead teenagers. Ron will bring issues to the board meetings for Jenny as she will usually be unable to attend.

Community Affairs - Norm: Nominal

OMSI - Peter: Star Party went pretty well despite lighting and tree issues.

Webmaster - Dareth: Moving the site to the non-profit server. Mike R. has offered to host our email list and will do so within the next

couple weeks. Email list is a benefit, discuss if it should be closed to members.

Telescope Library: All scopes currently out Brian to give inventory to Peter, who moved that Jeff Henning replaces Brian as telescope librarian. The motion was seconded by Dareth. Motion carried unanimously.

Magazine: Dareth moves that Larry replace Yohan as magazine coordinate. The motion was seconded by Vern. Motion carried unanimously.

Phone Line: Oct. 1 to Nov. 5<sup>th</sup> Matt, Dareth Nov. 5<sup>th</sup> to Dec.

Carol passed (Norms) slides onto Dale for safe keeping.

New member voting should be finalized by December 1<sup>st</sup>. November meeting bring the vote before the general membership.

2 minute board member talks worked well last meeting. If the board member needs a little extra time, let Peter know.

Some discussion around having an Annual meeting, which is meant to give the membership an opportunity to comment, etc. Peter to look into any restrictions on this.

We have discussed the WTC charity idea, and determined that the monies raised by the RCA are for astronomical purposes. No donation will be made by the RCA.

Carol moved that before speaking you will be recognized by the president by raising your hand and being called on. The motion was seconded by Jan. Some discussion around this being a good idea. A few cautioned against getting too formal. Motion carried unanimously.

Secretary has traditionally provided new board members with orientation packet with by-laws, etc. Ron to look into finding it, or creating new one.

Come up with a list of responsibilities for the registered agent (Peter?) – current definition is “The person the outside world contacts when dealing with the RCA as a corporate body, the person or entity responsible for the acceptance of legal papers if the RCA is ever sued.” Jan moved that we table this issue until next meeting. The motion was seconded by Doug. Discussion that we wanted Scott, Norm, and Matt to be present for the vote. 2 voted against motion. Motion carried by majority.

Kah-neetah needs a [refundable] \$250 deposit for next years event.

New solar scope – manufacturer rejected lenses provided to him, ordered new lenses.

## (Continued from page 1— Leonids)

400 meteors per hour in 2000. Unfortunately, the Pacific Northwest caught only outlying activity from these events. This year should be better, weather permitting.

Based on predictions by David Asher and Rob McNaught, among others, two major Leonid peaks are predicted in 2001. The most intense will occur for parts of Asia and Australia, but US longitudes may get their own storm on the morning of November 18. This event is probable, but by no means certain. Detailed analyses and predictions can be found in the November issue of *Sky and Telescope*, as well as at my meteor shower web site: <<http://skytour.homestead.com/met2001.html>>. Here are five basic rules to keep in mind.

1. The main activity is expected before dawn on **Sunday morning, November 18**. The predictions suggest maximum activity between 2:00 - 2:30am, PST. Such an outburst could last just a few hours. Ambitious observer will keep watch from about 12:30am through the beginning of morning twilight. Those who are only prepared to watch for a couple of hours may wish to center their observing period around the predicted time of maximum. Don't bother watching in the evening hours. Leonids won't be visible then, because the radiant is still below the horizon. Even after midnight, the rates will probably be low for an hour or so.
2. Find clear skies. This could be a daunting prospect, but significant parts of Oregon have been clear during the Leonid peaks in both 1999 and 2000.
3. Find dark skies. Your limiting magnitude will dramatically affect the number of meteors you see.
4. Dress in warm, comfortable clothes. Clear skies and warm weather generally do not coexist in November.
5. Stay informed; keep your expectations within reason. Major models predict a maximum zenithal hourly rate (ZHR) of 2000 to 2500 for the North American peak. Because the Leonid radiant will only be at around 30° altitude for the Northwest, observed rates under good sky conditions will be only ~50% of the ZHR. While times of outbursts are now fairly predictable, rate forecasts are much less reliable. The actual rate could be much higher or lower than predicted, highlighting the need for amateur observations to refine future forecasts. More information is available at the following web sites:

**North American Meteor Network:**

[www.namnmeteors.org](http://www.namnmeteors.org)

**Meteorobs Mailing List:** [ww.meteorobs.org](http://ww.meteorobs.org)



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012



**DECEMBER 2001**

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|-----|-----|-----|-----|-----|-----|
|     |     |     |     |     |     | 1   |
| 2   | 3   | 4   | 5   | 6   | 7   | 8   |
| 9   | 10  | 11  | 12  | 13  | 14  | 15  |
| 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 23  | 24  | 25  | 26  | 27  | 28  | 29  |
| 30  |     |     |     |     |     |     |

**NOVEMBER 2001**

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|-----|-----|-----|-----|-----|-----|
|     |     |     |     | 1   | 2   | 3   |
| 4   | 5   | 6   | 7   | 8   | 9   | 10  |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  |
| 18  | 19  | 20  | 21  | 22  | 23  | 24  |
| 25  | 26  | 27  | 28  | 29  | 30  |     |

**November**

- Nov. 5 Mon. Board Meeting OMSI Parker 7:00 PM
- Nov. 10 Sat. Telescope Making Workshop Tech Marine Srvc. 10-3
- Nov. 19 Mon. YRCA (ages 13-18) OMSI Cafeteria 6:30 PM
- Nov. 19 Mon. RCA Kids (ages 4-12) OMSI Cafeteria 7:00 PM
- Nov. 19 Mon. **General Meeting** OMSI Auditorium 7:30 PM
- Nov. 21 Thurs. Astro/Cosmology SIG Linus Pauling House 7:00 PM
- Nov. 28 Weds. Weather SIG Colonial Office 7:00 PM

**December**

- Dec. 1 Sat. Telescope Making Workshop Tech Marine Srvc 10-3
- Dec. 3 Mon. Board Meeting OMSI Parker 7:00 PM
- Dec. 10 Mon. YRCA (ages 13-18) OMSI Cafeteria 6:30 PM
- Dec. 10 Mon. RCA Kids (ages 4-12) OMSI Cafeteria 7:00 PM
- Dec. 10 Mon. **General Meeting** OMSI Auditorium 7:30 PM
- Dec. 26 Weds. Weather SIG Colonial Office 7:00 PM

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-omsi.org/>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

**RCA CLUB INFORMATION**

Message Line: (503) 255-2016

Web Site: <http://www.rca-omsi.org/>



# The Rosette Gazette

Volume 13, Issue 12

Newsletter of the Rose City Astronomers

December, 2001



## RCA CHRISTMAS HOLIDAY BUFFET

### December 17th

#### In This Issue:

- 1 General Meeting  
New Members
- 2 Board Directory  
Pres. Message  
Magazine  
Subscriptions  
Young RCA
- 3 Observer's Corner
- 4 Weather SIG  
Forecasters
- 5 Messier Menagerie
- 6 2002 RCA Board
- 7 2001 Leonids
- 8 Alan Bean
- 9 Board Minutes  
Classified Ads
- 10 Calendar/Events

In keeping with annual tradition, the December meeting of the Rose City Astronomers will be a holiday buffet and social gathering for all family members.

Please note this event will be held the **third Monday of December**, December 17th at 7:30 PM in the **OMSI Cafeteria**.

In addition to the pot luck dinner, we will also have a swap meet, holiday door prizes and sharing time for astronomy photos and astro-equipment. Save time to shop at the RCA Sales Table for your favorite holiday astronomy gifts.

Each member is asked to bring a dish to serve 10-12 people. **PLEASE BRING PLENTY!**

**If your last name begins with . . .  
Please bring:**

|               |                              |
|---------------|------------------------------|
| <b>A to H</b> | <b>Main dishes</b>           |
| <b>I to P</b> | <b>Appetizers/SideDishes</b> |
| <b>Q to Z</b> | <b>Desserts</b>              |

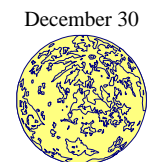
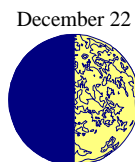
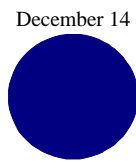
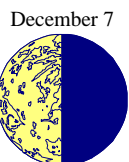
Plates, silverware and beverages/ice will be supplied by the club. Just bring your dish (and a serving utensil) and enjoy the holiday spirit of the RCA membership.

The **Swap Meet** will be back by popular demand for a third year! There will be ample empty tables around the room for everyone who is interested in displaying items for the Swap Meet. There will be excellent holiday deals!

If you have taken any astronomy pictures this year and want to share them, this is your ideal opportunity. Members also bring their latest in new astro-'stuff.' If you have a fun gadget/item/tool—bring it!

#### WELCOME NEW MEMBERS!

Vaughn Anderson  
Tim and Cara Esau  
Nick Gilbert  
Tony Noe  
MaryAnne Osolin  
Rick and Ashley Read  
Konrad Von Austerlitz



| Club Officers           |                   |                |                            |
|-------------------------|-------------------|----------------|----------------------------|
| President               | Peter Abrahams    | (503) 699-1056 | telscope@europa.com        |
| VP Members              | Doug Huston       | (503) 629-8809 | geometer31415@aol.com      |
| VP Observing            | Scott Turner      | (503) 788-6484 | kings11@qwest.net          |
| VP Community Affairs    | Norm Trost        | (503) 668-7979 | normt@europa.com           |
| VP, Communications      | Matt Brewster     | (503) 774-0360 | brewster@teleport.com      |
| Treasurer               | Vern Weiss        | (503) 236-1059 | vernlw@earthlink.net       |
| Secretary               | Ron Forrester     | (503) 504-8071 | rjf@skyhackers.org         |
| Sales Director          | Sameer Ruiwale    | (503) 617-0736 | sameer_ruiwale@hotmail.com |
| Editor                  | Candace Pratt     | (503) 296-6758 | candace@europa.com         |
| Web Master              | Dareth Murray     | (503) 762-4377 | dareth@web-ster.com        |
| Library Director        | Jan Keiski        | (503) 293-3281 | jikeiski@juno.com          |
| Telescope Librarian     | Brian Richardson  | (503) 625-7373 | brian_shelly@earthlink.net |
| Alcor, Historian        | Dale Fenske       | (503) 256-1840 | fenskedf@juno.com          |
| Media Director          | Glenn Graham      | (503) 579-1141 | sueandglenn@msn.com        |
| Special Interest Groups | Scott Fitzpatrick | (503) 669-8243 |                            |
| Youth Director          | Margaret McCrea   | (503) 232-7636 | mags@europa.com            |
| Light Pollution Rep.    | Bob McGown        | (503) 244-0078 | telscope@qwest.net         |
| New Member Programs     | Carol Huston      | (503) 629-8809 | StarsCarol@aol.com         |
| Magazine Subscriptions  | Larry Godsey      | (503) 675-5217 | larrygodsey@att.net        |



## President's Message

By  
Peter Abrahams

Even though the winter does not lend itself to stargazing, there are reasons to make an effort to get out to clear skies at this time of year.

The much longer nights & the ability to see into the southern hemisphere make it worthwhile to bundle up against the cold. It is only an hour's drive over the Cascades to better weather. Keep an eye out on the email list for events out by Klondike or Maupin. The winter meteors - Leonids and Geminids - can be worth a drive.

I admit that I do most of my

winter viewing on the internet, but I never advise anyone to do as I do!

The RCA meeting for December will be our potluck holiday dinner / swap meet / display / social gathering. No speaker, no business. It is a time to learn what other members are doing and maybe adopt a new astronomical sideline. Last year we ran out of food early in the evening; the RCA will be bringing more supplies and hopefully this year members will bring a little more as well.

We look forward to a new year, with some new volunteers on the board, and maybe even another comet-of-a-lifetime. Let us know what you'd like the RCA to be, and how you'd like to help implement the plan.

## RCA Magazine Subscriptions

One of the main services offered to RCA members is subscriptions to *Astronomy* and *Sky & Telescope* magazines at a much reduced rate from newstand prices. *Astronomy Magazine* is \$29 and *Sky & Telescope Magazine* is \$29.95. See Larry Godsey, Subscription Coordinator at the Membership Table at General Meetings for further information. Please note: Allow two months for your subscription to be renewed from the time you bring or send your renewal to Johan until the magazine has processed the renewal.

## The "Kids" of Rose City Astronomers



### RCA Kids

Children ages 4-12 are welcome to join in fun and educational activities while their grownups attend the monthly general RCA meetings. The kids' meeting takes place in the adjoining cafeteria at OMSI from 7:30 p.m. to 9:00 p.m. If you have any questions, please e-mail Jennifer at [jenny@theforrest.org](mailto:jenny@theforrest.org).

The **Young Rose City Astronomers** (ages 13 - 18). These groups meet from 6:30 to 7:30 on the third Monday of the month in the OMSI auditorium, before the regular RCA meeting. In addition, the YRCA meets on the first Thursday of the month. Kids with all levels of experience are welcome. There's no need to join - just come to the meetings and have fun. Adult volunteers are always welcome. Call Margaret McCrea, 232-7636, for more information.

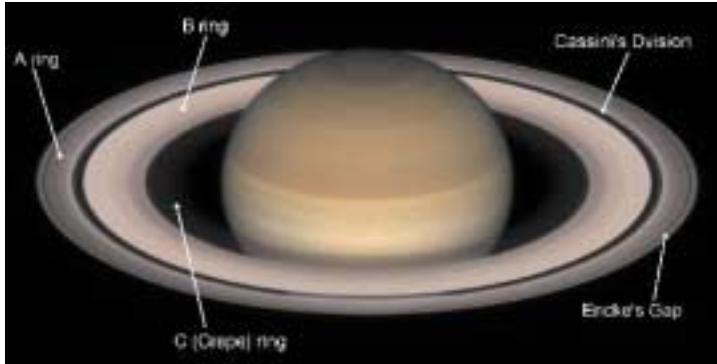


John Pane—Sunday, November 18, 2001—  
Pennsylvania—Leonid Meteor Storm

Saturn has always fascinated me, partially because it was the first thing I saw through a telescope when I was eleven years old, but mostly because of its unique and striking appearance. Over time, I began to read about the planet, and over the past 15 years or so I've actively looked for some of the more elusive features I've read about and seen images of. I've also found that occasionally there has been confusion about what feature is what.

The planet is now about as high in our sky as is possible, and its beautiful rings are almost as wide open as they can get from our point of view. And we're fortunate that this will be the case for several more years. By the way, the rings will open to their fullest in 2003 when the planet also reaches perihelion.

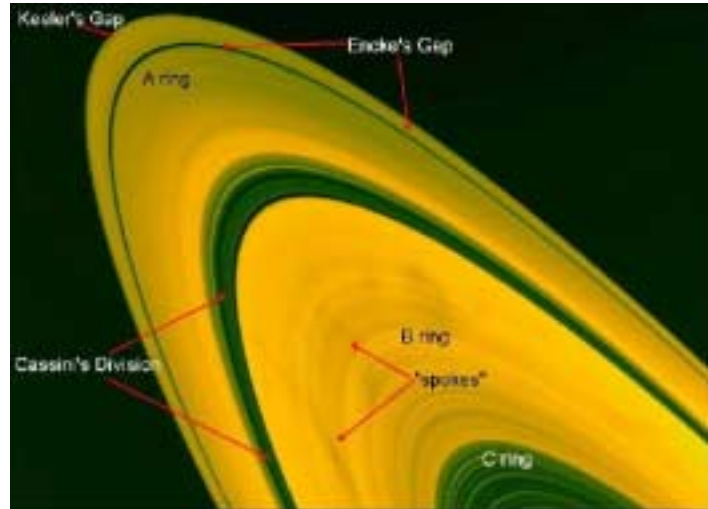
Below is an image of Saturn from the Hubble Space Telescope taken last November, showing the planet in all its natural color glory:



I've added labels showing the names of the major ring features. Note the location of the Encke Gap, which is the thin, dark gap in the very outer portion of the A ring. This is perhaps the most challenging feature for an Earth-bound observer to definitely see, perhaps because there still seems to be some confusion about its exact location.

Johannes Encke saw a "shading" almost centered in the A ring in 1837, but his observation was preceded by Captain Henry Kater in 1830. For the next 50 years or so several observers reported a dark gap near the outer edge of the A ring, with a sighting finally considered definitive coming from James Keeler in 1888.

The history of how the more obvious ring divisions got their names is interesting in itself and somewhat counter-intuitive as the sequence above shows. For more history check out Jeff Medkeff's article on the web, "This Rings of Confusion!" at <http://www.c2i2.com/~medkeff/n4ringgap.htm> and NASA/JPL's "Historical Background of Saturn's Rings" at <http://newproducts.jpl.nasa.gov/saturn/back.html>.



The color enhanced NASA Voyager image above shows the main components of the rings that we can usually see through our often-boiling atmosphere. Also, some of the more subtle and elusive features that can only be glimpsed during the steadiest moments of seeing are labeled. Some features in this image probably can't be seen visually from Earth, such as the Keeler Gap and the finest ring divisions, but then I wouldn't be surprised if someone has observed them.

Observations of Cassini's Division can be made with almost any size scope, but it requires steady seeing to be seen completely around the rings with small scopes, and detail along both edges of the division can be seen in large scopes in superb seeing. Cassini's Division is only 4700km wide, about the width of the U.S. east to west. By contrast, Encke's Gap is about 325km wide, about the distance from Portland to the site of the OSP! That's about 0.04 seconds of arc at Saturn's mean distance from the Earth. At face value, these numbers suggest that Cassini's Division should be much more difficult to see and Encke's Gap should be invisible. However, they are both high contrast linear features that defy the normal limitations of resolution – lucky for us.

This means that a modest size scope, with excellent optics, has a chance to see both features in superbly excellent seeing. If Encke's Gap is visible be on the look out for spokes and fine gradations in the B ring, as well as bands on Saturn's globe. Nights like this are rare, and it generally takes a concentrating, experienced observer to see the these contrast features.

The next few years have placed Saturn in its most favorable position for those of us in the Northern Hemisphere, making this a great time to start observing our solar system's most photogenic planet. Saturn reaches opposition on December 3<sup>rd</sup>, meaning it will gradually start moving into the evening sky and become more convenient to observe. But why wait – a crisp, high power view of Saturn in all its glory is a sight worth staying up late for. (Continued on Page 6)



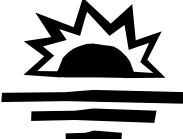
# Forecasters Re-Huddle

By Ron Thorikildson

In the parlance of football terminology, it was as if the Pacific Northwest was expecting the standard set of “plays” last winter. Unfortunately, Mother Nature ran a naked bootleg; completely confounding those who seek to better understand her playbook. So instead of getting the usual progression of storms across the Pacific and into our region, we experienced near record drought. And to top it all off, nobody has a satisfactory explanation as to why it even happened.

Partly to commiserate about last winter’s puzzling weather and partly to fearlessly look ahead at what might be on tap for us this season, a few brave weather/climate forecasters, as well as a number of interested spectators, converged on OMSI Halloween Eve. The event was the American Meteorological Society of Oregon’s 9<sup>th</sup> annual winter weather meeting. Three of the five invited speakers brought their crystal balls as they told the audience what kind of weather we could expect in the next four to five months. George Taylor, Oregon’s state climatologist, began by taking a glance backward. “The more I look, the less I understand why we had such a dry winter last year,” Taylor said. He went on to say that he thought it had something to do with an upstream response (eastern Pacific ridge) to a persistent upper level trough over the mid-West. The result was El Nino-like weather in a non-El Nino weather regime. Taylor sees a return to more normal conditions this winter with near average precipitation, except for January, which will be wetter. Seasonable temperatures will be the rule, but February will be slightly cooler than average. Best chance for valley snow events will occur in late January or early February.

George Miller, retired National Weather Service meteorologist, has developed his own system for ranking the severity of winter weather. He calls it the “M” scale and it is based on temperature and snow depth in the Portland metropolitan area. An M-1 winter (the least severe) implies that the coldest minimum temperature for the period remain above 20° F, the coldest maximum temperature stays above freezing, and less than 3 inches of snow accumulates on the ground. An M-8 ranking (most severe) requires a minimum temperature of less than 0° F or a snowfall measurement of greater than 36 inches. Miller foresees an M-2 or M-3 this winter, based mostly on his belief that we’ll see at least some valley snow and two mild outbreaks of arctic air—one in late December, the other sometime in January. Precipitation and temperature should be near normal, except in December and



## The Weather SIG

Date: Wednesday, December 26, 2001  
Place: Colonial Office Complex  
10175 SW Barbur Blvd, Suite 100-BB  
Portland, OR 97219  
Time: 7:00 pm

*Come rain or shine . . .*

January when it will be somewhat drier and colder.

The meteorologist-in-charge at the Portland office of the National Weather Service, Steve Todd, related the forecast of the government’s Climate Prediction Center. Maps depicting both precipitation and temperature showed a “CL” (climatology) for the Pacific Northwest. According to Todd, this can have two possible meanings: (1) that winter conditions will be average, or (2) that forecasting confidence is so low that a meaningful outlook can’t be determined. Highly variable weather should be expected throughout the winter.

While unwilling to take the forecasting plunge himself, Mark Nelsen of KPDX-TV checked the accuracy of recent forecasts put out by the Farmer’s Almanac. For the last three consecutive winters beginning with 1998-99, the predicted temperature for Portland was reasonably close 33% of the time on average. They did somewhat better with precipitation, getting it right about half the time. Jim Little, agriculture meteorologist for the state of Oregon, provided an opportunity for everyone who attended the meeting to get in on the action. He handed out a form upon which participants were asked to make selections with regard to temperature and precipitation (above, near, or below normal levels) for the months of November through March. The sheets were collected after the meeting and will be evaluated when the actual figures become available. Results will be announced at next year’s meeting. According to Little, “there’s no prize, only bragging rights!”

What kind of a game plan does Old Man Winter really have in store for us? We’re about to find out.

Hut-1...hut-2...hut-3...

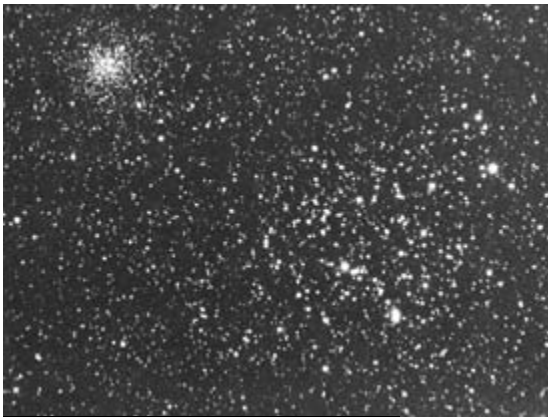


# Messier Menagerie- December 2001

By Dr. Rick Letherer, "starry-eyed" Astronomer

This is the first official month of winter. The nights are long and seeing can be very steady. For an astronomer, the nights offer observing sessions that can begin near 6:00 P.M. and offer hours of observing before midnight. Dress for maximum warmth and protect exposed skin and equipment from frost damage. This month I offer as a Christmas or Chanukah present, a discussion of the master hunter of the winter sky...Orion. Let's go hunting for some deep sky wonders of our own as we explore the diversity and color in the winter constellations!

M-35 This is a beautiful open cluster in Gemini. It is bright and large at approximately 45 minutes. There are several curving rows or chains of bright stars and no central condensation. Look for an orange star near the center. Also look approximately 1/2 degree SW for NGC-2158.



M35—Gemini

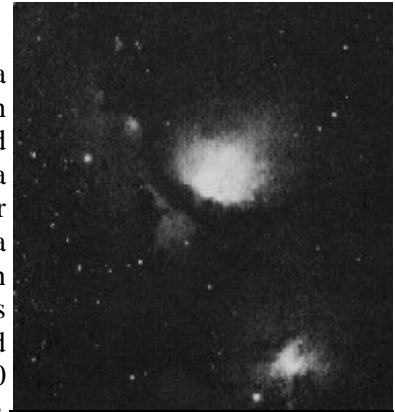
NGC-2158 This small companion to M-35 is one of many striking contrasts that astronomy offers. My first observation of this

companion cluster was little more than a faint glow similar to a planetary. With magnification the stellar composition becomes apparent. Unlike its cousin M-35 this is a very rich and dense cluster; at a distance of 16,000 light years, NGC-2158 is six times further than M-35 and near the outer edge of the Milky Way.

NGC-2392 This small, bright planetary was discovered by Herschel. It is located about half way between Kappa and Lambda Geminorum, both third magnitude double stars. Called the "Eskimo" nebula it has an outer ring resembling a parka hood and the inner shell has bright condensations that give the appearance of a human face. Comet-like in appearance the pale aqua colors are difficult to see in this 40-second disc, even though the entire object

is fairly bright at mag 8.

M-78 This diffuse nebula in Orion is dimmer than the dumbbell and located 2.3 degrees NE of Zeta Orionis. Messier described this object as "a cluster of stars with much nebulosity". The nebula is approximately 4' X 6' and has two magnitude 10 stars 53" apart that are enclosed within the cloud.



M78—Orion

M-79 A small globular in Lepus weighs-in at magnitude 7.9. This is one of the few globular clusters visible in the winter sky and is easy to find by extending a line south from alpha through beta Lepus. My 10-inch aperture showed no resolution.

H-3780 This is a pretty quadruple star system. I can identify different colors for each of the members of this grouping. Use medium magnification and slightly defocus the star images to compare colors; they are dim, so don't expect blazing beacons like the Pleiades. Look slightly north (up) from a point approximately midway between alpha and delta Lepus. Coordinates are: RA: 05h 37, DEC: -1753

M-42 This is the great "Orion Nebula". The mighty and impressive glow of ionized gas lies in the middle glow of the hunter Orion's sword. This nebula is so bright that it is visible as a star-like glow to the naked eye. Most of M-42's light is fluorescent from ultraviolet radiation emanating from the Trapezium. The greenish color visible in my scope results from ionization of oxygen. Much larger apertures show pale pink color in certain tendrils. The total mass of the nebula represents nearly 10,000 of earth's suns, yet it is spread so diffusely that its density is less than one-millionth of a good earthbound-laboratory vacuum. In addition to the color, I enjoy observing the Swiss-cheese structure of M-42 where bright and dark regions can blend imperceptibly or end abruptly. Star formation in this region is an active process in the bright knots of the nebula. Observe this with all levels of magnification; low magnification for overall view, and high magnification to resolve the trapezium and filamentary detail. Mary Proctor writes about the Orion nebula...

*"...Isles of light and silvery streams, and gloomy gulfs of mystic shade..."*

M-43 This is a nice object in its own right, but dwarfed to insignificance by its enormous neighbor. A dark projection of M-42 called the "fish-mouth" separates M-42 and M-43. The nebula is illuminated by its own central magnitude 8 star. **(Continued on Page 6.)**

(Continued from page 5—Messier Menagerie)

While M-43 lacks the long tendrils, dark bays, and turbulent bubbles that are hallmarks of M-42, observe it for the contrast it provides in size, color, and detail.

W Orionis This is a pretty variable star that displays a deep red-orange color. The color is due to the presence of carbon in the outer atmosphere that absorbs the longer blue and green wavelengths. Find W by tracing the curving line of stars that represent Orion's shield; begin at pi-1 and continue the arc past pi-6 to



find W nearly equidistant between Rigel and Bellatrix. Coordinates are: RA-05h 05.4, DEC-+0111. Scan the immediate neighborhood of W for the pretty bright yellow and many blue suns that contrast nicely.

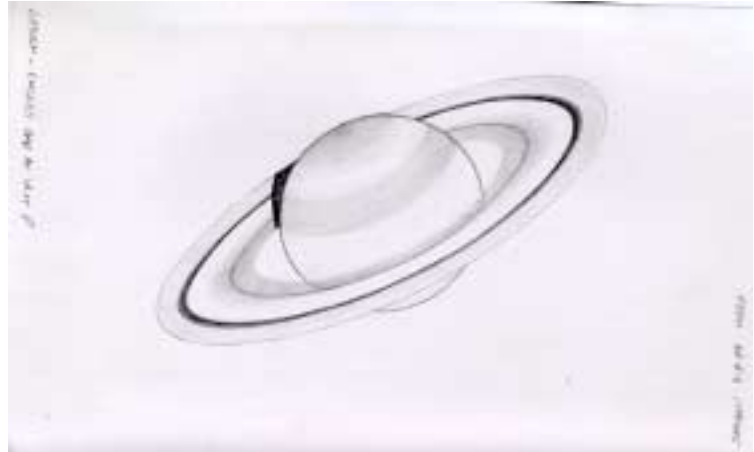
NGC-1535 This is a planetary nebula found in Eridanus with a central star magnitude 11.5. The nebula has a diameter of 18" and a magnitude of 9.3. Check for the central star and the faint color of the glowing gas shell. Look approximately four degrees from gamma Eridanus on a line toward Rigel.

U Camelopardus This is another red star located in Camelopardus. I've saved this for last because it is a very difficult star hop. None of my standard charts even show this star and it has no nearby bright object to use as a starting point. The challenging part of this object is the reward of finding it. Here are the coordinates...good luck! RA: 3h 31.8, DEC: +6239

The winter sky is a blazing display of nebula, multiple stars, colors, clusters and diversity. Enjoy the long nights and clear, steady seeing. May your nights be filled with clear skies and wide horizons.

(Continued from Page 3—Observers Corner)

Especially now that you know exactly what to look for.



## ***2002 RCA BOARD OF DIRECTORS ELECTED AT NOVEMBER MEETING***

In accordance with the RCA bylaws, the following members were elected as the 2002 Board of Directors of the Rose City Astronomers at the annual meeting on November 19th:

President: Peter Abrahams  
VP Members: Doug Huston  
VP Observing: Scott Turner  
VP Community Affairs: Norm Trost  
VP, Communications: Matt Brewster  
Treasurer: Vern Weiss  
Secretary: Ron Forrester

The following members have been appointed to perform the following roles for 2002:

Sales Director: Sameer Ruiwale  
Editor: Regis Krug  
Web Master: Dareth Murray  
Library Director: Jan Keiski  
Telescope Librarian: Jeff Henning  
Alcor, Historian: Dale Fenske  
Special Interest Groups: Scott Fitzpatrick  
Youth Director: Jenny Forrester  
Light Pollution Rep.: Bob McGown  
New Member Programs: Carol Huston  
Magazine Subscriptions: Larry Godsey

***Best Wishes to the 2002 Board of Directors!***

# 2001 LEONIDS SIZZLE — (NOT FIZZLE!)

**Editor's Note:** I could think of no better way to report the 2001 Leonids (hereby know as "the meteor storm of our lifetime!") than to share member comments. Enjoy!

**Wesley Stone:** LEONID STORM! I observed the Leonids from Pitcher Ranch in SE Oregon. In 5 hours of observing between 0800-1334 UT November 18 (midnight-5:34am



Photo by Dave Haworth, RCA member, 11/18/01, Leonid through Orion.

PST), I counted 2131 Leonids and 80 sporadics. Those numbers do not include the impressive display of 21 Leonid earthgrazers before midnight, nor the many Leonids seen during breaks. Wes's complete report at: <http://skytour.homestead.com/leo2001.html>

**Howard Knytych:**

Early in the evening, about 2200, before Leo had risen, there were several LONG meteors that must have covered a good 120 degrees across

the sky! As the night progressed, they shortened somewhat, but remained very bright. We listened to Holst's "The Planets", and Tchaikovsky's "1812 overture" as the shower reached its peak at about 0200.

**Jim Reilly:** The wind was fierce, but I was reasonably well bundled up. Kendall Auel appeared just before 11, and we were amazed at the lineup of car headlights aimed at Larch and Crown Point. Several long, bright, COLORFUL meteors culminated for me with the 12:20 monster that traveled pretty much due E-W, with a bright flare near the end. First peak for me was around 1:50, and again 2:20. The monster arrived at 3:04, catching me right between the eyes above the Pointer stars. The train was brighter than the Milky Way for 15 minutes as it writhed and drifted slowly westward.

**Vern Weiss:** I was there, and I saw more meteors yesterday morning that I have seen in my 72 years of life! I went to bed at 10:00 pm after some good telescopic viewing (Finished up my Messier list with # 74 and 77!). Got up at 1:00 am. When I stepped out of the trailer at 1:10 I saw three bright meteorites before I set foot on the ground. And it just went on and on! The temperature was 10° Fahrenheit, but who cares! A night to remember. By 10:00 am we were

all standing around in the lodge with big, sleepy grins!

**Chuck & Judy Dethloff:** 3:15 AM: 11 degrees and 89 percent relative humidity. Just finished a 70 minute count that recorded 738 Leonids, 2 Taurids and 4 sporadics. Very consistent over the entire hour with a few extremely active bursts lasting five or so minutes. Will be curious to see what peak rates Wes calculates for those brief bursts.

**Howard Banich:** Although it would have been nice to have captured a great photo, my memories of the 2001 Leonids are all tied to the awesome visual display and how fortunate we were with clear skies showing up when they did.

**Kendall Auel:** Chuck got me thinking about the greatest hits list. Here is mine:

- 1) Comet Hyakutake
- 2) Jupiter / Shoemaker-Levy collision
- 3) The 2001 Leonids
- 4) Turkey 1999 Total Eclipse
- 5) Comet Hale-Bopp

The northwest weather gods once again cooperated and opened up

Wish List:

- 1) Supernova in the Milky Way
- 2) The Aurora Borealis (in full glory)
- 3) The southern skies



**RCA  
MEMBER  
AWARDS**



*Dale Fenske, the RCA Alcor to the Astronomical League, announced the following observing program awards for the month of November. Congratulations to all!*

Meg Grace—  
Binocular Messier #466

Bob McGown—  
Binocular Messier #468

Dareth Murray—  
Binocular Messier #469

Candace Pratt—  
Herschel II #22-Manual

## **Alan Bean – Artist , Astronaut**

**By Bob McGown**

A standing ovation for Commander Alan Bean marked the end of a remarkable presentation at the Coaster theater in Cannon Beach Oregon on Nov 17,01 where Bean delivered a powerful message. The audience was moved to tears and cheers by his articulate and impassioned recounting of his space adventures and his opinion on what is happening in the world today.

### **The Apollo Missions**

We went to the Moon for all the right reasons. "We came in peace for all mankind." It took seven years for the astronaut core to prepare Neil Armstrong, Buzz Aldrin and Mike Collins to land on the Moon and the Sea of Tranquility on Apollo 11. If they didn't make it to the Moon, standing ready was the backup of Apollo 12 with Pete Conrad, Alan Bean and Dick Gordon and after them the crew of Apollo 13. Early on, the NASA Moon mission project had a major setback when Gus Grissom, Edward White II and Roger Chaffee died in the fire on the launch pad test run in Apollo 1 on January 27, 1967. Incredible risk was involved in the race to put Americans on the Moon before the end of the 60's. The space program went on to send 12 men to the Moon.

After Apollo 11, the team of Conrad, Bean and Gordon had only four months to prepare to land on the Moon's Ocean of Storms. Each astronaut had to be weighed and fitted into a bulky spacesuit in which they were supposed to gallop along the lunar hills in one-sixth of Earth gravity. On Earth Bean weighed over 300 pounds wearing the spacesuit and backpack; on the Moon he was a mere 50 pounds! There were many new things the astronauts had to learn - like geology, to determine which mineralized fractured rock specimens to pick up on the Moon. These fly boys wanted to pilot the spacecraft not collect rocks! They would have to learn geology if they wanted to fly to the Moon.

### **The Apollo 12 Mission**

Commander Bean describes the incredible shaking that the astronauts went through during lift off and his experience of walking on the Moon for over ten hours to conduct experiments. One of these was to pound a test cylinder into the lunar regolith to a depth of 28 inches to obtain test

samples. Because the lunar surface is so difficult to penetrate, he had to build up soil around the base of the American flag after pushing it into the Lunar regolith, so it would not fall.

The landing site in the Ocean of Storms was planned so it was in the vicinity of a Surveyor spacecraft from an earlier mission. Bean and Pete Conrad hiked to the abandoned lunar lander and removed the movie camera and other parts that would determine micro-meteorite impact on the skin of the space craft. When Bean was conducting his experiments on the surface of the Moon, he symbolically threw his silver rookie pin he received in the Naval Air Academy up in the air where it finally settled on the Moon's surface. One of his paintings reflects this moment. He proudly wears the gold pin earned when he attained full Astronaut status. Although they occasionally clowned around on their ten-day mission, he says being a space explorer was and is serious business.

### **The Astronaut Artist**

Alan Bean, the only artist to walk on the Moon, left NASA in 1981 to illustrate his adventures in space with an art style referred to as 'fantastic realism.' He always had a passion for art and now shares with audiences all over the United States his experiences on Apollo 12 in slide presentations and through his unique paintings. He told the audience that "it would have been great if an artist had traveled with Columbus to record that adventure" through the magic of the canvas and brush.

One of his artistic depictions is a simulation of Galileo's famous experiment, using a falcon feather and a hammer - showing the hammer and feather dropping simultaneously in a vacuum. After that simulation, the feather was accidentally stepped upon and disappeared into the lunar dust, impossible to find again. Bean brought the hammer back to Earth with him and uses it in his art work.

In his presentations, Commander Bean describes his painting technique as well as his personal philosophy. To add character and charisma to his artwork he uses his lunar geopick and moon boot to accentuate his brush strokes. He takes moon dust shaken from his spacesuit and patches and small pieces of foil from the command module and heat shield to give texture to the newly painted canvas. His paintings

depict views of the astronauts that the cameras didn't catch and even surreal fantasies, such as showing all three astronauts on the lunar surface. He wanted his partner Dick Gordon (who stayed above in orbit to pilot the spacecraft) to have been on the Moon, even if only in a painting.

### **On Freedom**

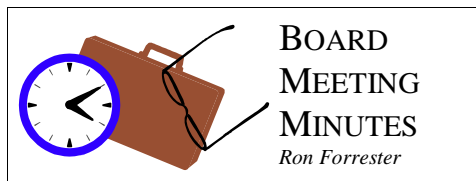
Commander Bean thinks that the current situation in the world is due to the fear of the rulers of monarchies and dictatorships that the people they repress will want the kind of freedoms we enjoy in the United States. In those regimes, the few with wealth control the rest of the population and suppress individual rights, especially for women. Bean says terrorism should not keep us in fear. We should turn that fear into courage. Although the last generation, those individuals who fought in WWII, have been called the "Great Generation", this generation is great too, because we took the risk, were courageous, went for the dream of space travel - and achieved it! We took the impossible and turned it into reality. He said he believes that there will be colonization of the Moon and Mars and in 400-500 years, more humans will live off the planet than on. He also predicted that the Olympics will someday be held on the Moon!

Commander Bean shared his insights and reflections as an explorer of another world. We all live together on the Earth and there is no instruction book. As he looked from the desert surface from the Moon back at the Earth, he realized, Earth is a paradise; it is the 'Garden of Eden.' We must take care of it. We are fortunate here in the United States. The standard of living we enjoy in the United States today is higher than even the kings and queens of the 1800's.

To travel to another world is a privilege and the American people shared the Apollo dream. The dream of the individual is an important one important too, from a housewife to a Nobel prize winner. Everybody counts.

He ended his lecture with a slide of our place in a spiral galaxy and related that as human beings we are special and unique in the universe and that we need to strive for our dreams. If we say 'how can I do it'?' instead of 'it can't be done', we can achieve anything.





Present: Vern Weiss, Peter Abrahams, Larry Godsey, Bob McGown, Dareth Murray, Matt Brewster, Ron Forrester, Dale Fenske, Scott Fitzgerald, Ginny Pitts

Treasurer - Vern: \$16,924 in the bank. Time to add Ginny to the checking count so she can cut checks, make deposits, etc. Vern motions to add Ginny as a signer to the checking account and money market account – Motion seconded by Scott Turner. Motion passed unanimously.

Programming - Matt: For November general meeting, Carol doing a program on observing, with Richard Berry on using digital cameras in astro-photography. December Holiday Potluck – have a member slide show running continuously – swap meet again this year. Will make sure there is extra food. Make sure people know to bring enough food for several people. Vern motions that Matt be allocated \$400 beyond his budget, Motion seconded by Dale. Motion passed unanimously. Add note that donations for the raffle are tax deductible. January’s Info-Fair – need to identify people to man booths: Star Parties, Scott; Observing Programs: Carol; SIG’s: Scott Fitzgerald; IDA: Bob/Dareth; Weather: Ron T.; Deep Sky: Alan Davenport; AL: Dale; YRCA: Jenny (have kids do something at the table); Haggard. JPL Ambassador will do a 2002 meeting, Jeffery Barnes might also do one; John Dobson, Dean Kettleon and George Taylor .have committed, just need to schedule them in. David Crawford or Tim Hunter for an IDA talk?

Star Parties - Scott: Nominal

Sales - Sameer: Nominal

Membership - Doug: Nominal

New Members - Carol: Nominal

Library - Jan: Nominal

Light Pollution - Bob: Have a new

projector for presentations. Put together a historical diorama on IDA. April conference, and looking into a design for banners, logo’s. Bill Hughes works in street lighting in Portland, maybe a good speaker for the conference.

SIG's - Scott: Nominal

AL - Dale: Membership has been updated, we got three awards this month. Phone line is up and running.

Editor-Candace: Nominal

YRCA - Ron: Ron motions Jenny is allowed to spend an additional \$100 (beyond YRCA budget) for teaching supplies. Motion seconded by Scott Fitzgerald. Motion passed unanimously.

Community Affairs - Norm: Nominal

OMSI - Peter: Nominal

Webmaster - Dareth: Website switchover went over well. Email list changes had some bumps, but things are looking good. Scott motions that the email lists be setup so that replies go to sender, not the list. Motion seconded by Vern. Motion passed unanimously.

Telescope Library: Nominal

Magazine: Nominal

Phone Line: Dareth Nov. 5<sup>th</sup> to Dec. 3<sup>rd</sup>, Bob McGown Dec. 3<sup>rd</sup> to Jan. 7<sup>th</sup>

- Galaxies Groups and Clusters by Bob McGown and Miles Paul
- Put a record of steps for the annual meeting to show that we covered the technical issues like the slate vote, etc.
- Registered Agent: Vern motions that Martin Alvey be appointed as the club’s registered agent. Motion seconded by Scott Fitzgerald. Discussion: Martin is an attorney and will know what to do with any legal paperwork served. Also, we should visit the appointment on an annual

basis. Motion passed by 8 yes with 1 no and 1 abstention.

- Departing officers need to leave a list of instructions for new appointments describing their function.
- Scott Turner to run November general meeting.

## CLASSIFIED ADS



**FOR SALE:** 8" Meade MTS SN8. Schmidt Newtonian, fork mount with pier, Dec & RA quartz drive, 1 1/4" 25mm Meade eyepiece, 2" rack and pinion with 1 1/4" adapter, 12mm illuminated reticle. Set up for photography (Variable camera T mount). Full aperture thousand oaks sun filter, 2" Deep sky filter, 3X power diagonal, extra 10 X 50 finder scope. \$600 OBO. Call John Burgeson (503) 760-0514.

**FOR SALE:** Skyquest 8 inch Dobsonian with 9 and 25 mm eyepieces. If you buy it new, it is \$499 plus \$50 shipping (total \$549). We are asking \$450. The telescope - for all intents and purposes - is brand new. I live in Salem. Delivery could take place in Salem, Portland, or somewhere in between. Interested people could contact me via e-mail at KenGN@msn.com or call me at home at 503-463-4764. Ken Niles.

**Coulter Optical - "Odyssey 1" Telescope** (13.1 inch, F 4.58). Dobsonian design, with rack-and-pinion focuser, Tel-Rad viewfinder, and a wide-angle eyepiece. \$950 OBO. Phone 503 661-1734. Ike Isaacs, Troutdale, 503 661-1734.

**FOR SALE:** TeleVue 70mm Pronto refractor with 2" star diagonal, 1 1/4" adaptor, 1/4-20 adapted for mount, dew cap, 25mm Plossl "star beam" finder, padded carrying case. 18 mo. old, like new. Awesome optics! \$800 OBO (was \$1100 new). Call Keith Osborne, 1-503-835-4420, Amity OR.

| DECEMBER 2001 |     |     |     |     |     |     |
|---------------|-----|-----|-----|-----|-----|-----|
| Sun           | Mon | Tue | Wed | Thu | Fri | Sat |
|               |     |     |     |     |     | 1   |
| 2             | 3   | 4   | 5   | 6   | 7   | 8   |
| 9             | 10  | 11  | 12  | 13  | 14  | 15  |
| 16            | 17  | 18  | 19  | 20  | 21  | 22  |
| 23            | 24  | 25  | 26  | 27  | 28  | 29  |
| 30            | 31  |     |     |     |     |     |

| JANUARY 2002 |     |     |     |     |     |     |
|--------------|-----|-----|-----|-----|-----|-----|
| Sun          | Mon | Tue | Wed | Thu | Fri | Sat |
|              |     | 1   | 2   | 3   | 4   | 5   |
| 6            | 7   | 8   | 9   | 10  | 11  | 12  |
| 13           | 14  | 15  | 16  | 17  | 18  | 19  |
| 20           | 21  | 22  | 23  | 24  | 25  | 26  |
| 27           | 28  | 29  | 30  | 31  |     |     |

**December**

|                |             |                           |                        |                |
|----------------|-------------|---------------------------|------------------------|----------------|
| Dec. 1         | Sat.        | Telescope Making Workshop | Tech Marine Srvc       | 10-3           |
| Dec. 3         | Mon.        | Board Meeting             | OMSI Parker            | 7:00 PM        |
| Dec. 17        | Mon.        | YRCA (ages 13-18)         | OMSI Cafeteria         | 6:30 PM        |
| Dec. 17        | Mon.        | RCA Kids (ages 4-12)      | OMSI Cafeteria         | 7:00 PM        |
| <b>Dec. 17</b> | <b>Mon.</b> | <b>General Meeting</b>    | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| Dec. 26        | Weds.       | Weather SIG               | Colonial Office        | 7:00 PM        |

**January**

|                |             |                            |                        |                |
|----------------|-------------|----------------------------|------------------------|----------------|
| Jan. 5         | Sat.        | Telescope Making Workshop  | Tech Marine Srvc       | 10-3           |
| Jan. 7         | Mon.        | Board Meeting              | OMSI Parker            | 7:00 PM        |
| Jan. 21        | Mon.        | YRCA (ages 13-18)          | OMSI Cafeteria         | 6:30 PM        |
| Jan. 21        | Mon.        | RCA Kids (ages 4-12)       | OMSI Cafeteria         | 7:30 PM        |
| <b>Jan. 21</b> | <b>Mon.</b> | <b>General Meeting</b>     | <b>OMSI Auditorium</b> | <b>7:30 PM</b> |
| Jan. 24        | Thurs.      | Cosmology/Astrophysics SIG | Linus Pauling House    | 7:00 PM        |

The RCA General Meeting falls on the third Monday of each month. We usually meet in the Auditorium at OMSI, next to the Murdock Planetarium. Occasionally the meeting is held in Murdock Planetarium. Check here each month for details, or look us up at the RCA web site (<http://www.rca-omsi.org/rca/index.htm>).

OMSI Parker Room is on the Mezzanine level. Go into the main lobby, past the turbine to the elevators at the end of the turbine hall. Take the elevators to the "Parker Room", which is marked on the elevator. The monthly Board Meeting is held there.

The Weather SIG address is: Colonial Office Complex, 10175 SW Barbur Blvd, Suite 100-BB, Portland. From downtown, go south on I-5 to the Barbur Blvd. Exit. Cross back over I-5 and the Complex will be on your left.

**RCA CLUB INFORMATION**  
 Message Line: (503) 255-2016  
 Web Site: <http://www.rca-omsi.org/rca/>



Oregon Museum of Science and Industry  
 Rose City Astronomers  
 1945 SE Water Avenue  
 Portland, Oregon 97214-3354

PRSR STD  
 US POSTAGE  
 PAID  
 PORTLAND OR  
 PERMIT NO. 3012