The Rosette Gazette

Volume 25, Issue 01 Newsletter of the Rose City Astronomers January, 2012

The Past, Present, and Future of the Schmidt Cassegrain Telescope

by Rod Mollise

"Uncle" Rod Mollise is familiar to amateur astronomers as the author of numerous books and magazine articles on every aspect of astronomy, amateur and professional. He is most well-known, however, for his books on Schmidt Cassegrain Telescopes, SCTs, especially his latest one, *Choosing and Using a New CAT* (Springer), which has become the standard reference for these popular instruments.

Rod's previous book, *The Urban Astronomer's Guide* has also been very popular. That's no surprise, since it is designed to help the majority of amateurs who must observe from light polluted urban and suburban sites see deep sky wonders.

In addition to his books, Rod's writing can be found in magazines including *Sky and Telescope, Sky and Telescope's SKYWATCH, Astronomy Technology Today*, *Amateur Astronomy Magazine*, and others. Look for Unk Rod on numerous online forums, too, especially his popular blog, *Uncle Rod's Astro Blog*. He is also one of the editors of the acclaimed online double star magazine, The University of South Alabama's *The Journal of Double Star Observations*.

Rod Mollise is an engineer by profession, working on the U.S. Navy's LPD Landing Ship program in Pascagoula, Mississippi, where he serves as the Combined Test Team's Navigation Systems Engineer. Despite long hours devoted to the new ships, he also finds time to teach astronomy to undergraduates at the University of South Alabama in Mobile. Rod has been enthusiastically observing the night sky since he received his first telescope, an humble 3-inch Tasco Newtonian, in 1965.

When he's not on the road speaking at star parties and at astronomy club meetings across the country, Uncle Rod shares a rambling old Victorian home in Mobile's Garden District, "Chaos Manor South," with his wonderful wife, Dorothy, two cats and, at last count, twelve telescopes.

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

All are Welcome! Monday January 16th

Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.

Location: OMSI Auditorium

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Full Moon	Last Quarter Moon	New Moon	First Quarter Moon
Jan 09	Jan 16	Jan 23	Jan 30

Darkness at Dawn

Columbia River Gorge Lunar Eclipse Expedition 2011

by Robert McGown

Oregon is not like Arizona for observing and star gazing. We have clouds fog and rain that seems to get in the way of almost astronomical event a few rare times in the summer. Today was no exception. John Foster and I watched the weather models to see where we could observe the Lunar eclipse of December 11, 2011 any where in the vicinity of Portland. On previous eclipse chasing adventures, would attempt to image eclipses next to one of the Columbia River Gorge formations. Cape Horn and Beacon Rock in the gorge with the sparkle path of the Columbia River in the foreground were two of our favorites.

I arrived at John's front door a bit late at 3:00 am ready to head up the gorge. We packed in the cameras, the short tube 80 mm refractor and a Swazey 8 inch Dobsonian telescope and breakfast. The freeway was frosty and our original destination of Mary Hill and Stone Henge up the gorge was too far for our late start. We headed up for Rooster Rock and set up under the Bridge of the Gods at a small access trail next to the Columbia River. First we tried the marina at Cascade Locks and the river was narrow with an island so we opted for a precarious position next to the railroad tracks just west of the Bridge of the Gods. The Moon was brownish red and in half eclipse as we set up the tripods with the short tube refractor right next to the rail road tracks. Shortly after, while I was viewing the eclipse and John was imaging, a freight train went by as we were set up right next to the tracks. It was deafening and very scary to come so close to up next to the tracks.

Most people had heard of the Indian legend of the Bridge of the Gods. The legend was about a delicate land bridge crossing the river and only the Gods could cross the bridge. It is curious that the original legend came from the amazing arches that cross a large collapsed trench of a great lava tube that looks like a dry river. If one didn't know volcanism and geology, they would say that these formations were also Bridges of the Gods. A story about the land bridge could be referenced by the nearby lava tube fields of Mt Adams. Another version of the Bridge of the Gods was about the landslide that crossed the river at Table Mountain. Rubble from the avalanche caused rapids in the river. When Lewis and Clark came down the Columbia River here they looked down and saw an underwater drown forest in the river.

The lunar eclipse progressed over the next 20 minutes. The umbra and penumbra crossed the face of the Moon and it was red with just a sliver of light on the bottom of the Moon. We had heard of the phrase of the *Old Moon in the Young Moons Arms*;

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Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, January 9th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: Monday, January 16th, 6:30pm
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: First meeting

Leader: Ada Hays
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, February 3rd, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, January 16th, 6:30pm
Location: OMSI Planetarium
Topic: TBD
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, February 4th, 10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island
Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wednesday, February 22nd, 7pm
Topic: No meetings in December or January

Presented by: "TBA"
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

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RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $32.95 for one year or $65.90 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information go to the RCA web site index and click on the link for magazines. Please make checks out to "RCA" and allow two months for your subscription to be renewed.
http://www.rosecityastronomers.org/magazines/
Larry Godsey <magazines@rosecityastronmers.org>

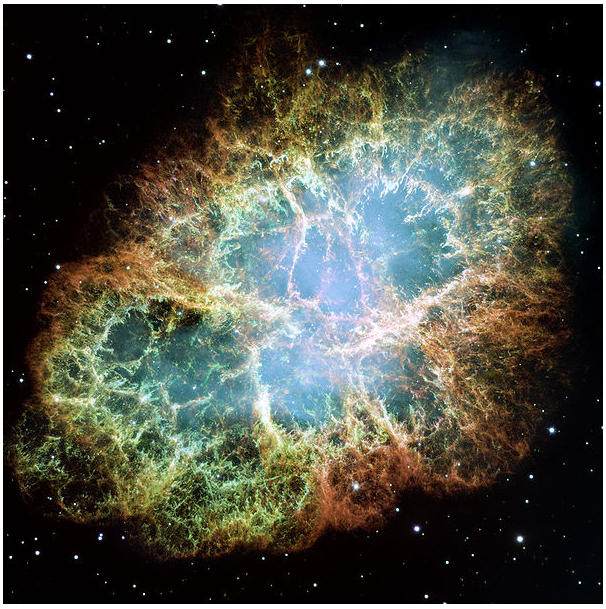
RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.
http://www.rosecityastronomers.org/library.htm
Jan Keiski <library@rosecityastronomers.org>

The Observer's Corner

Howard Banich

The First Messier



The first object on Charles Messier's famous list of things not to confuse with comets is commonly referred to as M1 or the Crab Nebula. He wrote that it was also his inspiration to compile his list.

"What caused me to undertake the catalog was the nebula I discovered above the southern horn of Taurus on September 12, 1758, whilst observing the comet of that year. This nebula had such a resemblance to a comet in its form and brightness that I endeavored to find others, so that astronomers would no more confuse these same nebulae with comets just beginning to appear. I observed further with suitable refractors for the discovery of comets, and this is the purpose I had in mind in compiling the catalog.
After me, the celebrated Herschel published a catalog of 2000 which he has observed. This unveiling of the heavens, made with instruments of great aperture, does not help in the perusal of the sky for faint comets. Thus my object is different from his, and I need only nebulae visible in a telescope of two feet [focal length]."

Although Messier found M1 in 1758 it had actually been discovered 27 years earlier by an English physician and amateur astronomer, John Bevis, and it wasn't until 1771 that Messier became aware of the priority of Bevis' discovery.

Messier used a number of telescopes but most typically used 3.5 inch refractors that produced magnifications around 120x. His favorite instrument was a 7.5 inch, f/51.2 Gregorian that gave a magnification of 104x. Its speculum mirrors gave an image about as bright as his refractors.

He observed from the top of the Hotel de Cluny in Paris where Joseph Nicolas Delisle, an astronomer of the French Royal Navy and Messier's first employer, had established an observatory. Paris was a large city in the mid-18th century so this was hardly an ideal setup for an observatory. Even though light pollution wasn't bad by modern standards it did exist, and smoke was a strong and constant source of air pollution. At the time the hotel was rented to the Navy as an administration building, so locating an naval observatory there made sense for the 18th century.

Messier began his observing career in 1757 by searching for Comet Halley on its first predicted return, but was thwarted by the incorrect positions calculated by his boss. On August 14, 1758 he came across another

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comet, which turned out to have already been discovered (C/1758 K1 De la Nux). In the course of follow Comet De La Nux he came across what appeared to be another comet – imagine Messier's excitement – but over the course of the following nights it didn't move. He'd found the first object for his non-comet catalog.

Interestingly, it seems he came across M1 on August 28, but measured its position on September 12th, which he regarded as its discovery date.

Messier's terse description of what he saw doesn't give a novice observer much to go on:
"Nebula above the southern horn of Taurus, it doesn't contain any star; it is a whitish light, elongated in the shape of a flame of a candle, discovered while observing the comet of 1758."

He wasn't trying to write an exhaustive portrayal of this non-comet object because, after all, his primary interest was finding real comets. He just wanted to note the position and give enough of a description so future observers would know these things weren't comets. A big part of his early astronomical training concerned taking accurate positional measurements, so once that was done he moved on.

But what an amazing object M1 turned out to be – the only supernova remnant in his catalog and one of the most intensely studied objects in the sky for the past 90 years. M1's supernova is likely the same object that Chinese astronomers noted as a "guest star" on July 4, 1054. It was visible for nearly two years before fading. Its color was reddish-white and was bright enough to been seen during the day for 23 days before fading around March-April of 1056.

There are no European records of M1's supernova but Arab astronomers noted its appearance and there are intriguing 11th century pictographs from the American Southwest that show a bright object near a crescent moon. As it turns out, the moon was a thin crescent just 2 degrees north of the supernova on the morning on July 5th, 1054, a day after the Chinese first recorded it. Although we'll never know for sure, it is tempting to link these pictographs to M1.

Physical Properties
The supernova left behind M1's expanding nebulosity and a fast spinning neutron star at its center. Spinning almost exactly 30 times per second, this 1.4 to 2.0 solar mass object is only about 18 miles in diameter. Its powerful magnetic field focuses its electromagnetic radiation into narrow beams, which happen to be directed toward Earth.

The neutron star is very gradually slowing its spin, a process that puts out 75,000 times the energy of our sun, and powers the synchrotron radiation that makes the main body of M1's nebulosity glow. Synchrotron radiation is produced by electrons curving their way through a strong magnetic field at up to half the speed of light.

This extreme energy produces an astronomically wild place in the central area of M1. The pulsars equatorial wind slams into the nebula and forms a shock front that has been seen to change shape on the order of days. There's a fantastic video of this process made by the Chandra X-Ray telescope here:
http://www.youtube.com/watch?v=9ioriGSOaLg&feature=related
Be sure to have the volume turned on so you can hear the radio pulses – this is great stuff!

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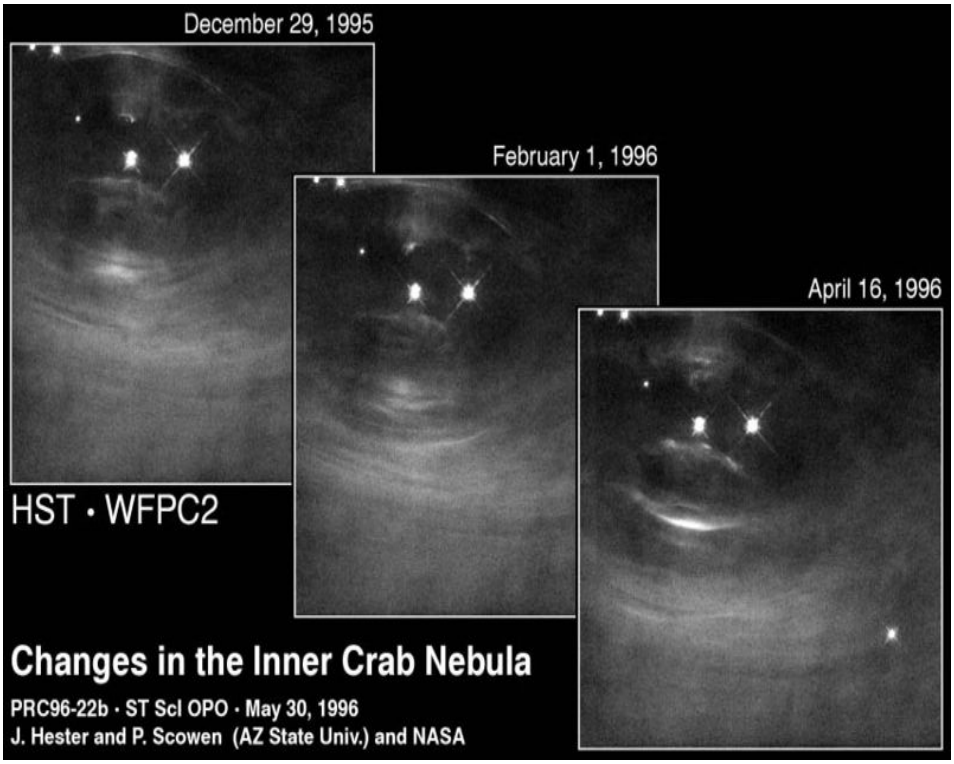


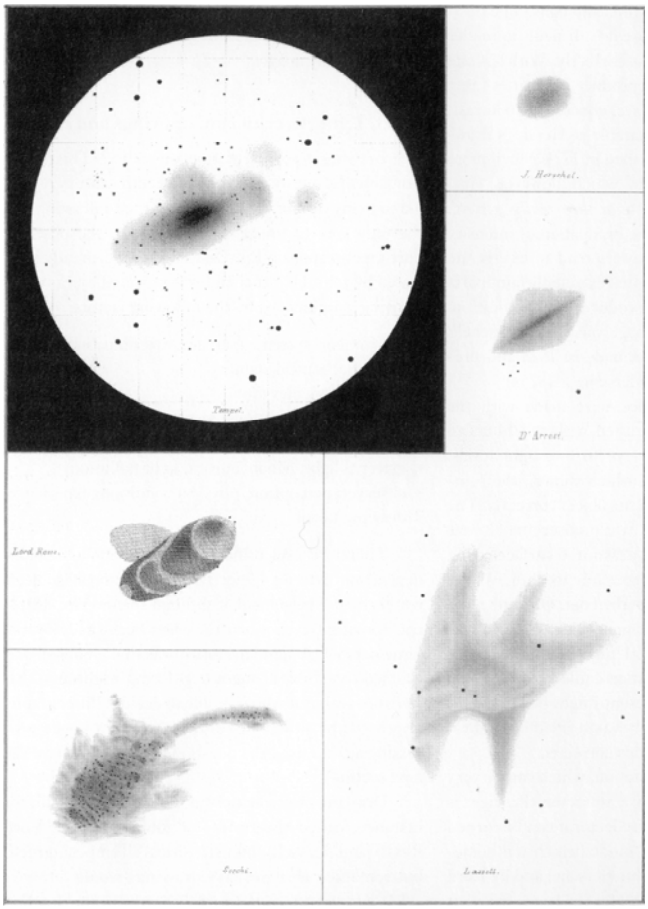
If you can't follow the link, this series of HST's images gives you an idea of the pace of change in vicinity of M1's pulsar. Note the dates of each photo, but remember that changes occur much faster than they imply.

And what caused the famous filaments? They are likely the remains of the progenitor star's atmosphere and are composed of ionized helium and hydrogen with carbon, oxygen, nitrogen, iron, neon and sulfur mixed in.

M1 is approximately 6300 light years away, and since its supernova explosion has expanded to about 13 light years along its greatest length.

Visual Observations

Messier didn't make a sketch of his first nebula, but many 19th century astronomers did. As was too often the case, sketches of the same object bore little resemblance to each other, sparking a lively debate on their scientific usefulness. The German astronomer Wilhelm Tempel complied a few of the more prominent sketches of M1 to make his point that a standardized methodology needed to be followed when making astronomical drawings. It's a fascinating example of what 19th century astronomy was faced with until the invention of practical astrophotography. Yep, all those crazy shapes are M1! Clockwise from top left the sketches were made by Tempel, John Herschel, Heinrich d'Arrest, William Lassell, Pietro Secchi, and Lord Rosse.



By the way, it was Lord Rosse who gave M1 its Crab Nebula nickname when he discovered its filaments in 1844. His 1855 "bumblebee" sketch is shown above (center left) but his first looked much like Secchi's drawing in the lower left corner.

Into this mix I'll toss two sketches I made in early December, 2011. Inspired by a thread on CloudyNights.com I sketched M1 without filters and then with an OIII filter to show how the appearance of the nebula changes.

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Without a filter the nebula has a broad, soft "S" shape that gently feathers along both ends. The central area is brightest and with a 16 inch or larger scope the 16th magnitude pulsar can be seen when the seeing is steady under a dark sky. A star just slightly brighter than pulsar, but not associated with it, forms an optical double with the pulsar and both can be seen near the center of the nebula. The pulsar is the slightly dimmer of the two.

The overall scene at 250x through my 28 inch scope is quite nice as M1 sits in a lovely star field that compliments its soft nebulosity.

With the OIII filter in place the nebula takes on a very different appearance. Now strongly oval in shape, several of the famous filaments appear, with the two brightest being quite easy to see. I've seen vague hints of other filaments but not enough to mark them on my sketch. However, the entire nebula has a mottled look and the perimeter of the nebula has a feathered appearance. Filaments have been detected with 12 inch scopes, so a huge instrument isn't needed to get a good view.

But a really big scope comes in handy if you want to see the pulsar in action! A few years ago Dan Gray of the RCA made a rotating shutter especially to "blink" M1's pulsar. He set the rotation speed just slightly off from the rotational speed of the pulsar so the pulsar would slowly fade and brighten. Attempts with our respective 28 inch scopes failed, but he met with success with 60 inch and 90 inch professional scopes in Arizona. I was fortunate to be part of the observing group that saw the pulsar dim and brighten using Dan's shutter when it was hooked up to the Bok 90 inch scope at Kitt Peak, and that experience will always rank as an observing highlight.

All Messier knew in 1758 was that he hadn't found a comet. Fortunately M1 has turned out to be one of the most intriguing astrophysical objects in the sky that's easily accessible to amateur telescopes, and modern science makes it all the more interesting with each new discovery. There's much more to learn, especially about the progenitor star. What happened to it mass during its supernova explosion? Was it a Type II or Type Ib/c supernova? Will more historical records be found? Stay tuned.

Dawn Takes a Closer Look

By Dr. Marc Rayman

Dawn is the first space mission with an itinerary that includes orbiting two separate solar system destinations. It is also the only spacecraft ever to orbit an object in the main asteroid belt between Mars and Jupiter. The spacecraft accomplishes this feat using ion propulsion, a technology first proven in space on the highly successful Deep Space 1 mission, part of NASA's New Millennium program.

Launched in September 2007, Dawn arrived at protoplanet Vesta in July 2011. It will orbit and study Vesta until July 2012, when it will leave orbit for dwarf planet Ceres, also in the asteroid belt.
Dawn can maneuver to the orbit best suited for conducting each of its scientific observations. After months mapping this alien world from higher altitudes, Dawn spiraled closer to Vesta to attain a low altitude orbit, the better to study Vesta's composition and map its complicated gravity field.

Changing and refining Dawn's orbit of this massive, irregular, heterogeneous body is one of the most complicated parts of the mission. In addition, to meet all the scientific objectives, the orientation of this orbit needs to change.

These differing orientations are a crucial element of the strategy for gathering the most scientifically valuable data on Vesta. It generally requires a great deal of maneuvering to change the plane of a spacecraft's orbit. The ion propulsion system allows the probe to fly from one orbit to another without the penalty of carrying a massive supply of propellant. Indeed, one of the reasons that traveling from Earth to Vesta (and later Ceres) requires ion propulsion is the challenge of tilting the orbit around the sun.

Although the ion propulsion system accomplishes the majority of the orbit change, Dawn's navigators are enlisting Vesta itself. Some of the ion thrusting was designed in part to put the spacecraft in certain locations from which Vesta would twist its orbit toward the target angle for the low-altitude orbit. As Dawn rotates and the world underneath it revolves, the spacecraft feels a changing pull. There is always a tug downward, but because of Vesta's heterogeneous interior structure, sometimes there is also a slight force to one side or another. With their knowledge of the gravity field, the mission team plotted a course that took advantage of these variations to get a free ride.

The flight plan is a complex affair of carefully timed thrusting and coasting. Very far from home, the spacecraft is making excellent progress in its expedition at a fascinating world that, until a few months ago, had never seen a probe from Earth.

Keep up with Dawn's progress by following the Chief Engineer's (yours truly's) journal at http://dawn.jpl.nasa.gov/mission/journal.asp. And check out the illustrated story in verse of "Professor Starr's Dream Trip: Or, how a little technology goes a long way," at:
http://spaceplace.nasa.gov/story-prof-starr.

This article was provided courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

This full view of the giant asteroid Vesta was taken by NASA's Dawn spacecraft, as part of a rotation characterization sequence on July 24, 2011, at a distance of 5,200 kilometers (3,200 miles). Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

(Continued from page 2)
however this was the *Fiery Eclipsed Moon in the Young Moons Arms*! It seemed like a dark eclipse to John and I. On a total solar eclipse, one amazing coincidence is that the angular diameter of the Sun is the same as the angular diameter of the Moon blocking out the Sun.

John used the Nikon D 20, the remote electronic shutter. He also used a black blank to reduce vibration with the hat trick the aperture for a brief moment. For the right exposure, It was difficult setting up in the rocks on the slope. I observed the eclipse in progress and was amazed at near totality how the Moon looked like Mars. Just before dawn the moon was nearly dark hence our title *Darkness at Dawn*. Just as the eclipse was finishing a fog bank moved in and our window of opportunity was over after two and a half hours of eclipse viewing. We called it good for the imaging session. We wanted to get in the most observing and imaging we could since we knew the next eclipse would be 2014. John was able to get a crisp image even though he wasn't tracking the Moon. There were also some crisp background stars near the limb of the Moon in the image.

The Moon was set almost in the center of the Winter Circle of stars which was quite beautiful. When the Moon set into a fog bank, we packed up and headed back to Portland listening to music from the Sticks and the Who on the drive home. On the drive home, we discussed the Kepler Space Telescope Mission and Isaac Asimov's estimate of the number of extra solar planets in the Milky Way. We were surprised at how his estimate of 500,000 blue water planets could even be an underestimate of the number planets in the life zone in the Milky Way!

Quadrantid Meteor Shower Adventure in the Columbia River Gorge

By Bob McGown

On January 4th at 2:50-4:30 am John Foster, Patsy Lindsay and I had the opportunity to observe the Quadrantid Meteor Shower. When we left Portland headed for the Women's Forum on the rim of the gorge up by Corbett, the sky was mostly socked in and we were skeptical that we would get to witness a meteor shower. The Larch Mountain road was snowed in so we observed near Corbett. We pulled into the culde sac and set up chairs at the Women's Forum to observe while John hiked around trying to get sky shots through the trees.

The Jet stream with unusual clouds with many high altitude standing wave patterns, and some noctilucent looking clouds hung on the sky over Portland. The sky changed from moment to moment. There were some good breezes and at altitude one could see how strong the winds were. We set up our observing gear in the lee ward side of the van to avoid the occasional wind gust.

John kept moving the camera around trying to get a better shot while we called out meteors as the universe evaded him. Once during a Leonid meteor shower, he got five meteors in the image. Tonight, it was as if the universe wanted to be observed and didn't want us to take pictures with any mechanical devices. It was as it there kind of an anti- synchronicity because every time John moved his camera, a bright meteor or fireball would come into view at that location after he moved the camera. It seemed to happen again and a gain. However this morning, we were treated to a good meteor show visually. The clouds had an orange-ish tint to them from the low pressure sodium lights. A big fireball came through Corvus near the Sombrero Galaxy field of view. One never knows what is on the long exposure images until it is processed and printed!

During out early morning meteor show, we saw 39 meteors, about 7 were sporadic in the hour and a half that we were there. Thirty two of the meteors were from the quadrantid radiant near Polaris. The other meteors were coming from a radiant near Arcturus.

Sam, our dog kept exploring and hiking down the steep face of the gorge. A slow moving bolide appeared behind a really cool tree and went over the Portland horizon. Everyone gave oh's and ah's and shouted at the meteors that crossed the entire sky.

Two other amateurs were also observing the meteor shower. They were lying on the hood of the car covered with a blanket. They frequented the planetarium where Pat Hanrahan had been giving planetarium shows on the first Monday night.

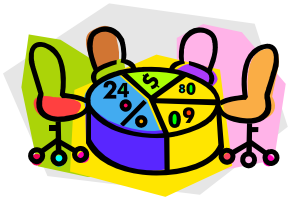
As we started to head home we were enchanted by the sky full of meteors and Patsy entertained us with the Frank Sinatra song. After singing it; she got Sinatra on her i-Phone!

Are the stars out tonight?
I don't know if it's cloudy or bright
'Cause I only have eyes for you, dear
The moon may be high
But I can't see a thing in the sky
'Cause I only have eyes for you.

For most of the time we observed, the sky was about 50% obscured. A good portion of the evening there was a hole about 90 degrees wide open right overhead. There is a Zenith Hourly Rate for meteor radiant below the horizon that is a multiplier to calculate for meteors below the horizon. Here in Oregon, the ZHR should have a fog factor for meteor showers! We could call it the Zenith Fog Hourly rate where we multiply the hourly rate times two. If we did that our meteor observations would be much higher.

We figured that some of the meteors were going into the morning terminator; from shadow to sunlight and we were missing them.

On the way home, we listened to classical music, mused about the evening and more astronomical adventures to come in the future.



Minutes of the Rose City Astronomers Board November 3rd 2011

Held at OMSI Classroom 1
Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership, ALCOR)
Mark Martin (VP Programming)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
Greg Rohde (Telescope Library)
David Nemo (Observing Site Director)
Scott Kindt (Newsletter Editor, SIG Director)

Guest: Ada Hayes (appointed to youth director during the meeting)

Call to Order

The meeting was called to order at 7:06pm by Sameer Ruiwale and, there being 11 of board members present, the quorum requirement of 9 was declared to be met.

Approval of Agenda

Moved: Sameer Ruiwale. Second: Jan Keiski. The agenda was approved by unanimous consent.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 11 voting members present. Motion: approve September minutes. Moved: Duncan Kitchin Second: Mark Martin Correction: one note in the minutes indicates quorum was met (it was not, as noted elsewhere). 11-0-0. Motion: approve October minutes. Moved: Duncan Kitchin. Second : Mark Martin. Approved 11-0-0.

Treasurer's Report – Larry Godsey: Balance sheet, month-by-month profit and loss, current profit and loss summary and profit & loss detail sheets distributed at the meeting and also available on the website. Currently $456 checks outstanding and $778 in bills to be paid. Currently everything tracking well according to budget.

VP Programming – Mark Martin: Rod Mollise is confirmed for January. Will be pre-ordering Rod's book "Choosing and Using a Cat" but will wait a month before placing the order. Mark has 7 talks lined up for next year so far, plus some ideas. Pat Hanrahan will be one of our speakers, but will need the planetarium so Mark will arrange to coincide with one of the summer months. Richard Berry will be our speaker in February, but his new book will not be in print by then, so he may come back to present on the subject matter of the book later in the year. This month's speaker is David Haworth on the subject of spectroscopy. For discussion: are we going to have the info fair next year? We will add this as a new business item for next month's meeting.

VP Observing – Matt Vartanian: Sameer is covering for Matt. Star party schedule for next year distributed, and also available on the forum. Kah-Nee-Ta is scheduled for March 23rd/24th. Block rate is $78 per night, compared to regular $150 rate. Resort will be providing a hospitality room also. The room commitment is 20 room-nights, and there is no charge for the hospitality room. Club will be liable for negotiated rate multiplied by the shortfall if the number of room-nights falls below 80% of the commitment and the resort is not otherwise able to fill the rooms. We exceeded the room block commitment by some margin last year. Also have an RCA star party at Rooster Rock on April 14th. Hancock is scheduled for May (and September). Discussion: not much dark sky days in March, besides Kah-Nee-Ta. Sameer: want to be careful not to compete with Kah-Nee-Ta, since we have a room block commitment. Skyview Acres is scheduled for June. This may be an issue if the ground is not yet dried out; may need to be rescheduled subject to the weather. Two star parties scheduled for White River, now that it is open again, in July and September. OSP is mid-August this year. Motion to accept the Kah-Nee-Ta. Moved: Larry Godsey. Second: Larry Froberg. Motion passes unanimously. Sameer has a permit form for Stub Stewart & Rooster Rock. There is a $100 permit application fee, which may be subject to negotiation.

VP Community Affairs – Dawn Willard: Not present.

VP Membership – Ken Hose: We had 6 new member signups and 15 renewals in the last month, bringing the total to 294 member families. We were at 280 member families this time last year and 304 the year before that. Memberships brought in a total of $471 in dues last month.

Alcor – Ken Hose: Pat Hanrahan submitted an observing log for the Southern Skies Award, and Ken has the certificate back from the Astronomical League ready for the general meeting this month.

New Member Advisor – Howard Knytych: Not present. There is a new members meeting this month; Larry Godsey will get details from Howard and post to the website.

Media Director – Diana Fredlund: Putting together a release for this month's meeting, including David Haworth's talk and the new member meeting.

Sales – Larry Froberg: Brought in $82 in sales this month; lower than usual, but did sell 4 more of the "We are not Alone" books. There will be some more orders of inventory before Christmas; Larry Froberg will provide Larry Godsey with

(Continued on page 11)

(Continued from page 10)

details. Will be ordering some calendars in addition to the RCA calendars, based on last year's sales figures. Observer's handbook was a very popular item last year, and Larry will be ordering more this year.

Book Library – Jan Keiski: Planning on a book sale in November.

Telescope Library – Greg Rohde: Nominal.

IDA – Dawn Nilson: Not present.

Magazine Subscriptions – Larry Godsey: Nominal.

Webmaster – Larry Godsey: Nominal.

Site Committee – David Nemo: Nominal.

Youth Director (Vacant): Post now filled!

Newsletter Editor – Scott Kindt: Just about ready for this month. Scott needs names for board elections.

SIGs – Scott Kindt: Nominal.

OMSI –Jan Keiski: Jim Todd wanted to know if we would be interested in using OMSI's catering for the holiday potluck. Current spend is about $350. Jan will discuss with Mark Martin. Jim Todd also wanted to know if there be interest in lunar eclipse viewing on December 10th at Stub Stewart (approximately 3:30am Saturday Morning).

Sister Club update – Jan Keiski: GAMA entering Spring in the Southern hemisphere, and holding regular star parties.

Old Business

Proposal for RCA / Clackamas Comm. Coll Haggart Observatory use – David Nemo / Sameer Ruiwale. No more updates.

Update on Calendar printing costs for larger sized calendar / different printers – Larry Froberg. Will be using Anders printing again. Cost is about the same as last year; plan on ordering 125 copies and keeping the same pricing. For next year, would be good to get images earlier, and plan for the sizing earlier. Hope to have calendars available for sale at this month's meeting. A proof in pdf form should be available before that. Will post to the website and send out a broadcast email for review purposes. Duncan will put together a slide show of all of the submissions for the December meeting, and will talk to Greg Marshall (Astro Imaging SIG director) about providing a regular monthly image for David Nemo's dark sky report, and providing images to Scott Kindt for the newsletter.

Contact Dawn Nilson to ask about the proposed dark sky conference in conjunction with a speaker for RCA – Sameer. Will remove this item from the agenda for now; already have a full calendar for next year.

Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde. In process.

New Business

Youth Director position – Ada Hayes

Ideas / Questions from Ada.

Board vote to confirm Ada as youth director. Moved : Duncan Kitchin. Second: Jan Keiski. Motion passes 11-0-0.

Election committee update

No additional nominations from the floor. Have an open position for VP of observing. Will hold election by show of hands at meeting in November. If somebody becomes available for this post after the elections, the board will be able to appoint them in the interim. Sales director position is also open, but is an appointed rather than elected position.

December Holiday potluck and swap meet logistics

Jan: may need to adjust the allocations as to what people are asked to bring. Ada may be able to arrange donations of items such as paper goods. Jim Todd may be able to arrange an IMAX showing of *The Polar Express*. What time would work? Possibly 8:30 or 9pm. Cost to be determined.

Adjournment

There being no further business, the meeting was adjourned at 8:50pm

2012 Calendar by RCA Members

On Sale at the General Meetings

The calendar is 17 inches high by 11 inches wide
It contains all of the planned RCA meetings,
SIG meetings and RCA outings.

Cost will be $10 again this year.

January 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 	**2**	**3**	**4**	**5**	**6** Noon Downtowners Luncheon Kell's	**7** 10am - 3pm Telescope Workshop
8	**9** 7pm  Board Meeting OMSI Classroom 1 7pm Astro Imaging SIG Beaverton Library	**10**	**11**	**12**	**13**	**14**
15	**16** 6:30pm  Junior Astronomers and New Members **7:30pm** **General Meeting** **OMSI Auditorium**	**17**	**18**	**19**	**20**	**21**
22	**23** 	**24**	**25**	**26**	**27**	**28**
29 **Merry Christmas**	**30** 	**31**				

February 2012

Feb 03	Friday	Downtowner's Luncheon	Kell's	Noon
Feb 04	Saturday	Telescope Workshop	Swan Island	10am-3pm
Feb 06	Monday	Board Meeting	OMSI Classroom 2	7pm
Feb 13	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Feb 20	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Feb 22	Wednesday	Cosmology SIG	Linus Pauling House	7pm

http://www.rosecityastronomers.org

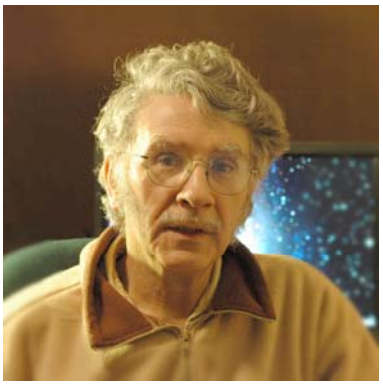
Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

Volume 25, Issue 02 Newsletter of the Rose City Astronomers February, 2012

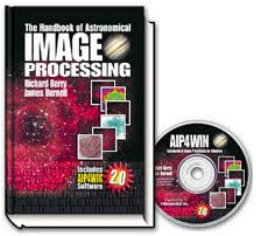
The First Really Big Telescopes and the Discovery of the Universe

by Richard Berry



William Herschel and his son John Herschel carried out the first comprehensive surveys of deep-sky objects and created a catalog we now call the New General Catalog, or NGC. To do this, they built and used the first really big telescopes with what today we consider primitive technology. I will describe the telescopes these early amateur astronomers built, and show that they were well designed and effectively employed tools for discovery. The story of the Herschels begins in about 1780 and continues through about 1835. Join me in a fascinating journey into the discovery of the Universe and the people who did it.

Richard Berry is an author, editor, and software programmer focused primarily on amateur astronomy. His books include a classic, *Build Your Own Telescope*, a popular introduction to observing, *Discover the Stars*, the acclaimed manual for big Dobs, *The Dobsonian Telescope* (with David Kriege), and the book best known to NEAIC attendees, *The Handbook of Astronomical Image Processing* (with Jim Burnell), which includes the *Astronomical Image Processing for Windows (AIP4Win)* software widely used for image processing as well as both photometry and astrometry.



At age 13, Richard built his first telescope (a 6-inch f/7 Newtonian) and moved on to construct an 8-inch f/10 planetary telescope, a 6-inch RFT, a 12-inch f/7 Newtonian, and an 8-inch Dall-Kirkham Cassegrain. He observed all of the planets, most of the Messier objects, and made deep inroads into the NGC catalog. In those distant days of darkroom chemistry and bromide paper, he specialized in lunar and planetary astrophotography.

(Continued on page 2)

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

All are Welcome! Monday February 20th

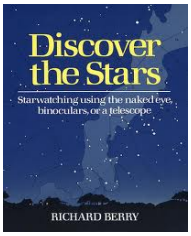
Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.

Location: OMSI Auditorium

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Feb 14	Feb 21	Feb 29	Mar 07

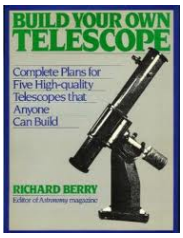
(Continued from page 1)



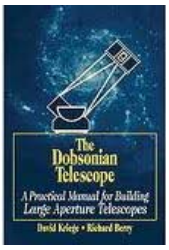
After majoring in astronomy for his B.A. degree, Richard went on to present a thesis on photoelectric photometry earning an M.Sc. in astronomy. In the technology world, he has designed rocket payload instrumentation, measured air pollution (ozone and hydrogen sulfide) using a laser beam, and tested key components for the Ultraviolet Absorption experiment (MA-059) flown aboard the Apollo-Soyuz Test Project.

Switching from technology to editing, Richard served a ASTRONOMY magazine's Technical Editor, then Editor, and finally Editor-in-Chief, for sixteen years, and played a key role in building the fledgling magazine's circulation from 38,000 in 1976 to its peak at 252,000 in 1988. During his years at ASTRONOMY, Richard built a strong, effective, and knowledgeable editorial staff, and worked tirelessly to ensure that manufacturers present only honest and accurate claims in their advertisements.

During his years at ASTRONOMY, Richard founded and edited *Telescope Making*, a quarterly magazine devoted to the community of amateur telescope makers. From 1978 through 1991,*Telescope Making* introduced its readership to the Dobsonian telescope, the Poncet platform, tilted-component telescopes, and many examples of outstanding amateur observatories.



From 1992 to the present, Richard has written and coauthored a string of books about telescope making, imaging with CCD cameras, and image processing. He has given countless talks and participated in workshops at conferences around the world. His current book, due out this summer or fall, is a comprehensive ray-trace analysis of the telescope, eyepiece, and astrographic camera designs available to today's amateur astronomer.



Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, March 12th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: Monday, February 20th, 6:30pm
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: First meeting

Leader: Ada Hays
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, March 2nd, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, March 19th, 6:30pm
Location: OMSI Planetarium
Topic: TBD
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, March 3rd
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wednesday, February 22nd, 7pm
Topic: To Be Announced

Presented by: To Be Announced
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

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Youth Programs Director	Ada Hays	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $32.95 for one year or $65.90 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information go to the RCA web site index and click on the link for magazines. Please make checks out to "RCA" and allow two months for your subscription to be renewed.
http://www.rosecityastronomers.org/magazines/
Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.
http://www.rosecityastronomers.org/library.htm
Jan Keiski <library@rosecityastronomers.org>

The Apparent Diameter of a Star

By Peter Abrahams.

Among the 'receding goals' of astronomy is obtaining an image of the disk of a star, and details on the disk of a star.

This was brought to mind by a remarkable event of 02 Jan 2012 (21:25 UT) - the occultation of Betelgeuse by Asteroid (147857) 2005 UW381. Visible in south western Asia, this tiny (possibly 2 mile diameter) asteroid passed in front of Betelgeuse, which is much larger in apparent diameter, and as a result the magnitude of Betelgeuse was predicted to drop by perhaps 0.01 magnitude, for perhaps 3.6 seconds. As of this writing (04 Jan.), no results are searchable on the internet.

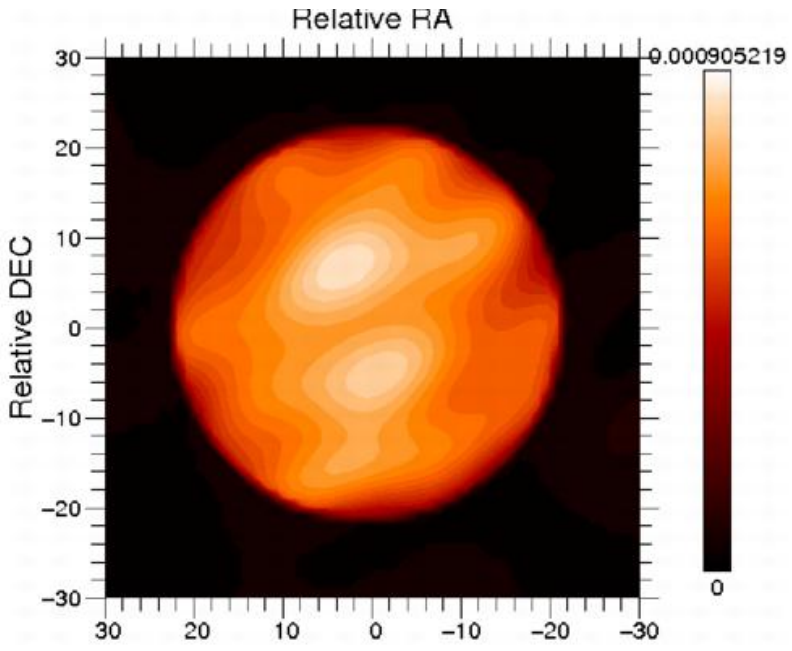
I find this 'remarkable' for two reasons. First is the ability to predict such an event, and the amazing accuracy of positional astronomy, given the perturbations and irregularities of the rotating, orbiting surface of the earth. Second is the newly observable disc-like nature of the star as observed from earth. Stars have been 'points' for most of the era of telescopic astronomy, and in recent years imaging has progressed to allow features of stellar disks to be resolved. (Actually stars were disks even before they were points, but that was a misinterpretation of the diffraction disk produced by optics.)

Some examples of stellar disks:

The (nonsolar) star with the largest apparent diameter is R Doradus (a red giant Mira variable in the southern hemisphere), with an angular diameter of 0.057 arcseconds (57 milliarcsec), measured with ESO's NTT using IR interferometry. R Doradus has a diameter equaling the orbit of Mars.

The angular diameter of Betelgeuse was measured at 0.044 arcsec by Albert Michelson using the 100 inch reflector at Mt. Wilson in the early 1920s. Current estimates are 0.043 to 0.056 arcseconds.

In 1996, HST imaged the surface of Betelgeuse using UV; the ultraviolet diameter is about twice the optical diameter, because the chromosphere is visible in UV. This was a direct image, without interferometry. In 2010, the Infrared Optical Telescope Array interferometer on Mt Hopkins acquired a superior image of Betelgeuse.



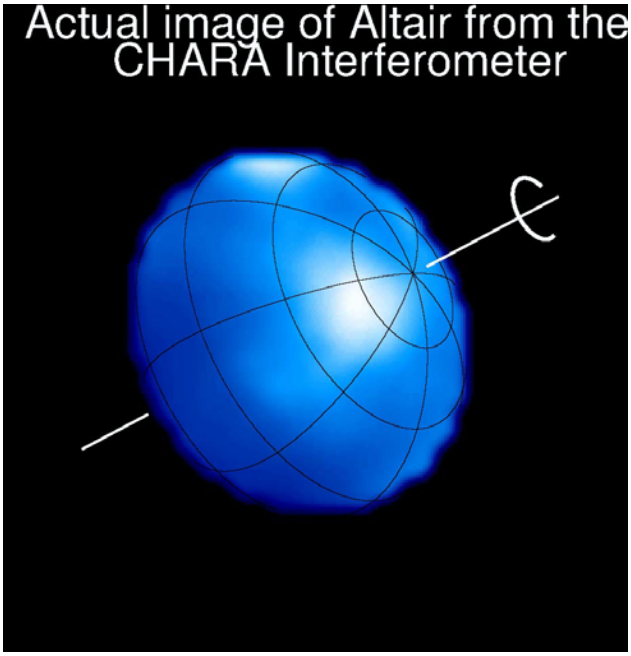
The surface of Betelgeuse in near infrared at 1.64 micron in wavelength, obtained with the IOTA interferometer (Arizona). The image has been reconstructed with two different algorithms, which yield the same details, of 9 milliarcseconds (mas). The star diameter is about 45 milliarcseconds. Credit: Copyright 2010 Haubois / Perrin (LESIA, Observatoire de Paris)

Altair's apparent diameter is .032 arcseconds.

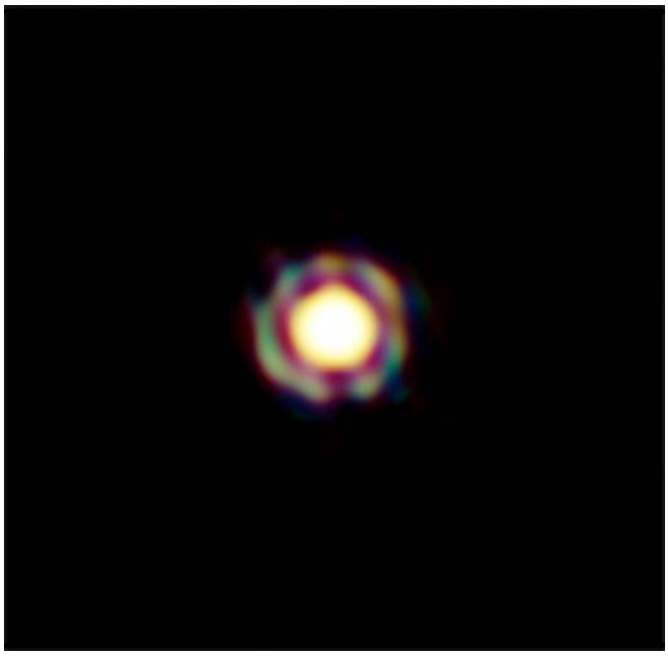
Aldebaran is .021 arcseconds in diameter from our location.

Antares measures .020 arcseconds (20 milliarcsec).

The CADARS list (Catalogue of Apparent Diameters and Absolute Radii of Stars), found at Vizier, includes measured diameters for over 9700 stars.



The disk of Altair was imaged in 2007 by CHARA (Center for High Angular Resolution Astronomy) on Mt Wilson.



The surface of T Leporis was imaged in 2009 by the Very Large Telescope auxiliary telescope interferometer.

Astrophoto of the Month

I would like to start a new column featuring one or two astronomy related photos from our readers. If you would like to submit a photo please send it with details in an email to the editor.
To start this off, this months astrophoto of the Rosette Nebula comes to us from Greg Marshall.

NGC 2237 - Rosette Nebula

Scope: AT111EDT with WO Flat 4 0.8x FR/FF
Mount: AP Mach1
Guiding: Meade DSI Pro and PHD Guiding
Guide Scope: Orion ST80
Camera: QSI 583 at -25C
Exposure: 15 x 480s H-a, 15 X 480s O-3 (2x each for mosaic) (8 hrs total)
Processing Software: Acquired, calibrated and stacked in MaxIm DL, further processing in Photo-shop, including Carboni tools and Noise Ninja

I had intended to add some RGB data to this image, but maybe that will have to wait until I can get to a dark sky site. Or at least until near the new moon! This version is just H-alpha for red and O-3 for green and blue.

A Convenient "Grab & Fly" Telescope Setup

February, 2012
By Tom Koonce
Lancaster, California

Have you ever headed out on a long trip and wished that you could do a little star-gazing once you arrived at your destination? But perhaps you have thought about the logistics of traveling with a telescope like the inconvenience of getting your telescope equipment through airport security, potential damage to the telescope, or maybe been daunted about what eyepieces and accessories to take? This article could help you to stop worrying… and start packing.

I had a unique opportunity to travel "down under" to observe from the dark skies of south central Australia, east of Melbourne, and then from the large island of Tasmania located off the southern tip of Australia. I knew I had to take a telescope with me or I'd certainly regret it. Major airlines fly into Melbourne, but only small "regional" airlines fly into Tasmania, so the amount of baggage I could take on the three week trip was strictly limited to a total weight of 23 kg (50.7 lbs). My astronomy setup would have to fit into an already limited volume that included work attire, a bulky jacket, shoes, shaving kit, notebooks of work materials, and a laptop. While the observing portion of this trip was secondary to the business portion of this trip, it was still very important to me personally and deserved careful planning ahead of time.

Some of my initial questions to be answered were concerning the climate of the location. Would it be hot or cold this time of year? Cloudy or clear? Dark skies or urban light pollution? My excitement grew as each of these answers were favorable to potential great southern sky views of the Clouds of Magellan, Southern Cross, Alpha Centauri, Canopus, the Coal Sack, the Tarantula Nebula, and on and on. Wow.

Now what telescope should be taken? It had to be portable, deliver wide-field views when paired with one or two eyepieces, but be of sufficient quality that I could "crank up the power" if I wanted to. It needed to be rugged enough to survive the jostling of going through security (I foresaw a major hassle regarding this) and the vibration shock of the flight and maybe a rough landing. It also needed to be light enough to be supported by a photo tripod since such a tripod was the only possible support within my weight and luggage volume limitations. The Tele Vue Pronto ED doublet refractor telescope with a 480 mm focal length, f/6.8 and an objective diameter of 70 mm was chosen. I had purchased a Pronto in mint used condition from a friend for $500 several years ago and loved it. When this short refractor is paired with both a Tele Vue 13mm Ethos and an 8mm Ethos, it can provide stunning views. The scope was also fitted with a 90 degree prism, two inch eyepiece focuser, a glass solar filter and a simple red dot sight.

I made a new foam insert for the stock Tele Vue Pronto padded carry bag to fit the telescope, both Ethos eyepieces, the right angle prism and accessories. I chose a closed cell foam with sufficient density to provide cushioning for all of the items, but rigid enough to hold each item securely. The solar filter, small red flashlight, my small southern sky atlas, dust blower and an O-III filter had to be carried in a 1 gallon ziplock in my suitcase, but still I was pleased that I managed to get my observing essentials down to such a small package.

The tripod I chose was the Manfrotto "Bogen" Carbon Fiber Tripod (BOG190CXPRO4) with a stan-

(Continued on page 7)

dard ball head. The entire tripod was no longer than the Pronto's carry case and I attached to the case with Velcro straps. The tripod was very light, but surprisingly stable with the 6 lb Pronto, diagonal, and with a 2 lb Ethos eyepiece mounted on it. Its maximum load was stated to be 11 lbs. The lack of a celestial drive was not an issue for my visual observations made with this setup. Also the time to setup and take down was less than 5 minutes. There was the expected difficulty looking at any object at zenith with this setup. To be honest, a big reason why I chose this tripod was because a friend offered to let me borrow one for the trip, and it's hard to argue with "free". It is an expensive tripod, but a perfect "Grab and Fly" match for this telescope setup.



The "Grab and Fly" Telescope Case and Contents

Before the trip I had a concern regarding what this telescope/eyepiece/tripod package would look like to the airport security folks on their scanners since they probably didn't seen too many telescopes come through as carry-on baggage? Primarily because of this, an extra hour was planned for security questions prior to the flight. I could have relaxed. I had no fluids (of course) in the bag, and nothing looked like a weapon on the X-ray. The TSA was very reasonable and had no problems whatsoever with the telescope. They did ask me what it was, to which I told them it was a "telescope lens", and then they sent me on my way. I was to my gate with an extra hour to spare. Once on the plane, this entire setup conveniently fit into an overhead aircraft bin, even on the regional-type aircraft from Melbourne south to Tasmania.

The trip allowed me ample time to observe the southern sky. The telescope setup worked like a champ. While I only used the solar filter once, I had the telescope out every night for at least two hours and all night long on the weekends. The weather in Tasmania had me chasing openings in the clouds for a couple of nights, but it cleared up and provided the darkest observing skies I have ever seen in my life. Regretfully the 70mm Tele Vue Pronto isn't made anymore, but its been replaced by its close (more expensive) cousin, the Tele Vue 76 APO Doublet Refractor.

While this article has been about the selection of a convenient "Grab and Fly" telescope that could be taken anywhere one may be headed, I haven't said much about the deep sky views I had on my trip, of the hours I spent smiling, ear-to-ear, as I leisurely cruised from the Tarantula Nebula over to the Clouds of Magellan, or mention the friendliness of the Australian amateur astronomers I met. Those experiences were the real story made possible by having a "Grab and Fly" telescope.

Telescope Reviews:

Pronto: http://www.company7.com/televue/telescopes/pronto.html
Ranger: http://www.company7.com/televue/telescopes/ranger.html

Creating Quantum Art
The alpha helix to carbon stars
By Bob McGown

Science and art can show us something about reality. Abstract art like modern science can be very profound and can help us wrap our mind around a complex idea or concept. To something as complex as quantum physics, language may be only like abstract art.

While I was in Lugarno, Switzerland for the Transit of Venus with physicist Maurice Stewart, and science writer Dareth Murray, I had the opportunity to view 3 meter gold plated quantum sculptures all over the city. The quantum art seemed to take you out of the reality that you were in and take you to another plane of existence.

In a forest south of the Oregon Food Bank faculty is a 15-foot diameter "Buckyball" carbon-60 atom steel sculpture. Blending in with the surroundings, the structure looks like a transparent molecule in space. The sculptor-physicist Julian Andre-Voss tacked the rebar together standing on the top rung of an extension ladder with his mig welder cranked up to the maximum. After setting up the Acetylene bottle and mig welder on a scaffold, Julian used a series of wooden jigs to set up the angles on the rebar. The ultimate challenge was to weld the halves of the Bucky ball together amongst the trees. Matching up the vertices of the Buckminsterfullerene Molecule was a difficult task to create the Carbon 60 atom out of metal rebar.

One of Julian's passions is to model molecules with his art sculpture. Inspired by his research in physics of the quantum effects of carbon-60 atoms at high temperatures, he recreates these molecules in his artistic models. Julian worked under renoun physicist, Anton Zeilinger who wrote, Dance of the Photons. Julian and Anton did quantum research sending high temperature Bucky Balls through the dual slit experiment in quantum physics.

The carbon-60 atom is an unusually large molecule sometimes found in meteoritical impacts and in the atmospheres of red giant stars. Astronomers observing the spectral/ absorption lines of the interstellar medium within the Milky Way have observed chains of carbon atoms from red giants. The cause of these long carbon molecules was finally found in cool red giant carbon stars. These stars have run out of primary hydrogen fuel and are now "burning" helium atoms. Finally this carbon is then blown into the inter-stellar space to create chains of carbon molecules.

When the carbon-60 molecule was discovered it looked like a geodesic dome and so the molecule named it after Buckminsterfuller. The discoverer of the molecule called it the "Buckminsterfullerene" or Bucky ball. I have a fond memory of talking to Bucky Fuller (as he was known to all) at University of Portland after a captivating lecture about his career in architecture and the future of humanity. He was a legendary inspirational speaker.

Portland's great Nobel Prize winner, Linus Pauling, also inspires Julian's sculptures of molecule art. In front of the Linus Pauling Complex on 39th & Hawthorne is a red10-foot tall Alpha Helix Molecule that Julian sculpted and welded into one of the important molecules discovered by Linus Pauling with X-ray spectroscopy. Julian poured a concrete footing and dedicated the Alpha Helix sculpture to Linus Pauling. Anderson Construction used a rubber tire track hoe to lift the 400 Kilogram quantum sculpture into place. The dedication of the Alpha Helix was an exciting event with Pauling's student and benefactor Douglas Strain (president of electro scientific) and Terry Bristol, President of the Institute for Science, Engineering and Public Policy, in charge of the event. It must have been interesting to the passersby as the Alpha Helix was dedicated at the Linus Pauling center on Hawthorne Street. There is a plaque describing the Alpha Helix.

Carbon Star (Red giant)

Julian's talent in physics is reflected his sculptures of molecules and proteins. I had the opportunity to view many of Julian's artistical creations at the North West College or Art, art exhibit. Some of Julian's creations on display were the triple helix, bamboo helix and others.

In a recent trip to Corvallis with Julian, we viewed the Linus Pauling collection of molecules, some of them he studied with X-ray spectroscopy. In the vault at the OSU library are hundred or so molecules that Pauling and his grad students created. There is a model of Pauling's triple helix, the early theorized creation of the DNA molecule.

If you get the chance, take a trip to see one of Julian's quantum sculptures of science. I have enjoyed the complex Alpha Helix sculptures that Julian has created, motivating me to build more esthetic and complex telescopes. Creating quantum art stretches the limits of the imagination, from the world of the quantum to the Carbon 60 molecules of red giant stars.

Kah-Nee-Ta Messier Marathon Star Party
March 23-25, 2012

You don't even need a telescope to participate; other members are enthusiastic to share their views. This is a good opportunity for beginners to get acquainted and seasoned observers to get back into the groove. We look forward to seeing you there!

Known for its clear, dark skies this time of year, the Kah-Nee-Ta Resort offers a family retreat atmosphere with many amenities and activities. Come and observe your favorite objects under Central Oregon's clear dark skies, spend a wonderful weekend with other astronomers swapping observing stories and exchanging information, or even just spend a relaxing weekend with your family, all in comfortable accommodations that offer various other activities. RCA Special Hotel Rate is $78 per room per night, advance reservations highly recommended! Deadline for the special rate is March 2nd.

You must CALL to make your own reservations and be sure to mention that you want the RCA rate. 1-800-554-4786

RCA is NOT responsible for your reservations or your deposit with the resort. No Refunds within 72 hours of your first reserved night.

More information can be found on the RCA website:
http://www.rosecityastronomers.org/sp/kahneeta.htm

Maupin Star Party
April 20-22, 2012

The Rose City Astronomers have been granted permission to use private property approximately 8 miles West of the town of Maupin for members-only scheduled Star Parties.

The Maupin Observing Site is located on a private airstrip about 8 miles east of Maupin, Oregon. Warning: this airstrip is used in the morning, but at the far end of the airfield. Most people don't even wake up.

There is no registration for the event itself, just show up and enjoy the weekend. You don't even need a telescope to participate; other members are enthusiastic to share their views. This is a good opportunity for beginners to get acquainted and seasoned observers to get some serious observing.

It can always be cold at night no matter what the season, so bring warm clothing.

RVs, trailers and tents will be allowed on the observing site (see observing site map for instructions). The town of Maupin offers lodging, restaurants and recreation if you don't want to rough it. We will have a portable outhouse on site.

More information can be found on the RCA website:
http://www.rosecityastronomers.org/sp/maupin.htm

Camp Hancock
May 18 - May 20, 2012

OMSI's Camp Hancock with meals and cabins fits the bill for a great outing on a cool Spring weekend. Dark skies, warm cabins, real bathrooms, hot showers, good meals and great friends top off the list of things to like and all are provided with the $45 per night registration fee (OK, maybe not the friends).

Camp Hancock is an OMSI sponsored field station for the promotion of science education. It is located about 150 miles from Portland and is 2 miles east of the John Day River in Eastern Oregon in the Clarno Fossil Beds. Camp Hancock is NOT a resort hotel; it is a rustic kid's camp with 16 bunkhouses that sleep up to 14 people each in A-frame buildings. The bunkhouses are one room with bunks, mattresses, limited electricity and heaters on a 60 minute timer. You will be sharing the bunkhouse with others in our group, but it's never crowded and we usually average less than 3 people per cabin. There is a limited area for Tents, RVs and trailers.

Registrations will be taken at both the March and April general meetings. For mail in registration forms, or to register and pay online please visit http://www.rosecityastronomers.org/sp/hancock.htm. The Registration and Payment Deadline is May 11th for mail in and May 13 for online payments.

OMSI - Vernal Equinox Celebration
March 17th, 2012

Held at Rooster Rock & Stub Stewart State Parks.

Viewing highlights includes the planets Venus, Jupiter, Mars, deep sky objects including the Orion Nebula, Beehive star cluster and more!

See http://omsi.edu/starparties for more information or cancellations.

Star Parties Coming Soon!

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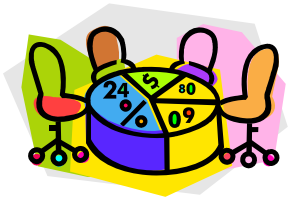

Minutes of the Rose City Astronomers Board December 5th 2011

Held at OMSI Classroom 1

Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

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Board Members Present

Sameer Ruiwale (President)
Mark Martin (VP Programming)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Howard Knytych (New Member Advisor)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
Greg Rohde (Telescope Library)
David Nemo (Observing Site Director)
Scott Kindt (Special Interest Groups Director)
Ada Hayes (RCA Youth Director)

Call to Order

The meeting was called to order at 7:07pm by Sameer Ruiwale and, there being 9 board members present, the quorum requirement of 9 was declared to be met.

Approval of Agenda

Moved: Sameer. Second: Duncan. The agenda was approved by unanimous consent.

Approval of Minutes

Moved: Approve minutes from the November 2011 board meeting. Moved: Duncan Kitchin. Second: Sameer Ruiwale. Correction to title of Rod Mollise's book (should include the word "new"). Approved 9-0-0.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 9 voting members present.

Treasurer's Report – Larry Godsey: Larry not able to attend, but provided financial reports on the website.

VP Programming – Mark Martin: Posted schedule for next year. January speaker is "Uncle" Rod Mollise. Mark has details of the talk which has been posted on the forum. Will be an extension of his earlier talk on "The Past Present and Future of the SCT". February is Richard Berry, who will talk about the first really big telescopes and their impact on discovery of the universe. Peter Ward from the University of Washington is booked for March, but Mark does not have details of the talk available at this time. James Schaumburg from the University of Oregon will be speaking in April about space telescopes. May will be the info fair. June or July will be Pat Hanrahan's presentation on the Southern Sky. Brother Guy Consolmagno will be speaking in September. Brother Consolmagno is planetary scientist and curator of the meteorite collection at the Vatican Observatory and author of the book "Turn Left at Orion". October's speaker will be Richard Berry, who will be talking about his new book about optics. Still looking for speakers for June or July, August and November. Mark has a number of leads on possible speakers which he is following.

VP Observing – Sameer Ruiwale (pro tem) : Fees at Rooster Rock – Sameer has confirmed that the park will waive fees in connection with our assistance of OMSI public star parties. Has not contacted Stub Stewart state park with respect to RCA star parties, but not expecting any issues.

VP Community Affairs – Dawn Willard: Not present.

VP Membership – Ken Hose: Not present.

Alcor – Ken Hose: Not present.

New Member Advisor – Howard Knytych: There was a new members meeting last month. Attendance down slightly, but still approximately 20 attendees. Next new member meeting will be in January.

Media Director – Diana Fredlund: Not able to attend, but report submitted via Sameer to be discussed under new business.

Sales – Larry Froberg: Sold 44 calendars already out of 125 ordered. Some additional seasonal items also available. Has ordered copies of the new edition of "Turn Left at Orion", which will be available in December. Made a total of $744 in sales last month. Have 10 pre-orders for Rod Mollise's book.

Book Library – Jan Keiski: Book library sale at the last meeting brought in $40. Book library will not be open for the next meeting.

Telescope Library – Greg Rohde: No new donations in the past month, but Greg has one to pick up tomorrow. Greg will be bringing about 6 surplus to requirements telescopes to the December meeting to sell. Spoke with one of the Park Rangers at Stub Stewart: they have a 10" Newtonian on an equatorial mount that they need help with. Greg will be bringing it in to the telescope workshop. The Park is considering building a permanent observatory to house it. Noted that we have a surplus 12" LX200 that might be more suitable for their use. Greg will explore whether we might be able to arrange for the Park to use it in place of the 10" Newtonian.

IDA – Dawn Nilson: Not present.

Magazine Subscriptions – Larry Godsey: Not present.

Webmaster – Larry Godsey: Not present.

Site Committee – David Nemo: No updates. Current balance approximately $20,000.

(Continued on page 11)

(Continued from page 10)

Youth Director – Ada Hayes: Planning to hold first meeting in January. Would like to start at 6:30pm; Sameer will check with Jim Todd to make sure that room is available. Also working on outreach to after school programs, and putting together a consistent plan for meetings. Suggested that it would be a good idea to send information on youth meetings to Diana; we have consistently been getting write ups in the Oregonian.

Newsletter Editor – Scott Kindt: Always looking for more articles; has had a couple of submissions this month.

SIGs – Scott Kindt: Nominal.

OMSI –Jan Keiski: Jim Todd has everything ready for December, including classroom 1 for the youth meeting. Later next year availability of classroom 1 for the youth meeting gets difficult – we might have to look into using the turbine hall or the planetarium.

Sister Club update – Jan Keiski: GAMA recently held their summer barbecue, which is to kick off their summer observing season. Jan has pictures that she will forward to Scott Kindt for inclusion in the newsletter.

Old Business

Proposal for RCA / Clackamas Comm. Coll Haggart Observatory use – David Nemo / Sameer Ruiwale. No updates.

Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde. No updates.

Elections: slate was elected unopposed with some vacant positions; VP observing position is still currently vacant for next year.

December Holiday potluck and swap meet

Food and other logistics. Suggestion to order pizzas as additional to whatever people bring. Mark has procured additional plates, plastic knives & forks and a selection of drinks.

Movie start time is currently planned for 8pm.

New Business

Beth Deal donations to the club. Peter Abrahams has been talking to Beth Deal. Various options: sell the items, donate to another club or a school, or possibly donate to GAMA. There are a number of high value eyepieces and an SCT. Very important to make sure that it goes to somebody who will appreciate it. Carlos and Leo will be visiting from GAMA and may be able to take it back with them.

Galileo Award nominees discussion. Motion to approve passes 8-1-1.

Adjournment

There being no further business, the meeting was adjourned at 8:56pm

Astronomical League Awards

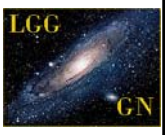
Congratulations to the following Rose City Astronomers members:

Henry Peterson
Lunar Program Award #744

Patrick L. Hanrahan
Southern Sky Telescopic
Program Award #35

Carolyn Nissen
Messier Program Award #2564

Mark Martin
Binocular Messier Program Award #920
Messier Program Award #2522



Howard Knytych
Local Galaxy Group Program
Award #14-M

2012 Calendar by RCA Members

On Sale at the General Meetings

The calendar is 17 inches high by 11 inches wide
It contains all of the planned RCA meetings,
SIG meetings and RCA outings.

Cost will be $10 again this year.

February 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3 Noon Downtowners Luncheon Kell's	4
5	6 7pm  Board Meeting OMSI Classroom 1	7	8	9	10	11 10am - 3pm Telescope Workshop
12	13 7pm  Astro Imaging SIG Beaverton Library	14	15	16	17	18
19	20 6:30pm  Junior Astronomers and New Members **7:30pm** **General Meeting** **OMSI Auditorium**	21	22 7pm Cosmology SIG	23	24	25
26	27 	28	29			

March 2012

Mar 02	Friday	Downtowner's Luncheon	Kell's	Noon
Mar 03	Saturday	Telescope Workshop	Swan Island	10am-3pm
Mar 05	Monday	Board Meeting	OMSI Classroom 2	7pm
Mar 12	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Mar 17	Saturday	OSMI Star Party	Rooster Rock and Stub Stewart	Sunset
Mar 19	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Mar 23-25	Fri-Sun	Kah-nee-ta Star Party	Kah-nee-ta Resort	
Mar 21	Wednesday	Cosmology SIG	Linus Pauling House	7pm

http://www.rosecityastronomers.org

Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

Volume 25, Issue 03 Newsletter of the Rose City Astronomers March, 2012

High Powered Rockets and Dreams of Space

by Nathan Bergey

From humble beginnings as a couple of Portland State undergraduates bored with their labs, Portland State Aerospace Society (PSAS) has grown into a serious group of engineers, scientists, and aerospace enthusiasts. Over the last decade PSAS has become one of the most advanced amateur rocketry clubs in the world. Working on a shoestring budget they have launched some impressive technology into the air high above the central Oregon desert.

PSAS wants to know what it takes to put something in space. To date the only objects humans have put into orbit around Earth have ridden there on top of multi-million dollar vehicles, and until just recently only a handful of nation-states that have been able to build such programs. We think we can do better.

Learn just why it's so hard to get to space, and follow along some of the trials and successes of PSAS through the years. Then explore some of the astronomy potential of high altitude platforms like sounding rockets and day-dream about the day when we can all afford our own backyard space telescope.

Nathan is freelance data scientist and programmer who has spent the last several years helping build Portland's own home grown space program. He has a life-long passion for all things space.

Nathan grew up wanting to be an astronaut, studied physics and astronomy at Appalachian State University before moving to Portland and becoming Portland State Aerospace Society's chief rocket scientist. In his free time he works on yet more space things, from visualizations of NASA spacecraft to building lights that are triggered by the International Space Station.

All are Welcome! Monday March 19th

New Members: 6:30 pm. Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Mar 14	Mar 22	Mar 30	Apr 06

Astrophoto of the Month
M33
By Ken Hose

Image was taken in September, 2010 at Skyview Acres.

Equipment used: Takahashi FSQ-85ED, CGEM, QSI583wsg camera.

12 x 300 second RGB images.

Stacked in MaxIm and finished in Photo-shop.

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, March 12th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: Monday, March 19th, 6:30pm
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: First meeting

Leader: Ada Hays
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, April 6th, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, March 19th, 6:30pm
Location: OMSI Planetarium
Topic: TBD
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, April 7th
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wednesday, March 21st, 7pm
Topic: Illusion of Time

Presented by: To Be Announced
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org

CLUB OFFICERS

Office	Name	Email
President	Sameer Ruiwale	president@rosecityastronomers.org
Past President	Carol Huston	pastprez@rosecityastronomers.org
VP Membership	Ken Hose	membership@rosecityastronomers.org
VP Observing/Star Parties	Ben Carlson	observing@rosecityastronomers.org
VP Community Affairs	Dawn Willard	community@rosecityastronomers.org
VP Communications	Mark Martin	communications@rosecityastronomers.org
Treasurer	Larry Godsey	treasurer@rosecityastronomers.org
Secretary	Duncan Kitchin	secretary@rosecityastronomers.org
Sales Director	Larry Froberg	sales@rosecityastronomers.org
Newsletter Editor	Scott Kindt	editor@rosecityastronomers.org
Media Director	Diana Fredlund	media@rosecityastronomers.org
New Member Advisor	Howard Knytych	newmembers@rosecityastronomers.org
Webmaster	Larry Godsey	webmaster@rosecityastronomers.org
ALCOR	Ken Hose	alcor@rosecityastronomers.org
Library Director	Jan Keiski	library@rosecityastronomers.org
Telescope Director	Greg Rohde	telescope@rosecityastronomers.org
Observing Site Director	David Nemo	sitefund@rosecityastronomers.org
IDA Liaison	Dawn Nilson	ida@rosecityastronomers.org
OMSI Liaison	Jan Keiski	omsi@rosecityastronomers.org
Magazines Director	Larry Godsey	magazines@rosecityastronomers.org
SIG Director	Scott Kindt	sigs@rosecityastronomers.org
Youth Programs Director	Ada Hays	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $32.95 for one year or $65.90 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information go to the RCA web site index and click on the link for magazines. Please make checks out to "RCA" and allow two months for your subscription to be renewed.
http://www.rosecityastronomers.org/magazines/
Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.
http://www.rosecityastronomers.org/library.htm
Jan Keiski <library@rosecityastronomers.org>

RCA Dark Sky Star Parties

Rooster Rock - April 14, 2012

This is an RCA member star party and is not one of the OMSI public star parties. There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.

The exit gate will be left open for us all night. There is a security guard onsite that will be checking during the night while we are there. This is a day-use only park and there is no viewing at this park outside of RCA or OMSI scheduled star parties.

Stub Stewart - April 21, 2012

This is an RCA member star party and is not one of the OMSI public star parties. There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.

There is an Oregon State Park Day-Use Fee of $5 for parking. Unless you have the Yearly Pass available the Oregon Parks Dept. If you plan on viewing outside of the RCA Star Party schedule you must have a special night-use permit available to RCA members from the Stub Stewart Park Ranger.

Maupin Star Party
April 20-22, 2012

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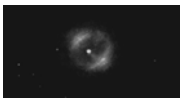
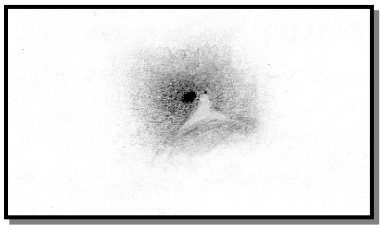


NGC 1999, HH1 and HH2

Generally, reflection nebulae like NGC 1999 are relatively unimpressive through a telescope. Filters don't help the view much so reflection nebulae are generally not as sought out as the showier emission nebula like M42, the Orion Nebula and M8, the Lagoon Nebula. However, NGC 1999 is not only bright enough to be seen in moderately sized amateur telescopes, it has a fascinating detail that may be uniquely visible to visual observers.

But first of all, what's a reflection nebula? Pretty much what it sounds like – a gaseous, dusty nebula that reflects the light of a nearby star or stars. They generally look blue in photos - think of the nebula that surrounds the stars of the Pleiades - but visually they appear cool grey through a telescope. M78 and its fainter neighbors located north of M42 are good examples of reflection nebulae.

NGC 1999 is located about a degree south of M42 as shown in the wide angle photo by Kerry Hepburn, which makes it both easy to find and something of a surprise if you haven't heard of it before. It's a classic example of an interesting object being overshadowed by a nearby showpiece. It's much smaller than M42 and has a high surface brightness, but even so you'll need a fairly dark and transparent sky to see it well. The variable star V380 Orionis illuminates 1999 and is visible near the center of the nebulosity and right next to its most interesting feature – a key hole shaped dark patch.



In my 28 inch the bright part of 1999 is quite distinct and when the sky is dark and transparent the nebula has a somewhat hairy perimeter. Filters don't help the view much although a broad band filter may help a little.

There isn't a listed magnitude for 1999 that I can find but it's bright enough to be seen in a 6 inch by an experienced observer on a dark, transparent night. The key hole is sharply bounded and is surprisingly dark.

Discovered by William Herschel in 1785 with his 18.7 inch speculum mirror telescope, which he described in his cryptic shorthand as "*10, 11 inv in Neb". That translates to something like "star, 10th or 11th magnitude involved in nebulosity." Herschel didn't notice the dark keyhole shaped patch but you probably can.

Until recently, this keyhole had been thought to be a Bok globule, a dense patch of un-illuminated nebula that was silhouetted against the brighter portion of 1999. In 2009, observations with the Herschel Space Telescope, the Atacama Pathfinder Experiment radio telescope, the Mayall and Magellan telescopes have shown that this dark area is a real hole through 1999. The cause is still being investigated but may have to do with the polar outflow jets of the young stars in this area.

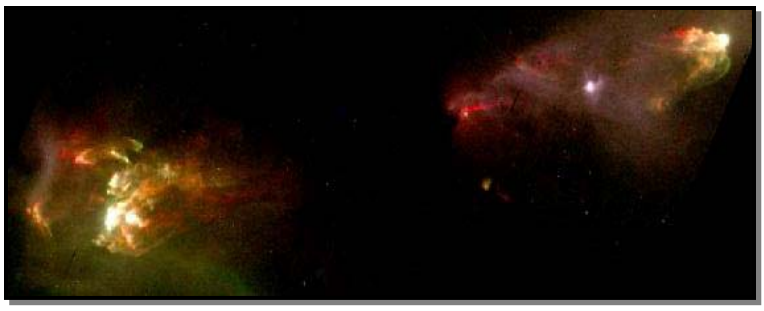
Polar outflows from newly forming stars create a localized shock front in the local interstellar medium, and these shock fronts are called Herbig-Haro objects. Two of them, HH1 and HH2, are in the same high power field of view with NGC 1999 and are associated with the Orion Molecular Cloud that include the Orion Nebula.

The photo here was taken by Adam Block of the Mt. Lemmon Sky Center/University of Arizona, and shows how close NGC 1999 and HH1 and HH2 are to each other. HH1 and HH2 are the two aligned, elongated, lumpy red objects directly below 1999. Both are about 1500 light years away from us, which is about two hundred light years further than the Orion Nebula.

I didn't realize they were so close to 1999 until they were pointed out by Steve Gottlieb while we were part of an observing group at the Visitor's Center on Mauna Kea in January 2012. HH1 was surprisingly easy to see at low power as a fuzzy star through a 20 inch ball scope, but HH2 was too faint. Perhaps more magnification would have helped, but this didn't work out given the number of people who were observing.

As an aside, the 20 inch was built and operated by Mike Connelly, a professional astronomer who works for NASA. There was another professional astronomer, Olivier Guyon of the Subaru Telescope and the Arizona Mirror Lab, at the Visitor Center with his homemade scope. Olivier had built an extremely sturdy 19 inch flex rocker Dobsonian, and in direct contrast to the stereotype of a professional astronomer who can't find the Big Dipper, these two guys were old hands at star hopping and observing with their manual telescopes. No drives, no digital setting circles, just a paper star atlas and general knowledge of the night sky. It was really cool observing with these guys, especially when Steve pointed out HH1 and HH2 to Mike, who wrote his Ph.D dissertation on HH objects and had never seen one visually until that moment. Man was he excited!

Herbig-Haro object shock fronts are formed when the polar jets from newly forming stars plow into nearby gas and dust, creating their characteristic shock front. Depending on the interstellar environment they're located in, the shock front is usually about 1.6 light years from its parent star, with very few of them several times that distance.



HH1, which is on the left in the HST image here, takes good seeing to identify because it will be smeared into a quivering blob in poor seeing and will look like an unremarkable field star. My guess is that it will be visible in a 10 or 12 inch scope in good conditions but you'll have to work at it with high power. I can't find a magnitude for either, but HH2 is the fainter of the two and will probably take a larger scope to be seen. If you're successful you'll have seen both shock fronts created by the polar jets from the still forming star half way in between. Pretty darn cool.

A Galaxy in your Coffee Cup: The Physics of Coffee

By Robert McGown

Physicists often can shed an interesting light on complex things that sometimes seem very simple. The physics of coffee is one of these wonderful thought experiments that make an everyday act of drinking coffee filled with wonder. This morning, I was able to sit, coffee cup in hand, and as the photons entered my optic nerve, the aroma of the coffee bathed my taste and olfactory receptors. It was a universal delight!

Some coffee beans grow at high almost arid places in the mountains and their flavor is reflected from their environment, nutrients of the soil, and nature of the coffee bushes, and how finely the beans are ground. The beans are picked by hand and pulverized and ground up to be saturated with 10^25 atoms of H2O, water. The finely ground up beans are percolated through a fine paper filter with water to get the fine coffee flavor. If you are out side of a coffee house or Starbucks and you smell the aroma of coffee in the air, you are inhaling about five to seven ppm (parts per million), of coffee molecules in the air.

The coffee is poured from the hot ceramic coffee pot into the cup which is at ambient room temperature. The cup heats up from the bottom and reaches the same temperature as the steaming liquid coffee heats the cup. Charles Law says as the temperature doubles in the air above the hot coffee it expands by twice. If the cup sits there without a thermo jacket, it will return to a thermal equilibrium with the room temperature in about 20 minutes. The entropy is also lowering as the coffee cools down. If everyone in the universe all drank coffee at he same time and let it cool down slowly, it might slow down the heat death of the universe.

As we pour cream into the coffee and stir it, a momentary fractal like shape appears as a spiral galaxy in the coffee cup. Convection cells and gyres are visible as the coffee cools on the surface and the cooler liquid sinks and the warmer liquid rises. Pouring cinnamons in the coffee, the particles of cinnamon dance on the surface of the hot liquid almost like Brownian motion of atoms. There are tiny bubbles that are trapped on the surface like bubbles and voids of galaxies. With surface tension of the polar water molecule, there is a slight curve to the surface of the coffee, an adhesion meniscus.

There is a phase transition going on as the steam is leaving the cup as the hot liquid is changing to steam. If you hold your coffee cup up to the light you can see atmospheric effects as the light travels through the wavy air above the hot liquid. Smelling the parts per million up close you appreciate the aroma and the amazing interactions that are taking place before your eyes. As the coffee molecules touch the receptor cells on your tongue and the olfactory nerves that control your sense of smell, the memory of the coffee flavor is stored by the neurons in your brain.

And if you waited long enough, longer than the theoretical age of the visible universe, your cup of coffee might quantum tunnel into the coffee holder in your car parked on the street! You can drink it on your way to work. Be careful that the kinetic energy doesn't cause you to spill it!

Minutes of the Rose City Astronomers Board January 9th 2012

Held at OMSI Classroom 1

Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Howard Knytych (New Member Advisor)
David Nemo (Observing Site Director)
Scott Kindt (Newsletter Editor, SIGs director)

Call to Order

The meeting was called to order at 7:11 by Sameer Ruiwale and, there being 7 board members present, the quorum requirement of 9 was declared to be not met.

Approval of Agenda

The agenda was approved by unanimous consent

Approval of Minutes

No quorum present: approval of minutes tabled until the next meeting

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** not met with 7 voting members present.

Treasurer's Report – Larry Godsey: Three sheets distributed by Larry. Balance sheet has nominal numbers – we are doing a little better than last year. Profit & loss sheet – we have spent a little more than last year, but have had more activities. Budget sheet – all but telescope library are well within budget. Profit and loss detail now shows "XFER" in addition to check numbers, because some payments are now happening electronically. Third sheet: contract for Camp Hancock for September 14-16 from OMSI. The contract has changed a little since last year: there is a new mutual hold harmless clause and a new insurance clause. There is also a change to the minimum number of attendees.

VP Programming – Mark Martin: A few changes to this year's program. Peter Ward will not be able to attend in March due to urgent family issues and Mark has instead secured Nathan Bergey to visit from the Portland State Aerospace Society. He will be talking about the future of spaceflight and their involvement in it. In June we have local astrophysicist Ethan Siegel who writes a well-known blog entitled "Starts with a Bang". Pat Hanrahan is now scheduled to talk at the July meeting. The potluck in December went very well; the additional food that was brought in seemed to cover the need, and the IMAX movie was very well received.

VP Observing – (Sameer pro tem): Sameer has a potential volunteer for this position. Sameer will either talk with him at the next general meeting or invite him to attend the next board meeting. Sameer has been working with Kah-Nee-Ta to finalize details for March 23rd-25th. Forms have been sent to Stub Stewart state park for the RCA star parties.

VP Community Affairs – Dawn Willard: No present.

VP Membership – Ken Hose: No checks received for renewals this month; all transactions via PayPal. Nine new members signed up in December. Total membership now stands at 320 member families, compared to 295 at this time last year and 324 the year before. Brought in $160 in membership dues in December.

Alcor – Ken Hose: One lunar observing award to hand out this month.

New Member Advisor – Howard Knytych: We have a meeting this month on the subject of winter observing tips.

Media Director – Diana Fredlund: Not present.

Sales – Larry Froberg: Not present, but report submitted via Larry Godsey. Brought in a total of $378 in merchandise sales in December. We have 56 calendars left; we are not yet at the breakeven point. Have pre-sold 20 copies of Rod Mollise's book.

Book Library – Jan Keiski: Not present.

Telescope Library – Greg Rohde: Not present.

IDA – Dawn Nilson: Not present.

Magazine Subscriptions – Larry Godsey: Nominal.

Webmaster – Larry Godsey: Have made changes on the AL award pages to align with their new program.

Site Committee – David Nemo: Nominal.

Youth Director – Ada Hayes: Not present. Sameer has confirmed availability of classroom 1 for this month with Jim Todd.

Newsletter Editor – Scott Kindt: Nominal.

SIGs – Scott Kindt: Nominal.

OMSI –Jan Keiski: Not present.

Sister Club update – Jan Keiski: Not present.

Old Business

Proposal for RCA / Clackamas Com. Coll Haggart Observatory use – David Nemo / Sameer Ruiwale. Planning to get back to them by the Spring. Have reviewed the legal agreements. Currently looking into the requirements for insurance.

Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde. No updates.

Stub Stewart Observatory and option for housing club's 12" LX200 scope there – Greg Rohde. No updates.

New Business

Galileo Award presentation. Tabling this until next month.

Portland Tribune Interview. Diana posted something on the forum about this; The Portland Tribune are looking for somebody to interview. Please let Sameer know if interested.

2012 Goals Review. Some proposals for goals for the year:
Set up Clackamas Community College program
Set up Stub Stewart observatory program.
Set up guidelines for donations to local schools.
Review the bylaws to see what updates are needed.
Update the new members packet.

Adjournment

There being no further business, the meeting was adjourned at 8:10pm

March 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2 Noon Downtowners Luncheon Kell's	3 10am - 3pm Telescope Workshop
4	5 7pm Board Meeting OMSI Classroom 1	6	7 	8	9	10
11  Set Clocks Forward One Hour	12 7pm Astro Imaging SIG Beaverton Library	13	14 	15	16	17 OSMI Star Party Rooster Rock and Stub Stewart
18	19 6:30pm Junior Astronomers and New Members **7:30pm** **General Meeting** **OMSI Auditorium**	20	21 7pm Cosmology SIG	22 	23 Kah-nee-ta Star Party	24 Kah-nee-ta Star Party
25	26	27	28	29	30 	31

April 2012

Apr 02	Monday	Board Meeting	OMSI Classroom 2	7pm
Apr 06	Friday	Downtowner's Luncheon	Kell's	Noon
Apr 07	Saturday	Telescope Workshop	Swan Island	10am-3pm
Apr 09	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Apr 14	Saturday	Rooster Rock Star Party	Rooster Rock State Park	Sunset
Apr 16	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Apr 18	Wednesday	Cosmology SIG	Linus Pauling House	7pm
Apr 20-22	Fri-Sun	Maupin Star Party	Wapanita Air Strip near Maupin	
Apr 21	Sat	Stub Stewart Star Party	Stub Stewart State Park	Sunset
Apr 28	Sat	OMSI Star Party	at Rooster Rock and Stub Stewart State Parks	Sunset

http://www.rosecityastronomers.org

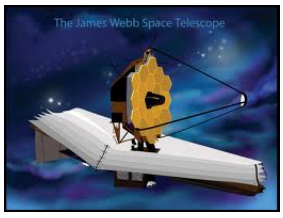
Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

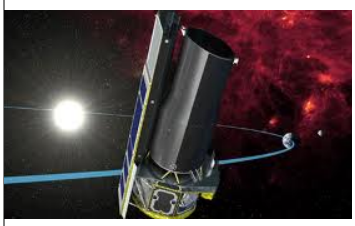
Volume 25, Issue 04 Newsletter of the Rose City Astronomers April, 2012

Space Telescopes: Astronomy's Golden Age

by James Schombert



The last 20 years have been a golden age for astronomy as advances in space technology has allowed us to study the Universe at wavelengths impossible to observe from the surface of the Earth. Space telescopes allow us to see the most violent phenomenon in the Universe (supernovae, black holes, colliding galaxies) and the most exotic phenomenon (expanding Universe, cosmic background radiation, protostars). The changes to our scientific thinking in the last 20 years has outpaced our ideas for the last 500 years. This talk will be a non-technical review of the history of space telescopes from the 1960's to today, our discoveries, our plans for the future and the probable decline of American science in the 21st century.



Prof. Schombert is an observational astronomer whose research centers around galaxy evolution and formation, as well as topics in cosmology. His recent efforts have involved the discovery, imaging and spectroscopy of low surface brightness galaxies, tracing color evolution of ellipticals and the structure of galaxies.

After receiving his Ph.D. from Yale University in 1984, Schombert was a postdoctoral fellow at Caltech and a visiting assistant professor at UMichigan. Before arriving at UOregon in 1996, he was a staff scientist at NASA/Caltech for 6 years, the last two working for the Astrophysics Division of NASA HQ, Washington, D.C.

All are Welcome! Monday April 16th

Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Apr 13	Apr 21	Apr 28	May 05

Scope: Vixen ED103S with WO Flat 4 0.8x FR/FF

Mount: Orion Atlas EQ-G with GoTo

Guiding: Meade DSI Pro and PHD Guiding

Guide Scope: ATM 60mm f/4.1 Achromat

Camera: Canon EOS 1000D (Modified / Peltier Cooled to 34F) Special Settings: None ISO: 800 Exposure: 5 hours 30 minutes (66 x 300s)

Processing Software: Acquired in Nebulosity with High Dither, Calibration and Stacking in Deep Sky Stacker, Levels/ Curves/Enhancements in Photoshop

Support Files: 40 flats, 40 bias, 12 darks

The Cave Nebula

Astrophoto of the Month by Neil Heacock

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, April 9th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: Monday, April 16th, 6:30pm
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: TBD

Leader: Ada Hays
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, May 4th, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, May 21st, 6:30pm
Location: OMSI Planetarium
Topic: TBD
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, May 12th
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wednesday, April 23rd, 7pm
Topic: TBD

Presented by: To Be Announced
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

CLUB OFFICERS

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President	Sameer Ruiwale	president@rosecityastronomers.org
Past President	Carol Huston	pastprez@rosecityastronomers.org
VP Membership	Ken Hose	membership@rosecityastronomers.org
VP Observing/Star Parties	Ben Carlson	observing@rosecityastronomers.org
VP Community Affairs	Dawn Willard	community@rosecityastronomers.org
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OMSI Liaison	Jan Keiski	omsi@rosecityastronomers.org
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SIG Director	Scott Kindt	sigs@rosecityastronomers.org
Youth Programs Director	Ada Hays	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information go to the RCA web site index and click on the link for magazines. Please make checks out to "RCA" and allow two months for your subscription to be renewed.
http://www.rosecityastronomers.org/magazines/
Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.
http://www.rosecityastronomers.org/library.htm
Jan Keiski <library@rosecityastronomers.org>

RCA Dark Sky Star Parties

Rooster Rock - April 14, 2012

This is an RCA member star party and is not one of the OMSI public star parties. There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.

The exit gate will be left open for us all night. There is a security guard onsite that will be checking during the night while we are there. This is a day-use only park and there is no viewing at this park outside of RCA or OMSI scheduled star parties.

Stub Stewart - April 21, 2012

This is an RCA member star party and is not one of the OMSI public star parties. There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.

There is an Oregon State Park Day-Use Fee of $5 for parking. Unless you have the Yearly Pass available the Oregon Parks Dept. If you plan on viewing outside of the RCA Star Party schedule you must have a special night-use permit available to RCA members from the Stub Stewart Park Ranger.

Maupin Star Party
April 20-22, 2012

The Rose City Astronomers have been granted permission to use private property approximately 8 miles West of the town of Maupin for members-only scheduled Star Parties.

The Maupin Observing Site is located on a private airstrip about 8 miles east of Maupin, Oregon. Warning: this airstrip is used in the morning, but at the far end of the airfield. Most people don't even wake up.

There is no registration for the event itself, just show up and enjoy the weekend. You don't even need a telescope to participate; other members are enthusiastic to share their views. This is a good opportunity for beginners to get acquainted and seasoned observers to get some serious observing.

It can always be cold at night no matter what the season, so bring warm clothing.

RVs, trailers and tents will be allowed on the observing site (see observing site map for instructions). The town of Maupin offers lodging, restaurants and recreation if you don't want to rough it. We will have a portable outhouse on site.

More information can be found on the RCA website:
http://www.rosecityastronomers.org/sp/maupin.htm

Camp Hancock
May 18 - May 20, 2012

OMSI's Camp Hancock with meals and cabins fits the bill for a great outing on a cool Spring weekend. Dark skies, warm cabins, real bathrooms, hot showers, good meals and great friends top off the list of things to like and all are provided with the $45 per night registration fee (OK, maybe not the friends).

Camp Hancock is an OMSI sponsored field station for the promotion of science education. It is located about 150 miles from Portland and is 2 miles east of the John Day River in Eastern Oregon in the Clarno Fossil Beds. Camp Hancock is NOT a resort hotel; it is a rustic kid's camp with 16 bunkhouses that sleep up to 14 people each in A-frame buildings. The bunkhouses are one room with bunks, mattresses, limited electricity and heaters on a 60 minute timer. You will be sharing the bunkhouse with others in our group, but it's never crowded and we usually average less than 3 people per cabin. There is a limited area for Tents, RVs and trailers.

Registrations will be taken at both the March and April general meetings. For mail in registration forms, or to register and pay online please visit http://www.rosecityastronomers.org/sp/hancock.htm. The Registration and Payment Deadline is May 11th for mail in and May 13 for online payments.

OMSI - Astronomy Day Celebration
April 28th, 2012

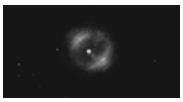
Held at Rooster Rock & Stub Stewart State Parks.

Viewing highlights includes the planets Venus, Saturn, Mars, the first quarter moon, deep sky objects including the Beehive star cluster, M3 and more!

See http://omsi.edu/starparties for more information or cancellations.

Star Parties Coming Soon!

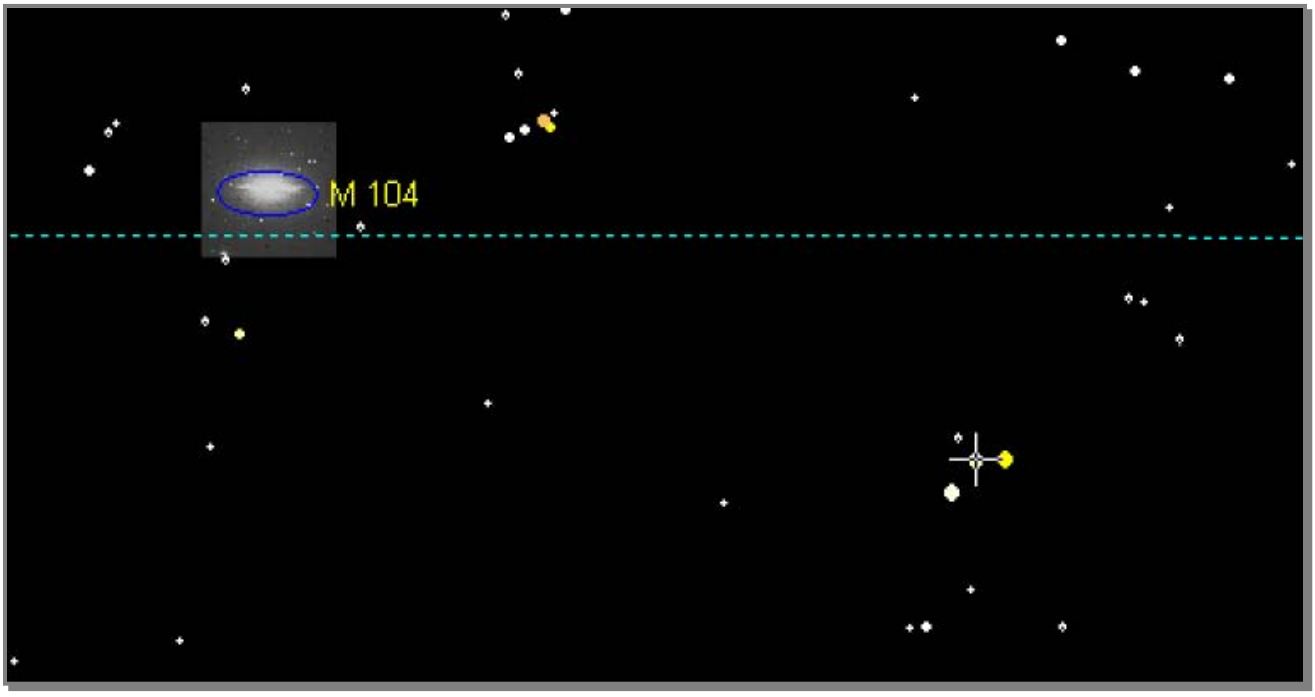
OMSI Planet Parade Star Party	May 12
Camp Hancock	May 18-20
Stub Stewark Dark Sky Star Party	May 19
OMSI Partial Solar Eclipse	May 20
OMSI Transit of Venus	Jun 05
Maupin Dark Sky Star Party Weekend	Jun 15-17
Rooster Rock Dark Sky Star Party	Jun 16
SkyView Acres Dark Sky Star Party	Jun 22-23
OMSI Summer Solstice Celebration	Jun 30
White River Starparty	Jul 14
Trout Lake Star Party	Jul 20-21



Stargate Corvus

I've been a fan of the Sci-Fi Channel's Stargate TV series ever since the first one came on the air in the late 1990's. Based on the movie "Stargate" the premise for the three TV series was – well, let's not get into all that but instead focus on the real subject of this article, the Stargate asterism. And just to set the record straight, the name for this asterism didn't come from the Stargate TV series or the movie, but from the Buck Rogers 1979 TV series.

The real Stargate is an asterism located in Corvus near the Sombrero Galaxy, M104. This intriguingly distinctive asterism of six stars arranged in two perfectly nested triangles. Strictly a line-of-sight coincidence, these stars are unrelated but are still officially known as the multiple star STF 1659. By the way, the DSS image here exaggerates the visual differences in the magnitudes of the stars – through a scope the brightness's of the stars seems more equal.



I'd heard of this group for years before finally deciding on paying it a visit because I'm generally not drawn to search out asterisms. But this one is definitely worth the tiny bit of effort to track down, and being so close to the Sombrero Galaxy it can be used as part of a star hop to the Sombrero's location. The

crop from Megastar shows how close the Stargate is to M104 and also shows another asterism, “Jaws”, directly to its west.

The best view is with relatively low magnification. I found that something around 100x worked best, but follow your personal taste to best frame this group of stars given your scope and eyepieces. You don’t even need really dark skies to enjoy the Stargate as the magnitudes of these six stars range from 6.6 to 11.5.

When I first swept up the Stargate, even knowing what to expect, I was still startled at its apparent symmetry and near perfect geometry. With all the stars visible through even a small telescope there’s no other compact group I know of that’s this geometrically striking.

Even knowing these six stars are separated by hundreds of light years I couldn’t help but wonder about the odds of this particular arrangement. My thoughts even wandered back to some sci-fi books I read long ago about unimaginably advanced alien civilizations that arranged stars for their own vast and cool and unsympathetic purposes, but all this shows is how evocative this arrangement of stars can be.

April and May are the best months to see the Stargate in the evening sky, so weather permitting, have a look before summer rolls around. We don’t get many clear nights this time of year in the Northwest, except around full Moon of course, but even with the Moon brightening the sky the Stargate should still be an interesting sight. Oh, and while you’re in the area you might as well have a look at M104, the Sombrero galaxy – it’s pretty cool too!

Sombrero Galaxy also known as M104 and NGC4594.
Courtesy of NASA/ESA and The Hubble Heritage Team (STScI/AURA)

A MODIFIED MESSIER MARATHON FOR SOUTHERN OBSERVERS

by Leo Cavagnaro

One of the main observing events of G.A.M.A. (Grupo de Astrónomos Mendocinos Aficionados)

February 17-19 we held the 10th ***"GAMA Modified Messier Marathon for the Southern Hemisphere"***, a list of 110 objects to observe all night long from Uspallata Valley. In middle February the end of astronomical twilight occurs around 9:50pm and the beginning of the astronomical dawn occurs at 5:45am. Thus, we had about 8 hours of observation for those who wanted to carry out the marathon. Other people were observing different targets.

Why a "Modified" Marathon?

The 110 Messier deep-sky object list is impossible to observe entirely from our latitude, so our astronomy club in Mendoza (GAMA) thought that the observing list below was the best way to be as close as possible to the real Messier Marathon that northern observers carry out every year in March/April.

In middle February we cannot see 28 Messier objects, so we added that amount of southern highlights to complete the list.

From our latitude (-32 degrees) some Messier objects are not visible, some of them are hidden and never rise, like M81 and M82 for example, others like M31 or M72 are visible from this part of the planet but not in summer when this observing event takes place because of sunlight.

Messier Marathon 2012. The observing field. Waiting for darkness to begin with the observation

This year, approximately 45 people stayed in the field observing the starry sky. We had a good observing night with good seeing, transparency and perfect temperature. At the end of the night lightning from a few thunderstorms in the distance bothered a little with the observations but the sky was clear the entire time in the valley.

On the next page is the 2012 GAMA Modified Messier Marathon Observing Program with the suggested sequence. Non Messier objects are in blue.

No.	Object	Type	No.	Object	Type
1	**M74**	Galaxy in Pisces	56	**M99**	Galaxy – Virgo Cluster
2	**M77**	Galaxy in Cetus	57	**M100**	Galaxy – Virgo Cluster
3	**NGC 253**	Galaxy (Silver Coin) in Sculptor	58	**M85**	Galaxy – Virgo Cluster
4	**NGC 55**	Galaxy in Sculptor	59	**M60**	Galaxy – Virgo Cluster
5	**SMC**	Galaxy – Small Magellanic Cloud	60	**M59**	Galaxy – Virgo Cluster
6	**NGC 362**	Globular Cluster in Tucana	61	**M58**	Galaxy – Virgo Cluster
7	**NGC 104**	Globular Cluster (47 Tucanae) in Tucana	62	**M89**	Galaxy – Virgo Cluster
8	**NGC 1261**	Globular Cluster in Horologium	63	**M90**	Galaxy – Virgo Cluster
9	**NGC 1316**	Radiogalaxy (Fornax A) in Fornax	64	**M91**	Galaxy – Virgo Cluster
10	**NGC 1360**	Planetary nebula in Fornax	65	**M88**	Galaxy – Virgo Cluster
11	**M45**	Open Cluster (Pleiades) in Taurus	66	**M87**	Galaxy – Virgo Cluster
12	**M38**	Open Cluster in Auriga	67	**M86**	Galaxy – Virgo Cluster
13	**M36**	Open Cluster in Auriga	68	**M84**	Galaxy – Virgo Cluster
14	**M37**	Open Cluster in Auriga	69	**M64**	Galaxy (black eye) in Coma Berenices
15	**M1**	Supernova Remnant in Taurus (Crab Nebula)	70	**M53**	Globular Cluster in Coma Berenices
16	**M35**	Open Cluster in Gemini	71	**M3**	Globular Cluster in Canes Venatici
17	**M78**	Bright Nebula in Orion	72	**M5**	Globular Cluster in Serpens
18	**M42**	Bright Nebula (Orion Nebula)	73	**M80**	Globular Cluster in Scorpius
19	**M43**	De Mairan´s Nebula (part of Orion)	74	**M4**	Globular Cluster in Scorpius
20	**M79**	Globular Cluster in Lepus	75	**NGC 6231**	Open Cluster in Scorpius
21	**NGC 1851**	Globular Cluster in Columba	76	**NGC 6067**	Open Cluster in Norma
22	**LMC**	Galaxy – Large Magellanic Cloud	77	**NGC 6397**	Globular Cluster in Ara
23	**30 Doradus**	Starburst Region (Tarantula) in LMC	78	**NGC 6752**	Globular Cluster in Pavo
24	**M50**	Open Cluster in Monoceros	79	**M7**	Open Cluster (Ptolomy´s Cluster) in Scorpius
25	**M41**	Open Cluster in Canis Major	80	**M6**	Open Cluster (Butterfly) in Scorpius
26	**M93**	Open Cluster in Puppis	81	**M62**	Globular Cluster in Ophiuchus
27	**M47**	Open Cluster in Puppis	82	**M19**	Globular Cluster in Ophiuchus
28	**M46**	Open Cluster in Puppis	83	**M9**	Globular Cluster in Ophiuchus
29	**M48**	Open Cluster in Hydra	84	**M107**	Globular Cluster in Ophiuchus
30	**M67**	Open Cluster in Cancer	85	**M106**	Galaxy in Canes Venatici
31	**M44**	Open Cluster (Beehive) in Cancer	86	**M94**	Galaxy in Canes Venatici
32	**NGC 2516**	Open Cluster in Carina	87	**M63**	Galaxy (Sunflower) in Canes Venatici
33	**NGC 2808**	Globular Cluster in Carina	88	**M51**	Galaxy (Whirlpool) in Canes Venatici
34	**IC 2602**	Open Cluster (Southern Pleiades) in Carina	89	**M12**	Globular Cluster in Ophiuchus
35	**NGC 3293**	Open Cluster in Carina	90	**M10**	Globular Cluster in Ophiuchus
36	**NGC 3372**	Bright Nebula (Eta Carinae Nebula) in Carina	91	**M14**	Globular Cluster in Ophiuchus

No.	Object	Type	No.	Object	Type
37	**NGC 3532**	Open Cluster in Carina	92	**M23**	Open Cluster in Sagittarius
38	**NGC 3766**	Open Cluster in Centaurus	93	**M20**	Nebula (Trifid) in Sagittarius
39	**NGC 3201**	Globular Cluster in Vela	94	**M21**	Open Cluster in Sagittarius
40	**NGC 3242**	Planetary Nebula (Ghost of Jupiter) in Hydra	95	**M8**	Bright Nebula (Lagoon) in Sagittarius
41	**M95**	Galaxy in Leo	96	**M28**	Globular Cluster in Sagittarius
42	**M96**	Galaxy in Leo	97	**M69**	Globular Cluster in Sagittarius
43	**M105**	Galaxy in Leo	98	**M70**	Globular Cluster in Sagittarius
44	**M65**	Galaxy in Leo (Leo triplet)	99	**M54**	Globular Cluster in Sagittarius
45	**M66**	Galaxy in Leo (Leo triplet)	100	**M22**	Globular Cluster in Sagittarius
46	**NGC 4755**	Open Cluster (Jewel Box) in Crux	101	**M25**	Open Cluster in Sagittarius
47	**NGC 4945**	Galaxy in Centaurus	102	**M24**	Stellar Cloud (Delle Caustiche) in Sagittarius
48	**NGC 5139**	Globular Cluster (Omega Centauri) in Centaurus	103	**M18**	Open Cluster in Sagittarius
49	**NGC 5128**	Radiogalaxy (Centaurus A) in Centaurus	104	**M17**	Bright Nebula (Omega) in Sagittarius
50	**M83**	Galaxy in Hydra	105	**M16**	Cluster with nebulosity (IC 4703) in Serpens
51	**M68**	Globular Cluster in Hydra	106	**M55**	Globular Cluster in Sagittarius
52	**M104**	Galaxy “Sombrero” in Virgo	107	**M26**	Open Cluster in Scutum
53	**M61**	Galaxy – Virgo Cluster	108	**M11**	Open Cluster (Wild Duck) in Scutum
54	**M49**	Galaxy – Virgo Cluster	109	**M75**	Globular Cluster in Sagittarius
55	**M98**	Galaxy – Virgo Cluster	110	**M13**	Globular Cluster in Hercules

Messier objects not included in the observing list 2012

M2, M15, M27, M29, M30, M31, M32, M33, M34, M39, M40, M52, M56, M57, M71, M72, M73, M76, M81, M82, M92, M97, M101, M102, M103, M108, M109, M110

The objects **M2, M15, M27, M29, M30, M31, M32, M39, M56, M57, M71, M72, M73, M76 and M110** are not visible this part of the year because of sunlight.

The objects **M40, M52, M81, M82, and M103** never rise and they are not visible from this latitude.

The objects **M97, M101, M102, M108 and M109** are visible at very low altitude, reaching just 4 degrees of altitude and lower, for that reason they have not been included in the list.

Finally, the objects **M33** and **M34** are very low in the west sky at dusk in February. Conversely, the same situation occurs with **M92** in the dawn sky, and for that reason they have been removed from the list because they are hard to see in such conditions.

If some day you visit Mendoza in February, you will be able to carry out a “Southern Messier Marathon”!

Erratum:
The photo of the rocket launch on the cover of last months newsletter should have been credited to Alex Speaks.
Speaks Photographic
alex@speaksphotographic.com

Minutes of the Rose City Astronomers Board February 6th 2012

Held at OMSI Classroom 1

Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership)
Mark Martin (VP Communications)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
Greg Rohde (Telescope Library)
David Nemo (Observing Site Director)
Ada Hayes (RCA Youth Director)
Scott Kindt (SIGs director, Newsletter editor) (arrived after quorum count)

Ben Carlson (Guest)

Call to Order

The meeting was called to order at 7:25pm by Sameer Ruiwale and, there being 10 board members present, the quorum requirement of 9 was declared to be met.

Approval of Minutes

Moved: Approve minutes from the December 2011 board meeting Moved Duncan. Second Sameer. Approved 10-0-0.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 10 voting members present.

Treasurer's Report – Larry Godsey: Not able to attend, but report provided. Everything is mostly under budget. All of the reports are available on the website. Mark Martin has some receipts which he will send to Larry Godsey.

VP Programming – Mark Martin: No changes to schedule. August and November are still open. Mark is coordinating with Howard Knytych to try to bring in a nationally known speaker for both the RCA meeting and OSP, since the August RCA meeting is right after OSP. This month's speaker is Richard Berry, who will be talking about the Herschel telescopes. The meeting will be in the planetarium this month. Jim Todd has suggested renting the movie "The City Dark" about dark sky issues; this is a possibility for a future meeting.

VP Observing – (vacant): No report.

VP Community Affairs – Dawn Willard: Not present.

VP Membership – Ken Hose: Last moth we had 4 renewals and 4 new members, bringing in a total of $241 in dues. Membership now stands at 329 member families, compared to 314 at the same time the year before, and 326 the same time the year before that.

Alcor – Ken Hose: Nothing additional to report; there was a lunar observing report last month, but no new awards this month.

New Member Advisor – Howard Knytych: Not present (no new member meeting scheduled this month; the next one is in March).

Media Director – Diana Fredlund: Will be putting out a news release in the next few days.

Sales – Larry Froberg: Outstanding sales for this month with a total of $807 in sales. Of that, $260 in calendar sales; have sold 95 so far. Still about 5-10 calendars short of breakeven. Another $220 in sales was from Rod Mollise's book "Choosing and Using a New Cat". Remaining revenue in other items, including a large number of t-shirts and sweatshirts. Larry has found a new volunteer for the sales table: Aru will be there at this month's meeting.

Book Library – Jan Keiski: Nominal.

Telescope Library – Greg Rohde: Greg has tentative sales on two of the excess telescopes, will try to close this month. One is the 10" Newtonian on a GEM, the other is a Newtonian tube.

IDA – Dawn Nilson: Not present.

Magazine Subscriptions – Larry Godsey: Nominal.

Webmaster – Larry Godsey: Nominal.

Site Committee – David Nemo: David has found a prospective site, and there are a couple of scouting reports from volunteers posted on the board. David will discuss once we have some more details.

Youth Director – Ada Hayes: Held first meeting last month, with 3 attendees. Wide age range from 3 – 10. Continuing to develop program, and planning outreach to schools to bring in new members. We should consider acquiring some youth-oriented telescopes for the telescope library. Will also be adding more information to the website.

Newsletter Editor – Scott Kindt: Nominal.

SIGs – Scott Kindt: Nominal.

OMSI –Jan Keiski: Classroom 1 is confirmed for this month for the youth meeting. We will be in the planetarium this month, and then back in the auditorium after that.

Sister Club update – Jan Keiski: GAMA is actively observing, and the club is growing. The telescope workshop is doing particularly well.

Old Business

Proposal for RCA / Clackamas Comm. Coll Haggart Observatory use – David Nemo / Sameer Ruiwale. Draft of a proposal, with RCA edits, distributed at the meeting. This proposal is still under discussion and is likely to have additional edits. Of particular interest is the use agreement section, permitting the club to use the observatory and surrounding facilities for astronomy purposes. In return, the club would be required, among other things, to organize a minimum of 3 public star parties in a year and perform maintenance. The college and RCA will corporate on maintenance of the website. The college may also want to hold their own events, and RCA will help in locating volunteers.

Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde. No updates.

Stub Stewart Observatory and option for housing club's 12" LX200 scope there – Greg Rohde. Greg has exchanged emails with the Ranger at Stub Stewart, but no additional progress. Greg has also stripped down the telescope from Stub Stewart

for cleaning. The mirror appears to be in a good state, and does not look like it will need recoating. May require a replacement drive motor; Greg does not anticipate this being a problem.

Update to new member packet. Ken Hose is working on this, will be sending out some proposals and requests for comment.

New Business

Introduce VP Star Parties volunteer – Ben Carlson. Motion: Appoint Ben Carlson as VP of Observing for the remainder of this year. Moved: Sameer Ruiwale. Second: Greg Rohde. Motion passes 11-0-0.

Galileo Award presentation.

Randall Road property update -David Nemo. Already discussed earlier in the meeting.

Bylaws Review – Part 1. Suggest that this issue be discussed on the forum, and we will identify specific items to discuss next month.

Adjournment

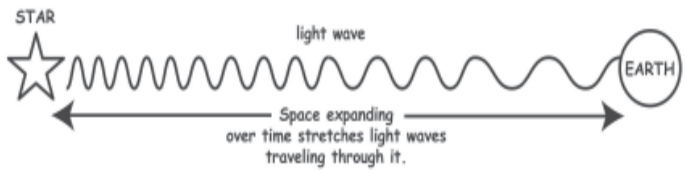
There being no further business, the meeting was adjourned at 8:33pm.

Clues from Ancient Light

Some people are good at telling other people's ages. They can look at you and know you are 9 years old or 22 or 49 or 99. How? They read the clues: your size, shape, proportion, gray hair (or no hair), wrinkles, how you talk, and how you act.

Astronomers know how to tell the ages of the stars-or least the ages of the stars' light. What clues do they use? Light changes as it travels through space and time. It's as if, like aging humans, the light gets "tired." Light that has been traveling a long, long time (say, billions of years) starts looking pretty tired! Astronomers say that the light is ***red-shifted***, because red light has the least energy of all the colors of the light we can see with our eyes.

No matter how "old and tired" light is, it always travels at the same speed in space: 300,000 kilometers (or 186,000 miles) per second (in round numbers). That means it takes some amount of time—a little or a lot—for light to get anywhere. The distance light can travel in one Earth year is called a ***light year***. A light year is very long distance: around 9 trillion kilometers (6 trillion miles).



Light travels in waves, just as energy traveling through the ocean pushes the water into waves. But as light waves travel through space, they gradually get stretched out. That is because, along with the universe, space itself is expanding and stretching the distances between things.

GALEX Looks Back in Time

GALEX (short for Galaxy Evolution Explorer) is a space telescope that was launched into orbit around Earth in 2003. From space, GALEX gets a great view of the ultraviolet light from stars, without Earth's atmosphere getting in the way.

GALEX is now looking at most of the galaxies in the Universe. A galaxy is a grouping of stars. All but a few stars in the universe live in galaxies. Our Sun is just one of at least 200 billion stars in our own Milky Way Galaxy.

GALEX sees starlight that has been traveling for just a few years from stars that are "only" a few trillion kilometers away. But it also sees really "tired" starlight that has been traveling over 10 billion years! That is more than two-thirds of the age of the whole Universe! So GALEX is seeing galaxies as they were 10 billion years ago, as well as how the nearby galaxies looked just a few hundred thousand years ago. Just as you look younger in a picture of you from several years ago, GALEX sees pictures of galaxies when they were much younger than now. So astronomers can look at the young galaxy pictures from far away (and long ago), compare them with pictures of older galaxies nearby (very recent) and see how galaxies and their stars are born, age, and die over time. They can learn how galaxies *evolve*.

Learn More

Books:

Universe by Robin Kerrod, DK EYEWITNESS BOOKS, 1st ed. (March 2003), ISBN: 0789492385 (ages 9-12).

Galaxies by Seymour Simon, HarperTrophy, Reprint ed., 1991, ISBN: 0688109926 (ages 9-12)

Our Galaxy and the Universe by Ken Gruan et al., Ken Press, 2002, ISBN: 1928771084 (ages 9-12).

Websites:

GALEX Website, http://www.galex.caltech.edu.
See "Image Gallery."

The Space Place, http://spaceplace.nasa.gov.
Under "Projects," see "Galactic Mobile" and "Galaxy Montage" activities.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

April 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	**2** 7pm Board Meeting OMSI Classroom 1	**3**	**4**	**5**	**6** Noon Downtowners Luncheon Kell's	**7** 10am - 3pm Telescope Workshop
8	**9** 7pm Astro Imaging SIG Beaverton Library	**10**	**11** 	**12**	**13**	**14** Rooster Rock Star Party
15	**16** 6:30pm Junior Astronomers **7:30pm** **General Meeting** **OMSI Auditorium**	**17**	**18** 7pm  Cosmology SIG	**19**	**20** Maupin Star Party	**21** Maupin Star Party Stub Stewart Star Party
22	**23**	**24**	**25**	**26** 	**27**	**28** OSMI Star Party Rooster Rock and Stub Stewart
29	**30**					

May 2012

May 04	Friday	Downtowner's Luncheon	Kell's	Noon
May 12	Saturday	Telescope Workshop	Swan Island	10am-3pm
May 07	Monday	Board Meeting	OMSI Classroom 2	7pm
May 12	Saturday	OMSI Star Party	at Rooster Rock and Stub Stewart State Parks	Sunset
May 14	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
May 18-19	Fri-Sun	Camp Hancock Star Party	Rooster Rock State Park	After 3pm
May 19	Saturday	Stub Stewart Star Party	Stub Stewart State Park	Sunset
May 20	Sunday	OMSI Star Party	Solar Eclipse Viewing at OMSI	5-7:30pm
May 21	Monday	New Members Meeting	OMSI Planetarium	6:30pm
May 21	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
May 23	Wednesday	Cosmology SIG	Linus Pauling House	7pm

http://www.rosecityastronomers.org

Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

Volume 25, Issue 05 Newsletter of the Rose City Astronomers May, 2012

RCA Information Fair

This months general meeting features our annual Information Fair. Come visit us and get acquainted with RCA activities and members.

There will be several tables set up in OMSI's Auditorium with information on RCA programs and activities. Learn about the following:

- Learn about membership benefits.
- Learn about RCA star parties & regional star parties.
- Learn about Astronomical League amateur observing programs such as the Messier, Caldwell and Herschel programs and how to earn observing certificates and awards for these.
- Find out about RCA special interest groups (SIGs) such as Cosmology, Astrophysics, Astrophotography, Amateur Telescope Making and others.
- Find out about our Telescope Library where members can check out a variety of telescopes to try out.
- The RCA library will be open with hundreds of astronomy related books and videos.
- The RCA Sales table will feature a large assortment of Astronomy reference books, star-charts, calendars and assorted accessories for purchase.

RCA swap meet to be held, where members have the opportunity to trade their astronomy related items.

The fair begins at 7:00 PM with a short business meeting at 7:30 PM.

Enter at the Planetarium Entrance right (north) of the Main Entrance. Proceed to your right to the auditorium.

All are Welcome! Monday May 21st

Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
May 12	May 20	May 28	Jun 04

Astrophoto of the Month

Do you have an astronomy related photo that you might like to have published here? Please submit a photo with details to the newsletter editor. Email address is on the following page.

Taken:
April 22, 2012
Location:
La Center, WA
Equipment:
Scope: AT111EDT
Camera: QSI 583
Mount: AP Mach1

Comments:
Added Hydrogen-alpha data reveals red "tongues" on M82 and multiple spots on M81.

M81 & 82
By: Greg Marshall

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, May 14th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: Monday, May 21st, 6:30pm
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: TBD

Leader: Ada Hays
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, Jun 8th, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: TBD, 6:30pm
Location: OMSI Planetarium
Topic: TBD
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, May 12th **Date Changed**
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wednesday, May 23rd, 7pm
Topic: TBD

Presented by: To Be Announced
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

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Youth Programs Director	Ada Hays	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information and payment options, including Paypal, please see the website.
http://www.rosecityastronomers.org/mags/index.htm
Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.
http://www.rosecityastronomers.org/library.htm
Jan Keiski <library@rosecityastronomers.org>

RCA Dark Sky Star Parties

Stub Stewart - May 19, 2012

This is an RCA member star party and is not one of the OMSI public star parties. There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.

There is an Oregon State Park Day-Use Fee of $5 for parking. Unless you have the Yearly Pass available the Oregon Parks Dept. I f you plan on viewing outside of the RCA Star Party schedule you must have a special night-use permit available to RCA members from the Stub Stewart Park Ranger.

OMSI - Solar Star Parties

Partial Solar Eclipse - May 20th 5PM-7:30pm

The Moon passes in front of the Sun on Sunday, May 20, bringing an annular eclipse to the border between Oregon and California and a partial eclipse to the rest of the Pacific Northwest. OMSI and Rose City Astronomers Club will host an eclipse viewing party at the east parking lot of OMSI.

Transit of Venus - June 5th 3pm-9pm

On June 5, a rare celestial event called a transit of Venus will take place, and it won't be repeated until 2117. OMSI and Rose City Astronomers Club will host a transit of Venus viewing party at the south parking lot of OMSI.

Maupin Star Party
June 15-17, 2012

The Rose City Astronomers have been granted permission to use private property approximately 8 miles West of the town of Maupin for members-only scheduled Star Parties.

The Maupin Observing Site is located on a private airstrip about 8 miles east of Maupin, Oregon. Warning: this airstrip is used in the morning, but at the far end of the airfield. Most people don't even wake up.

There is no registration for the event itself, just show up and enjoy the weekend. You don't even need a telescope to participate; other members are enthusiastic to share their views. This is a good opportunity for beginners to get acquainted and seasoned observers to get some serious observing.

It can always be cold at night no matter what the season, so bring warm clothing.

RVs, trailers and tents will be allowed on the observing site (see observing site map for instructions). The town of Maupin offers lodging, restaurants and recreation if you don't want to rough it. We will have a portable outhouse on site.

More information can be found on the RCA website:
http://www.rosecityastronomers.org/sp/maupin.htm

Camp Hancock
May 18 - May 20, 2012

OMSI's Camp Hancock with meals and cabins fits the bill for a great outing on a cool Spring weekend. Dark skies, warm cabins, real bathrooms, hot showers, good meals and great friends top off the list of things to like and all are provided with the $45 per night registration fee (OK, maybe not the friends).

Camp Hancock is an OMSI sponsored field station for the promotion of science education. It is located about 150 miles from Portland and is 2 miles east of the John Day River in Eastern Oregon in the Clarno Fossil Beds. Camp Hancock is NOT a resort hotel; it is a rustic kid's camp with 16 bunkhouses that sleep up to 14 people each in A-frame buildings. The bunkhouses are one room with bunks, mattresses, limited electricity and heaters on a 60 minute timer. You will be sharing the bunkhouse with others in our group, but it's never crowded and we usually average less than 3 people per cabin. There is a limited area for Tents, RVs and trailers.

Registrations will be taken at both the March and April general meetings. For mail in registration forms, or to register and pay online please visit http://www.rosecityastronomers.org/sp/hancock.htm.

** The Registration and Payment Deadline is May 11th for mail in and May 13 for online payments. **

OMSI - Planet Parade Star Party
May 12th, 2012

Held at Rooster Rock & Stub Stewart State Parks.

Viewing highlights includes the planets Venus, Saturn, Mars, deep sky objects including the Beehive star cluster, M3 and more!

See http://omsi.edu/starparties for more information or cancellations.

Star Parties Coming Soon!

Rooster Rock Dark Sky Star Party	Jun 16
SkyView Acres Dark Sky Star Party	Jun 22-23
OMSI Summer Solstice Celebration	Jun 30
White River Star Party	Jul 14
Trout Lake Star Party	Jul 20-21
OMSI Lunar Viewing Star Party	Jul 28
Stub Stewart Dark Sky Star Party	Aug 11
OMSI Perseid Meteor Shower Watch	Aug 12
Oregon Star Party	Aug 15-18
Camp Hancock Star Party	Sep 14-15
Rooster Rock Dark Sky Star Party	Sep 15

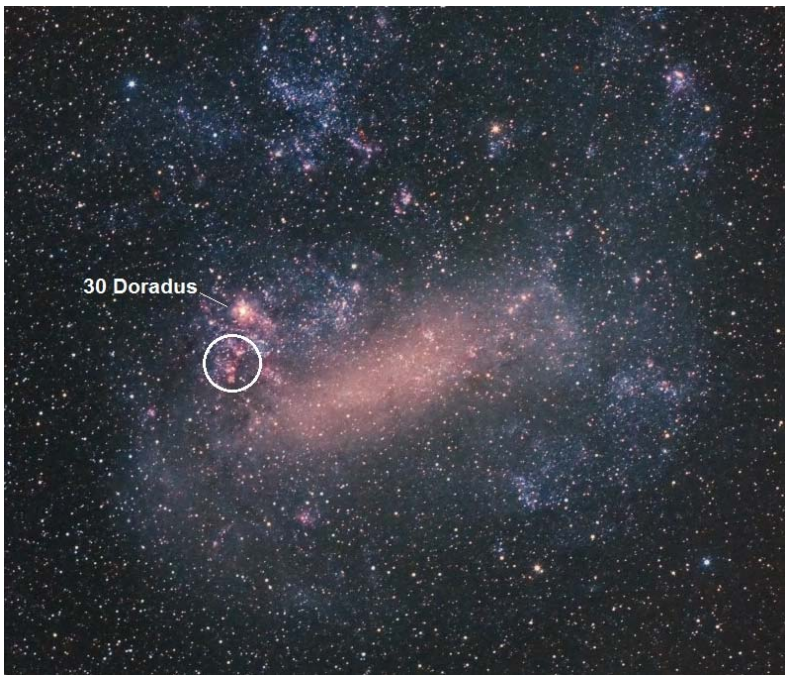
A Remarkable Complex in the Vicinity of 30 Doradus

by Leo Cavagnaro

A notable chain of extragalactic nebulae is displayed to visual observers to the south of the famous "Tarantula Nebula"

Summer in the southern hemisphere is the best season of the year to observe the Magellanic Clouds. Take a look at the 30 Doradus region if you are south of declination +15°, a starburst region in the Large Magellanic Cloud usually known with the colorful name "*Tarantula Nebula*". It is impressive even in small telescopes showing dark and bright features of nebulosity.

But if you want to know a little more about the HII regions content of our satellite galaxy just aim your telescope about 35 arc minutes due south of that bright nebula, in fact the brightest and biggest of this kind of object in our nearby galaxy, and you will find a very interesting field displaying several nebulae and some small clusters. I´m referring to a 1 degree wide field centered at R.A. 05hs 41m Dec. -69° 41´ J2000.0 (see **Figure 1** in page 2).

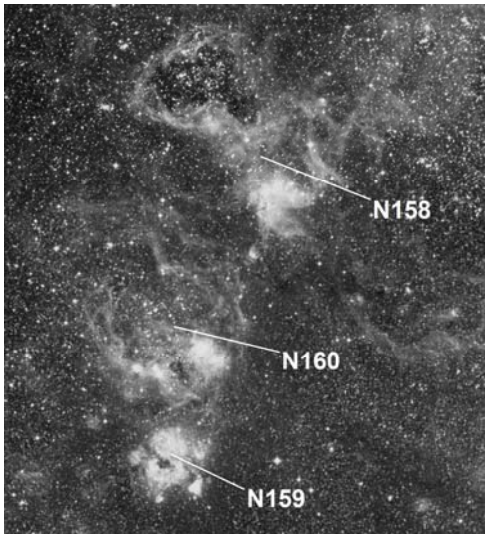


The nebulae complex near 30 Doradus (indicated with a circle in the picture). North is up. Image from Photopic Sky Survey ©Nick Risinger

A first view using 42x made it possible to see a set of objects and nebulae structures grouped in the northwest quadrant of the eyepiece field. Different than the case of 30 Doradus for example whose shape is well known, these nebulae are visually obvious but their less well known appearances made the identification of them a bit hard, at least in my case. Some asterisms were easily recognized using a reference chart making it possible to verify that the field under observation was correct.

The Chain N158, N160, N159

About half a degree south of 30 Doradus lies a line-shaped group of three nebulae named N158, N160 & N159. Using low magnification (42x) all of them were visible even without any nebular filter, detaching from the background sky and surrounding field and being by far the most interesting and brightest objects there.



DSS image of the three major regions in the complex. North is up.

Under a dark sky at low magnification, a UHC filter works properly displaying an astounding field where the nebulae structures appear very detached. With the whole complex centered, extended and elongated zones of nebulosity are visible in the northwest part of the eyepiece field. Prominent nebulosity exists in the area connecting 30 Doradus with the N159/160 complex. Through this filter, NGC 2080 in the N160 region is the brightest zone of the whole complex (UHC works very well in this case). On the other hand, N159 looks more detached with a similar brightness of that of N158 (LH 101 region).

The Cloud N158

The structure closest to 30 Doradus is named N158 (see picture in page 3). In the paper **"The OB associations LH 101 and LH 104 in the HII region N158 of the LMC",** G. Testor and V. Niemela state that the northern part of this region is composed of a super bubble around the OB association[1] LH 104, while the southern part containing the OB association LH 101, dominated by un-evolved and evolved O-type massive stars, is a diffuse HII region which is characterized by three bright zones. Using the mentioned magnification, the area coincident with the OB association LH 101 is the brightest part of the whole complex under study, rivalling in brightness with the zone in NGC 2080 situated farther south where the small blobs named A1 and A2 are situated (read more about this below) also displaying bright. In the zone of the OB association LH 101 at least five stars are visible (magnitudes around 10 and 11) forming a sort of crown-shaped asterism that is better viewed using averted vision. Very close to this asterism, on the side opposite to the position of 30 Doradus, a small and bright nebulosity is clearly visible, N158C (also NGC 2074), an emission nebula + cluster according with the NGC/IC Project web page, where LH 101 lies. As said, one of the most prominent zones where faint stars could be hardly glimpsed using averted vision. This technique was useful to see the overall shape of the cloud N158 appearing elongated southwest-northeast. The region in the middle of N 158 looked less conspicuous, with a 10th magnitude star (GSC-9167-0702) well detached there equidistant from both stellar associations and some of faint nebulosity present there. At the other end of the cloud, in the area coincident with the OB association LH 104, the brightness of the complex arises again becoming more obvious (little less bright than the LH 101 zone and a little bigger) and showing a similar appearance with nebulosity and stars situated on the side. The appearance of the nebulosity surrounding LH 104, evident in the DSS image, was not visible at this magnification.

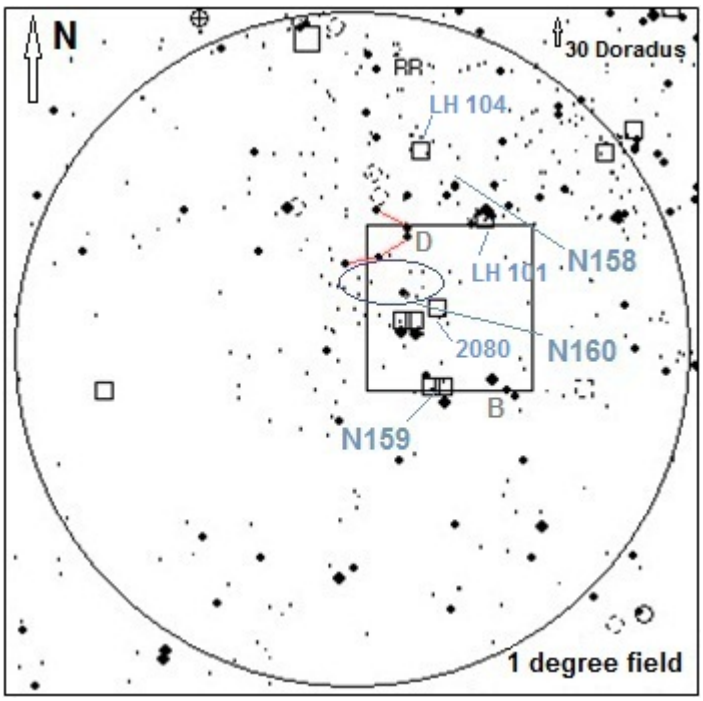


Figure 1. 1-degree eyepiece field centered at R.A. 05h 41m Dec. -69° 41′. The field shows the complex south of 30 Doradus. North is up.

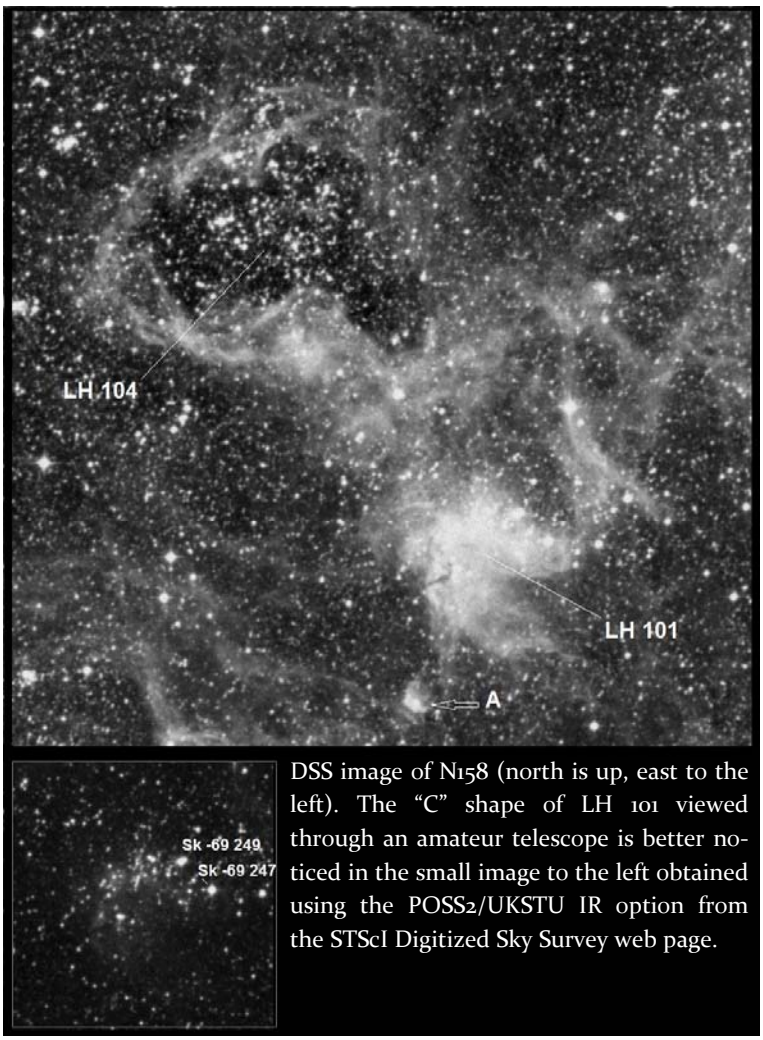
Using the stars indicated with letter **D** in the eyepiece field (see **Figure 1**) as reference I tried to identify and see a very small nebulosity near LH 101 labeled with letter **A** in the DSS image in next page but it was not visible under the observing conditions. The asterism marked with a red line was also identified.

Focusing again on N158, the view through a UHC filter was interesting. The middle zone shows more nebulosity if we compare it with the view without a filter. This filter allowed me to identify the overall shape of N158 better. Like the view without a filter, the zone coincident with LH 101 is the most conspicuous, a bright patch of light with some stars visible close to it. Helped by averted vision the elongated central region is visible reaching the zone of LH 104 where stars with some nebulosity are visible. This area of the complex was observed around 10:30pm local time (UT – 3hs) when the altitude of the target on the sky was around 52 degrees.

A view of N158 using higher magnification (78x) shows the region of LH 101 bright with a few stars embedded in the brightest zone. A lane of nebulosity seems to follow the shape formed by the distribution of the brightest stars there suggesting a crown or arc shape. Scanning the rest of this region with this magnification, the middle area looks less conspicuous (the same as with the lower power observation), however some of faint nebulosity could be seen there. At the end of the brighter nebulosity is visible embedding of the OB association LH 104 where the use of averted vision makes possible the identification of a faint swarm of stars.

At 78x with a UHC filter the view of this cloud was very interesting because its detailed shape started to be revealed (see DSS image). The OB association LH 101 looks elongated approximately northwest-southeast, the middle zone shows the nebula lane and observing carefully with averted vision the faint nebulosity surrounding the association LH 104 could be fairly glimpsed.

The region in LH 101 looked like a C-shaped nebulosity at higher power (106x), harboring a few stars brighter than the others in the nearby surrounding field at both ends of the "C". The association LH 104 looked like a roundish group of faint stars of similar brightness and nebulosity. HD 38489, an extreme supergiant star, is located in this association and its ultraviolet spectrum is similar to the spectrum of the peculiar Eta Carinae star.



DSS image of N158 (north is up, east to the left). The "C" shape of LH 101 viewed through an amateur telescope is better noticed in the small image to the left obtained using the POSS2/UKSTU IR option from the STScI Digitized Sky Survey web page.

The small and elusive nebula indicated by **A** in DSS image here could be glimpsed at this magnification using averted vision.

At this magnification and with a UHC filter, N158 looked prominent in two sections. One of them coincident with LH101 again suggesting the "C" shape mentioned with two stars named Sk -69 249 and Sk -69 247 in its northern side well detached from the nebulae background (see lower panel in DSS image above). The other section is situated between the central star of the cloud reaching the zone of LH104, appearing like a pretty faint and smooth lane of nebulosity. N158 is the third richest area of the Large Magellanic Cloud for WR stars[2].

The Complex N159/N160

According to a team of researchers from Universidad de la Plata and Casleo Observatory in Argentina, Carnegie Institute and the Space Telescope Institute, the field south of 30 Doradus is particularly rich in clusters, associations, and nebulae, including the N159/N160 complex. This field also contains the most massive CO concentrations in the LMC, so it may be expected that in a few million years a successor to 30 Doradus will appear there (you can read the paper "**Spectroscopic Study of the N159/N160 Complex in the Large Magellanic Cloud"** Cecilia Fariña et. al. 2009).

The HII Region N160 and the "Ghost Head Nebula"

Moving the telescope away from N158 in the opposite direction to 30 Doradus we find another region of the complex under observation, N160. Yasushi Nakajima *et. al.* in their paper **"Near-infrared Imaging Observations of the N159/N160 Complex in the Large Magellanic Cloud: Large Clusters of Herbig Ae/Be Stars and Sequential Cluster Formation"**, *The Astronomical Journal* (2005), divide N160 in two parts, N160-north and N160-south. The first one (older) is situated in the zone coincident with an asterism I could easily identify and I indicate with a red line in **Figure 1** (page 2). On the southern side of this asterism in the area indicated with an ellipse, faint and smooth nebulosity could be seen even without a filter at 42x. This nebulosity stretches to the N160-south region which shows some prominent features. At 78x, very faint nebulosity was visible with faint stars present there. The nebulosity was also visible through a UHC filter but the view was not improved. At 106x and with a UHC filter the nebulosity was very hard to see so in this case lower magnification was better .

N160 region containing NGC 2080 "Ghost Head Nebula". A1 and A2 blobs are the bright dots at the ends of the chain near the center of the picture. Photo obtained by the author using a 16-inch remote-controlled telescope installed at La Punta Observatory in San Luis Province, about 150 miles to the east of Mendoza city.

What Happened in N160-south?

The feature most interesting and conspicuous in this part of the complex, appearing at 42x like a small and round nebulosity (in my opinion the brightest feature of the whole complex under study) is N160A. Actually it is also an NGC object (NGC 2080). Discovered by John Frederick William Herschel in 1834, it is the nebula patch in the middle of the HII regions under observation, nicknamed the "Ghost Head Nebula". NGC 2080 requires higher magnification for a more detailed observation. To the southwest and very close (bounded) to NGC 2080 a small, faint and round nebula was visible. The star HDE 269953, the brightest one in the area (visual magnitude 9.9), was visibly immersed in faint nebulosity in the zone where the nebulae NGC 2085, 2086 and IC 2145 lie. At this magnification these nebulae were not visible at all.

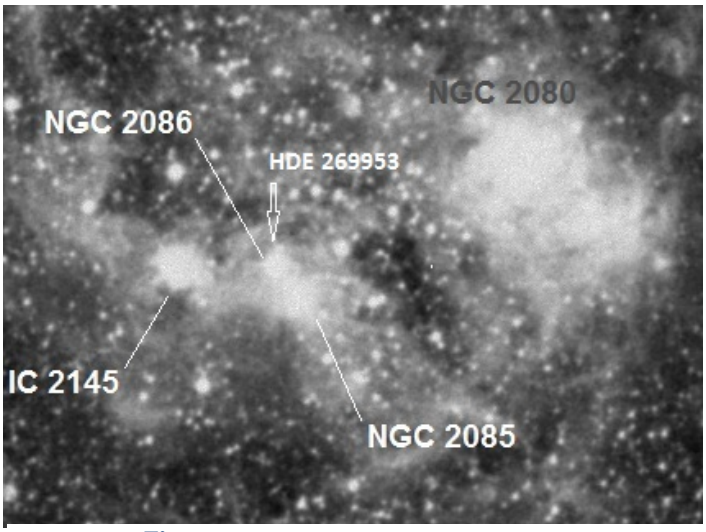


Figure 2. The N160 region. North is up.

Using a UHC filter, NGC 2080 looks very bright and small suggesting a slight elongation. Again, faint nebulosity close to this object was detected. To the east-southeast, two "stars" were visible embedded in a zone of nebulosity.

The view of NGC 2080 at 78x without a filter starts to suggests two small patches of nebulosity with similar brightness. They are very close each other and to discern them was very hard so higher magnification was necessary for a better view. Faint nebulosity was viewed very

close to those patches and at this power it seems to engulf them. The view of NGC 2080 and the nearby nebulosity through an UHC filter was similar.

About 2.7 arc minutes to the east-southeast of NGC 2080 lie a group of small objects (see **Figure 2**). A pretty faint and small nebula dot was visible like a little defocused star. According to the position given by the STScI DSS web page it is IC 2145. The zone connecting this object with NGC 2080 displays faint nebulosity that was better viewed using averted vision.

The star indicated with the arrow in **Figure 2** and IC 2145, a diffuse nebula according to the NGC/IC Project web page, were visible at 78x and with a UHC filter. This source indicates the position of NGC 2086, another diffuse nebula, coincident with that star. I found an observing report where it is stated that NGC 2086 is a very small nebula almost hidden by a 10th magnitude star, while the STScI DSS web page gives the same object for NGC 2086 as that for IC 2145. The sharp and bright view of the star through a UHC filter in my 8-inch supports the idea of the nebulae-nature of this star and/or the immediate surrounding area. Whatever the case, both the star/nebula and IC 2145 appeared embedded in fainter nebulosity. Observing carefully a faint "dot" was visible within that nebulosity close to the mentioned star.

The view of the "Ghost Head Nebula" at 106x was very interesting and worked very well to see the details of this region in the middle of the complex. Averted vision suggests the presence of three bright and small patches (see picture in preceding page), the patches are surrounded by faint nebulosity. This nebulosity is also visible toward the southwest where a faint star is visible within it, near the center. Through a UHC filter it was not easy to discern the three patches of NGC 2080, the zone showed "granularity" and appeared bright.

The two hazy objects IC 2145 and NGC 2085 close to the star HDE 269953 in **Figure 2** looked very small resembling distant and compact open clusters. The fainter one (NGC 2085) is situated close to the star, the other one (IC 2145) is a little brighter and was easier to see.

A final observation of NGC 2080 using high magnification (360x) in a 16-inch telescope to try to see "the eyes" showed a blurry image. However, a sort of chain of small nebulae objects embedded in nebulosity could be seen.

The "Eyes of the Ghost"

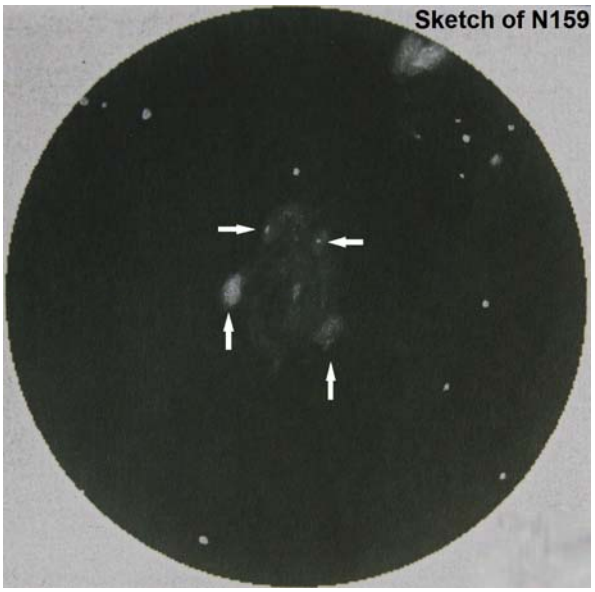
NGC 2080, the Ghost Head Nebula. Copyright: ESA, NASA, & Mohammad Heydari-Malayeri (Observatoire de Paris, France)

Heydari-Malayeri & Testor (1986) discovered two compact HII regions embedded in N160A identified as N160A1 and N160A2, the "eyes of the ghost" (bright spots in the picture to the left). These objects belong to the special class of so-called High Excitation Blobs (HEBs[3]) in the Magellanic Clouds. HEBs are very dense small regions usually 5" to 10" in diameter. A1 (left) is powered by a single massive star. A2 (right) harbors several exciting stars enshrouded by large quantities of dust. The best part of this story is that they can be glimpsed through a common amateur telescope like an 8 inch using high magnification and good seeing conditions!

The N159 Cloud

Interesting! Roughly round in shape this cloud has maybe the most striking appearance of the three patches in the complex. The line of three stars (between magnitudes 9.4 and 11) labeled **B** in **Figure 1** was used as a guide to identify this HII region. At 42x N159 looks like a round and smooth nebula with a few bright spots on the periphery (I talk about them below) distributed in the form indicated by arrows in a sketch I made. Through an 8-inch telescope and without a nebular filter the dark feature across the "disk" in N159 was glimpsed for moments using averted vision and observing carefully (see DSS image – **Figure 3**).

The brightest and easiest patch to see is N159A (also named NGC 2079), situated on the southwest corner of N159.



Sketch of N159 made by the author. The four patches seen through an 8-inch telescope, two are nebulae in appearance (below in the sketch) and the other two look stellar (up in the picture)

The "patch" labeled **A** in **Figure 3** looked like a star and is coincident with the position of LMC X-1 (read about this objet in N159´s Features section below). Higher power was necessary to observe and identify the east region where NGC 2084 and a supernova named SNR 0540-697 are situated.

Using the same magnification with a UHC filter the view was clearer because N159 looked more contrasted to the background sky and definitively round in shape. The dark lane across N159 was glimpsed with averted vision.

Only two of the four spots in N159 were clearly visible through this filter, by far N159A is the most obvious being visible like a defocused star or very small spot of nebulosity. Fainter and less contrasted is the other patch situated more centrally in N159 (see **Figure 3**). Its position seems to match that of NGC 2084. However, higher magnification was necessary in order to have a better view.

At 78x, NGC 159 was clearly visible. It is still necessary to use averted vision to discern the black feature inside. The four "patches" are again visible; two of them are undoubtedly nebula in appearance and somewhat similar in apparent size. The other two clearly look like stars.

At the same magnification but this time using a UHC filter the cloud looked round and smooth in brightness. The two nebulae patches were detected immediately, especially N159A which is the brightest one. In fact, N159A is brighter than the rest of N159 cloud. Using the configuration offered by the two stars indicated with **A** and **B** in the lower panel of **Figure 3** and the nebula N159A the other patch seems to be NGC 2084. This was later confirmed while having an observation of the zone with a 16-inch telescope. This telescope also made possible the identification of other features situated between both patches as indicated with white arrows in **Figure 3** (lower panel). According to the NGC/IC Project web page (http://www.ngcicproject.org/ngcicdb.asp) NGC 2084 is a bright nebula. Once again the black feature was barely visible using averted vision.

An observation of this object at 106x (a good magnification) showed the two round nebulae patches appearing similar with N159A being slightly smaller and brighter.

As usual for most of the nebulae the H-beta filter didn´t work to observe N159

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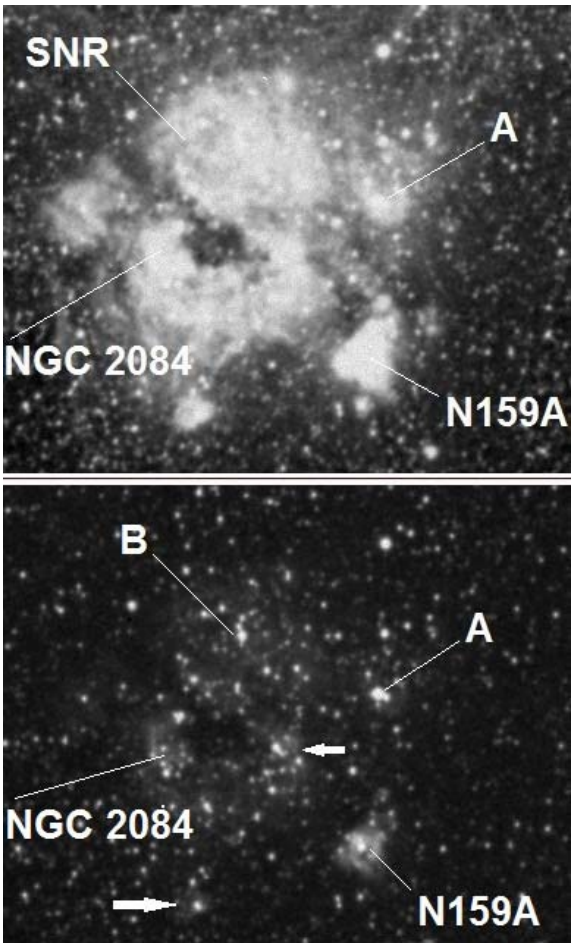


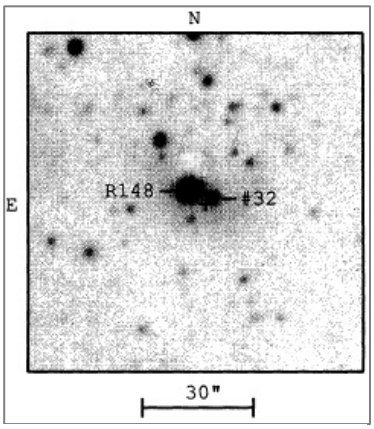
Figure 3. North is up.

N159´s Features

A Supernova Remnant and an X-ray source

A recently identified supernova remnant lies within N159. I´m talking about SNR 0540-697, which is situated at 05h 40m 00s -69° 45´ 10" (J2000.0) according to MCELS (The UM/CTIO Magellanic Cloud Emission Line Survey). On the northeast corner of N159, a small zone slightly brighter than the rest of the cloud was visible in the zone coincident with the position of the supernova remnant when viewed through an 8-inch telescope at 78x and with a nebula filter. However, 0540-697 is not an object for amateur astronomers. The supernova remnant, discovered by Chu et al. (1997), is difficult to observe in optical and radio due to emission from the surrounding H II region N159.

Not too far from this remnant and indicated in the DSS image with letter **A** we find LMC X-1 which along with Cyg X–1 is one of only two known persistently luminous x-ray binaries consisting of a black hole accreting the wind of a massive blue star (**"The nature and cause of spectral variability in LMC X–1"** L. Ruhlen et. al. 2011). I think the star visible there through my 8-inch telescope at different magnifications is surely R148, a B5 type supergiant star in LMC with a visual magnitude around 12.5, one of the four "patches" in N159. The fainter star very close to R148, labelled #32 in the photo to the right, is probably the optical counterpart of the x-ray source LMC X-1.



The 14.8 magnitude star #32 is the optical counterpart of LMC X-1, a radio source in our satellite galaxy. This photo appears in Figure 2 in the paper "Determination of the Optical Counterpart of LMC X-1" (A.P. Cowley et. al. 1995).

The "Papillon Nebula", an elusive object

Situated in the HII region N195, this small nebula is also the prototype of the HEB family, "High-Excitation Blobs" (Heydari-Malayeri & Testor 1982) that constitute a rare class of ionized nebulae in the Magellanic Clouds, according to the paper **"Stellar Populations Associated with the LMC Papillon Nebula" by F. Meynadier *et. al.* (2004),**. It is known with the name N195-5 and its angular dimension is about just 2x2.8 arc seconds.

If current researchers are right… will generations in a remote future see a "new 30 Doradus" in this part of our neighbor galaxy?

1_ OB Association: The concept of a stellar association was originally introduced in 1949 by V. A. Ambartsumian, who later separated them into OB and T associations (Ambartsumian 1968). Morgan, Sharpless, & Osterbrock (1952) considered as a stellar association any loose group of stars within an area where bright OB stars exist and with evidence of a common origin.
A recent definition of a stellar association (Kontizas et al. 1999) refers to it as a single, unbound concentration of early-type luminous stars, embedded in a very young star forming region.

2_ WR Star: Wolf-Rayet stars are hot massive stars (20+ solar mass) with a high rate of mass loss. Strong, broad emission lines arise from the winds of material being blown off the stars.

3_ HEB: Stands for High Excitation Blobs, compact HII regions which constitute a rare class of ionized nebulae in the Magellanic Clouds. They are characterized by high excitation, small size, high density, and large extinction compared to typical Magellanic Cloud HII regions. These objects are tightly linked to the early stages of massive star formation.

Minutes of the Rose City Astronomers Board March 5th 2012

Held at OMSI Classroom 1
Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership)
Mark Martin (VP Communications)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Howard Knytych (New Member Advisor)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
Greg Rohde (Telescope Library)
David Nemo (Observing Site Director)
Scott Kindt (Newsletter Editor)

Call to Order

The meeting was called to order at 7:25pm by Sameer Ruiwale and, there being 11 board members present, the quorum requirement of 9 was declared to be met.
Approval of Minutes
Moved: Approve minutes from the January 2012 board meeting. Moved: Howard. Second: Ken. Approved 11-0-0.
Moved: Approve minutes from the February 2012 board meeting. Moved: Duncan. Second: Sameer. Approved 11-0-0.

Directors' Reports

· Secretary's Report – Duncan Kitchin: Quorum (9) met with 11 voting members present.
· Treasurer's Report – Larry Godsey: Not able to attend, but report submitted in advance: monthly itemized reports are available on the website. Please send Larry any bills and he will prepare checks as required.
· VP Programming – Mark Martin: Mark read through Rod Mollise's blog post describing his presentation, and wrote to him expressing thanks again. Also spoke with Greg Crinklaw, who originally suggested Rod Mollise as a speaker. Greg has created a starter edition of SkyTools, and is prepared to make available to the club a number of licenses for use by club members at no cost. Last remaining speaking spots have now been filled. August: Professor Fulvio Melia will be visiting from the University of Arizona. Professor Melia is an excellent speaker and a very accomplished astrophysicist with a large number of publications to his name. In November we have Dr. Doug Buettner who helped to develop Aerogel which has been used in NASA missions such as Stardust. Sue French was not available in August, but has tentatively agreed to speak next November.
· VP Observing – Ben Carlson: Not present, but Sameer still acting in role during handover. Sameer: Working on permission letter for the Kah-Nee-Ta site. Expecting to have that in hand by next week. 10th March is the deadline for booking before the room block expires. Room commitment of 20 room nights; currently at 5 or 6.
· VP Community Affairs – Dawn Willard: Not present.
· VP Membership – Ken Hose: Last month had 9 new members sign up and 5 renewals. Total member families now stands at 341 compared to 323 last year and 330 the year before that. Greg has been through the new member packet and has assigned chapters for review and sent to board members. Suggestion from Sameer to add a handout about astronomy related software; commonly receive requests for recommendations. Ken will update the star party list.
· Alcor – Ken Hose: Submitted documents for an outreach award for Greg.
· New Member Advisor – Howard Knytych: This month will present "how to present a messier marathon". Howard is thinking about whether to continue the new member presentations repeating in a cycle, or whether to develop new materials. Discussion: should keep as it is; new member presentations are intended to be an introduction for beginners and the repeating cycle serves that purpose well.
· Media Director – Diana Fredlund: Will have a news release about this month's meeting out this week.
· Sales – Larry Froberg: Brought in $279 in sales in the last month, bringing the year to date total to $3760. We are now 4 calendars beyond the breakeven point; still have 20 left. Will be contacting printers about pricing for larger calendar, and technical details for prints. Still have 5 cat books remaining. There are 7 people still on the list who signed up for the books; Larry will be contacting them and sell the books to whoever wants them. Suggestion: send the remaining calendars to people we would like to show them, such as TV stations; could also give as gifts to speakers. Diana will provide a list of possible recipients. Mark: we have book events coming up for each of August, September and October: Fulvio Melia's book "Cracking the Einstein Code", Brother Guy Consolmagno's new edition of " Turn left at Orion" and Richard Berry's new work on optical design.
· Book Library – Jan Keiski: Jan wants to thank those who responded to an appeal for volunteers that was sent out prior to the last meeting.
· Telescope Library – Greg Rohde: Still trying to sell two surplus to requirements scopes: a 6" Newtonian OTA and a 10" Newtonian on a German equatorial mount.
· IDA – Dawn Nilson: Not present.
· Magazine Subscriptions – Larry Godsey: Not able to attend, but report submitted in advance: Nominal.
· Webmaster – Larry Godsey: Not able to attend, but report submitted in advance: Nominal.
· Site Committee – David Nemo: No updates.
· Youth Director – Ada Hayes: Not present.
· Newsletter Editor – Scott Kindt: Newsletter in production now.
· SIGs – Scott Kindt: Nominal.
· OMSI –Jan Keiski: March 17th there are OMSI public star parties at Rooster Rock and Stub Stewart. March and April are both confirmed for the auditorium.
· Sister Club update – Jan Keiski: GAMA held a highly successful Southern Messier Marathon.

Old Business

· Proposal for RCA / Clackamas Comm. Coll Haggart Observatory

use – David Nemo / Sameer Ruiwale. Waiting to hear back on the agreement.
· Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde. No updates.
· Stub Stewart Observatory and option for housing club's 12" LX200 scope there – Greg Rohde. Working on the 10" scope; looking for a drive gear.

New Business

· Diana Fredlund: could we get some generic club business cards printed with information about meetings? This would be useful to hand out to people to publicize the club. Sameer & Diana will work on this.
· May General meeting – Info fair format. One of the issues raised last year was that everything was happening at once, and this made it difficult for people to see everything. Propose that each SIG prepare a short presentation and issue a schedule of designated times. Presentations could happen at the SIG booths, but in such a way that members are better able to get to see what they want. Ken: moved to eliminate the info fair. Second: David Nemo. Possible alternative: have some time set aside before general meeting alternating with new members meeting. Motion fail 3-5-3; we will keep the info fair for the time being.
· Bylaws Review – Part 1. Discussion? How much should we change? There are numerous sections that are in need of clarification. Agreed to start with discussion of Section 4.3. Discussion on process for electing officers. Moved: create a draft set of bylaws to be edited prior to approval. Second: Diana Fredlund. Motion passes 11-0-0. Diana: would like to eliminate text in the draft between "The RCA board will select volunteers… " and "… at the August General Meeting". Strike the word "consecutively" from the preceding sentence. Remove corresponding rows from election process guidelines. Moved: Duncan. Second: Sameer. Motion passes unanimously.

Adjournment

There being no further business, the meeting was adjourned at 9pm.

Neil Heacock talking about Differential Flexure in telescope imaging systems.

2012 Imaging The Sky Conference

The 2012 Imaging the Sky Conference was held May 5th and 6th. The conference was well attended with just over 60 attendees on Saturday and a few less on Sunday. Thanks to Intel for allowing us to use this fantastic auditorium. Topics included:
Saturday, May 5
- Solar Eclipses and Transit Excursions, Greg Babcock
- An Introduction to Astrophotography for Terrestrial Photographers, Greg Marshall
- Automating the Observatory, Miguel Casas
- PixInsight Image Processing Software, Sean Curry
- Collaborative Imaging, Duncan Kitchin
- Better Acquisition - Cleaning Up Our Images, Neil Heacock
- Share Your Image Session, Various Attendees
- Astro Gear Swap Meet

Sunday, May 6
- Optical Configurations for Astrophotography, Richard Berry
- Astronomical Spectrographs, David Haworth
- Variable Star Observing with CCD's, Tim Crawford
- Differential Photometry, Tim Crawford
- Detecting Exoplanet Transits: Adventures in Milli-mag Photometry, Ken Hose
- Asteroid Light Curves and Occultations, Joe Garlitz

A lot of great presentations and discussions took place. Stay tuned for information on the next conference session.

May 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4 Noon Downtowners Luncheon Kell's	5 10am - 3pm Telescope Workshop
6	7 7pm Board Meeting OMSI Classroom 1	8	9	10	11	12 OSMI Star Party Rooster Rock and Stub Stewart
13	14 7pm Astro Imaging SIG Beaverton Library	15	16	17	18 Camp Hancock Star Party	19 Camp Hancock Star Party Stub Stewart Star Party
20 OMSI Star Party Solar Eclipse 5-7:30pm	21 6:30pm Junior Astronomers **7:30pm** **General Meeting** **OMSI Auditorium**	22	23 7pm Cosmology SIG	24	25	26
27	28	29	30	31		

June 2012

Jun 02	Saturday	Telescope Workshop	Swan Island	10am-3pm
Jun 04	Monday	Board Meeting	OMSI Classroom 2	7pm
Jun 05	Saturday	OMSI Star Party	Transit of Venus - OMSI South Parking Lot	3pm-9pm
Jun 08	Friday	Downtowner's Luncheon	Kell's	Noon
Jun 11	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Jun 15-17	Fri-Sun	Maupin Star Party	Wapanita Air Strip near Maupin	
Jun 16	Saturday	Rooster Rock Star Party	Rooster Rock State Park	Sunset
Jun 18	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Jun 20	Wednesday	Cosmology SIG	Linus Pauling House	7pm
Jun 22-24	Sunday	SkyView Acres Star Party	SkyView Acres near Goldendale WA	
Jun 30	Saturday	Telescope Workshop	Swan Island	10am-3pm
Jun 30	Saturday	OMSI Star Party	Rooster Rock and Stub Stewart State Parks	Sunset

http://www.rosecityastronomers.org

Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

Volume 25, Issue 06 Newsletter of the Rose City Astronomers June, 2012

Where does all this come from?

Ethan Siegel

All of this -- everything that we know of in existence -- had to come from somewhere. In this journey, we'll start with the world that we know and journey out into the Universe, exploring where the elements that form everything on our planet originate from, how they were created in previous generations of stars, where the building blocks of those stars came from and how they formed into galaxies, where those very first atoms came from in the earliest stages of the Big Bang, and finally, why we have a Universe with something in it instead of nothing at all.

Ethan was born in New York City as the son of a Jewish postal worker. He did his undergrad at Northwestern, taught public school in Houston, Texas and Los Angeles, California, before moving to Florida, where he got his PhD in theoretical astrophysics at the University of Florida. After that, he moved to Madison, Wisconsin, where he taught at the University of Wisconsin, ate too much cheese, and also met his life partner, Jamie. After working in astrophysics research at the University of Arizona and starting the world-renowned science blog, Starts With A Bang, he moved from the hellish desert to rain-soaked Portland in 2008. Since then, he's been a professor at the University of Portland and Lewis & Clark College, grown a nationally renowned beard and mustache, got invited to join a circus and probably drank more beer than a healthy person should. He currently works as the science and health editor at trapit up the street at Eastbank Commerce Center, and can't wait to tell you a little bit more about the Universe.

All are Welcome! Monday June 18th

Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Planetarium

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

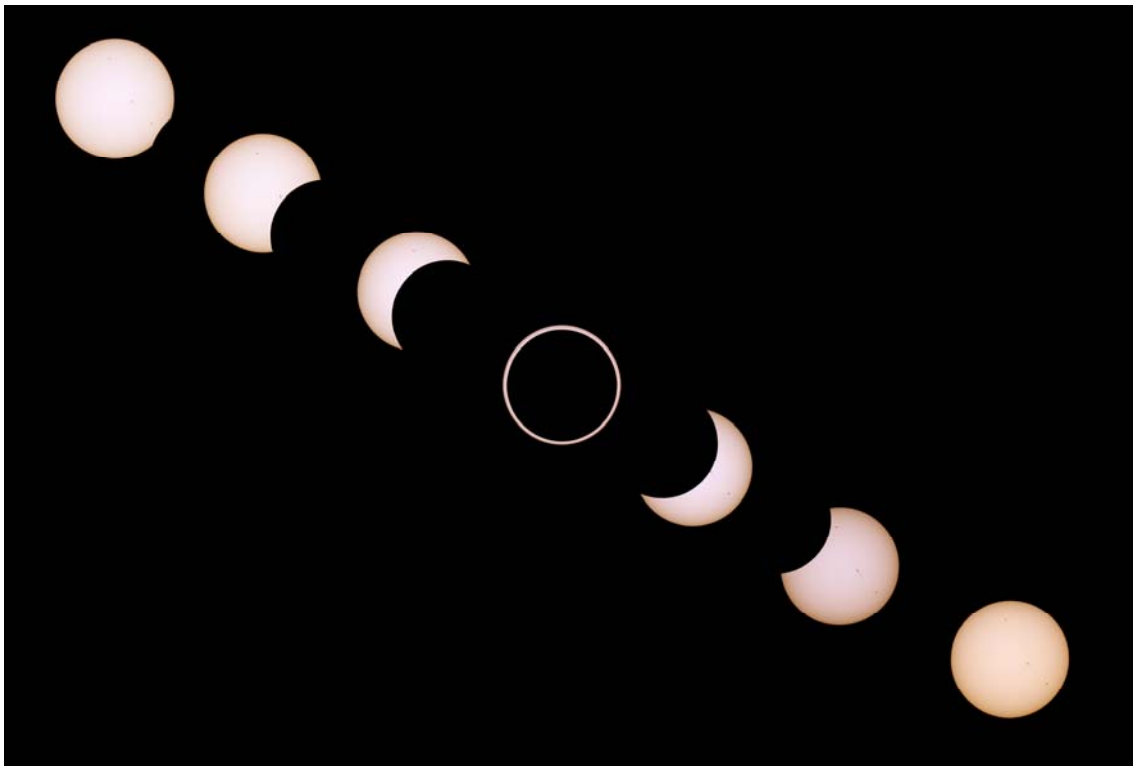
Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Jun 11	Jun 19	Jun 26	Jul 03

Astrophoto of the Month

It's a composite of images taken 24 minutes apart, 1/2000th second, ISO 100 through a Kendrick Baader filter on a William Optics Megrez 90 refractor using a Canon Rebel XS. Some Photoshop work to compose the composite, sharpening and color balance towards the yellow/orange for a warmer look. The Baader film gives solar images a cold, blue look.

The composite timeline begins at the upper left and ends just before sundown at the lower right. It was a wonderful experience!



Annular Solar Eclipse

By: Bruce Alber

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, Jun 11th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: On Hold
Location: TBD
TBD
Topic: TBD

Leader: Vacant
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, July 6th, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, July 16th, 6:30pm
Location: OMSI Planetarium
Topic: TBD
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, Jun 30th
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wednesday, Jun 20th, 7pm
Topic: Exoplanet Discoveries

Presented by: Ken Hose
Location: Linus Pauling House
SIG Leader: Viktor Berstis
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

CLUB OFFICERS

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OMSI Liaison	Jan Keiski	omsi@rosecityastronomers.org
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SIG Director	Scott Kindt	sigs@rosecityastronomers.org
Youth Programs Director	Vacant	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information and payment options please see the website.

http://www.rosecityastronomers.org/mags/index.htm

Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.

http://www.rosecityastronomers.org/library.htm

Jan Keiski <library@rosecityastronomers.org>

RCA Dark Sky Star Parties

Rooster Rock - Jun 16, 2012

This is an RCA member star party and is not one of the OMSI public star parties. There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.

There is an Oregon State Park Day-Use Fee of $5 for parking. Unless you have the Yearly Pass available the Oregon Parks Dept.

SkyView Acres Star Party - Jun 22-24, 2012

Private property located 5 miles NE of Goldendale, WA. Approximately 120 miles from Portland. All roads, except the 200 yard-long driveway are paved At 2,800', Skyview Acres has similar skies to the RCA Maupin site with much less light-bubble to the west. Minor light bubble from Yakima, the Tri-Cities area and The Dalles. Good horizons. Come and observe your favorite objects and spend a wonderful evening with friends, and friends you haven't met yet.

Nearby points of interest: St John, a Greek Orthodox Monastery's bakery, deli, and gift-shop (about 5 miles north on US97), Goldendale Observatory State Park, Maryhill Museum and Stonehenge Peace Memorial. More information can be found at http://www.rosecityastronomers.org/sp/skyview.htm

Maupin Star Party
June 15-17, 2012

The Rose City Astronomers have been granted permission to use private property approximately 8 miles West of the town of Maupin for members-only scheduled Star Parties.

The Maupin Observing Site is located on a private airstrip about 8 miles east of Maupin, Oregon. Warning: this airstrip is used in the morning, but at the far end of the airfield. Most people don't even wake up.

There is no registration for the event itself, just show up and enjoy the weekend. You don't even need a telescope to participate; other members are enthusiastic to share their views. This is a good opportunity for beginners to get acquainted and seasoned observers to get some serious observing.

It can always be cold at night no matter what the season, so bring warm clothing.

RVs, trailers and tents will be allowed on the observing site (see observing site map for instructions). The town of Maupin offers lodging, restaurants and recreation if you don't want to rough it. We will have a portable outhouse on site.

More information can be found on the RCA website:
http://www.rosecityastronomers.org/sp/maupin.htm

Other Star Parties

Sunriver Star Party - Jun 21-23, 2012
Brothers OR

The Brothers site is located just outside Brothers, Oregon Brothers is 40 miles East of Bend, OR. This is a primitive prairie site. Be prepared to camp out and bring your own supplies and water. Portable toilets will be available. This site is DARK and provides an excellent view of the surrounding horizon. This site is only 45 miles SW of the OSP location. Click link for more information.

Table Mountain Star Party - Jul 19-22, 2012
Near Ellensberg WA

The Table Mountain Star Party is an annual gathering of people interested in astronomy and its many related topics. Most people attending are amateur astronomers who enjoy the great viewing which the mountain provides, however, anyone with an interest or curiosity is welcome to register and enjoy the experience. Programming is provided for everyone from the seasoned astronomer to the beginning novice. Click link for more information.

Golden State Star Party - Jul 18-22, 2012
Adin CA

The Golden State Star Party is a 4 night dark sky event held each summer at Frosty Acres Ranch in North-Eastern California, near Mount Lassen, alongside rural Adin, California. GSSP has dark skies from horizon to horizon, and room for 100s of astronomers. Click link for more information.

OMSI - Summer Solstice Star Party
June 30th, 2012

Held at Rooster Rock & Stub Stewart State Parks.

Viewing highlights include the moon, Saturn, Mars, deep sky objects including the star cluster, M3, M13, M57 and more! The ISS could make an appearance.

See http://omsi.edu/starparties for more information or cancellations.

Star Parties Coming Soon!

White River Star Party	Jul 14
Trout Lake Star Party	Jul 20-21
OMSI Lunar Viewing Star Party	Jul 28
Stub Stewart Dark Sky Star Party	Aug 11
OMSI Perseid Meteor Shower Watch	Aug 12
Oregon Star Party	Aug 15-18
Camp Hancock Star Party	Sep 14-15
Mt. Bachelor Star Party at Sunriver	Sep 13-15
Rooster Rock Dark Sky Star Party	Sep 15
White River Star Party	Sep 21
OMSI Autumnal Equinox Star Party	Sep 22

The Observer's Corner

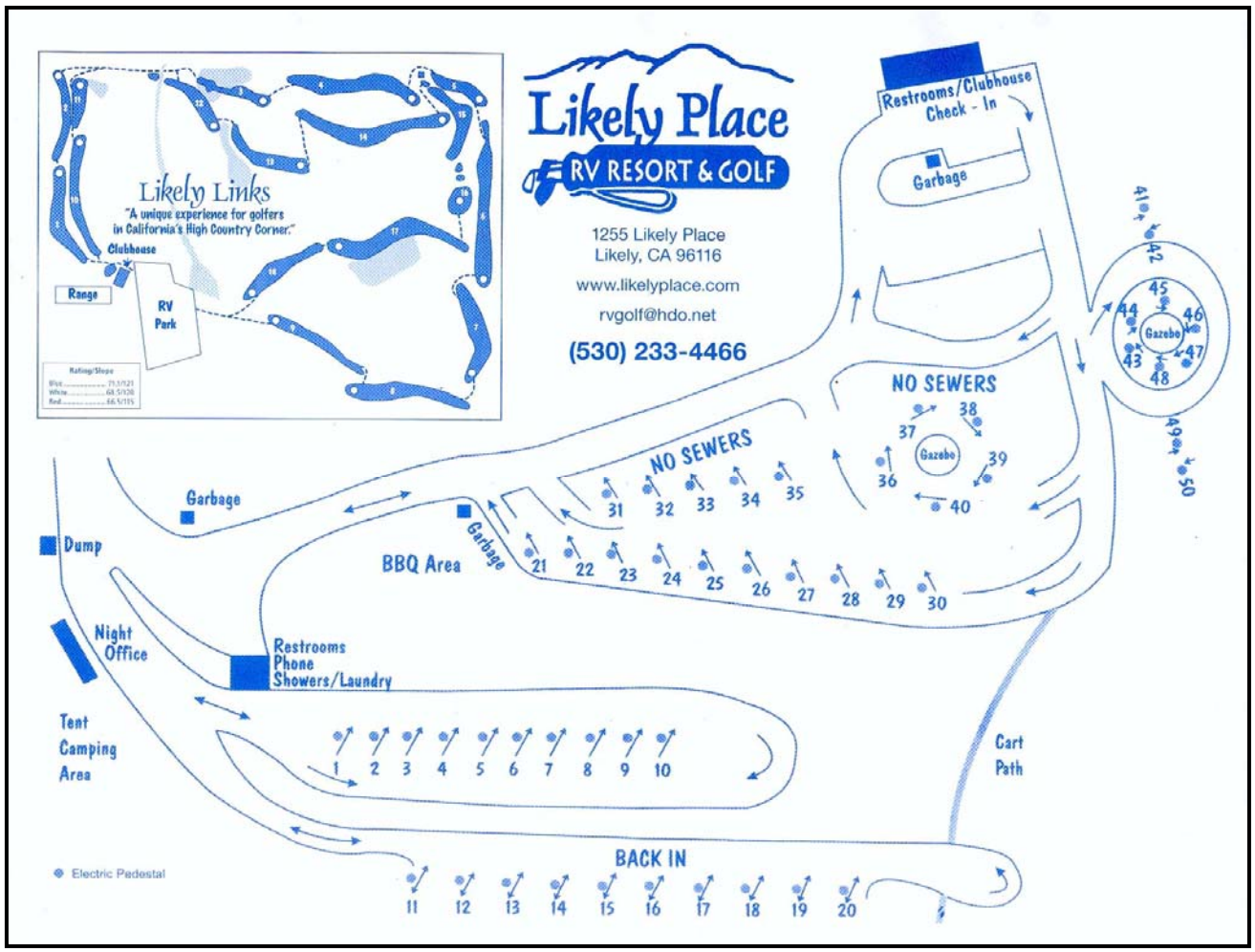
Howard Banich

A Likely Story

Tucked away in a remote spot in northeast California is an oasis for those looking to escape the interminable clouds and rain of northwest Oregon – the Likely Place RV and Golf Resort (http://www.likelyplace.com/). I first heard about it a few years ago at the Golden State Star Party (GSSP) and thought that I'd go someday. Then I read about it in the March 2012 issue Astronomy Magazine article by Tony Hallas at about the same time I was fed up with not being to observe for three months because of our frustrating Oregon weather. It was time for my first visit.

Any place that combines two of my favorite activities has got to be good. My plan was to go in March but the weather this spring in Likely had been just about as cloudy as here in Oregon, and it wasn't until the April new moon that the forecast opened up. I packed up the van and after a 7 hour drive from Portland I arrived in Likely, a wide spot on Highway 395 in the middle of cattle country, took a left turn on Modoc County Road 64. After a mile and half I came to the access road to Likely RV and turned right.

Another half mile of paved road brought me to the RV park itself. The two upper levels are spacious and laid out well for large RV's, with a smaller lower level for smaller RV's and tent camping. Electric and water are available at each pull-in, and the rates are around $32 a day. There are two gazebo's on the upper level for groups to use for barbeques. For those who can't do without indoor plumbing, women's and men's bathrooms and showers are available. There's also a laundry room if you plan on staying awhile.



They have a wireless connection available throughout the RV park but it wasn't working for the three off-season April days of my first visit and it was intermittent in May when I was there for the annular solar eclipse. There's a good signal for Verizon phones but practically none for AT&T.

The golf course has few trees and only one sand trap and the fun layout has consistent greens, but the clubhouse and restaurant weren't yet open in April. They open in mid-May.

This is all fine and dandy, but how dark, transparent and steady are the skies, and is the RV park a good place to observe from? I'd been told that the skies were about the same as at GSSP, which is very good and for me worth the 7 hour drive. Now that I've been there I agree, but a plus for Likely is that the observing environment isn't surrounded by farm lights along the horizons like at GSSP, so feels darker.

Likely RV is a little over 4400 feet altitude in an environment very much like central Oregon.

It's a mostly friendly place for astronomers, and we can thank the good folks at Stellarvue for that. They've been holding a customer star party at Likely RV for the past few years so the management knows what we want – no lights. On my April visit they were happy to turn off the outdoor lights at the restroom. The gentleman running the resort even asked me if I'd like him to turn off the lights before I had a chance to ask.

It was a different story in May when Chuck and Judy Dethloff, who arrived before I did, had to ask repeatedly for the lights to be turned off. Also, there's a bright light on a pole on the upper level of the RV park that can spoil your dark adaptation no matter where you are in the park, so be sure to ask to have it turned off too.

Another consideration are the interior bathroom lights. They're on a timer, and can spoil your dark adaptation if you're set up too close or don't block them with your RV because there are no curtains on the bathroom windows. Perhaps the best spots for astronomy are 9, 10 and 20 because they're the farthest from these lights and have the best southern horizons.

The photo below looks due south from spot 20, which is on the lower level.

I was there for three nights in April and each was fabulous. The darkest SQM reading I got for each night was 21.81, 21.78 and 21.80 respectively, which means it's just as dark as GSSP and OSP skies. The seeing was – at times - around 1 arc second the first night and 1.5 to 2 arc seconds for the second and third nights, which is more typical of GSSP skies. In short, the observing was excellent.

I think these conditions are rather typical for Likely, but that's no guarantee it's always this way. February and March were just about as cloudy and wet as they were in Portland so pay close attention to the weather reports before heading down.

Transparency was around 8 on a scale of 10 and there was little wind during the night and only a gentle breeze during the day. I really liked the breeze during the day, especially as I was drifting off for an afternoon nap, listening to the gentle mooing of a distant heard of cattle.

There were more clouds to contend with in May and out of three nights we had one good full night of observing, with less than half of the second night. The third night was mostly cloudy. We were too tired from the eclipse to observe anyway, but that's another story.

There's a large pond on the south end of the RV park that was full of ducks and frogs in April, which made for a surprisingly reassuring symphony of croaks and quacks to accompany my observing. It was a little quieter in May but still nice.

Horizons vary depending on were you are in the RV park, but mostly they're pretty good.

If you set up on the lower level there's a line of trees that block the northwest sky but everywhere else the horizons are quite good, with the southern horizon being the best. You'll notice that objects in the south are a little (5 degrees) higher than in the Portland area.

You can set up your scopes on the pea gravel next to your rig or depending on your RV pull-in, on a small strip of grass and leave them set up all day without worry. You'll probably get a visitor or two asking about your equipment, but that's almost always an enjoyable interaction and a chance to invite a few folks over for a look or two later that night.

Overall, I'm impressed with Likely Place RV and Golf Resort. It's the best combination of true dark sky observing and amenities I've come across, and I especially hope to return during the fall and spring months when we're having our worst weather in northwest Oregon.

This is a good match to their off-season (October through early May) when the upper level of the RV park isn't open and there are much fewer visitors. In April I was one of about 6 visitors, but in May the place was nearly full because of a golf tournament – which made a big difference in the overall ambiance and the amount of light from the big RV rigs. The RCA had a strong contingent of eclipse chasers, which helped fill up the park.

The large photo above shows where I set up in April on the lower level in spot 20, and the tree on the far right of the photo is near where the Chuck, Judy and myself set up on the second level in May in pull-ins 9 and 10. All three are excellent but are by no means the only good RV slots in the park for astronomy. Number 30 could be the best of all if your fellow RV'ers turn their lights off.

If you're like me and have just about had it with missing out on observing during the winter and spring, Likely Place RV and Golf Resort is an excellent choice for an extended and comfortable observing experience. It's not perfect but it's way better than looking at the bottom of the Oregon clouds for most of the year.

Thank Goodness for Magnetism

By Dr. Tony Phillips

Only 93 million miles from Earth, a certain G-type star is beginning to act up.

Every 11 years or so, the solar cycle brings a period of high solar activity. Giant islands of magnetism—"sunspots"—break through the stellar surface in increasing numbers. Sometimes they erupt like a billion atomic bombs going off at once, producing intense flares of X-rays and UV radiation, and hurling massive clouds of plasma toward Earth.

This is happening right now. Only a few years ago the Sun was in a state of deep quiet, but as 2012 unfolds, the pendulum is swinging. Strong flares are becoming commonplace as sunspots once again pepper the solar disk. Fortunately, Earth is defended from solar storms by a strong, global magnetic field.

In March 2012, those defenses were tested.

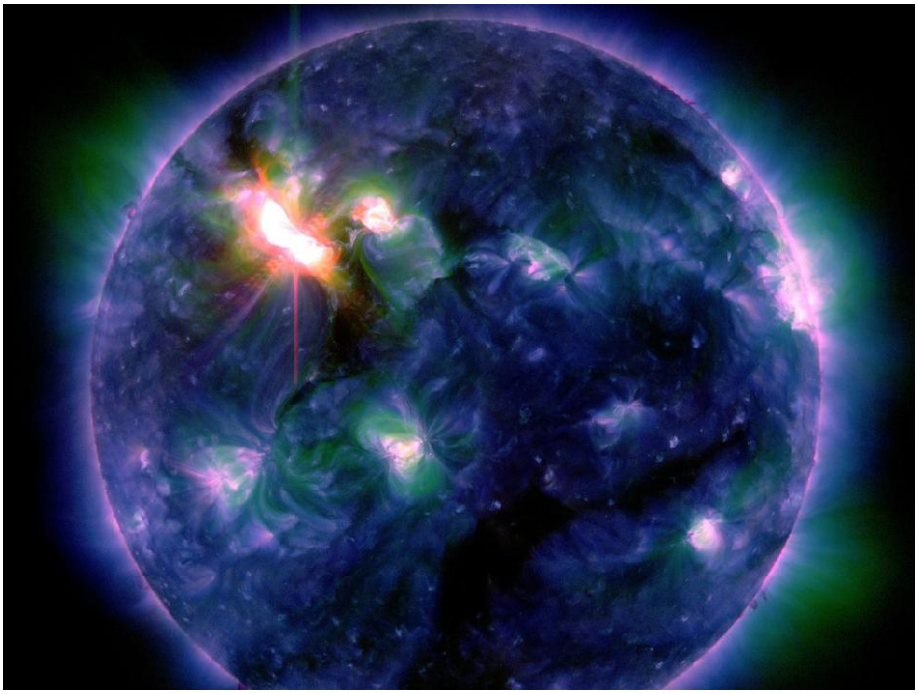
At the very beginning of the month, a remarkable sunspot appeared on the Sun's eastern limb. AR1429, as experts called it, was an angry-looking region almost as wide as the planet Jupiter. Almost as soon as it appeared, it began to erupt. During the period March 2nd to 15th, it rotated across the solar disk and fired off more than 50 flares. Three of those eruptions were X-class flares, the most powerful kind.

As the eruptions continued almost non-stop, Earth's magnetic field was buffeted by coronal mass ejections or "CMEs." One of those clouds hit Earth's magnetosphere so hard, our planet's magnetic field was sharply compressed, leaving geosynchronous satellites on the outside looking in. For a while, the spacecraft were directly exposed to solar wind plasma.

Charged particles propelled by the blasts swirled around Earth, producing the strongest radiation storm in almost 10 years. When those particles rained down on the upper atmosphere, they dumped enough energy in three days alone (March 7-10) to power every residence in New York City for two years. Bright auroras circled both poles, and Northern Lights spilled across the Canadian border into the lower 48 states. Luminous sheets of red and green were sighted as far south as Nebraska.
When all was said and done, the defenses held—no harm done.
This wasn't the strongest solar storm in recorded history—not by a long shot. That distinction goes to the Carrington Event of September 1859 when geomagnetic activity set telegraph offices on fire and sparked auroras over Mexico, Florida, and Tahiti. Even with that in mind, however, March 2012 was remarkable
It makes you wonder, what if? What if Earth didn't have a magnetic field to fend off CMEs and deflect the most energetic particles from the Sun.

The answer might lie on Mars. The red planet has no global magnetic field and as a result its atmosphere has been stripped away over time by CMEs and other gusts of solar wind. At least that's what many researchers believe. Today, Mars is a desiccated and apparently lifeless wasteland.

With your inner and outer children, read, watch, and listen in to "Super Star Meets the Plucky Planet," a rhyming and animated conversation between the Sun and Earth, at http://spaceplace.nasa.gov/story-superstar.
This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Multiple-wavelength view of X5.4 solar flare on March 6, captured by the Solar Dynamics Observatory (SDO) in multiple wavelengths (94, 193, 335 angstroms). Credit: NASA/SDO/AIA

Minutes of the Rose City Astronomers Board April 2nd 2012

Held at OMSI Classroom 1

Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership)
Mark Martin (VP Programming)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
Greg Rohde (Telescope Library)
David Nemo (Observing Site Director)
Scott Kindt (Special Interest Groups Director)
Ada Hayes (RCA Youth Director)

Call to Order

The meeting was called to order at 7:07pm by Sameer Ruiwale and, there being 11 of board members present, the quorum requirement of 9 was declared to be met.

Approval of Minutes

Moved: Approve minutes from the March 2012 board meeting with correction to strike incomplete sentence at end of first paragraph on page 2. Motion passes 10-0-1.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 11 voting members present.

Treasurer's Report – Larry Godsey: Profit and loss sheets and current balances distributed and have also been made available on the website. We are currently running very close to expectations per budget. There is additionally a bill just received for the November speaker's airfare and hotel, which will appear in next month's accounts.

VP Programming – Mark Martin: James Schombert is our speaker for April from the University of Oregon, and will be talking about space telescopes. August speaker has fallen through. Mark is working on a replacement and will have more information in a few days. Info fair will be held in May. In response to comments from last year, we will have a schedule of demonstrations to make it easier for attendees to attend multiple demonstrations. May opt to have multiple "tracks" to make it easier for attendees to plan.

VP Observing – Ben Carlson: Not present. Sameer needs to hand over materials to Ben. Kah-Nee-Ta went very well; there were 38 booked room nights which is almost twice the contracted level. Despite high clouds there was plenty of opportunity to observe. Many new members were in attendance. RCA party at Rooster Rock is set up for the 14th of this month. The following weekend there is a Maupin star party, plus Saturday-only star party at Stub Stewart. All the necessary permits have been received.

VP Community Affairs – Dawn Willard: Not present.

VP Membership – Ken Hose: We had 8 new members and 2 renewals this month, bringing the current membership to 350 families compared to 334 this time last year, and 338 the year before that, putting us well ahead of previous years.

Alcor – Ken Hose: No additional awards in the queue.

New Member Advisor – Howard Knytych: Not able to attend, but sent report via Sameer: no new members meeting this month.

Media Director – Diana Fredlund: Not able to attend, but report submitted via Sameer: recommends giving remaining calendars to speakers and creating a list of media contacts to distribute calendars to for next year.

Sales – Larry Froberg: Reduced price on calendars to $5, but only sold 4 additional. Have 17 calendars remaining. Sales rate is below that for last year, but still above the breakeven point.

Book Library – Jan Keiski: Now have club laptop in the library and looking to upgrade Office software. Inventory has been entered into Excel. Discussion about whether to expend library budget on upgrading the software, or switch to Open Office. Sameer will investigate.

Telescope Library – Greg Rohde: Nominal.

IDA – Dawn Nilson: Not present.

Magazine Subscriptions – Larry Godsey: Nominal.

Webmaster – Larry Godsey: Nominal.

Site Committee – David Nemo: Nominal.

Youth Director – Ada Hayes: Will be extending meeting duration to 2 hours; currently finding that 1 hour is not quite enough. Proposed new schedule is 6:30 to 8:30pm. Would be useful to have access to a projector. The club has one; Sameer will try to track down where it is. Ada will also be setting up a table for the info fair.

Newsletter Editor – Scott Kindt: Nominal.

SIGs – Scott Kindt: Nominal.

OMSI –Jan Keiski: April star parties on the 28th; OMSI is looking for volunteers. May 20th OMSI eclipse event 4 – 6:30pm ; also looking for volunteers. August 5th there is the Curiosity landing which will be shown in the auditorium. Eclipse glasses will be available for sale in the OMSI store.

Sister Club update – Jan Keiski: There will be elections in GAMA this year (probably May or June), resulting in a new GAMA board. On April 28th there will be a public observing night in Palmira, a small town to the east of Mendoza (about 40 minutes driving) to show the Moon and planets. The club is in conversations with Villavicencio natural area to see if they can create an observatory or astronomical park there. On April 14th the club will hold their monthly observing night in Canota. Thinking ahead, in February 2017 there will be an annular solar eclipse visible from Patagonia. GAMA hopes that their RCA friends can join them...

Old Business

RCA generic business cards – Diana Fredlund / Sameer Ruiwale. No updates.

Proposal for RCA / Clackamas Comm. Coll Haggart Observatory use – David Nemo / Sameer Ruiwale. Still waiting for updates from the community college.

Create guidelines for possible telescope award donations to local

schools or other organizations – Greg Rohde. No updates.

Stub Stewart Observatory and option for housing club's 12" LX200 scope there – Greg Rohde. No updates.

Still working on Camp Hancock 13" Coulter telescope.

New Business

Saturday 28th April astronomy day. We have an invitation for participation in the event at Sisters. OMSI representatives will be in attendance. RCA will not be able to support this event with volunteers due to the distance involved.

2012-2013 Budget – initial proposal – Larry Godsey. Proposed budget distributed; shows this year's numbers up to this month, plus last five years. Currently running right around projected budget. Larry suggests sending in proposed numbers for discussion for next year's budget. Action item: everybody to send proposed budget numbers to Larry.

Bylaws Review – Part 2. Ken will post an editable copy of the current bylaws on the web forum.

New member packet; Ken is still waiting for suggestions on updates from several board members. Will be sending reminders by email.

Adjournment

There being no further business, the meeting was adjourned at 8:30pm.

The transit of Venus occurred on Tuesday June 5th. The weather in the morning looked like we might get clouded out for the entire Pacific Northwest. By 2pm it was looking much better and we should be able to see parts of the transit in between cloud banks. By 3:30pm it was more sun than clouds and stayed that way until after sunset. Below is a photo of the OMSI entrance area with many solar telescopes and plenty of people to look through them. There is also an image of second contact through my Lunt solar telescope with a bit of the black drop effect. If you missed this one, the next one is only a few years away in December of 2117.
Scott Kindt

We had a great eclipse "expedition" to the little farming town of Estancia, NM. I wanted to share a photo of my 13-year-old (Harry) with you. Note the perfect ring on his projected image and his choice of attire. :-)
Greg Crinklaw - Astronomical Software Developer skyhound.com

June 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	**2**	**3**	**1**	**2** 10am - 3pm Telescope Workshop
3	**4** 7pm Board Meeting OMSI Classroom 1 	**5** OMSI Star Party - Transit of Venus	**6**	**7**	**8** Noon Downtowners Luncheon Kell's	**9**
10	**11** 7pm Astro Imaging SIG Beaverton Library 	**12**	**13**	**14**	**15** Maupin Star Party	**16** Maupin Star Party Rooster Rock Star Party
17 Maupin Star Party	**18** **7:30pm General Meeting OMSI Planetarium**	**19** 	**20** 7pm Cosmology SIG	**21**	**22** SkyView Acres Star Party	**23** SkyView Acres Star Party
24 SkyView Acres Star Party	**25**	**26** 	**27**	**28**	**29**	**30** 10am - 3pm Telescope Workshop OSMI Star Party Rooster Rock and Stub Stewart

July 2012

Jul 02	Monday	Board Meeting	OMSI Classroom 2	7pm
Jul 06	Friday	Downtowner's Luncheon	Kell's	Noon
Jul 09	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Jul 14	Saturday	White River Star Party	White River parking area near Government Camp, OR	Sunset
Jul 16	Monday	New Member Meeting	OMSI Planetarium	6:30
Jul 16	**Monday**	**General Meeting**	**OMSI Planetarium**	**7:30pm**
Jul 18	Wednesday	Cosmology SIG	Linus Pauling House	7pm
Jul 19-22	Fri-Sun	Table Mt. Star Party	Ellensberg, WA	
Jul 19-22	Fri-Sun	Golden State Star Party	Adin, CA	
Jul 20-22	Fri-Sun	Trout Lake Star Party	Flattop Sno-park near Trout Lake, WA	
Jul 28	Saturday	OMSI Star Party	Rooster Rock and Stub Stewart State Parks	Sunset

http://www.rosecityastronomers.org

Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

Volume 25, Issue 07 Newsletter of the Rose City Astronomers July, 2012

The Southern Sky From Namibia

Last fall, Pat spent over two months as an unpaid astronomer in the NamibRand Nature Reserve of Namibia. This reserve was recently named Africa's First International Dark Sky Reserve and is ranked as one of the darkest places on Earth. As it is just below the Tropic of Capricorn, the Southern Sky is clearly visible from the reserve. Pat will be showing off some of his pictures of the highlights of the area (both in the sky and on the ground). This will be followed by viewing the sky as seen from Namibia using the OMSI Planetarium and a demonstration of Microsoft's Worldwide Telescope software.

Pat Hanrahan is the Planetarium Director and Lead Astronomy Instructor at Mount Hood Community College. He is also a registered professional engineer in both chemical and environmental engineering and an air quality modeling consultant. He is the author of the Sky Simulator II planetarium software, which was sold at OMSI back in the 1980's, and created the EPA's methodology for modeling of atmospheric nitrogen oxide emissions from industrial sources. He holds an M.S. in Chemistry from the University of Illinois - Urbana.

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

All are Welcome! Monday July 16th

Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Planetarium

It's time to RENEW your membership!
Our membership year is from July 1st, 2012 through June 30th, 2013

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Jul 10	Jul 18	Jul 26	Aug 01

Astrophoto of the Month

The sunspot photo was taken on May 11th in the afternoon from my home in Vancouver, WA.

Sunspot 1476 is the huge one.

William Optics
Megrez 90
Canon Rebel XS
ISO 200
Exposure 1/2000

A little color modification, levels, and sharpening in Photoshop CS3.

Clear skies! (yeah!)

Sunspots

By: Bruce Alber

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, Jul 9th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: On Hold
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: TBD

Leader: Vacant
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, August 3rd, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, July 16th, 6:30pm
Location: OMSI Planetarium
Topic: Summer Viewing
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, Aug 4th
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wednesday, Jul 18th, 7pm
Topic: Potluck

Presented by: TBD
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

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Youth Programs Director	Vacant	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information and payment options please see the website.
http://www.rosecityastronomers.org/mags/index.htm
Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.
http://www.rosecityastronomers.org/library.htm
Jan Keiski <library@rosecityastronomers.org>

RCA Dark Sky Star Parties

~~White River~~ - Jul 14, 2012

The White River site is being utilized for road construction materials. We are looking for an alternate location for a star party. Please see http://www.rosecityastronomers.org/calendar or the forum for the latest information.

There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views. It can always be very cold at night no matter what the season, so bring warm clothing.

Stub Stewart Star Party - Aug 11, 2012

This is an RCA member star party and is not one of the OMSI public star parties.

There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.

There is an Oregon State Park Day-Use Fee of $5 for parking unless you have the Yearly Pass available the Oregon Parks Dept.

Trout Lake Star Party
July 20-22, 2012

You will be setting up your telescopes on asphalt or gravel. There are fancy pit toilets on the south side of the parking lot. The nearest gas/food/water is in Trout Lake.

If you bring an RV, park in an organized way that leaves access lanes for others who may be coming/going over the weekend. All RVs must be on the pavement.

You can tent camp on the side of the parking lot in the grassy areas. You will want a ground cloth under your tent and a reflective cover during the day helps keep the inside temperatures down. Propane stoves only and please use them up off the ground on a table or stand. No open fires or charcoal briquettes.

There is no formal registration for the event itself, just show up and enjoy the weekend. You don't even need a telescope to participate; other members are enthusiastic to share their views. This is a good opportunity for beginners to get acquainted.

There are lots of daytime activities in the area. Ice caves, waterfalls, day hike trails and Mt. Adams to name a few.

Directions can be found on the RCA website:
http://www.rosecityastronomers.org/sp/trout_lake.htm

Other Star Parties

Table Mountain Star Party - Jul 19-22, 2012
Near Ellensburg, WA

The Table Mountain Star Party is an annual gathering of people interested in astronomy and its many related topics. Most people attending are amateur astronomers who enjoy the great viewing which the mountain provides, however, anyone with an interest or curiosity is welcome to register and enjoy the experience. Programming is provided for everyone from the seasoned astronomer to the beginning novice. Click link for more information.

Golden State Star Party - Jul 18-22, 2012
Adin, CA

The Golden State Star Party is a 4 night dark sky event held each summer at Frosty Acres Ranch in North-Eastern California, near Mount Lassen, alongside rural Adin, California. GSSP has dark skies from horizon to horizon, and room for 100s of astronomers. Click link for more information.

Oregon Star Party - Aug 14-19, 2012
Near Prineville, OR

Every summer, amateur astronomers gather in the high mountains of central Oregon at a place called Indian Trail Spring in the Ochoco National Forest. Astronomers from all over the world enjoy the warm friendly atmosphere and some of the darkest skies in the United States. Click link for more information.

OMSI - Lunar Viewing Star Party
July 28th, 2012

Held at Rooster Rock & Stub Stewart State Parks.

Viewing highlights include the moon, Saturn, Mars, deep sky objects including the star cluster, M3, M13, M57 and more! The ISS could make an appearance.

See http://omsi.edu/starparties for more information or cancellations.

Star Parties Coming Soon!

Stub Stewart Dark Sky Star Party	Aug 11
OMSI Perseid Meteor Shower Watch	Aug 12
Oregon Star Party	Aug 15-18
Camp Hancock Star Party	Sep 14-15
Mt. Bachelor Star Party at Sunriver	Sep 13-15
Rooster Rock Dark Sky Star Party	Sep 15
Location TBA Star Party	Sep 21
OMSI Autumnal Equinox Star Party	Sep 22
Maupin Star Party	Oct 12-14
Stub Stewart Dark Sky Star Party	Oct 13

The Observer's Corner

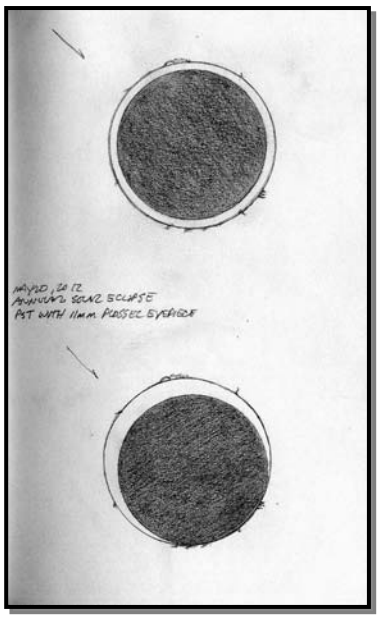
Howard Banich

Eclipse and Transit

May 20 to June 5, 2012. In the space of 16 days we were treated to an annular eclipse of the Sun and a transit of Venus. Centuries go by before a particular location on our fair planet are graced with two such events so count your blessings if you were able to see either, and doubly so if you saw both. Interestingly, they're closely related phenomenon. A transit can be considered a very small eclipse, or an eclipse as a very large transit.

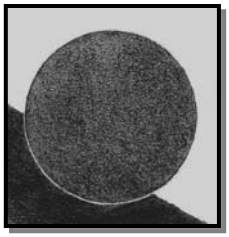
For those of us the Pacific Northwest it took a trip to the southwest corner of the state, or more likely to California to see the annular phase of the eclipse, and many in the RCA did just that. I joined Chuck and Judy Dethloff in Likely California for a few nights of dark sky observing before the eclipse and we drove about an hour south to Honey Lake, almost dead center on the center line of the eclipse to see the perfectly symmetrical annular phase of the eclipse. The entire eclipse lasted a little over two hours, the annular part about four and half minutes but the dead center phase zoomed by in a few seconds.

Watching the entire eclipse may sound boring but in a little over two hours we saw the Moon slide from one side of the Sun to the other, which turned out to not be boring at all. Aside from watching the eclipse itself, looking around and noticing the effects of the eclipse on our surroundings was fascinating. There was also time for taking photos – in my case afocal shots through the PST that didn't turn out very well. The crummy shot here shows what can be done by holding up a digital point and shoot camera to the eyepiece of a PST - I couldn't capture the entire field of view. The eclipse looked really cool through the PST though, especially at 3rd contact when the edge of the moon started covering up some solar prominences, looking like a little bit of a total solar eclipse as shown in the sketch to the right.

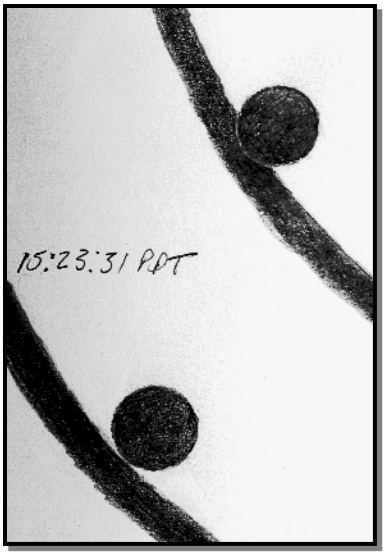


The temperature dropped several degrees, and daylight dimmed enough for way too many mosquitos to come out for dinner. They might have gone away after the eclipse but by then it was their normal time to come out anyway. They did provide us with a little extra incentive to head back to Likely a little faster than we might have though. Overall the annular eclipse was more dramatic and exciting than I imagined it would be. The perfect geometry required to see a perfectly centered moon silhouetted against the Sun made this a special sight indeed.

Viewing the transit of Venus was very different. My wife Judy and I stayed home and leisurely enjoyed the transit from our backyard – that's her looking through my 8 inch Newtonian. It was a real treat to see a major astronomical event from home. The clouds parted a few minutes before 2nd contact and we were able to view the transit almost all the way to sunset after that. Watching the entire transit was too tiring so we found that pulling a few weeds, listening to John Philip Sousa's "The Transit of Venus March" every so often, and making a nice lunch gave the experience a wonderfully relaxed cadence.



The only part that went by too fast was 2nd contact, the instant that the disc of Venus was fully silhouetted against the Sun. Just before this happened, the part of Venus that was still not quite on the Sun showed its back lit atmosphere – the aureole – as an exceedingly thin and delicate curve. As such, for a few moments the full disc of Venus was visible before 2nd contact. This is one of the coolest astronomical sights I've seen.



I also made a timing of second contact, and was tickled pink to find it was only 3 seconds off the official time when I checked after the transit was over.

On the other hand I didn't see any trace of the black drop effect, so I missed this interesting illusion even though I was looking for it. Once second contact was over though, watching Venus inch across the face of the Sun went by pretty slow, but that us the chance to try to observe it without a telescope.

With solar viewing glasses Venus was seen as a tiny dot and it was about as obvious as large sunspots that I've seen in the past. I couldn't see it all with a pin hole projector either so it seems that accidently viewing a transit before the invention of the telescope would have been difficult. It was fun to try these non-telescopic observations just to see what was possible.

I also tried more afocal shots, this time through my 8 inch Newtonian, and some of them turned out pretty nice, like this one.

But now these two great events are over. The next transit of Venus will occur on December 11, 2117 and we'll all miss that one. However, the next solar eclipse we'll see in the Pacific Northwest is on August 21, 2017 which, amazingly enough, is during the Oregon Star Party! It will be a total eclipse of the Sun, the very best and by far the most spectacular kind. For my money, a total solar eclipse is the most spectacular astronomical event of any kind.

The path of totality will go over the OSP although the exact center line will be a few miles to its north, shaving a few seconds off the time of totality for those of us at the star party. Hard to say if that will matter enough to drive north for the eclipse, but one thing is for sure, it's our next big date with the Sun.

Tale of Two Venus Transits

Lugano, Switzerland to Mauna Loa, Hawaii

By Robert D. McGown FRAS

Experiencing a transit is a unique observation although they are not as rare in the solar system as the transit of Venus. More common transits that one might observe would be the transit of Jupiter or an eclipse as the moon transits the Sun. When viewing eclipsing star systems, the chance of observing an eclipsing edge on disc is one in two hundred, which can be calculated out. After observing the transit of Mercury over 25 years ago, observing a triple transit of Jupiter, and recording the light curve of transiting extra solar planet HD209458, I became interested in the upcoming Transits of Venus in 2004 and 2012. The Transits of Venus come in pairs with the first transit separated by 122 years from the next pair. The second transit in the pair comes 8 years apart. The transit time from 1st contact to 4th contact of the disc of Venus on the face of the Sun is about 6 hours and 45 minutes.

During the transit of Venus event in 2004 in Europe, friends and I traveled to the rain shadow of the Alps with Willamette University physics professor Maurice Stewart and Dareth Murray to image and observe the event. At Lake Lugano on the Swiss-Italian border, we observed the transit 1st and 2nd contact using the three telescopes brought from Portland, Oregon and Paris, France. We imaged the transit and took a fast train to Zurich Switzerland and observed 3rd and 4th contact at the Zurich University on the way to Zurich Observatory.

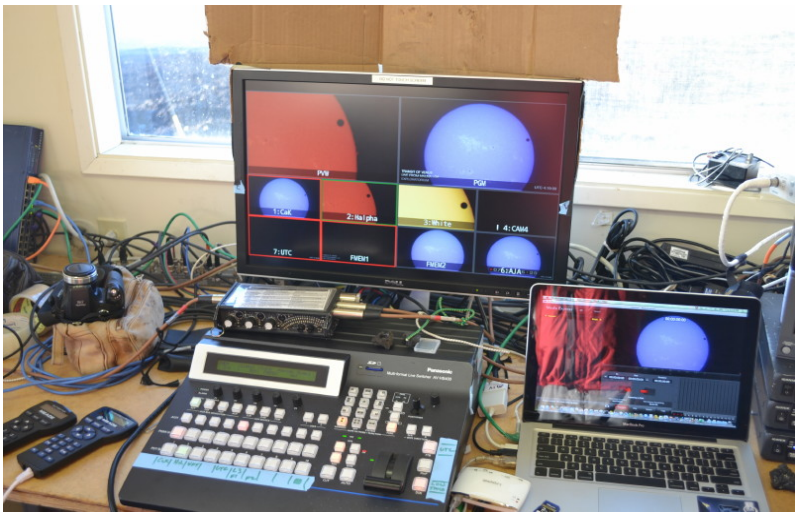
Control Room of the Solar Coronagraph on Mauna Kea during the Transit of Venus, Joe Wilcox and Ben in the picture.

On the 2012 Venus transit, Professor Joe Wilcox, Walter de Sagher (Belgium), and I experienced a high altitude transit observing on the 13,800 foot summit of Mauna Kea and later on Mauna Loa (the most massive mountain on Earth). We left Kailua-Kona at 4am because we were sure the transit of Venus would bring tour buses and amateur astronomers to the mountain. Professor Joe Wilcox teaches for the University of Hawaii Kona, so we had access to the summit that morning. We arrived at Mauna Kea's Summit just after sunrise to do some hiking around the Ice Age glacier preserve and the true summit. It was windy and cold and it might have been slightly below freezing. Joe and Walter were training for climbing Chimborazo and Alaska, so they repeated the summit trail up and down for conditioning on Mauna Kea's summit. I circumnavigated the mountain to look at the site of NASA's future Thirty Meter Telescope (TMT) and hike out the Submillimeter Valley. On the way out of the Submillimeter Valley, I drank some tea at the Caltec Robert Leighton sub millimeter telescope and photographed the telescope. By the time I got back up to the telescopes on the summit ridge from the circumnavigation, it was nearly time to set up our telescopes for the transits.

We had two Schmidt Newtonians, with two Nikon cameras with a 300mm lens using a split diffraction filter and a photographic milar filter. We also used a Coronado solar telescope and a Sunspotter to observe with some amateurs 1st and 2nd contact. We photographed the transit for an hour and shared our scopes with a group from Australia and a couple from London. When we observed 1st contact in white light we could see an atmosphere ring around Venus as it came out to the disc of the sun in the white light solar filter. Other than our eye moving in and out of the focal plane of the 20mm eyepiece, we could not see what we thought was a tear drop effect. Later in the afternoon, we did see a wavering of the sun's disc observing at high power due to the atmosphere effects. In early transits, this may have contributed to the possibility of poor timing of the transit to the inability to resolve the timing of contact 1-4 points of Venus on the edge of the disc.

As the transit progressed on the summit of Mauna Kea, there were many professionals and amateurs on the Canada France Hawaii,CFH, observatory ridge. The Sun was intense as the wind continued to blow at subzero temperatures, so we decided to come off the summit ridge and return to the visitor center at 9,200 feet to observe the Venus transit. Professor Joe drove his Tracker 4 wheel drive down the summit road past the Very Large Baseline Array VLBA, the Ice Age glacier corridor, and the snow plows parked for summer. We arrived at the Onizuki visitor center, named after the Hawaiian astronaut that died on in the Challenger disaster. The Mauna Kea volunteers and summit rangers were waiting for visitors that heard about the Venus transit from the newspaper. Many amateurs were set up at the visitor center with a great variety of solar telescopes, including cassegrains, dobs, refractors, and Sunspotters. It seemed like there were about three people for each solar telescope. The narrow parking lot was roped off along with the entry to the Mauna Kea visitor center where I counted 76 solar telescopes that were set up. Joe Wilcox made a quick estimate that morning that the final third and fourth contact would not be visible in from the visitor center ridge as the Sun went behind a ridge. We briefly photographed the transit from the visitor center and visited with the ranger, Joe's students, and other colleagues.

We decided to descend to the Saddle Road and drive up to the Mauna Loa NOAA solar observatory where we would observe the final observations of the Venus transit. Professor Joe's 4 wheel drive tracker made it up to the 5,000 ft climb from the Saddle Road to the observatory at 11,135 feet with the road under construction. We drove past the Japanese Cosmic ray research station to the sampling antennas, and solar coronagraph domes of the NOAA research station. Joe is a NASA Space Grant director and had a student under a NASA grant working at the Mauna Loa observatory on a Clidar atmospheric research project using a laser to study particulates in a vertical column of air.



Exploratorium Transit of Venus observations set up at Mauna Loa Observatory. This set up was done with multiple telescopes in three frequencies of light and with a solar coronagraph.

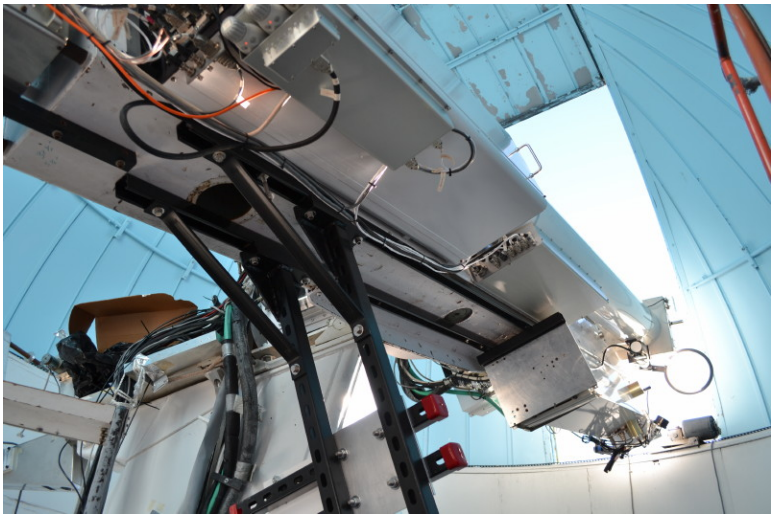
At the Mauna Loa observatory, Ben (a solar physicist), NOAA Station Chief John Barnes along with some astronomers from the Exploratorium in San Francisco had set up an observing session of the TOV comparing observations of white light, Hydrogen alpha, Calcium light, coronagraph observations. Joe was looking at the telescopes and set up, going back and forth and later observed the TOV contrasting 3rd and 4th contact with the photosphere of the Sun in white light, Hydrogen alpha, and Calcium light 3rd and 4th. As the final transit approached, we noticed that the circular depression of Venus on the limb of the Sun's disappeared first in Calcium wavelength, by approximately 15-20 seconds, behind the white light image of the photosphere. Then almost exactly 2 minutes after Venus traversed the enlarged image of the Sun's limb in H-alpha as the transit finished. This was quite spectacular while Venus went through 3rd and 4th contact as solar flares erupted on the Sun's limbs.

During the transit as the disc of Venus approached the 3rd contact, I pointed out that there were antipodal diffraction lines that started to appear when Venus was one half to ⅓ planet diameter from the Sun's limb in H alpha light. There were no tear drop effects that I observed in the Calcium light or white light photosphere, however this may have been due to the crisp modern catadioptric optics of the telescopes that I observed in. The diffraction lines I observed on the H alpha image were the same diffraction lines that I observed many years before at the transit of Mercury in an H-alpha telescope which I published a paper on the antipodal diffraction line that appeared in visual observations of the transit of Mercury. At that time, Mercury was visible in H-alpha light while it came through the corona before it transited the disc of the Sun very much like NASA's videos of the TOV with satellite imagery. Although this CCD image and the previously published visual image shared this antipodal diffraction line in H-alpha observations, I would think these artifacts were spherical aberration and the intermediate weak diffraction lines as the image of Venus acted as a diffraction mask on the H-alpha enlarged image of the Sun. Venus slipped

past the H-alpha disc, the largest and last image of the Sun to transit and one would have to wait over 100 years to experience another Venus transit.

An evening at Mauna Loa NOAA Observatory

After the June 5th, 2012 Venus transit observations at the Mauna Loa Observatory, Professor Joe Wilcox, Walter de Sagher and I spent some time at the Array for Microwave Background Anisotropy (AMiBA) at the Mauna Loa observatory. The directional microwave interferometer is the largest hexapod telescope of its kind. The telescope is operated by two grad students and is driven by a hydraulic system tracking with a canvas clam shell dome. The microwave interferometer is a multi dish telescope apparatus detector that has thirteen element, 1.2 meter receiver dishes. The hexapod array is built and run by the Taiwanese Ministry of Education. Astrophysicists using the array record data using the Sunyun-Zeldovitch effect to study galaxies recessing through the cosmic microwave background. The instrument operates at 86-102 GHz at 3mm wavelength with a 20GHz band width. The goal of the project is to create an atlas and map super massive galaxies. With instruments like this, the recession, acceleration and large scale structure of the universe can be studied. The data collected with this instrument sometimes takes months to analyze.



This is the Solar Coronagraph Observing the Transit of Venus At Mauna Loa Observatory.

During the evening, John Barnes NOAA science chief set up the laser for the Clidar. The Clidar shoots a laser up as high as 50 kilometers which is then studied by a remote camera analyzing sections at the vertical laser to study particulates in the upper atmosphere such as volcano smog (Vog). It was fascinating to see some of the scientific instruments: Solar Coronagraph, Clidar instrument and the AMIBA microwave array on the mountain and work with astrophysicists and scientists about cutting edge technologies studied at the Mauna Loa research site.

Telescope Tracking Error and Exoplanet Research

Research Question:
What is the effect of telescope tracking error on the accuracy of exoplanet light curves?

Brian Graham took 3rd place in the Astronomical League National Young Astronomer Award Program with his research into this question. This award recognizes outstanding work, by amateur astronomers of high school age, in areas of research, public education, academic scholarship in astronomy or science, observing, imaging, telescope or equipment design or construction, publications and writing, local Program activities, and regional and national organizational activities.

Data used in this project was obtained through observations of HD189733b and TrES-3b taken on 21/10/11 and 4/26/11 respectively from Beaverton, Oregon. To measure the light curves from his sample stars, Brian used a Meade 12 inch LX200 telescope with an ST-7 CCD camera from Santa Barbara Instrument Group and software he developed for this project that has potential applications for those who do not possess equipment capable of taking consistently high quality images. Brian found that when the tracking error was removed, the depth and duration of the transit light curve were improved significantly.
Congratulations Brian!

More information and Brian's research paper can be found on the RCA website at:
http://www.rosecityastronomers.org/BrianGraham.htm

Minutes of the Rose City Astronomers Board May 7th 2012

Held at OMSI Classroom 1

Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership)
Mark Martin (VP Programming)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Howard Knytych (New Member Advisor)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
Greg Rohde (Telescope Library)
David Nemo (Observing Site Director)
Scott Kindt (Special Interest Groups Director)
Ben Carlson (VP Observing)

Jim Higgs (Guest) (Appointed as VP Community Affairs)
David Horne (Guest) (Appointed as Telescope Librarian)
Peter Abrahams (Guest)

Call to Order

The meeting was called to order at 7:13pm by Sameer Ruiwale and, there being 13 board members present, the quorum requirement of 9 was declared to be met.

Approval of Minutes

Moved: Approve minutes from the April 2012 board meeting. Moved: Duncan. Second: Sameer. Motion passes 12-0-0.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 13 voting members present.

Treasurer's Report – Larry Godsey: Documents distributed at the meeting, and also all available on the website. Balance sheet shows $1000 in bills currently due which will be paid in the next week. Profit & loss also distributed. Well within budget at this point in the year. Detail of profit and loss shown with all individual payments and receipts. Also month by month numbers, and proposed budget for this year. Payment to Astronomical League will be $1645.

VP Programming – Mark Martin: Still looking for an August speaker, but has several possibilities. June speaker is Ethan Siegel; expecting materials soon. Info fair this month. Have heard from two of the SIG leaders who should have displays, and also Sunriver Nature Center are expected to attend. Need to start thinking about a book order for the new edition of "Turn Left at Orion" to coincide with author Brother Guy Consolmagno's presentation in September. Larry Froberg will organize a pre-sale. Also will be doing a book order for Richard Berry's new book to coincide with his presentation in October.

VP Observing – Ben Carlson: Camp Hancock has 16 signups so far; need 20. Expect we should meet the target. Sameer has spreadsheets from last year's star party plan, will forward to Ben. Expect notification around August or September for available Camp Hancock dates for next spring. Ken: in the new members packet we include a star party schedule. Is this something we should continue? Might consider putting in a generic description with a link to the website for the actual schedule.

VP Community Affairs (vacant): Dawn Willard has sadly stepped down from this post after running a successful community outreach program for many years. Jim Higgs has volunteered to take on this role. Motion: appoint Jim Higgs as VP community affairs. Moved: Sameer. Second: Duncan. Motion passes 12-0-0.

VP Membership – Ken Hose: This month we had 10 new members and 4 renewals. The membership total now stands at 364 member families, compared to 346 at this time last year and 344 for the year before that. We brought in $421 in dues in April. Still waiting for a few items for the new member packet.

Alcor – Ken Hose: Sent in the membership roster for Reflector renewals, but there are no new awards.

New Member Advisor – Howard Knytych: Howard will not be here for the new members meeting this month (will be travelling to view the eclipse). Will not have a new members meeting, but will investigate a presentation on the transit of Venus to be held in the planetarium in its place. Sameer will investigate and send information to Mark Martin.

Media Director – Diana Fredlund: Diana has received a contact from the Oregonian with a query about astronomy apps. Will return call with information from Sameer and David.

Sales – Larry Froberg: Brought in $170 in total last month. A little below typical, but still well ahead of budget for this year.

Book Library – Jan Keiski: Chris Steinkamp is completing write-up of inventory in a spreadsheet.

Telescope Library (vacant): Greg Rohde is sadly leaving us to take up a new job in Texas. The Stub Stewart dynascope is still under repair at TMS. The critical missing part is a new gear. David Horne has stepped

forward to replace Greg as telescope librarian. Motion: appoint David Horne as telescope librarian. Moved: Sameer. Second: Duncan. Motion passes 13-0-0.

IDA – Dawn Nilson: Not present

Magazine Subscriptions – Larry Godsey: Payment now available through PayPal.

Webmaster – Larry Godsey: Larry Godsey will be setting up board access for the two new members and sending them information about access.

Site Committee – David Nemo: Nominal.

Youth Director – Ada Hayes: Not able to attend, but did send a report via Sameer to indicate that she will be at the info fair.

Newsletter Editor – Scott Kindt: this month's newsletter will be published shortly.

SIGs – Scott Kindt: Nominal.

OMSI –Jan Keiski: May 12th, 20th OMSI needs volunteers. Star parties on 12th at Rooster Rock & Stub Stewart. Eclipse party on May 20th.

Sister Club update – Jan Keiski: Nominal.

Old Business

RCA generic business cards – Diana Fredlund / Sameer Ruiwale. Diana has the format, will be ordering some generic cards.

Proposal for RCA / Clackamas Comm. Coll Haggart Observatory use – David Nemo / Sameer Ruiwale. Draft agreement sent to college, has just heard back. There are only a few minor edits requested. David now has signed copies of the completed agreement for RCA signature. Key elements: annual agreement, will self-perpetuate unless terminated by either party with 30 days notice. RCA would have use of all telescopes and related equipment. Immediately after signing, RCA will take inventory. RCA will schedule, promote and host a minimum of 3 public outreach events per year. RCA will provide regular maintenance. College will be responsible for major repairs. College does have some funds available for maintenance and repairs. RCA will have access to all equipment in the storage room. RCA will also have access to the adjacent lakeside hall suitable for lectures. There are a certain number of trained RCA volunteers who have keys, and at least one is required to be on site during RCA events. Indemnity and liability insurance: RCA will be required to carry liability insurance for a single item not less than $1,000,000, RCA to provide certificate of insurance prior to completion of agreement. College must approve any changes or upgrades other than routine maintenance. David will provide Larry Godsey with a copy of the agreement. David proposes to start with 3 events in June, July and August (subject to timing of completing the agreement) and then schedule something more comprehensive for next year. For college events, RCA will facilitate locating volunteers, but volunteers will be considered college volunteers for liability purposes. Motion: Authorize Sameer to enter into the agreement, subject to receiving an agreement from our insurers. Moved: David Nemo. Second: Howard Knytych. 8-0-4.

Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde. No updates. This item is tabled for now.

Stub Stewart Observatory and option for housing club's 12" LX200 scope there – Greg Rohde. Already discussed.

Member Packet Updates by board members (several) – Ken Hose. Already discussed.

2012-2013 Budget update – Larry Godsey. Already discussed.

New Business

May '12 Info Fair Logistics

No New Members meeting . Discussed previously.

Heritage Day at Stub Stewart SP (Sept 8th) – exhibits / star party. Looking for volunteers; Sameer will coordinate with Jim.

Bylaws Review – Part 2. Tabled until next month.

Adjournment

There being no further business, the meeting was adjourned at 9:25pm.

There are several vacancies on the Board of Directors for the Rose City Astronomers.

Are you interested in helping to provide direction for your club? We currently have openings for the Sales Director, Youth Director, and Special Interest Group Leader. The sales table can always use a reliable helper or two as well. If interested in any of these positions, please contact any board member by email or in person at the monthly meetings. Remember, most of these positions are volunteer led. If we don't have someone to lead them these programs may not be available.

July 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	**2** 7pm Board Meeting OMSI Board Room	**3** 	**4**	**5**	**6** Noon Downtowners Luncheon Kell's	**7**
8	**9** 7pm Astro Imaging SIG Beaverton Library	**10** 	**11**	**12**	**13**	**14** TBA
15	**16** 6:30 New Member Meeting **7:30pm** **General Meeting** **OMSI Auditorium**	**17**	**18** 7pm Cosmology SIG 	**19** Table Mt. Star Party	**20** Trout Lake Star Party Table Mt. Star Party Golden State Star Party	**21** Trout Lake Star Party Table Mt. Star Party Golden State Star Party
22	**23**	**24**	**25**	**26** 	**27**	**28** OMSI Star Party at Rooster Rock and Stub Stewart State Parks
29	**30**	**31**	**Aug 1** 	**2**	**3** Noon Downtowners Luncheon Kell's	**4** 10am - 3pm Telescope Work-shop

August 2012

Aug 03	Friday	Downtowner's Luncheon	Kell's	Noon
Aug 04	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Aug 06	Monday	Board Meeting	OMSI Classroom 2	7pm
Aug 11	Saturday	Stub Stewart Star Party	Stub Stewart State Parks	Sunset
Aug 12	Sunday	OMSI Star Party (Perseids)	Rooster Rock and Stub Stewart State Parks	Sunset
Aug 13	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Aug 14-19	Fri-Sun	Oregon Star Party	Near Prineville, OR	
Aug 20	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Aug 22	Wednesday	Cosmology SIG	Linus Pauling House	7pm

It's time to RENEW your membership!
Our membership year is from July 1st, 2012 through June 30th, 2013

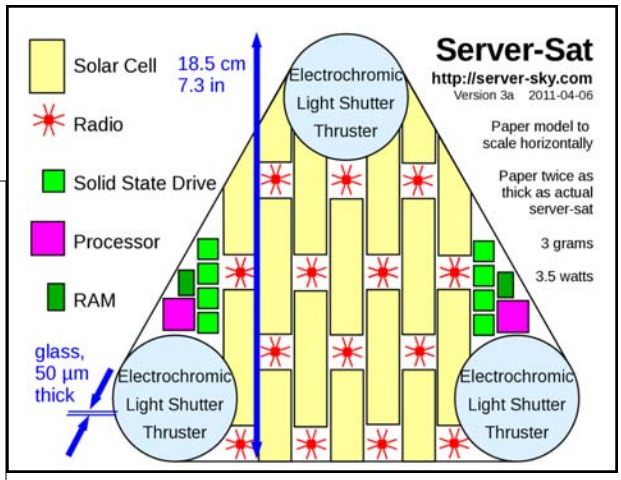
http://www.rosecityastronomers.org

Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

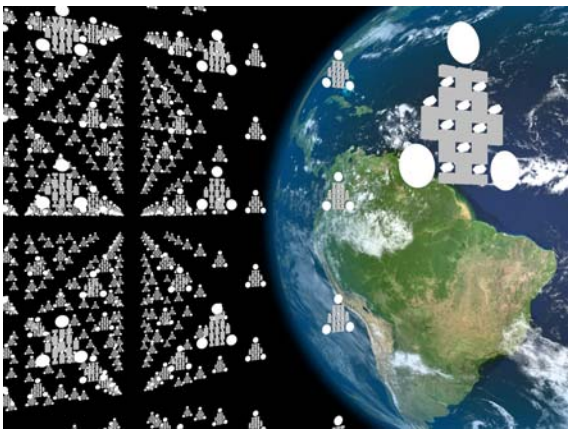
Volume 25, Issue 08 Newsletter of the Rose City Astronomers August, 2012

Server-Sky: Solar powered server and communication arrays in Earth orbit - Keith Lofstrom



Server sky (http://www.server-sky.com) is a proposal to build large dispersed arrays of 3 gram paper-thin solar-powered computer satellites and launch them into 6400km earth orbit. Arrays act as large parallel computers, as well as sparse phased array antennas, transmitting thousands of communication beams simultaneously to ground receivers and other arrays in space. Thinsat arrays use unlimited space solar power, and operate outside the biosphere. The environmental impact of power generation and heat disposal is tiny. Earth can return to what it is good at – green and growing things – while space can be filled with gray and computing things.

Besides the presentation of the overall system, we will discuss the astronomical and ecological consequences of very large solar collectors in orbit, and how Server Sky will minimize or eliminate them.



Keith Lofstrom (http://www.keithl.com/) is a mixed-signal integrated circuit designer in Beaverton, Oregon. He is CEO of SiidTech, which licenses silicon identification technology. He is active in the open source community, and has a special interest in low power, high efficiency computing. Keith has written for Kluwer Press, various IEEE journals, SysAdmin magazine, Liberty magazine, aerospace journals, and Analog.

In This Issue:

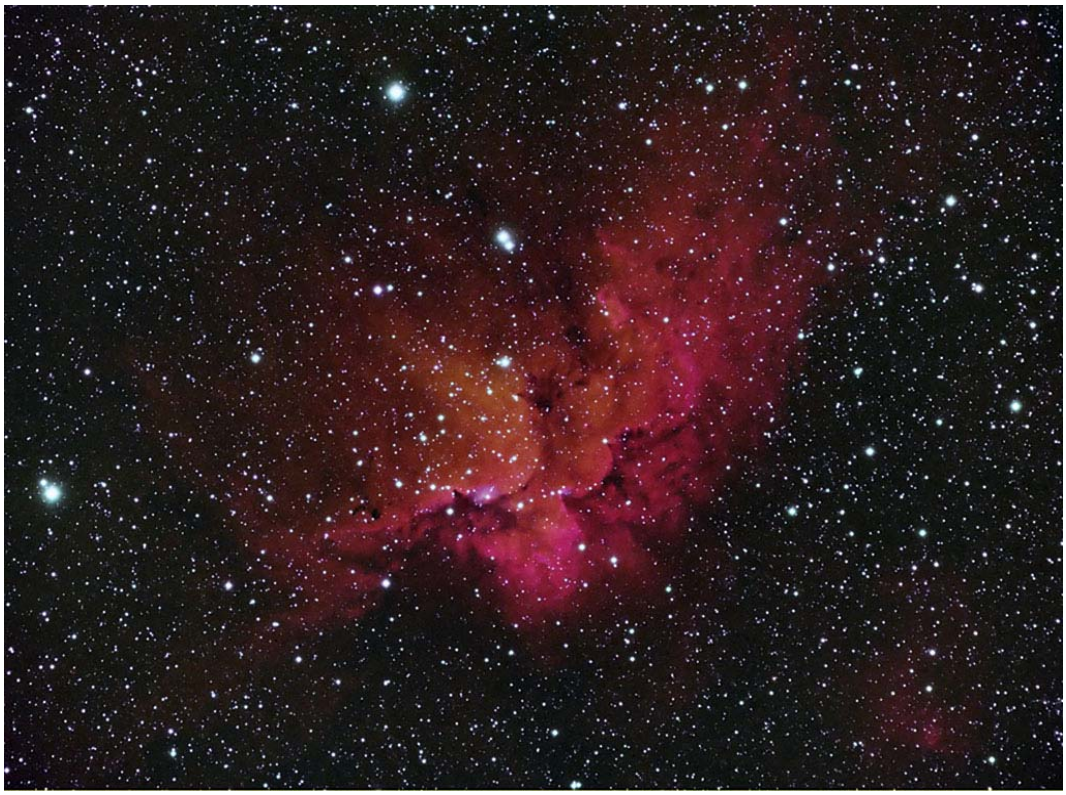
RCA is a member of the Astronomical League.
http://www.astroleague.org

All are Welcome! Monday August 20th

Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Planetarium

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Aug 9	Aug 17	Aug 24	Aug 31



Astrophoto of the Month

AP Starfire 142 at f/7
AP Mach1 mount
QSI583 camera

Taken July 3rd to 7th at "Wa-chur-ed Observatory" in La Center, WA.
This is a narrowband image consisting of Hydrogen-alpha (red), Oxygen-3 (green), and Sulfur-2 (blue).

Total exposure time is 7.5 hours. The scope is a 25 year old Astro-Physics triplet refractor that I recently acquired. It is a fine example of classic high quality optics, as evidenced by the fact that this was done with no field flattener or other corrections.

Wizard Nebula (NGC 7380)

By: Greg Marshall

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, Sep 10th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

****Due to conflicts, Astro-Imaging Meeting Cancelled for August.****

Junior Astronomers

When: On Hold
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: TBD

Leader: Vacant
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, Sept 7th, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, Sept 17th, 6:30pm
Location: OMSI Planetarium
Topic: Question and Answer
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, Sept 1st
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wednesday, Aug 22nd, 7pm
Topic: Curiosity on Mary

Presented by: Jay Wilkens
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

CLUB OFFICERS

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Youth Programs Director	Vacant	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. THIS MONTH ONLY - RENEWALS VIA MAIL IN ONLY. For more information go to the RCA web site: http://www.rosecityastronomers.org/mags Please make checks out to "RCA" mail to the address on the website and allow two months for your subscriptions to be renewed.

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.
http://www.rosecityastronomers.org/library.htm
Jan Keiski <library@rosecityastronomers.org>

RCA Dark Sky Star Parties
Stub Stewart Star Party - Aug 11, 2012

This is an RCA member star party and is not one of the OMSI public star parties.
There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.
There is an Oregon State Park Day-Use Fee of $5 for parking unless you have the Yearly Pass available the Oregon Parks Dept.

OMSI - Perseid Meteor Shower Watch
Aug 12th, 2012

OMSI - Autumnal Equinox Celebration
Sep 22nd, 2012

Held at Rooster Rock & Stub Stewart State Parks.
Viewing highlights include the planets Saturn, Mars, deep sky objects including the star clusters M13, M15, Andromeda Galaxy M31, the Ring Nebula M57 and more! The ISS could make an appearance.
See http://omsi.edu/starparties for more information or cancellations.

Camp Hancock Star Party
Sep 14 - Sep 16, 2012

OMSI's Camp Hancock with meals and cabins fits the bill for a great outing on a cool Spring weekend. Dark skies, warm cabins, real bathrooms, hot showers, good meals and great friends top off the list of things to like and all are provided with the $45 per night registration fee (OK, maybe not the friends).
Camp Hancock is an OMSI sponsored field station for the promotion of science education. It is located about 150 miles from Portland and is 2 miles east of the John Day River in Eastern Oregon in the Clarno Fossil Beds. Camp Hancock is NOT a resort hotel; it is a rustic kid's camp with 16 bunkhouses that sleep up to 14 people each in A-frame buildings. The bunkhouses are one room with bunks, mattresses, limited electricity and heaters on a 60 minute timer. You will be sharing the bunkhouse with others in our group, but it's never crowded and we usually average less than 3 people per cabin. There is a limited area for Tents, RVs and trailers.
Registrations will be taken at the August general meeting. For mail in registration forms, or to register and pay online please visit:
http://www.rosecityastronomers.org/sp/hancock.htm.
The Registration and Payment Deadline is September 7th for both mail in and online payments.

Other Star Parties
Oregon Star Party - Aug 14-19, 2012
Near Prineville, OR

Every summer, amateur astronomers gather in the high mountains of central Oregon at a place called Indian Trail Spring in the Ochoco National Forest. Astronomers from all over the world enjoy the warm friendly atmosphere and some of the darkest skies in the United States. Click link for more information.

Mt. Bachelor Star Party - Sep 13-16, 2012
Sunriver, OR

This star party has been at the Sunriver Nature Center and Observatory for the past three years. This years star party will be held in September, which will help with availability of housing in the area. As in the past, there will be NO on-site camping. Limited space is available for telescopes. Secure scope storage will also be provided (as well as security). Attendees will have full use of the SNCO facility during the star party.

Star Parties Coming Soon!

Stub Stewart Dark Sky Star Party	Aug 11
OMSI Perseid Meteor Shower Watch	Aug 12
Oregon Star Party	Aug 15-18
Camp Hancock Star Party	Sep 14-15
Mt. Bachelor Star Party at Sunriver	Sep 13-15
Rooster Rock Dark Sky Star Party	Sep 15
OMSI Autumnal Equinox Star Party	Sep 22
Maupin Star Party	Oct 12-14
Stub Stewart Dark Sky Star Party	Oct 13

A Sky Tour at Cloud Cap Inn

By Howard Knytych

Having responded to a request from Jim Higgs to offer a sky tour at Cloud Cap Inn, my wife, Darla, and I joined Jeffrey Sheetz up there late in the afternoon of July 26th. Negotiating the tortuous, 9.5 mile gravel road up to the 6000' Inn took longer than I'd expected, but we still arrived in plenty of time to check the place out and set up our telescopes. My first thoughts after turning off the ignition, stepping out of our SUV, and witnessing the STUNNING VIEW and fresh mountain air was that this was going to be an evening to remember. We were there to outreach to the Wounded Angels, a group of Air Force para-rescue vets who were disabled as a result of injuries sustained in Iraq and Afghanistan. They were there with their chaperones, members of the 304th Aerospace Rescue Squadron out of PDX who sponsored the program, and our hosts, the Hood River Crag Rats who operate Cloud Cap Inn. All told, about thirty people.

My 18" dob, Jeff Sheetz, and a rather large mountain in the background.

About the time we finished setting up our scopes on the up-hill side of the Inn, the Wounded Angels returned from their activities that day. Although they were disabled, we'd never have known that from first appearances. These guys were in shape. They'd been bivouacking up there all week, and that day they'd divided into small activity groups, some climbing the glaciers on the north side of Hood, fishing or rafting on the Deschutes, touring the orchards around Hood River, or touring a local brewery. So returning to Cloud Cap Inn around six-ish was "kick back time", with lots of beer and good natured talk. I had my Coronado PST set up to observe the Sun, and Jeff had a short tube Orion refractor pointed at the Moon. My 18" dobsonian and Jeffrey's 8" LX-90 were magnets for several of the guys, who were soon barraging us with questions – who we were, how far can you see with that thing, is there life elsewhere in the solar

system, how about in the universe, what happened before the big bang, do black holes really evaporate like Hawking says, and what's string theory all about – pretty heady stuff for a relaxing afternoon. These guys were sponges for information about what's out there.

We broke off for dinner, which was fresh Chinook salmon, corn on the cob, macaroni salad, green salad, and a variety of beverages. Dinner gave us more opportunity to talk with the Wounded Angels, and hear some of the harrowing combat experiences from which they were still recovering. A larger purpose of their week at Cloud Cap was to give them an opportunity to decompress and share their experiences with others who had been there.

After dinner, it was Jeffrey's and my turn to be "on" for the evening. Although the sky was clear, with calm winds and warm temperatures, the viewing was not good: It was clear, but not steady, so while the sky's transparency was OK, the seeing was poor. Saturn, for example, looked pretty fuzzy, as did detail on the Moon. Still, the evening was fabulous. We weren't there for hard core observing, so the sky conditions really didn't matter much. What made the event was the response of our audience. After a few speeches, they gathered around our scopes for an early evening naked-eye sky tour, followed by views of some of the usual summer highlight objects: M51, M13, M57, M31, M16, Mizar & Alcor, Albireo, M81 & M82. We had folks lining up to view them, and lots of continuing Q & A about what they were seeing. Having had a long day Thursday, our viewers didn't hang around much past 11:00 or so. After strumming a couple of songs in front of the fireplace, Darla and I were also ready for bed around midnight.

Following an excellent breakfast of eggs, breakfast burritos, coffee, and more conversations where a few of the Wounded Angels shared their experiences with Darla and me, we packed up and departed about 10:00. While descending down to Cooper Spur, we took the time to enjoy the alpine wildflowers, and reflect on the meaning of sacrifice.

This was the first year the 304th Aerospace Rescue sponsored the Wounded Angels, and Thursday night was the last night of their week-long event. They hope to do it again at Cloud Cap Inn, and the Crag Rats would like us back as well for a separate evening with them. So that's two potential outreach opportunities for the club. But from my own point of view, this was the best outreach event I can recall. After talking with these guys about some of the horrendous trauma and injuries they suffered, I feel honored to have been able to contribute something, no matter how small or indirect, to their recovery. If RCA does anything at Cloud Cap Inn again, I'M THERE!

Darla & I in front of the plaque at Cloud Cap Inn. The Inn was unused, and in a state of disrepair until the mid 80s. The Forest Service was planning to tear it down until the Hood River-based Crag Rats came to its rescue. Although it's still owned by the USFS, the plaque commemorates granting control and operation of the Inn to the Crag Rats.

Becoming a Time Traveler: the universe as a time machine

By Bob McGown FRAS

If you are sitting at your computer looking at light that left the screen one three hundredth millionth of a second ago, you are looking back in time. Whenever you look at the Moon, you are viewing the Moon as it was one and a half seconds ago. Looking up at the night sky, you see stars as they were years into the past. We see the super giant star Betelgeuse as it was 420 years ago into the past because light doesn't travel at an infinite speed. As we look for a greater perspective, it makes us think beyond our physical lifespan to what Carl Sagan once said, "We are all travelers in space and time"

This paper is intended to give us a better perspective about time and time travel in the universe through a list of different approaches. Some of the approaches we will explore are: the Holographic model of the universe, science fiction ideas like Doctor Who and the TARDIS, Tipler's Cylinder, the twin paradox, suspended animation, robot bodies, an alien time capsule, "*The Time Traveler*" by H.G. Wells, and quantum concepts related to time travel.

The Holographic Model

As we read an old novel like "*The Time Traveler*" by H.G. Wells, our imagination is recreating a mental picture of life a hundred years ago. Time travel into the past beyond our imagination is more problematic. One possible way to time travel into the past is with the mind. In an early version of the Holographic model of the universe, consciousness shapes reality. The Holographic Model is a complex model of black hole entropy and string theory. Reality structures might re-create themselves again and again throughout time on many worlds throughout the universe. We look at ourselves standing between two mirrors, fathoming that consciousness shapes our reality.

Doctor Who and the TARDIS

The pop culture science fiction television time traveler, *Doctor Who* travels in a time machine/spacecraft called a TARDIS that on the out side looks like a police box. The word "TARDIS" (**T**ime **a**nd **R**elative **D**imension **i**n **S**pace) has been used to describe anything that seems to be bigger on the inside than on the outside.

A TARDIS is an advanced technology of the Time Lords, an extraterrestrial civilization where the Doctor has come from. The Doctor maintains and pilots the TARDIS that can transport its occupants to any point in time and any place in the universe despite the paradoxes of time travel. To stealth the TARDIS, the ship's "chameleon circuit" can blend in with its surroundings.

In the series, the Doctor pilots an undependable, obsolete TARDIS. Its chameleon circuit is defective, leaving it in the configuration of a 1960s-style London police box after his visit to London in 1963. In the series, the Doctors TARDIS was stolen from the Time Lord's planet. In one clever series episode, "The Doctor's Wife" (2011), the ship's consciousness briefly inhabits a humanoid body with a complex plot where she left on her own free will. The Doctor tries to get back to his home planet and the unpredictable TARDIS takes him on a wild journey around unusual habitable worlds in the universe.

Amateur astronomer, an RCA member, Duncan Kitchin built a model of a TARDIS as an observatory for his telescope!

A Time Machine Constructed out of a Neutron Star

If we were able to create a wormhole into the past, "would physics have a built in failsafe to prevent paradoxes from happening?" One of the first time machine papers about traveling into the past was Tipler's Cylinder. Frank Tipler is a theoretical physicist/ relativist and proposed creating a rotating cylinder constructed out of four neutron stars that would open up a worm hole in the fabric of space/time. Hard science fiction writer Larry Niven liked the idea so much that he immediately published a science fiction paper of the same title as Tipler's original paper. *Time Warps*

and Rotating Cylinders. We don't know if a space ship could go through a worm hole into the Earth's past history and save the future Earth; however, it certainty is fun to think about.

In quantum physics, when a wave is observed, the wave function is collapsed in a moment of time. However in the world of stick and rocks (classical physics) sometime the combination of two events may create more meaningful events like a synchronicity event. In one way, this is might be like a quantum interaction. In this way, when two meaningful objects or events come together, they create a new wave function of consciousness. We think of time as a linear concept. Experiments like the Delayed Choice Experiment by John Wheeler show us that we may want to have a different concept of time.

Suspended Animation and the Twin Paradox

Traveling into the future is as easy as sleep. A star faring civilization might let the astronauts of an interstellar flight sleep for a hundred years waking up to a totally different world of the future at a new star system. In the hard science fiction books *Flight of the Dragonfly* and *Roche' World*, Robert Forward describes a star ship in which the crew sleeps for 50 years while they fly near light speed to explore Bernard's Star. Just after they arrive at Bernard's Star a space craft that was launched 20 years later also arrives at the solar system traveling at a velocity close to light speed.

As far as information and archiving things in a time capsule, it might think of the World War II pilots emerging from the alien spacecraft in Close Encounters of the Third Kind. The idea that Steven Spielberg had in the movie was kind of time machine like the thought experiment that Einstein called the Twin Paradox. Two twins are separated at one point in their life and one travels near the speed of light on a spaceship and one stays on Earth. When the pilots are reunited 20 years later, the twin aboard the spacecraft appears not to have aged. This artifact of relativity is another example of a living time capsule.

Traveling into our Distant Past

Looking back in time at micro-fossils we see simple life forms that may have taken hundreds of millions of years to evolve. How did the complex chain of DNA it self emerge and form out of a primordial soup to create us almost four billion years later? In one perspective, a chemical reaction was a synchronicity event in time that led to the creation of our DNA. On the timeline of the grand scheme of things, our life span (say 100 years) seems like a scintillation flash in time compared to the grand timescale of the universe. In the Many Worlds model of the universe, there are an infinite number of your selves living on many worlds in the quilted multiverse.

The Earth is stable enough to have nature's chemistry experiment with bacteria cooking in a hot mineral geyser for millions of years. However, our life itself is woven into the tapestry of space and time. Our ancestral family tree goes back to microbes in a primordial ocean, 4.6 billion years ago. If we look further back perhaps to the amino acid chains that make up our body, they came might have come from a cometary interloper of the solar system traveling through a proto planetary solar nebula. The second generation star spread its elements through a super nova explosion that made up the parent star to our Sun perhaps many billion years ago. It is these elements that became our Sun and solar system that we are made of. Comically, we could say that our great, great grandmother 10^11 was a solar nebula! You have won the cosmic lottery by being here.

Stretching out our imagination further into the past, the hydrogen, helium, and lithium in our bodies was formed in the Big Bang 13.7 billion years ago. We are part of the fabric of the universe observing itself, like the universe personified looking into the mirror or perceiving information back into time. We perceive ourselves at the moment creation entangled with all the 10^88 photons of the visible universe. This would be a cosmic connection of consciousness connecting our ancestry across light years of time back to the beginning of time.

Our radio waves have been traveling out in space for the last 100 years. Aliens on a planet 50 light years away might be watching reruns of "Perry Mason" or "I Love Lucy". Our great Radio Telescopes Arecibo or the Byrd steerable radio telescope can look at waves coming across the galaxy or the universe. Perhaps we might come across an alien radio broadcast from a civilization on an extra solar planet, a message from 200 years ago. How would that

change a child's imagination or the average person's perspective of time?

As we look out into the galaxy with our telescopes, we are gazing back into time. We realize that when we look at the fuzzy patch in our sky known as the Andromeda galaxy, photons are striking the photoreceptor cells of your eye's of light that are three million years old, dating back to the dawn of human kind. When we look at the galaxy through a telescope in the nearby Super clusters, Virgo and Fornax, we are looking back 50-65 million years ago to the time of the dinosaurs.

An Alien Time Capsule

If we were to preserve our important ideas or artifacts in a time capsule, where would we place such a time capsule? The time capsule would contain information or things that could be accessed in the distant future. Some astronomers have actually looked for an alien time capsule at a stable Lagrangian point of the Earth, one of the gravitational points of residence in the Earth - Moon system. Just imagine that an alien could have visited the earth and achieved information in a Lagrangian point for a billion years. The universe is certainly old enough. On Earth a time capsule may be lost or buried never to be found. Astronomers like Frank Drake turned his receiver antenna to look at nearby stars forty years ago to detect alien life that could have visited the Earth perhaps millions of years ago.

A Robot Body

How would a robot with an AI computer mind perceive the passage of time? We could leave a diary or information about a person's life or important information. Perhaps one could leave our genome or to recreate ourselves from the genetic code. If we were in the time capsule, our memories would need to be reconstructed down to the individual electron state. Would this also include a list of the books and newspaper articles that we have read? Could we download our brain into a computer with a robot body and live for 10,000 years as we travel in time extending our spatial baseline?

A View from Within: a Summary

Time slows down the closer one gets to a black hole. Some physicists theorize the information of all the things that a black hole consumed is left in an ash when the black hole has evaporated. To a black hole theorist like John Wheeler, this ash is called a Boltzmann. One may doubt that all of the information about your life will be preserved in inside a black hole or at the event horizon since the Cosmological (Entropic) Arrow of Time curves back on itself. At the end of life of a black hole an ash is left containing the information of everything consumed in the black hole and the entropy would be preserved. However, one would like to think so. It is amazing that in moderate amateur telescopes, the black hole jet in M87 is visible.

Newton imagined a clock work universe with an all knowing God in which one could reconstruct all the motions of the universe to be tracked by a great machine, so we might be able to predict a moment in the past or in the future. However, Newton did not perceive an active quantum universe with Heisenberg's Uncertainty Principle or the Gödel's Incompleteness theorem. These are some of the limitations in quantum physics and mathematics that are limits to knowledge and that show that you are connected to the universe as a process rather than a thing. Physicist David Bohm argued that this model was a more accurate interpretation of our understanding of reality and space/ time. As we gain a greater perspective of time in the universe, we see that a greater understanding of time travel will enhance our knowledge of our place the universe.

References:

Duncan Todd, Craig Tyler, *Your Cosmic Context*, Addison Wesley, 2008
Greene Brian, *Hidden Reality:Parallel Universes and the Deep Laws of the Cosmos* 2009
McGown, Robert, D. *Cosmic Expansion*, 1995
Niven, Larry, a meeting at Orycon discussing the Cosmic Expansion 2007
Sirag, Saul, Paul, a meeting with Frank Tipler @ I.S.E.P.P.

Minutes of the Rose City Astronomers Board June 4th 2012

Held at OMSI Classroom 1

Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Mark Martin (VP Programming)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
David Horne (Telescope Library)
David Nemo (Observing Site Director)
Scott Kindt (Newsletter Editor)

Call to Order

The meeting was called to order at 7:08pm by Sameer Ruiwale and, there being 10 board members present, the quorum requirement of 9 was declared to be met.

Approval of Minutes

Moved: Approve minutes from the January 2010 board meeting

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 10 voting members present. Motion: approve May 2012 minutes, second: Sameer. Approved 10-0-0.

Treasurer's Report – Larry Godsey: Handout with 3 sheet distributed. Ahead of budget, but have about $3000 in outstanding bills. Supporting information with all itemization available on the website.

VP Programming – Mark Martin: Swap meet & info fair went very well; there was a good crowd on hand. Mark had about 15 people for the SkyTools demo, with many requests for additional classes. June speaker is astrophysicist Ethan Siegel. July speaker is Pat Hanrahan. Mark has two potential speakers for August, subject to availability currently under discussion. One is David Grinspoon, who is curator for astrobiology at the Denver Museum of Nature and Science. Other possibility is Keith Lofstrom, who is a local engineer working on a satellite constellation for supercomputing applications. Also have a list of possibles for next year. Mark has started the book promotion for Brother Guy Consolmagno's talk in September. Also working on promotion of Richard Berry's new book for his talk in October.

VP Observing – Ben Carlson: Not present. Not much happening with observing right now, but need to start working on next year's calendar.

VP Community Affairs - Jim Higgs: Not present. There have been a couple of requests for public outreach star parties.

VP Membership – Ken Hose: Not able to attend, but Ken did send a report: membership currently stands at 378 member families, compared to 355 at this time last year and 358 the year before that. Brought in a total of $446 in dues this month, with 11 new members and 5 renewals.

Alcor – Ken Hose: Nothing to report.

New Member Advisor – Howard Knytych: Not present – there is no new members meeting this month. The next one is scheduled for July.

Media Director – Diana Fredlund: News release has been published on the Haggart Observatory agreement (thanks for assistance to David Nemo). News release will go out this week for this month's speaker.

Sales – Larry Froberg: No sales last month. However, currently $700 over budget for sales for the year and $35 below budget for costs. Still looking for a replacement to run the sales table – Larry will be stepping down at the end of the year.

Book Library – Jan Keiski: Nominal

Telescope Library - David Horne: Have most of the telescopes transferred from TMS, working on getting everything organized. OMSI has a donation of a 16" Meade Starfinder with the intention that it be installed in a roll-off roof observatory to be built at Camp Hancock.

IDA – Dawn Nilson: Not present

Magazine Subscriptions – Larry Godsey: Nominal

Webmaster – Larry Godsey: Nominal

Site Committee – David Nemo: Nominal

Youth Director (vacant): Now vacant – Ada Hayes has stepped down due to other time constraints.

Newsletter Editor – Scott Kindt: Nominal

SIGs – Scott Kindt: Nominal

OMSI –Jan Keiski: June, July & August general meetings will be in the planetarium. Board meetings for July and August will be in classroom 2.

Sister Club update – Jan Keiski: Nominal – almost winter in the southern hemisphere.

Old Business

RCA generic business cards – Diana Fredlund / Sameer Ruiwale. Diana has everything required for the order.

Proposal for RCA / Clackamas Comm. Coll Haggart Observatory use – David Nemo / Sameer Ruiwale. This item is now done. We owe the community college a check for monthly payments through the end of the year.

Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde. David Horne will look into this.

Stub Stewart Observatory and option for housing club's 12" LX200 scope there – Greg Rohde Need to re-establish contact with the park to continue discussing this.

Member Packet Updates by board members (several) – Ken Hose. Ken is still awaiting some inputs from board members.

2012-2013 Budget review – Larry Godsey. Proposed budget distributed. Currently shows a deficit of $1425 for next year, but this is ok – current year is showing $900 positive. David Nemo – suggests adding a line item to cover expenses that might arise from repairs or upgrades at Haggart Observatory. Will include this as a line item to cover observing sites. Suggest adding $200 to cover this item. One additional item is

Camp Hancock, but this does not show up as a budgeted item because the net is zero. Motion: approve the budget as presented and amended to include $200 for observing sites. Moved: Sameer. Second: Duncan. Motion passes 9-0-0.

New Business

Photo / Footage request for Astronomy related app – Diana. Commercial company is looking for photographs or footage of astronomers looking through scopes for use in a video program that they are producing. We don't have anything suitable available – Diana will reply to let them know.

OMSI / RCA Agreement – 2012-2013, review and signing – Sameer. Copies of agreement distributed for review. The agreement as proposed by OMSI includes a release and waiver clause which reads extremely broadly. Sameer will reply to Jim Todd and ask for clarification.

Emeritus membership – Dan Gray / Greg Rohde. We have a provision for this in our bylaws. Motion: provide emeritus membership to Dan Gray and Greg Rohde for the next year. Moved: Larry Godsey. Second: Jan Keiski. Motion passes 9-0-0.

Bylaws Review – Part 2. Tabled for this meeting.

Adjournment

There being no further business, the meeting was adjourned at 8:41pm

Astronomy Day at OMSI

OMSI's annual Astronomy Day was held on August 5th. RCA participated with approximately a dozen volunteers. It was estimated that approximately 1,000 visitors walked by our RCA tables. Free star maps, astronomy information, and telescopic landscape views were available for the kids (and adults too!). In addition, three scopes were set up for solar viewings and were popular for those entering OMSI's facility. Kids loved seeing the sun.

Jim Todd reports that, partly because of RCA's help, Astronomy Day went smoothly, coordination all worked properly, and there were no train wrecks! He says that guests and donors were inspired by community club presentations and interactive displays.

Jim Higgs, head of RCA Outreach, says that Astronomy Day is just one of the many opportunities RCA members have in bringing astronomy to the attention and awareness of students, kids, and adults in the greater Portland area. Aside from designated astronomy parties (as mentioned and publicized on RCA's website), we receive several requests for "Outreach Events." Jim encourages members to participate in Outreach Events—"What better way to enjoy the stars than to see a grin on a kid as wide as the rings of Saturn?" Experienced RCA observers and RCA newcomers are equally welcome. Jim sends out emails to the membership about upcoming Outreach Events.

There are several vacancies on the Board of Directors for the Rose City Astronomers.

Are you interested in helping to provide direction for your club? We currently have openings for the Sales Director, Youth Director, and Special Interest Group Leader. The sales table can always use a reliable helper or two as well. If interested in any of these positions, please contact any board member by email or in person at the monthly meetings. Remember, most of these positions are volunteer led. If we don't have someone to lead them these programs may not be available.

August 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 	**2**	**3** Noon Downtowners Luncheon Kell's	**4** 10am - 3pm Telescope Work-shop
5	**6** 7pm Board Meeting OMSI Board Room	**7**	**8**	**9** 	**10**	**11** Stub Stewart Star Party
12 OMSI Star Party (Perseids)	**13** **Cancelled** Astro Imaging SIG **Cancelled**	**14** Oregon Star Party	**15** Oregon Star Party	**16** Oregon Star Party	**17**  Oregon Star Party	**18** Oregon Star Party
19 Oregon Star Party	**20** **7:30pm** **General Meeting** **OMSI Auditorium**	**21**	**22** 7pm Cosmology SIG	**23**	**24** 	**25**
26	**27**	**28**	**29**	**30**	**31** 	**Sep. 1** 10am - 3pm Telescope Work-shop

September 2012

Sep 01	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Sep 07	Friday	Downtowner's Luncheon	Kell's	Noon
Sep 10	Monday	Board Meeting	OMSI Classroom 2	7pm
Sep 10	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Sep 14-16	Fri-Sun	Camp Hancock Star Party	OMSI's Camp Hancock Field Station	
Sep 15	Saturday	Rooster Rock Star Party	Rooster Rock State Park	Sunset
Sep 17	Monday	New Member SIG	OMSI Planetarium	6:30pm
Sep 17	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Sep 19	Wednesday	Cosmology SIG	Linus Pauling House	7pm
Sep 22	Sunday	OMSI Star Party	Rooster Rock and Stub Stewart State Parks	Sunset
Sep 29	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm

http://www.rosecityastronomers.org

Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

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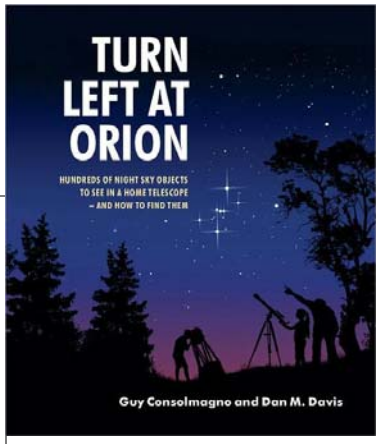
Twenty Five Years of Turning Left: Are We There Yet?

Brother Guy Consolmagno



Turn Left at Orion has become one of the most popular guides to using a small telescope ever published... but the adventures of getting it written and published were almost as much fun as all the observing we did for the book! Hear stories of the steps, and missteps, that have gone into various editions of their book... what we learned about astronomy, and observing... and watch out for those pesky wabbits!

Brother Guy Consolmagno SJ was born in Detroit, Michigan. He earned undergraduate and masters' degrees from MIT, and a Ph. D. in Planetary Science from the University of Arizona, was a researcher at Harvard and MIT, served in the US Peace Corps (Kenya), and taught university physics at Lafayette College, Pennsylvania, before entering the Jesuits in 1989. At the Vatican Observatory since 1993, his research explores connections between meteorites, asteroids, and the evolution of small solar system bodies. He has served on the governing board of a number of international scientific organizations, including the International Astronomical Union, the Meteoritical Society and the Division for Planetary Sciences of the American Astronomical Society.

In This Issue:

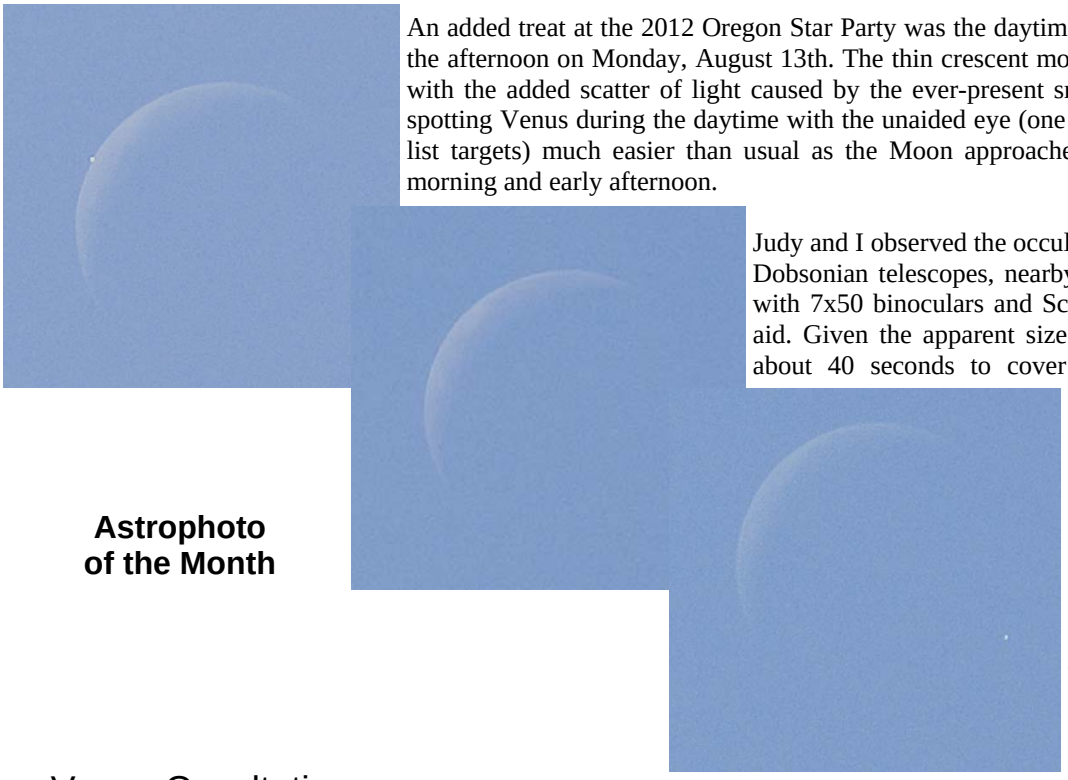
RCA is a member of the Astronomical League.
http://www.astroleague.org

All are Welcome! Monday September 17th

Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Sep 7	Sep 15	Sep 22	Sep 29



Astrophoto of the Month

Venus Occultation

Chuck Dethloff

An added treat at the 2012 Oregon Star Party was the daytime occultation of Venus during the afternoon on Monday, August 13th. The thin crescent moon stood out fairly well, even with the added scatter of light caused by the ever-present smoke in the air. And it made spotting Venus during the daytime with the unaided eye (one of Matt Vartanian's advanced list targets) much easier than usual as the Moon approached Venus throughout the late morning and early afternoon.

Judy and I observed the occultation with her 16" and our 6" Dobsonian telescopes, nearby Howard Banich observed it with 7x50 binoculars and Scott Kindt without any optical aid. Given the apparent size of Venus, it took the Moon about 40 seconds to cover Venus after 1st contact at 1:15:10 pm (hr:min:sec).

Venus reappeared from behind the Moon at 2:30:35pm, spotted by Judy in the 16" slightly before Chuck in the 6". A couple seconds later Howard spotted it in the binoculars as well, Scott saw it visually at 2:30:53pm.

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, Oct 8th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: On Hold
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: TBD

Leader: Vacant
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, Oct 5th, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, Sept 17th, 6:30pm
Location: OMSI Planetarium
Topic: Question and Answer
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, Sept 29th
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Friday, Sep 21st,
7pm
Topic: Comets

Presented by: Bob McGowan
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org

Notice
Due to a conflict in scheduling, All future cosmology meetings will occur on the Friday evening following the general meeting.

CLUB OFFICERS

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SIG Director	Vacant	sigs@rosecityastronomers.org
Youth Programs Director	Vacant	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information and payment options please see the website.

http://www.rosecityastronomers.org/mags/index.htm

Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.

http://www.rosecityastronomers.org/library.htm

Jan Keiski <library@rosecityastronomers.org>

RCA Dark Sky Star Parties
Rooster Rock Star Party - Sep 15, 2012

This is an RCA member star party and is not one of the OMSI public star parties.
There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.
The exit gate will be left open for us all night. There is a security guard onsite that will be checking during the night while we are there.

OMSI - Autumnal Equinox Celebration
Sep 22nd, 2012

On Saturday evening, September 22, OMSI, Rose City Astronomers and Vancouver Sidewalk Astronomers will celebrate the beginning of autumn with a free Star Party! Join us as we gaze at the heavens at Rooster Rock & Stub Stewart State Parks starting at 7:30 p.m. and is free with $5 parking per vehicle. From beginners to experts of all ages, visitors will have the opportunity to view the stars and other objects through a variety of telescopes. Viewing highlights includes Mars, Saturn, Moon and more! On the scheduled day of each OMSI Star Party, it is suggested that interested visitors call the OMSI Star Parties Hotline, (503) 797-4000 #3 then #5, or check the OMSI Star Parties web site http://www.omsi.edu/starparties for possible weather-related cancellations.

Maupin Star Party
October 12-14, 2012

The Rose City Astronomers have been granted permission to use private property approximately 8 miles west of the town of Maupin for member-only scheduled Star Parties.
The Maupin Observing Site is located on a private airstrip about 8 miles east of Maupin, Oregon. Warning: this airstrip is used in the morning, but at the far end of the airfield. Most people don't even wake up.
There is no registration for the event itself, just show up and enjoy the weekend. You don't even need a telescope to participate; other members are enthusiastic to share their views. This is a good opportunity for beginners to get acquainted and seasoned observers to get some serious observing.
Our host owns the nearby Walters Corner store (see map) and everyone is encouraged to stop in and buy gas and groceries, or just say hello and thank you.
RVs, trailers and tents will be allowed on the observing site (see observing site map for instructions). The town of Maupin offers lodging, restaurants and recreation if you don't want to rough it. We will have a portable outhouse on site. Propane stoves only and please use them up off the ground on a table or stand. No open fires or charcoal briquettes.
It can always be cold at night no matter what the season, so bring warm clothing.

Other Star Parties

Mt. Bachelor Star Party - Sep 13-16, 2012
Sunriver, OR

This star party has been at the Sunriver Nature Center and Observatory for the past three years. This years star party will be held in September, which will help with availability of housing in the area. As in the past, there will be NO on-site camping. Limited space is available for telescopes. Secure scope storage will also be provided (as well as security). Attendees will have full use of the SNCO facility during the star party.

Star Parties Coming Soon!

Camp Hancock Star Party	Sep 14-15
Mt. Bachelor Star Party at Sunriver	Sep 13-15
Rooster Rock Dark Sky Star Party	Sep 15
OMSI Autumnal Equinox Star Party	Sep 22
Maupin Star Party	Oct 12-14
Stub Stewart Dark Sky Star Party	Oct 13

How the Milky Way became spiral?

Astronomers have long known that the Milky Way is a spiral galaxy. But how did our home galaxy get its beautiful spiral arms?

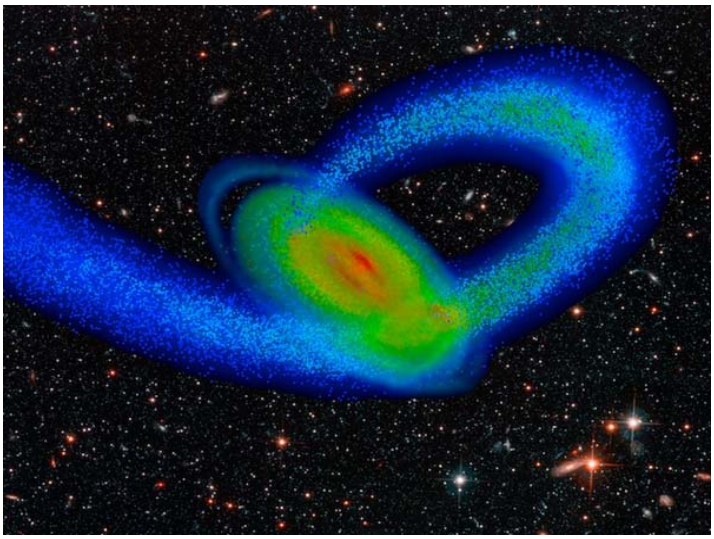
A simulation run on the GreenPlanet supercomputer cluster at the University of California, Irvine suggests its spiral structure may have been triggered by an act of cosmic violence: a series of collisions with a dwarf galaxy.

Dwarf galaxy, big impact

Since 1994, it's been known that the Sagittarius Dwarf galaxy—named after the constellation in which it appears from Earth—is in a polar orbit around the Milky Way and in the process of merging with our galaxy. In 2003, infrared telescopes and supercomputers that traced the orbital motions of its stars revealed that the Sagittarius Dwarf had actually collided with the Milky Way twice—once 1.9 billion years ago and again 0.9 billion years ago—and that it is now coming in for a third collision in just another 10 million years.

Until recently, most investigators have been studying how the Milky Way's tremendous gravitational field and tidal forces are ripping the Sagittarius Dwarf into long streamers of stars.

In computations for his dissertation research, however, former Irvine graduate student Chris Purcell asked a different question: What effects did the repeated collisions of the Sagittarius Dwarf, with its invisible but massive halo of dark matter, have on the larger Milky Way itself?



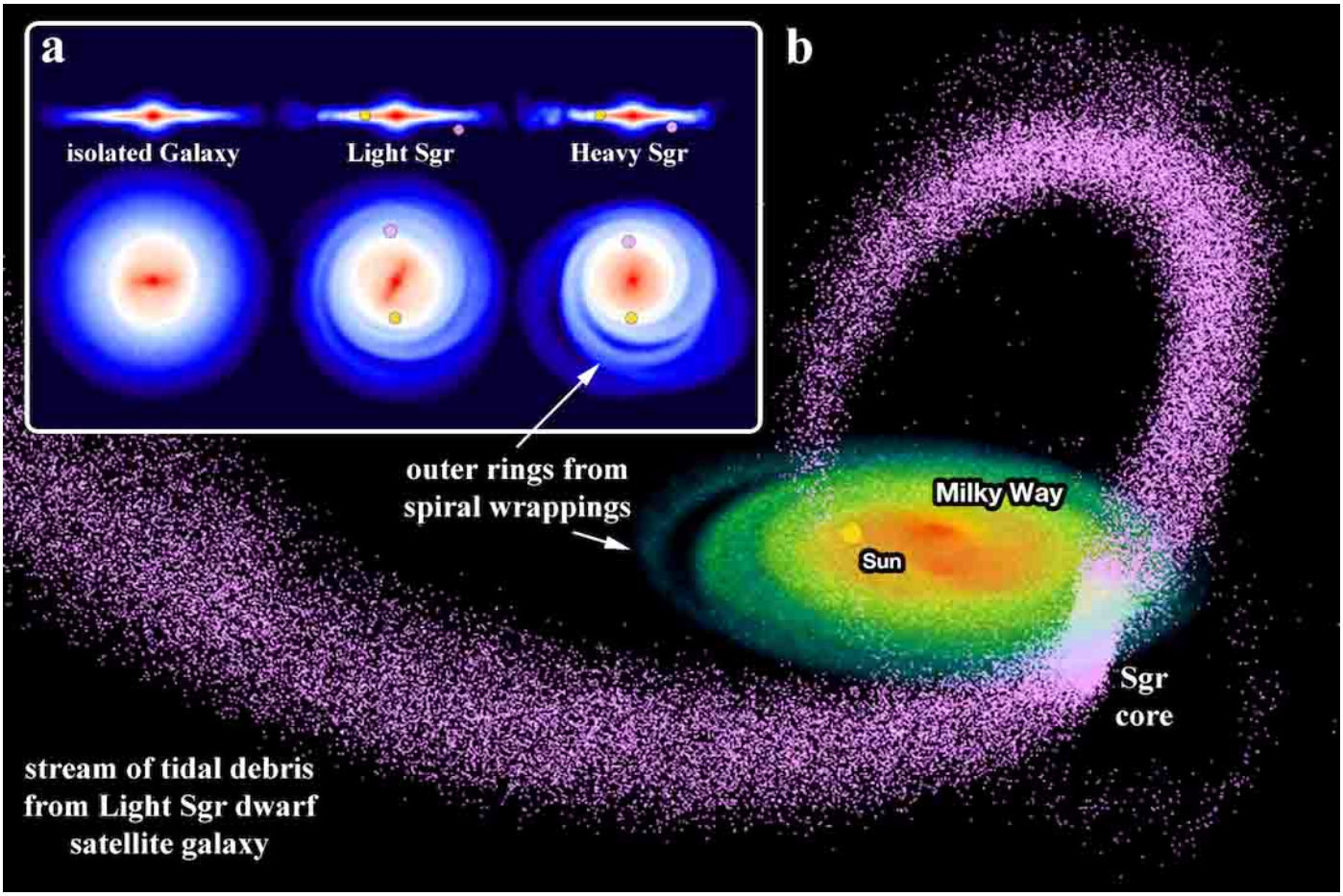
Incoming third impact of the Sagittarius Dwarf galaxy (blue stream of stars) with our Milky Way Galaxy (multicolored disk) was simulated by the GreenPlanet supercomputer cluster at the University of California, Irvine, and rendered by co-author Erik J. Tollerud against a background of galaxies seen in the Hubble Deep Field. Note the simulated disk's ring-like spiral extensions in the outer Milky Way (upper left), which strongly resemble actual streams found at low latitudes with respect to the disk plane, in the nearby region of the Milky Way viewed from the Earth in the opposite direction from the center of the Galaxy. According to a Letter by Chris W. Purcell and coauthors in the British journal Nature*, those spiral arms began to emerge after the initial impact of the Sagittarius Dwarf galaxy nearly two billion years ago.*

Dark matter, visible results

Ordinary matter makes up only 4.6 percent of the cosmic density; only 0.5 percent is visible. Nearly five times that much—23 percent—of the universe is made of invisible, transparent "dark matter," whose existence is felt through its gravitational influence. It is now known that every galaxy, including the Sagittarius Dwarf (pre-collision) and our own Milky Way, resides at the center of a giant halo of dark matter several times larger in radius and many times greater in mass.

Pre-collision, the Sagittarius Dwarf was quite large—somewhere in number of stars between the Small and Large Magellanic Clouds (the Milky Way's two irregular galaxy companions visible to the naked eye from the southern hemisphere). But its dark matter mass likely exceeded the mass of all the visible stars in the Milky Way.

"When all that dark matter first smacked into the Milky Way like a ghostly belly flop, 80 to 90 percent of it was stripped off," Purcell explained. "But the whirling disk of stars that was the Milky Way at that time was a very tenuous, chaotic system. That



Computer simulations visualized the disk of the Milky Way galaxy for three cases: no impact with a dwarf galaxy, impact with a Sagittarius Dwarf galaxy of lower mass (Light Sgr), and impact with a Sagittarius Dwarf galaxy of higher mass (Heavy Sgr). Our Milky Way galaxy is shown both edge-on and face-on in the inset panels; the sun's location is marked as a yellow dot and the present location of the Sagittarius dwarf's remnant core is marked as a pink dot, as shown after more than two billion years of isolated evolution. Shown in the background is a global rendering of the 'Light Sgr' tidal debris and the Milky Way disk.

first impact produced instabilities that were amplified and quickly formed spiral arms and associated ring-like structures in the outskirts of our Galaxy."

Purcell's paper, "The Sagittarius impact as an architect of spirality and outer rings in the Milky Way," which he wrote with four coauthors (including his Irvine dissertation advisor James S. Bullock), has been published as a Letter in the September 15, 2011 issue of *Nature*.

- Trudy E. Bell, M.A.

Further reading

The full reference to the *Nature* Letter is: "The Sagittarius impact as an architect of spirality and outer rings in the Milky Way," by Chris W. Purcell, James S. Bullock, Erik J. Tollerud, Miguel Rocha, and Sukanya Chakrabarti, *Nature* 477: 301–303, 15 September 2011. The full text is available online from http://www.nature.com/nature/journal/v477/n7364/full/nature10417.html and from http://arxiv.org/abs/1109.2918 and http://xxx.lanl.gov/abs/1109.2918 . Two computer-simulation movies of the impact appear in the press release at http://hipacc.ucsc.edu/MilkyWayImpact.html (scroll down to the bottom).

The University of California High-Performance AstroComputing Center (UC-HIPACC), based at the University of California, Santa Cruz, is a consortium of nine University of California campuses and three Department of Energy laboratories (Lawrence Berkeley Laboratory, Lawrence Livermore Laboratory, and Los Alamos National Laboratory). UC-HiPACC fosters collaborations among researchers at the various sites by offering travel and other grants, co-sponsoring conferences, and drawing attention to the world-class resources for computational astronomy within the University of California system. More information appears at http://hipacc.ucsc.edu .

Minutes of the Rose City Astronomers Board July 2012

Held at OMSI Boardroom

Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership)
Mark Martin (VP Programming)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
David Horne (Telescope Library)
David Nemo (Observing Site Director)
Scott Kindt (Newsletter Editor)

Call to Order

The meeting was called to order at 7:12 by Sameer Ruiwale and, there being 10 board members present, the quorum requirement of 9 was declared to be met.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 10 voting members present.

Treasurer's Report – Larry Godsey: 4 pages of financial information distributed. End of year reports are preliminary, since there may be some items yet to be accounted for. Profit and loss came out in surplus this year, despite originally budgeting a loss. Larry Godsey needs to buy a new version of *Quickbooks* which will come out of last year's budget. Sameer also has a pending bill in the amount of $20 which will also come out of last year's budget. Profit and loss detail for the last month with every receipt and payment included. Also included is a monthly profit and loss by category. There was a donation to Camp Hancock of $481 from the difference in camping fees versus OMSI charges, rounded up to $500. There is a $1000 fund that is earmarked to rebuild the Camp Hancock 13" Coulter telescope. This was budgeted for last year but will be moved into the current financial year. Since Greg Rohde's departure, we need to find somebody to take over this project. The CD for the club operating funds has matured. We will roll over the CD, but since we no longer need to keep a $5,000 minimum balance in the checking account, that $5,000 float will also be included in the new CD. All of the reports are also available on the website.

VP Programming – Mark Martin: Still have not confirmed an August speaker, but is in discussion with David Grinspoon, who is curator for astrobiology at the Denver Museum of Nature & Science. Also in discussion with Keith Lofstrum, who is a local engineer working on a satellite constellation for supercomputing applications. Details finalized for Brother Guy Consolmagno in September; will be arranging a dinner with Brother Guy before the meeting. Demonstration of Meade Lightbridge setup before the last meeting went very well; there were about 15 attendees.

VP Observing – Ben Carlson: Not present. We have a contract from OMSI for Camp Hancock which needs signature, under similar terms to previous years. Motion: Larry Godsey sign the contract with OMSI for Camp Hancock. Moved: Duncan Kitchin. Second: Larry Godsey. Motion passes 11-0-0.

VP Community Affairs - Jim Higgs: Not present. There was an outreach event last week, but was clouded out.

VP Membership – Ken Hose: Took in a total of $1169 in the last month, with 9 new members and 37 renewals. Ended the membership year with 389 member families, compared with 364 last year and 367 the year before that.

Alcor – Ken Hose: No new requests for observing awards.

New Member Advisor – Howard Knytych: Not present, but there is a new members meeting this month. Details are on the website.

Media Director – Diana Fredlund: News release will go out this week. Also received a request for assistance with making a short documentary about exobiology, but given the deadlines, nobody was available to participate.

Sales – Larry Froberg: Brought in $182 last month to close out the year. The total is just short of $4900 for the year, resulting in a profit of approximately $1429. Currently have 3 pre-orders for Richard Berry's book, and 1 pre-order for Brother Guy Consolmagno's book. Still looking for a volunteer to replace Larry Froberg, who will be stepping down at the end of the year.

Book Library – Jan Keiski: Nominal

Telescope Library - David Horne: Has been out to TMS a couple of times to take inventory, and has been over the local inventory here at OMSI. There are some concerns with the amount of equipment we currently have stored. There are in storage some items that have nominal value and are just taking up space; need to think about how to appropriately donate or sell it. May need to rent a storage unit (at approximately $75 a month) if there is excess. Might also consider storage of some of the larger pieces at the Haggart Observatory. Motion: Donate the C8 NexStar to the Athena public library. Moved: Duncan Kitchin Second: Sameer Ruiwale. Motion passes 11-0-0. Will also create a list of the other items, and offer for sale on the forum initially.

IDA – Dawn Nilson: Not present.

Magazine Subscriptions – Larry Godsey: Nominal.

Webmaster – Larry Godsey: Currently 343 of the 389 member families are on the broadcast email list. 118 members have been active on the forum in the last month. 124 have never been on the forum.

Site Committee – David Nemo: No activity on the observing site. Haggart Observatory: David has spoken with Craig Hlady, who is interested in taking on the role of coordinating. Will be taking inventory and taking possession of keys in the next few weeks.

Youth Director (vacant): No report.

Newsletter Editor – Scott Kindt: Nominal.

SIGs – Scott Kindt: Nominal.

OMSI –Jan Keiski: Jim Todd has asked for a form for astronomy day – Sameer to send. Looking for volunteers for August 5th Curiosity landing event.
Sister Club update – Jan Keiski: Leo Cavagnaro will be coming to Oregon on August 4th, and will be speaking at OSP.

Old Business

RCA generic business cards – Diana Fredlund / Sameer Ruiwale. No updates.
Proposal for RCA / Clackamas Comm. Coll Haggart Observatory use – David Nemo / Sameer Ruiwale. Discussed earlier; will move this to site committee reports.
Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde. No updates. Will remove this from the list.
Stub Stewart Observatory and option for housing club's 12" LX200 scope there – David Nemo. No updates.
Member Packet Updates by board members (several) – Ken Hose. Ken has received several updates, but some still outstanding.
2012-2013 Budget review – Larry Godsey. Already discussed.
OMSI / RCA Agreement – 2012-2013, review and signing – Sameer. Awaiting some modifications to the agreement before signature.

New Business

Astronomy Day – Aug. 5th Jim Higgs is organizing this, and will be putting out a call for volunteers.

Adjournment

There being no further business, the meeting was adjourned at 8:58pm

Elections for RCA Officers

At the November General Membership Meeting we will be electing the following RCA officers for 2011:

President
Vice President - Membership
Vice President - Community Affairs
Vice President - Programming (Communications)
Vice President - Observing
Treasurer
Secretary

If you are interested in running for one of these positions, or would like to nominate another member, please contact one of the members of the Nominating Committee listed below (via RCA Forum personal message or Forum email link) by September 30.

Diana Fredlund - Scott Kindt - Howard Knytych

We are in need of 3 club members to serve on the Nominating Committee. This committee is responsible for setting up and implementing the nominations and elections process. The time commitment for this committee is minimal.

We also have the Youth Director, and Special Interest Group Leader positions open for anyone wanting to help shape the future of the club.

2013 Club Calendar

Calling all photographers! We are currently soliciting photo submissions for the 2013 RCA Club Calendar. Do you have an image to rival the Hubble Deep Field photo? Maybe a nice wide field landscape with a backdrop of stars? Got a photo that you took of the Apollo landing sites? Send your submission to Calendar@rosecityastronomers.org

September 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						**1** 10am - 3pm Telescope Work-shop
2	**3** Labor Day	**4**	**5**	**6**	**7** Noon Downtowners Luncheon Kell's 	**8** Stub Stewart Star Party
9	**10** 7pm Board Meeting OMSI Classroom 1 7pm Astro Imaging SIG Beaverton Library	**11**	**12**	**13**	**14** Camp Hancock Star Party	**15**  Camp Hancock Star Party Rooster Rock Star Party
16	**17** 6:30 New Members - OMSI Planetarium **7:30pm General Meeting OMSI Auditorium**	**18**	**19** Cosmology SIG date/day of week has changed. →	**20**	**21** *Autumnal Equinox* 7pm Cosmology SIG	**22**  OMSI Star Party (Autumnal Equinox) At Rooster Rock and Stub Stewart
23	**24**	**25**	**26**	**27**	**28**	**29**  10am - 3pm Telescope Work-shop
30						

October 2012

Oct 01	Monday	Board Meeting	OMSI Classroom 1	7pm
Oct 05	Friday	Downtowner's Luncheon	Kell's	Noon
Oct 08	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Oct 12-14	Fri-Sun	Maupin Star Party	Wapanita Airstrip near Maupin, OR	
Oct 13	Saturday	Stub Stewart Star Party	Stub Stewart State Park	Sunset
Oct 15	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Oct 19	Friday	Cosmology SIG	Linus Pauling House **Note: New Day of Week**	7pm
Oct 27	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm

http://www.rosecityastronomers.org

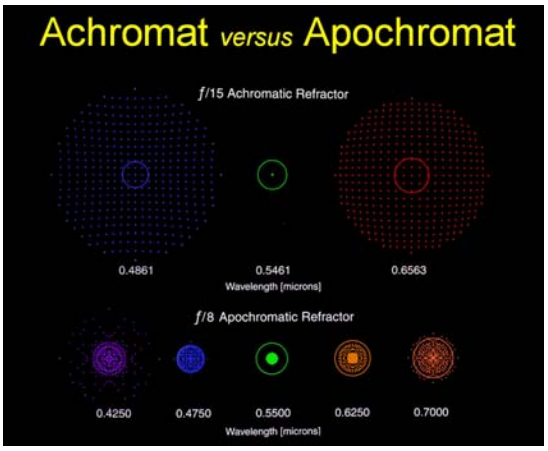
Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

Volume 25, Issue 10 Newsletter of the Rose City Astronomers October, 2012

Telescopes, Eyepieces, and Astrocameras

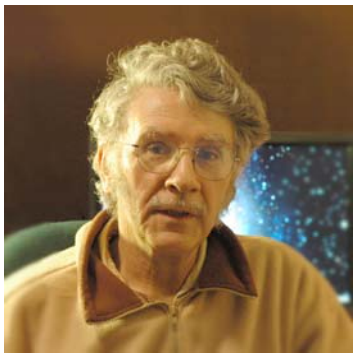
Richard Berry



We all use telescopes and want them to perform well, yet how they work sometimes seems mysterious. This talk is an introduction to optics as applied to amateur astronomy. I introduce the basic concepts in a simple, non-mathematical way and then show how, when analyzed, the familiar telescopes we all love actually work and perform. Although I'll focus primarily on telescopes -- achromatic refractors, Newtonian reflectors, apochromats, various Cassegrain types, SCTs, and Maksutovs -- and their performance, I'll also review classic eyepiece types and their modern, wide-angle successors. I will conclude with a brief discussion of astrographs, that is, telescopes optimized for imaging with CCD cameras.

Richard Berry has been an amateur astronomer and telescope maker for as long as he can remember. At age 13, he ground and polished his first telescope mirror, and went on the complete a dozen more telescopes. Early in his career, he built payloads launched on Black Brant research rockets, tested and certified components flown in the Apollo Soyuz mission, and measured ozone pollution with laser light.

Then, in 1976, Berry joined the staff of Astronomy magazine. In sixteen years as its editor, he built Astronomy magazine from a struggling start-up to the largest circulation astronomy magazine in the world. During this time, he also founded and edited Telescope Making, the quarterly journal that helped make the 1980s such explosive growth years for amateur astronomy.



In the last two decades, Richard's books "Build Your Own Telescope", "Discover the Stars", "The CCD Camera Cookbook", "The Dobsonian Telescope" and "The Handbook of Astronomical Image Processing" have introduced thousands to the joys of amateur astronomy, telescope making, CCD imaging, and digital image processing.

All are Welcome! Monday October 15th

Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.

Location: OMSI Auditorium

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Oct 8	Oct 15	Oct 22	Oct 29

Maupin Star Party
October 12-14, 2012

The Rose City Astronomers have been granted permission to use private property approximately 8 miles west of the town of Maupin for member-only scheduled Star Parties.
The Maupin Observing Site is located on a private airstrip about 8 miles east of Maupin, Oregon. Warning: this airstrip is used in the morning, but at the far end of the airfield. Most people don't even wake up.
There is no registration for the event itself, just show up and enjoy the weekend. You don't even need a telescope to participate; other members are enthusiastic to share their views. This is a good opportunity for beginners to get acquainted and seasoned observers to get some serious observing.
Our host owns the nearby Walters Corner store (see map) and everyone is encouraged to stop in and buy gas and groceries, or just say hello and thank you.
RVs, trailers and tents will be allowed on the observing site (see observing site map for instructions). The town of Maupin offers lodging, restaurants and recreation if you don't want to rough it. We will have a portable outhouse on site. Propane stoves only and please use them up off the ground on a table or stand. No open fires or charcoal briquettes.
It can always be cold at night no matter what the season, so bring warm clothing.

RCA Dark Sky Star Parties
Stub Stewart Star Party - Oct 13, 2012

This is an RCA member star party and is not one of the OMSI public star parties.
There is no registration for RCA star parties at this location, just show up and enjoy the evening. You don't even need a telescope to participate; other members are enthusiastic to share their views.
There is an Oregon State Park Day-Use Fee of $5 for parking, unless you have the Yearly Pass available the Oregon Parks Dept.

Hilltop area used for astronomy viewing at Stub Stewart.

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, Oct 8th, 7pm
Location: Beaverton Public Library
Conference Room
12375 SW 5th St
Beaverton
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: On Hold
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: TBD

Leader: Vacant
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, Oct 5th, Nov 2nd, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, Nov 19th, 6:30pm
Location: OMSI Planetarium
Topic: TBA
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, Oct 27th
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wed, Oct 17th, 7pm
Topic: TBA

Presented by: TBA
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

Notice
Meeting day of week moved back to Wednesdays following the general meeting.

CLUB OFFICERS

Office	Name	Email
President	Sameer Ruiwale	president@rosecityastronomers.org
Past President	Carol Huston	pastprez@rosecityastronomers.org
VP Membership	Ken Hose	membership@rosecityastronomers.org
VP Observing/Star Parties	Steve Jaynes	observing@rosecityastronomers.org
VP Community Affairs	Jim Higgs	community@rosecityastronomers.org
VP Communications	Mark Martin	communications@rosecityastronomers.org
Treasurer	Larry Godsey	treasurer@rosecityastronomers.org
Secretary	Duncan Kitchin	secretary@rosecityastronomers.org
Sales Director	Larry Froberg	sales@rosecityastronomers.org
Newsletter Editor	Scott Kindt	editor@rosecityastronomers.org
Media Director	Diana Fredlund	media@rosecityastronomers.org
New Member Advisor	Howard Knytych	newmembers@rosecityastronomers.org
Webmaster	Larry Godsey	webmaster@rosecityastronomers.org
ALCOR	Ken Hose	alcor@rosecityastronomers.org
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Telescope Director	Dave Horne	telescope@rosecityastronomers.org
Observing Site Director	David Nemo	sitefund@rosecityastronomers.org
IDA Liaison	Dawn Nilson	ida@rosecityastronomers.org
OMSI Liaison	Jan Keiski	omsi@rosecityastronomers.org
Magazines Director	Larry Godsey	magazines@rosecityastronomers.org
SIG Director	Vacant	sigs@rosecityastronomers.org
Youth Programs Director	Vacant	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information and payment options please see the website.

http://www.rosecityastronomers.org/mags/index.htm

Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.

http://www.rosecityastronomers.org/library.htm

Jan Keiski <library@rosecityastronomers.org>

Astrophoto of the Month

The Heart Nebula - IC1805 in Cassiopeia

By Greg Marshall

2013 Club Calendar

Calling all photographers! We are currently soliciting photo submissions for the 2013 RCA Club Calendar. Do you have an image to rival the Hubble Deep Field photo? Maybe a nice wide field landscape with a backdrop of stars? Got a photo that you took of the Apollo landing sites? Send your submission to Calendar@rosecityastronomers.org. Deadline is October 14th.

Doing Science with a Spacecraft's Signal

By David Doody

Mariner 2 to Venus, the first interplanetary flight, was launched August 27 fifty years ago. This was a time when scientists were first learning that Venus might not harbor jungles under its thick atmosphere after all. A Russian scientist had discovered that atmosphere during the rare Venus transit of 1761, because of the effects of sunlight from behind.

Mariner 2 proved interplanetary flight was possible, and our ability to take close-up images of other planets would be richly rewarding in scientific return. But it also meant we could use the spacecraft itself as a "light" source, planting it behind an object of our choosing and making direct measurements.

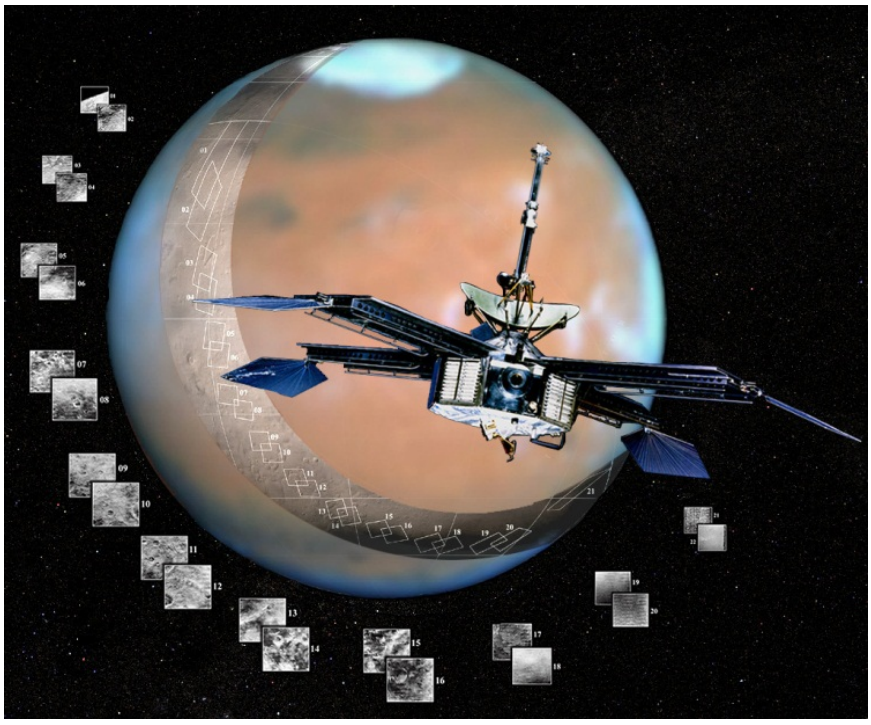
Mariner 4 did the first occultation experiment of this sort when it passed behind Mars as seen from Earth in July 1965. But, instead of visible light from the Sun, this occultation experiment used the spacecraft's approximately 2-GHz radio signal.

The Mariner 4 experiment revealed Mars' thin atmosphere. Since then, successful radio science occultation experiments have been conducted at every planet and many large moons. And another one is on schedule to investigate Pluto and its companion Charon, when the New Horizons spacecraft flies by in July 2015. Also, during that flyby, a different kind of radio science experiment will investigate the gravitational field.

The most recent radio science occultation experiment took place September 2, 2012, when the Cassini spacecraft carried its three transmitters behind Saturn. These three different frequencies are all kept precisely "in tune" with one another, based on a reference frequency sent from Earth. Compared to observations of the free space for calibration just before ingress to occultation, the experiment makes it possible to tease out a wide variety of components in Saturn's ionosphere and atmosphere.

Occultation experiments comprise only one of many categories of radio science experiments. Others include tests of General Relativity, studying the solar corona, mapping gravity fields, determining mass, and more. They all rely on NASA's Deep Space Network to capture the signals, which are then archived and studied.

Find out more about spacecraft science experiments in "Basics of Space Flight," a website and book by this author, http://www2.jpl.nasa.gov/basics. Kids can learn all about NASA's Deep Space Network by playing the "Uplink-Downlink" game at http://spaceplace.nasa.gov/dsn-game.



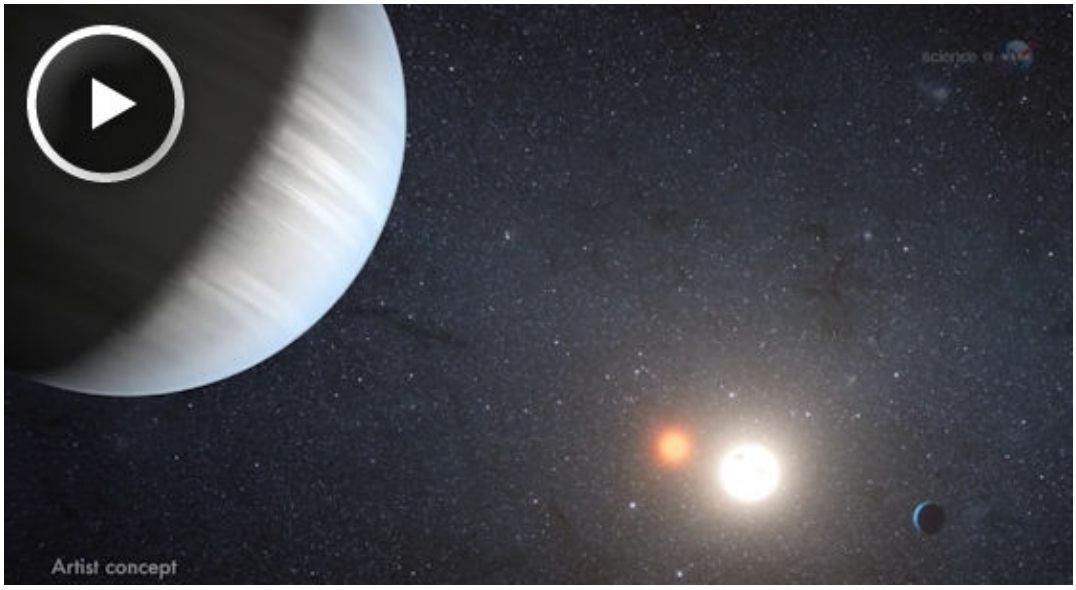
Caption:
In this poster art of Mariner 4, you can see the parabolic reflector atop the spacecraft bus. Like the reflector inside a flashlight, it sends a beam of electromagnetic energy in a particular direction. Credit: NASA/JPL/Corby Waste.

Space Place Partners' article *September 2012*

Weird Planets

Sept. 12, 2012: News flash: The Milky Way galaxy just got a little weirder.
Back in 2011 astronomers were amazed when NASA's Kepler spacecraft discovered a planet orbiting a double star system. Such a world, they realized, would have double sunsets and sunrises just like the fictional planet Tatooine in the movie Star Wars. Yet this planet was real.

Now Kepler has discovered a whole system of planets orbiting a double star.



A new ScienceCast video takes viewers on a tour through the Kepler-47 system. Play it.

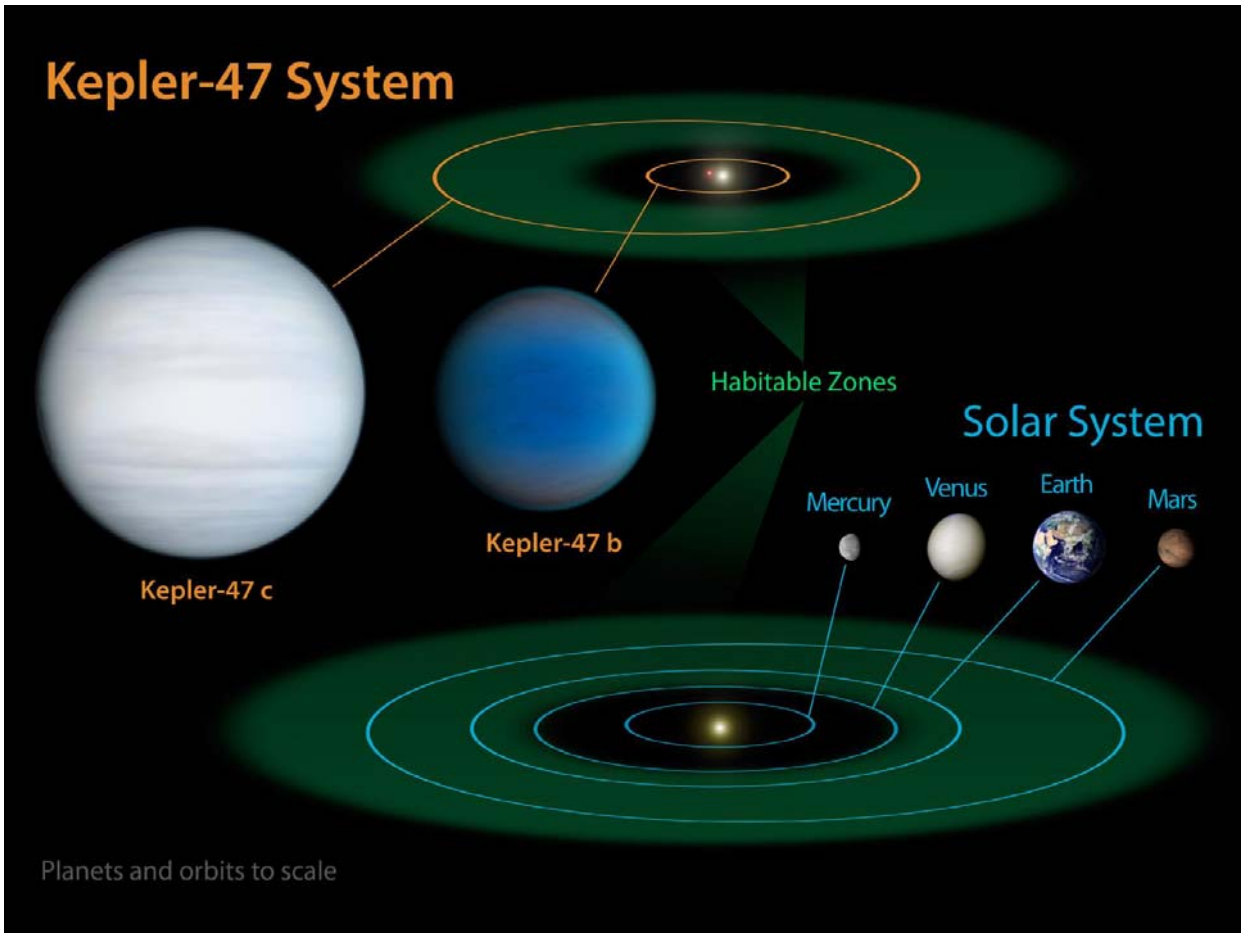
The star system, known as Kepler-47, is located 4,900 light-years from Earth in the constellation Cygnus. Two stars orbit one another at the center of the system: One is similar to the sun in size, but only 84 percent as bright. The second star is smaller, only one-third the size of the sun and less than 1 percent as bright. Kepler found two planets orbiting this mismatched pair.
"The presence of a full-fledged planetary system orbiting Kepler-47 is an amazing discovery," says Greg Laughlin, professor of Astrophysics and Planetary Science at the University of California in Santa Cruz. “This is going to change the way we think about the formation of planets.”

The inner planet, Kepler-47b, closely circles the pair of stars, completing each orbit in less than 50 days. Astronomers think it is a sweltering world, where the destruction of methane in its super-heated atmosphere might lead to a thick global haze. Kepler-47b is about three times the size of Earth.
The outer planet, Kepler-47c, orbits every 303 days. This puts it in the system's habitable zone, a band of orbits that are “just right” for liquid water to exist on the surface of a planet. But does this planet even have a surface? Possibly not. The astronomers think it is a gas giant slightly larger than Neptune.
The discovery of planets orbiting double stars means that planetary systems are even weirder and more abundant than previously thought.

This diagram compares our own solar system to Kepler-47, a double-star system containing two planets, one orbiting in the so-called "habitable zone." Credit: NASA/JPL-Caltech/T. Pyle more
"Many stars are part of multiple-star systems where two or more stars orbit one another. The question always has been -- do they have planets and planetary systems?" says William Borucki, Kepler mission principal investigator at NASA's Ames Research Center. "This Kepler discovery proves that they do."
Our own sun is a single, isolated star, with a relatively simple gravitational field that rules the motions of the planets orbiting it.
But, as Borucki points out, not all stars are single. Astronomers estimate that more than half of the stars in the galaxy have companions. There are double, triple and even quadruple star systems. Any planets in such systems would have to navigate a complex gravitational field, tugged in multiple directions by multiple stars. In fact, for many years, astronomers doubted that planets could even form in such an environment.
Kepler-47 erases those doubts—and poses a conundrum: "These planets are very difficult to form using the currently accepted

paradigm," says Laughlin. "I believe that theorists, myself included, will be going back to the drawing board to try to improve our understanding of how planets are assembled in the dusty gaseous disks that surround many young stars."
The Kepler spacecraft is on a mission to find Earth-like planets that might support life. Says Borucki: "In our search for habitable worlds, we have just found more opportunities for life to exist."

Author: Dr. Tony Phillips | Production editor: Dr. Tony Phillips | Credit: Science@NASA



Orbiting in the Habitable Zone of Two Suns

This diagram compares our own solar system to Kepler-47, a double-star system containing two planets, one orbiting in the so-called "habitable zone." This is the sweet spot in a planetary system where liquid water might exist on the surface of a planet.

Unlike our own solar system, Kepler-47 is home to two stars. One star is similar to the sun in size, but only 84 percent as bright. The second star is diminutive, measuring only one-third the size of the sun and less than one percent as bright. As the stars are smaller than our sun, the systems habitable zone is closer in.

The habitable zone of the system is ring-shaped, centered on the larger star. As the primary star orbits the center of mass of the two stars every 7.5 days, the ring of the habitable zone moves around.

This artist's rendering shows the planet comfortably orbiting within the habitable zone, similar to where Earth circles the sun. One year, or orbit, on Kepler-47c is 303 days. While not a world hospitable for life, Kepler-47c is thought to be a gaseous giant, slightly larger than Neptune, where an atmosphere of thick bright water-vapor clouds might exist.

The discovery demonstrates the diversity of planetary systems in our galaxy and provides more opportunities to search for life as we know it.

For more, visit: http://www.nasa.gov/mission_pages/kepler/news/kepler-47.html

Credit: NASA/JPL-Caltech/T. Pyle

Lithium in the Sun and the Solar System: Milestones in the ongoing search for extra solar planets

by Robert McGown

It has long been thought that the metalicity of a star had something to do with whether or not a star had a solar system. Now a European study of the element lithium depletion points toward a ground breaking milestone in the search for extra solar planets. This discovery will revolutionize the search for extra solar planets.

New Questions for Stellar and Planetary Scientists:

Did the solar lithium stratify in the gas giant planets and not the Sun?

Did the lithium escape into the proto planetary disc?

What was the solar or planetary formation mechanism to release or destroy the element lithium on the Sun?

Recently nine astronomers from Europe made a census of 500 stars, 70 of which are known to host planets. This has successfully connected a correlation to the long-standing "lithium mystery" observed in the Sun associated with the presence of planetary systems. Using the HARPS spectrograph on the European Southern Observatory, a team of European astronomers has found that Sun-like stars that host planets have used up their lithium much more efficiently than star systems with out planets. This discovery gives astronomers a new method in finding a way to determine if stars have planetary systems using our Sun and solar system as a model.

"*For almost 10 years we have tried to find out what distinguishes stars with planetary systems from their barren cousins," says Garik Israelian, lead author of a paper appearing this week in the journal Nature. "We have now found that the amount of lithium in Sun-like stars depends on whether or not they have planets*."

Compared to other stars our Sun has low levels of lithium and a correlation is the first time that a large cross section of data has been successfully analyzed. The trend among planet-bearing star systems with low lithium star correlation with solar systems will give extra solar planet hunters a new direction to seek out stars with solar systems.

"*The explanation of this 60 year-long puzzle is for us rather simple," adds Israelian. "The Sun lacks lithium because it has planets*."

The findings were made with the analysis of 500 stars, including 70 planet-hosting stars. Most of these star systems were analyzed for several years with ESO's High Accuracy Radial Velocity Planet Searcher. One of the best exoplanet hunting spectrographs, also known as HARPS, was used with the ESO's 3.6-metre telescope.

"*This is the best possible sample available to date to understand what makes planet-bearing stars unique*," says co-author Michel Mayor (co discover of 51 Pegasi) .

The team looked at the spectra of Sun-like stars, and found that the majority of stars with planetary systems contain less than 1% of the amount of lithium than other star systems that didn‘t appear to have planetary systems.

“*Like our Sun, these stars have been very efficient at destroying the lithium they inherited at birth. Using our unique, large sample, we can also prove that the reason for this lithium reduction is not related to any other property of the star, such as its age*.” says team member Nuno Santos. (Centro de Astrofisica, Universidade de Porto, Portugal)

An analysis of the formation from the paper published in Nature 2009: Unlike most other elements lighter than iron, the light nuclei of lithium, beryllium and boron are not produced in significant amounts in stars. However, it is thought that lithium, composed of just three protons and four neutrons, was mainly produced just after the Big Bang, 13.7 billion years ago had recondensed in the solar nebulas with the formation of star systems. According to the stastical analysis, most stars will have the same amount of lithium, unless this element has been destroyed inside the star or released in the process of the solar system building.

This result also provides the astronomers with a direct new way to search for planetary systems using the existing methods of astrometerics, spectroscoptic and direct imaging. The amount of lithium present allows astronomers to have specific target star systems to study.

While the correlation of the presence of planets and the suspect low levels of lithium has been established, the physical mechanism behind it has to be investigated which may lead to the detection of the possibility of discovery of Earth like planets and solar system formation and composition.

“*There are several ways in which a planet can disturb the internal motions of matter in its host star, thereby rearrange the distribution of the various chemical elements and possibly cause the destruction of lithium. It is now up to the theoreticians to figure out which one is the most likely to happen*,” Michel Mayor (Observatoire de Genève, Switzerland).

More information on the team of astronomers:
This groundbreaking research was presented in a paper that appears in the 12 November 2009 issue of Nature (Enhanced lithium depletion in Sun-like stars with orbiting planets, by G. Israelian et al.).

The team is composed of Garik Israelian, Elisa Delgado Mena, Carolina Domínguez Cerdeña, and Rafael Rebolo (Instituto de Astrofisíca de Canarias, La Laguna, Tenerife, Spain), Nuno Santos and Sergio Sousa (Centro de Astrofisica, Universidade de Porto, Portugal), Michel Mayor and Stéphane Udry (Observatoire de Genève, Switzerland), and Sofia Randich (INAF, Osservatorio di Arcetri, Firenze, Italy).

ESO, the European Southern Observatory, is the foremost intergovernmental astronomy organisation in Europe and the world’s most productive astronomical observatory. It is supported by 14 countries: Austria, Belgium, the Czech Republic, Denmark, France, Finland, Germany, Italy, the Netherlands, Portugal, Spain, Sweden, Switzerland and the United Kingdom. ESO carries out an ambitious programme focused on the design, construction and operation of powerful ground-based observing facilities enabling astronomers to make important scientific discoveries. ESO also plays a leading role in promoting and organising cooperation in astronomical research. ESO operates three unique world-class observing sites in Chile: La Silla, Paranal and Chajnantor. At Paranal, ESO operates the Very Large Telescope, the world’s most advanced visible-light astronomical observatory. ESO is the European partner of a revolutionary astronomical telescope ALMA, the largest astronomical project in existence. ESO is currently planning a 42-metre European Extremely Large optical/near-infrared Telescope, the E-ELT, which will become “the world’s biggest eye on the sky”.

Minutes of the Rose City Astronomers Board August 6th

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership)
Mark Martin (VP Programming)
Jim Higgs (VP Community Affairs)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Howard Knytych (New Member Advisor)
Jan Keiski (Library Director, OMSI & Sister Club Liaison)
David Horne (Telescope Library)
David Nemo (Observing Site Director)
Dawn Nilson (International Dark Sky Liaison)
Scott Kindt (Special Interest Groups Director)

Herry Tedja (Guest, volunteer to replace Larry Froberg as sales director)

Call to Order

The meeting was called to order in the OMSI Board Room at 7:10pm by Sameer Ruiwale and, there being 14 board members present, the quorum requirement of 9 was declared to be met.

Approval of Minutes

Moved: Approve minutes from the July 2012 board meeting. Moved: Duncan. Second: Sameer. Motion passes 14-0-0. Approve minutes from the June 2012 meeting. Moved: Duncan Second: Howard. Motion passes 14-0-0.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 14 voting members present.

Treasurer's Report – Larry Godsey: Passed out 4 pages, also available on the Board website. We are only one month into this year with 1 check not yet cleared from last year. Profit & loss shows very little in the way of expenditures, but there is $1000 which has been transferred over from last year for the repair of the Camp Hancock telescope showing up this month. Profit & loss detail shows every check paid and deposited. Larry intends this year to get checks onto the books in the month in which the moneys were actually collected to avoid delays in checks clearing. The software purchased shows up on last year's accounts as previously discussed, including new version of Quickbooks and new desktop publishing tools for the newsletter, which were acquired at a significant discount.

VP Programming – Mark Martin: August speaker is Keith Lofstrom, who will be speaking about a network of satellites to perform supercomputing. David Grinspoon, who is curator for astrobiology at the Denver Museum of Nature and Science and columnist for Sky & Telescope, has been booked for next July. Brian Graham will likely speak next summer. Sue French is tentatively scheduled to speak in November 2013. Also have lined up Fulvio Melia for next year, with exact details to be determined.

VP Observing: Currently vacant(?). Camp Hancock is coming up, need a volunteer to organize registration at the general meeting. Ken Hose will take care of this. Scheduling for Kah-Nee-Ta next year in March will be awkward, because the new Moon in March is very early in the month. If we move it to April, this may end up colliding with the dates for Camp Hancock. We will look into possibly scheduling it in early May.

VP Community Affairs - Jim Higgs: Slow start due to cloudy conditions, but have held two events in July: one at cloud cap, which was a huge success, and one at St Helens high school, which was somewhat limited due to weather. Also have two more upcoming events, one in two weeks at a winery and another with a group of acupuncturists. Astronomy day was a big success, with 12 volunteers showing up to run the event.

VP Membership – Ken Hose: Updated new members packet distributed. Also sent out soft copies for formal review. Brought in a total of $2564 in dues collected in the last month, resulting in 212 total member families for July. 18 new members, 85 renewals. At the same time last year, we had 195 member families, and 181 the year before that. Peak 389 member families at the end of last year.

Alcor – Ken Hose: Nominal.

New Member Advisor – Howard Knytych: Suggestion: we should add a question to the membership form to ask where new members heard about RCA; this would help in finding potential new members. Will also print some new name badges for board members and SIG leaders to be worn at general meetings.

Media Director – Diana Fredlund: News release will go out this week.

Sales – Larry Froberg: Brought in a total of $257 in sales last month. Now have a total of 14 pre-orders for Richard Berry's book, and 11 for Brother Guy Consolmagno's book.

Book Library – Jan Keiski: Nominal.

Telescope Library - David Horne: Made $750 in sales of surplus to requirements telescopes, as a result of which TMS is now cleaned out. Have now acquired a 13" Coulter and 11" Celestron donated by Lewis and Clark. The 13" Coulter mirror is of high quality, planning to construct a truss-tube Dobsonian around it. The Celestron is in good shape, but the tripod and mount are in need of attention. Need to work out how to complete two other projects: one is fixing the Stub Stewart telescope, which needs a new synchronous motor and gear, and the Camp Hancock telescope, repair of which was already well underway. Proposed that we take the 12" Meade that the club has and install it at Stub Stewart on extended loan, and send out a broadcast message requesting club volunteers who might be available to work on the Camp Hancock scope.

IDA – Dawn Nilson: Budget item: IDA has a display board used for meetings, cost is $100 to ship. Can also create one; IDA has a kit that can be used to make one. Would also like to set up an IDA event separately from astronomy day, showing IDA film, and followed with a panel discussion. Proposed date would be some time in mid fall, and then follow up with a meeting to discuss a model ordinance at a later date in the winter. Dawn to determine cost for the display board and report back. Will also propose a date for a showing of the film and panel discussion.

Magazine Subscriptions – Larry Godsey: Nominal.
Webmaster – Larry Godsey: Nominal.
Site Committee – David Nemo: Haggart Observatory update: completed an inventory of the equipment. Meeting last week with the head of maintenance for Clackamas Community College. They will be trimming some tree limbs and steam wash the stairs. The community college will also be putting in a couple of new locks on the storage units. Will be continuing to visit and take an inventory of maintenance items. Looking to schedule a public event sometime later this year or early next year. There is a meeting September 15th to create a master plan for the Johnson Ridge site.
Youth Director (vacant): No report
Newsletter Editor – Scott Kindt: Nominal
SIGs – Scott Kindt: Nominal
OMSI –Jan Keiski: Report from Jim Todd:
HUGE thank you to Jim Higgs for helping out on Astronomy Day at OMSI. Successful day and evening events.
Sunday, August 12 Perseid Meteor Shower Watch at Rooster Rock and Stub Stewart. Some concern of volunteers at Stub Stewart. Last star party on July 28, had 36 telescopes at Rooster Rock while only 6 at Stub Stewart with large crowd. Help?
August 20 meeting in the planetarium.
Huge thank you to David for clearing out the telescopes in the backspace of the planetarium!
September, general meeting back in the auditorium; board meeting in board room.
Sister Club update – Jan Keiski: Leo Cavagnaro will be speaking at OSP, and will be attending the next general meeting and board meeting.

Old Business

RCA generic business cards – Diana Fredlund / Sameer Ruiwale. Business card backs are set, finalizing details of phone number on the front.
Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde
Stub Stewart Observatory and option for housing club's 12" LX200 scope there – David Nemo. Already discussed
Member Packet Updates by board members (several) – Ken Hose. Done and sent for review.
OMSI / RCA Agreement – 2012-2013, review and signing – Sameer. Changes since last discussion: the waiver section that had been a concern has been removed. An indemnification section has been added, along with a workers compensation section. Also added is a new insurance coverage section. The wording also requires news releases to be pre-approved by OMSI. The agreement does not currently identify who the official liaison is; we would like to request that Jim Todd be specifically identified as the contact. In addition, we need to run the insurance language past our insurance agent. Motion: approve the agreement subject to OMSI agreeing to designate a specific liaison and our insurance carrier verifying that our insurance is compatible with the terms of the agreement. Moved: Duncan. Seconded: Sameer. Motion approved 13-0-0.

New Business

July Mtg Telescope Sale Update / Telescope storage update – David Horne. Already discussed
Volunteer Tshirts (should RCA supply Tshirts for volunteers) – Sameer. Tabling until next month.
Introduction of new sales director: Herry Tedja has volunteered to take over sales from Larry Froberg. Larry will stay on for a handover period, until Harry is comfortable taking over the post.
Volunteers for the election committee: Diana Fredlund, Sameer Ruiwale and Scott Kindt volunteer to be on the election committee.

Adjournment

There being no further business, the meeting was adjourned at 9:20pm.

Elections for RCA Officers

At the November General Membership Meeting we will be announcing the following candidates RCA officers for 2011:

David Nemo - President
Ken Hose - Vice President - Membership
Jim Higgs - Vice President - Community Affairs
Mark Martin - Vice President - Programming (Communications)
Steve Jaynes - Vice President - Observing
Larry Godsey - Treasurer
Duncan Kitchin - Secretary

If you are interested in running for one of these positions, or would like to nominate another member, please contact one of the members of the Nominating Committee listed below (via RCA Forum personal message, email link listed previously in this newsletter or in person) prior to the beginning of the general meeting on October 15th.
Diana Fredlund- -Scott Kindt- -Howard Knytych- -Jim Todd

We also have the Youth Director, and Special Interest Group Leader positions open for anyone wanting to help shape the future of the club. These are appointed positions, not elected positions.

October 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 7pm Board Meeting OMSI Classroom 1	**2**	**3**	**4**	**5** Noon Downtowners Luncheon Kell's	**6** 10am - 3pm Telescope Workshop
7	**8**  7pm Astro Imaging SIG Beaverton Library	**9**	**10**	**11**	**12** Maupin Star Party	**13** Stub Stewart Star Party Maupin Star Party
14	**15**  **7:30pm** **General Meeting** **OMSI Auditorium**	**16**	**17** 7pm Cosmology SIG Note: Date/day of week has changed back to Wednesday	**18**	**19**	**20**
21	**22** 	**23**	**24**	**25**	**26**	**27** 10am - 3pm Telescope Workshop
28	**29** 	**30**	**31**			

November 2012

Nov 02	Friday	Downtowner's Luncheon	Kell's	Noon
Nov 05	Monday	Board Meeting	OMSI Classroom 1	7pm
Nov 12	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Nov 19	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Nov 21	Wednesday	Cosmology SIG	Linus Pauling House **Note: Moved Back to Wed.**	7pm
Dec 01	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm

http://www.rosecityastronomers.org

Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

Volume 25, Issue 11 Newsletter of the Rose City Astronomers November, 2012

Catching a Comet with Aerogel: an insiders story

Doug Buettner, Ph.D.

Comets are thought to have been created before the planets, so scientists hoped analysis of the comet samples would reveal information about the creation of our solar system.

Today, we know a bit more about them thanks in large part to an amazing substance called Aerogel. Invented over 80 years ago by Samuel S. Kistler in California's Bay area, Aerogel is composed of 99.8% air and is chemically similar to ordinary glass. Being the world's lightest known solid, it weighs only three times that of air.

JPL's Dr. Peter Tsou and Dr. Doug Buettner built the equipment and perfected the techniques to make space flight quality Aerogel that Dr. Don Brownlee (University of Washington Professor) along with other scientists and engineers used to successfully return to Earth samples from the comet P/Wild-2.

The Stardust spacecraft, which has traveled 2 billion miles, was launched Feb. 7, 1999, and returned to earth Jan. 15, 2006, where its capsule landed safely in the Utah desert containing Aerogel with embedded samples of comet and interstellar dust.

Aerogel was also flown on the Soviet Union's MIR space station to capture high and hyper-velocity dust in space, as well as supplying Aerogel to insulate the electronics on Sojourner, the very first robotic rover to land on Mars.

Dr. Buettner will provide a brief review of comet lore, some behind the scenes stories from his part working at JPL to build their equipment, making Aerogel for NASA space flights, and supporting the STARDUST mission.

(Continued on page 2)

All are Welcome! Monday November 19th

New Member 6:30 Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon	New Moon	First Quarter Moon	Full Moon
Nov 6	Nov 13	Nov 20	Nov 28

Dr. Doug Buettner was born in Klamath Falls and grew up in Madras, graduating from Madras High in 1984. After high school, he spent two years studying Astrophysics at Boston University, after which he transferred to Oregon State and completed his bachelors and masters degrees in Physics in '88 and '91. His graduate work at Oregon State was funded in part by a NASA student research grant where he worked with OSU's Dr. David Griffiths and NASA Jet Propulsion Laboratory scientist Dr. Peter Tsou on hypervelocity intact capture; invented at JPL by Dr. Tsou. This work led to further research funding to support JPL and U.S. Air Force experiments to characterize the ballistic performance of high density foams for use in mannequins to capture shrapnel from live fire tests on F-16 fighter jets.

Following graduation from OSU he moved to Southern California to work on a contract for JPL to build the equipment to make Aerogel for space flight. The laboratory he built at JPL was used on numerous space shuttle flights, and on the Soviet Union's MIR space station to capture high and hyper-velocity dust in space. The lab also supplied Aerogel to Sojourner, the very first robotic rover on Mars, and ultimately his autoclave was used by STARDUST mission scientists and engineers to make Aerogel to return for the first time in human history intact dust samples from a Comet.

He later received his Ph.D. as an Aerospace Corporate Fellow from the University Of Southern California Viterbi School Of Engineering's Astronautical Engineering Department in the area of software intensive satellite acquisitions; all while working as the Systems Director managing a team of Aerospace Corporation engineers that successfully oversaw the development of mission critical flight software for one of their large satellite programs.

Dr. Buettner is now a Sr. Project Engineer at Aerospace, residing in Colorado Springs CO, where he is assisting government contractors test and improve their ground software.

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, Nov 12th, 7pm
Location: Beaverton Resource Center
12500 SW Allen Blvd
SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Note Meeting Location

Junior Astronomers

When: Monday, Jan 21st, 6:30pm
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: TBD

Leader: John Oreskovich
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/youth.htm

Note youth program starting back up.

Downtowners Luncheon

When: Friday, Dec 7th, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, Nov 19th, 6:30pm
Location: OMSI Planetarium
Topic: AL Observing Programs and Awards
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, Dec 1st
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wed, Nov 21st, 7pm
Topic: TBA

Presented by: TBA
Location: Linus Pauling House
SIG Leader: Lamont Brock
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

Note No Meeting In December 2012 or January 2013

CLUB OFFICERS

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Youth Programs Director	John Oreskovich	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information and payment options please see the website.

http://www.rosecityastronomers.org/mags/index.htm

Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

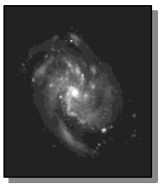
The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.

http://www.rosecityastronomers.org/library.htm

Jan Keiski <library@rosecityastronomers.org>

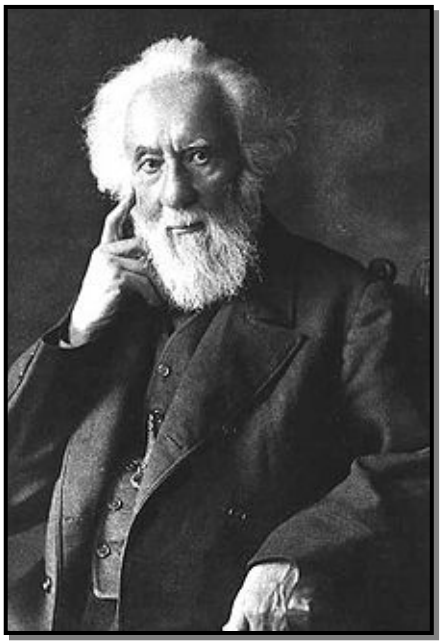
The Observer's Corner

Howard Banich



NGC 6543, William Huggins and the Birth of Modern Astrophysics

In 1863, William Huggins, a British amateur astronomer, and W. A. Miller, a chemistry professor, determined that the chemical composition of the stars was similar to the sun, firmly establishing that stars were distant suns and not merely points of light in the night sky.



Determined to extend this work to nebulae, in 1864 the physical nature of planetary nebulae was determined by Huggins when he pointed his 8 inch refractor equipped with his visual spectroscope, seen below, at NGC 6543, the Cat's Eye Nebula. Until then all astronomers had to go on was speculation, and many felt that all nebulae would eventually be shown to be composed of faint stars.

Huggins and Miller's 1864 paper in the Royal Society's Philosophical Transactions explains how they were the first to see the spectrum from a non-stellar object and finally settle the fact that planetary nebulae are clouds of tenuous, luminous gas and partially determined their chemical composition.

As Huggins later wrote:

"On the evening of August 29, 1864, I directed the telescope...to a planetary nebula in Draco [NGC 6543]. The reader may be able to picture to himself...the feeling of excited suspense, mingled with a degree of awe, with which, after a few moments of hesitation, I put my eye to the spectroscope. Was I not about to look into a secret place of creation?

I looked into the spectroscope. No such spectrum as I expected! A single <u>bright line</u> only! ... The light of the nebula was monochromatic, and so, unlike any other light I had yet subjected to prismatic examination, could not be extended out to form a complete spectrum...A little closer looking showed two other bright lines on the side towards the blue. The riddle of the nebulae was solved. The answer, which had come to us in the light itself, read: Not an aggregation of stars, but a luminous gas"

How utterly thrilling a discovery! Read those two paragraphs above again – essentially, this moment was the birth of modern astrophysics.

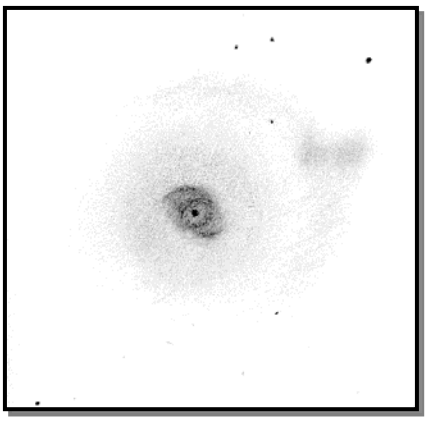
Huggins had discovered an emission line of hydrogen and two mystery lines that were later shown to be doubly-ionized oxygen, although at first they were dubbed "nebulium" because they couldn't immediately be matched to a known element.

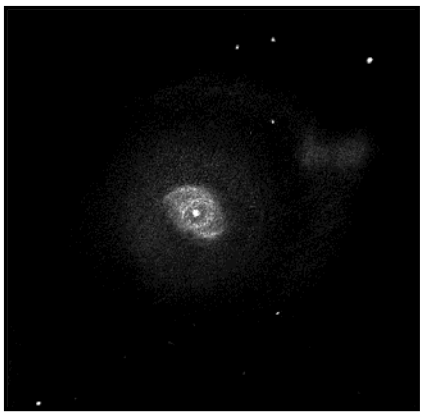
This is extraordinary not only from a scientific standpoint but also because NGC 6543 is so accessible to amateur observers. Far from being an obscure object at the edge of the universe, 6543 is a

bright object that can be appreciated in any size telescope. Walter Scott Huston wrote that it looked like *"a green star, but much wider than those around it"* with a 1 inch refractor at 40x, so any modern telescope will show something of its structure.

My notes say much the same thing from a 1983 observation with my 8 inch f/4 Newtonian, although I noted that the central star was readily seen at 117x. Since then I've observed 6543 many times, most notably one near perfect night at Steens Mountain several years ago when the darkness, transparency and steady seeing all came together for an all too brief period of near perfection when I was observing 6543 with my old 20 inch f/5 Obsession. I was able to push the magnification to 1000x (yes, three zeros) but just as I was getting ready to start a sketch the seeing deteriorated and all the marvelous detail I was seeing disappeared. Rats!

I've not come close to seeing so much detail since then, even with my 28 inch scope, but I keep trying and my hope is that some fine night I'll see as least as much as I did that night at Steens, if not a bit more. I began another sketch a few months ago at OSP which is the start of a composite sketch that I'll continue to add details to over time in an attempt to record as much detail as I can tease out of this fascinating object.





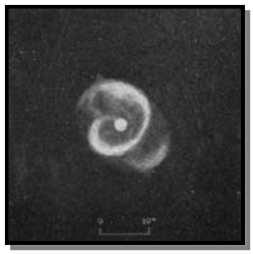
Aside from the bright helix shape that's readily seen, there's also a faint round glow that it's set in. Further out I could see part of the irregular outer ring with magnitude 15.7 IC 4677 as it's brightest part. About five times further away on the opposite side of 6543 is the small, faint galaxy NGC 6522, shining at magnitude 14.6. All this fits easily into a low power field of view.

At low power the first thing that jumps out to me is the wonderful blue-green color of the bright inner nebula. At first it looks like an oblong ring with a bright central star, but it will show its helix shape with higher power only if the seeing is steady in scopes 8 inches and larger under steady, dark skies. The color will fade away with increasing magnification but the trade off of more detail is a good bargain.

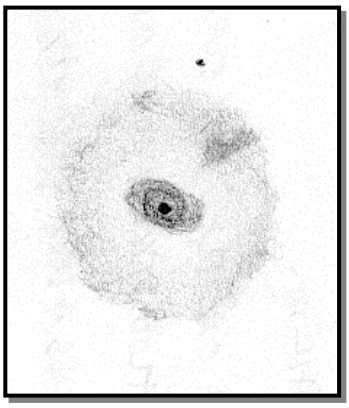
I used magnifications from 155x to 695x for my sketch, with a foray into silly magnification up to nearly 1400x. It was pretty cool, but the seeing didn't support this much power. Even so, it was fun to imagine what I might have seen if the seeing had been steady enough.

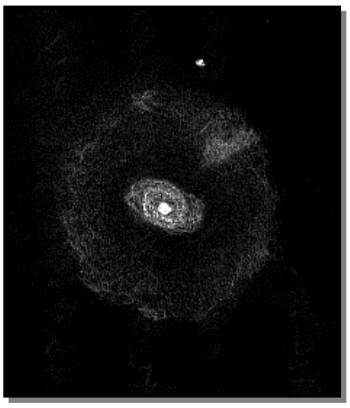
Nebula filters don't improve the view of 6543 in my opinion, especially at lower power, because they remove its wonderful blue-green color. Obvious color is a rare thing in deep sky objects so I suggest enjoying this fine example unfiltered, at least at first. Try your nebula filters and see which view you prefer.

In the early 20th century, H. D. Curtis of Lick Observatory made this sketch from several photographic images, a technique used until photography had advanced enough to need no interpretation. He drew a corkscrew shape similar to what I've seen in my 20 and 28 inch scopes when the seeing is decent. But when the seeing is really steady this corkscrew turns into a helical shape as shown in my sketch.



NGC 6543 is one of the objects I was lucky enough to briefly observe with the Bok 2.3 meter scope a few years ago at Kitt Peak. Everything - and more - shown in my sketch above, which took several hours over two nights to record, was seen at a glance.





My notes say: *"Yes sir, the outer halo shows nicely all the way around. The bright central area is a bright turquoise with a blazing central star – too bad the seeing isn't steadier. 502x"*

It really was too bad the seeing wasn't steadier, and like everyone else in the observing group, I had only a few minutes of eyepiece time. There was so much detail to see, but I could only start drawing after I'd finished my all too brief turn at the eyepiece, making my sketch only a rough approximation of what I saw.

The image at the far right of my sketch was made with the 2.5 meter Nordic Optical Telescope at the Observatorio del Roque de los Muchachos on the Canary Islands and shows the outer halo and it's brightest segment, IC 4677, very well. It's an interesting comparison to my view through the similarly sized Bok Telescope.

Huggins started us down the road of discovery toward 6543's true nature, so what more do we know of it today? There's still much to learn, but it seems likely that the intricate structure is caused by the central star being a double star, with their orbits around each other shaping the growing planetary nebula over time. Even so, there's no clear cut evidence for the central star being a double yet.

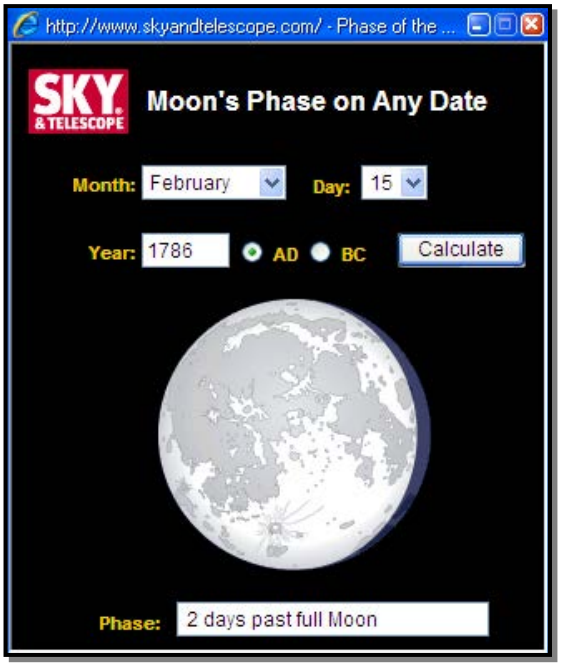
The spherical rings and radiating lines near the bright helical central area – shown in the beautiful HST image on the next page - and the outer hexagon shaped ring were expelled during the central star's red giant phase, but it's not clear what forces shaped them.

The chemical make up of the nebula is known to much greater precision than in Huggins day, but two recent studies using different methods don't agree exactly. All of which means we know a lot about 6543 but there's still a lot to learn about it.

6543's chemical make up is similar to most other planetary nebulae and is made up of mostly hydrogen and helium, with traces of carbon, nitrogen and oxygen in greater amounts than found in our Sun. These elements were created by nucleosynthesis in the outer atmosphere of 6543's central star during its red giant phase, just before it was ejected to start the formation of the planetary nebula.

Distances to planetary nebulae have typically been difficult to determine accurately, but images from the Hubble Space Telescope taken several years apart have been used to directly measure the nebula's angular expansion rate. When combined with spectroscopic line of sight velocity measurements they indicate 6543 is about 3300 light years away.

Its small apparent size of 20 arc seconds (for the bright inner area) with an apparent magnitude of 8.8 gives 6543 a high surface brightness, making it a pleasure to observe even in light polluted skies or when the Moon is up.



To help make this point, William Herschel thoughtfully discovered NGC 6543 on February 15, 1786, a night when the Moon was just two days past full.

It was also the first planetary nebula to be recognized having an obvious central star, and Herschel speculated the star was in the process of being condensed from the surrounding nebula. Even though he, understandably, had it exactly backward he was right that this fabulous object illustrated an extraordinary phase in the life of a star – a star that Huggins would later prove to be a distant sun and its nebula a luminous gas.

Not bad for a couple of amateur astronomers.

NGC7023, the Iris Nebula, by Craig Hlady.

Date: 9/16/12
Location: Camp Hancock
Mount: AP Mach1
Exposure: 5 x 180 seconds
Scope: 200mm f/5 Newtonian
Camera: Canon 450D

Astrophoto of the Month

Do you have an astronomy related photo that you might like to have published here? Please submit a photo with details to the newsletter editor.

A Cosmic Tease:
Trials of the Herschel Space Telescope Science Teams

By Dr. Marc J. Kuchner

Vast fields of marble-sized chunks of ice and rock spun slowly in the darkness this week, and I sat in the back of a grey conference room with white plastic tables spread with papers and laptops. I was sitting in on a meeting of an international team of astronomers gathered to analyze data from the Herschel Infrared Observatory. This telescope, sometimes just called Herschel, orbits the Sun about a million miles from the Earth.

The meeting began with dinner at Karl's house. Karl charred chorizo on the backyard grill while the airplanes dribbled into Dulles airport. Our colleagues arrived, jetlagged and yawning, from Germany, Sweden, and Spain, and we sat on Karl's couches catching up on the latest gossip. The unemployment level in Spain is about twenty percent, so research funding there is hard to come by these days. That's not nice to hear. But it cheered us up to be with old friends.

The meeting commenced the next morning, as the vast fields of ice and rock continued to spin—shards glinting in the starlight. Or maybe they didn't. Maybe they didn't exist at all.

You see, this team is looking at a series of images of stars taken by a device called a bolometer that is blind to ordinary starlight. Instead, the bolometer inside Herschel senses infrared light, a kind of light that we would probably refer to as heat if we could feel it. But the idea of pointing the bolometer at the stars was not to collect ordinary starlight. It was to measure heat coming from the vicinity of these stars, like an infrared security camera, in case there was something else to be found lurking nearby.

And lo and behold, for a handful of stars, the bolometer measurements were off the charts! Maybe something was orbiting these stars. From the details of the bolometer readings—which channels lit up and so on—you would guess that this stuff took the form of majestic fields or rings of icy and rocky particles. It would be a new kind of disk, a discovery worth writing home to Madrid about.

There are several teams of astronomers analyzing data from the Herschel Space Telescope. They call themselves by oddly inappropriate sounding acronyms: GASPS, DUNES, DEBRIS. For the time being, the scientists on these teams are the only ones with access to the Herschel data. But in January, all the data these teams are working on will suddenly be released to the public. So they are all under pressure to finish their work by then. The team whose meeting I was sitting in on would like to publish a paper about the new disks by then.

But it's not so simple. The stars that this team had measured were relatively nearby as stars go, less than a few hundred light years. But the universe is big, and full of galaxies of all kinds—a sea of galaxies starting from maybe a hundred thousand light years away, and stretching on and on. Maybe one of those background galaxies was lined up with each of the stars that had lit up the bolometer—fooling us into thinking they were seeing disks around these stars.

The team argued and paced, and then broke for lunch. We marched to the cafeteria through the rain. Meanwhile, vast fields of marble-sized chunks of ice and rock spun slowly in the darkness.

Or maybe they didn't.

What else did Herschel recently uncover? Find out at http://spaceplace.nasa.gov/comet-ocean.

Dr. Marc J. Kuchner is an astrophysicist at the Exoplanets and Stellar Astrophysics Laboratory at NASA's Goddard Space Flight Center. NASA's Astrophysics Division works on big questions about the origin and evolution of the universe, galaxies, and planetary systems. Explore more at http://www.science.nasa.gov/astrophysics/.

Caption:

Samuel Pierpoint Langley, who developed the bolometer in 1878. His instrument detects a broad range of infrared wavelengths, sensitive to differences in temperature of one hundred-thousandth of a degree Celsius (0.00001 C). In 1961, Frank Low developed the germanium bolometer, which is hundreds of times more sensitive than previous detectors and capable of detecting far-infrared radiation.

Courtesy NASA Space Place Partners' Article October 2012

Dates in History - Courtesy NASA's Space Place

Nov. 9, 1934: Carl Sagan was born. Dr. Sagan helped pick the sounds and images for the Voyager spacecrafts' "Golden Record." See and hear samples at space-place.nasa.gov/voyager-to-stars.

Nov 13, 1946: Vincent Joseph Schaefer made the first artificially induced snowstorm. It's easy to predict a snowstorm it you make it yourself. If nature makes it …not so much. Check out a little booklet that explains in the simplest possible terms how to make a weather-prediction satellite. It's at space-place.nasa.gov/story-weather-satellite.

Nov 29, 1803: Birthday of Christian Doppler. He described the Doppler effect, a good analogy for the expansion of space and understanding why the sky is dark at night. Check it out at space-place.nasa.gov/classroom-activities#bluesky.

Dec. 14: Geminids Meteor Shower Get tips on the best meteor viewing techniques at space-place.nasa.gov/meteorshower.

Dec. 25, 1642: Birthday of Isaac Newton. He understood how orbits work, and so can you by firing a cannon into space. With enough gunpowder, you, too, can achieve orbit! Go to spaceplace.nasa.gov/how-orbits-work.

Dec. 31, 1705: First recorded sighting of Halley's comet.

Searching for Messier Galaxies: through the door of time -

Finding St. Katherine's Wheel

By Robert McGown FRAS

Amateur observers and astronomers have given certain deep sky objects nicknames since the days of Charles Messier. Some of these names were given by the discoverer and others were dubbed serendipitously according to their unique or special characteristics such as an unusual nebular pattern, spiral shape or the resemblance to an everyday or common object.

In the 200 page Francis Jacobs' diary of 1898, recently transcribed by the McGown, Murray and Stone in 2002, she has sketches of deep sky objects shown as ovals and occasionally referred to them in her written commentary by their popular nicknames. One example is her reference to the "Dumbbell" Nebula, also known as M27. She sketched some of the better-known NGC objects in her constellation diagrams as well. To orient the constellations she used Roman numeral right ascension numbers. In contemporary books on astronomy, these are considered sometimes too detailed and esoteric for the amateur astronomer and general public.

Frances Jacob studied astronomy in Portland Oregon during the era when the great refractors dominated the astronomical scene. Lick Observatory's 36 inch Alvin Clark refractor had just seen first light in 1888. Yerkes Observatory's massive 40-inch Alvin Clark was under construction. Although her observational astronomical diary may not be the work of primary field research, it is a reflection of the times and the scientific climate. Frances' handwritten field research and astronomical diary is a unique example of a time in early Portland history of the inquiring mind of a young woman interested in a science usually reserved for men. Reflected in her astronomical diary are the discoveries and mention of leading astronomers of the day like Emerson Bernard and Edward Pickering.

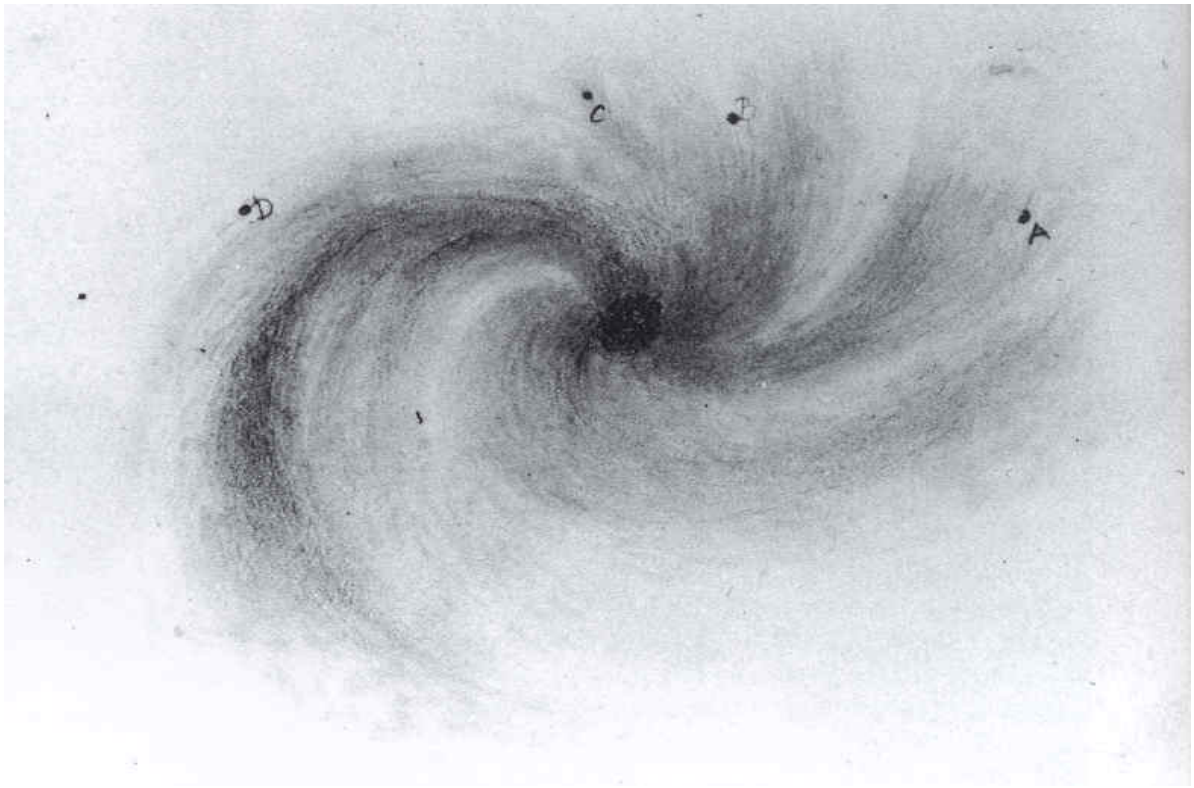
In the course of transcribing the diary, we discovered a curious thing. Francis referred to M99 as "St. Katherine's Wheel" as if it was a well-known nickname for the galaxy. Messier 99 or *NGC 4254*) is an unbarred spiral galaxy approximately 50million light-years away. Searching Stephen J. O'Meara's, *The Messier Objects*, *Burnham's Celestial Handbook* and other early astronomical books, we found no mention of M99 having such a nickname! We did more research on the Internet and still found nothing indicating that M99 had ever been called St. Katherine's Wheel. Talking to my friend Dave Sandage, son of Allan Sandage, about our 'find' he was astounded by the story. He had never heard of this as well. Some detective work was in order!

M99
Adam Block
Mt.Lemmon

St. Katherine is a well-documented Catholic martyr. She was an Egyptian princess, daughter of the King of Crete, who upbraided Emperor Maxentius for his heathen ways. He was enraged and had her scourged and thrown into the dungeon. The Empress reportedly was curious about this beautiful, well-spoken woman and visited her in the dungeon. According to some stories, the Empress was converted to Christianity by the eloquence of Katherine's words. There are many versions of the tale, but one has the Emperor beheading his own wife for her conversion. He then declared that Katherine be killed on the spiked wheel, a common instrument of torture in those times. Legend has it that either the wheel was struck by a bolt of lightning or Katherine's touch miraculously caused it to burst into flame and explode. Furious, Maxentius had her beheaded. The year was 420 and the place, Alexandria. She probably patronized the great library in Alexandria and could possibly have known about the famous Hypatia who had been killed by Christian zealots just five years before. Hypatia and Katherine were both women of beauty and intelligence who spoke with passionate eloquence about what they believed. Ironically they were both schooled in science, although their beliefs were quite opposite. Their fate was the same.

Her name is spelled variously as "Katherine" or "Catherine". According to the Catholic Encyclopedia, Catherine is patron of craftsmen working with a wheel as well as young girls and librarians! Although the festival in her name has been removed from the Catholic Calendar, a few places in England, France and Italy still celebrate St. Katherine's feast day.

This powerful and moving legend of the beautiful martyr and the wheel of fire may have led observers at the turn of the century to call M99, in Coma Bernenices, 'St. Katherine's Wheel'. M99 was discovered by Pierre Mechain in 1781. It was also the second object that the Earl of Rosse recognized as having a spiral structure. William Parsons, or the third Earl of Rosse, wrote a book published in 1926 that describes his scientific endeavors from 1800 through 1867. His sketch of M99 through the Leviathan 72 inch speculum reflector depicts the galaxy as swirling sparkling light. As Burnham's Celestial Handbook puts it: " The spiral pattern is very well defined…This system has sometimes been called a 'three branch spiral', although there are only two major arms…Thin dust lanes can be traced deep into the bright central mass, and there is a small, almost stellar nucleus.." D'Arrest described M99 as large, round, with vividly sparkling light; nucleus more or less resolvable.



M99 "Lord Rosse's sketch of M99 in Coma Berenices in the Virgo Super Cluster. He recognized the spiral shape of this nebula in March 1846. This was one of the first galaxies that had a distinguished spiral shape. In modern times three supernovae have been observed in this galaxy.

Anyone of these descriptions could have led to galaxy association to well-known type of fireworks, a fast spinning pinwheel, which is known as the Catherine Wheel. So this name has notoriety not only in the astronomical world. However, at some point, most of the religious names were abandoned from popular use in scientific nomenclature and this may be a case in point. During the 16th century Dutch cosmographer and map maker Petrus Plancius, instructor of Pieter Theodor, included the "Dove" and "Noah's Arc" in his constellation maps. In other star maps, the twelve constellations of the Zodiac were renamed for the twelve apostles but were changed back to the original in later editions. Of course the renaming of the Zodiac was an extreme example of the attempt to recreate religious doctrine over a 3000 + year old legend. The "Dove" or "Noah's Dove" in the constellation Columba is the only one that remains. Perhaps it is time to reinstate a name for the spiral galaxy M99 – formerly known as 'Catherine's Wheel'.

References:

1) Francis Jacob's Astronomical Diary of 1895
A snapshot of an inquiring young woman growing up in the early Portland's scientific community *by Robert McGown, D. Murray, Wes Stone, Museum of Oregon Country*

2) Reaching For the Stars in 1895 (The Story of Francis Jacob) Portland Oregon, R.McGown, D. Murray, Rosette Gazette, October 2002

3) Burnham's Celestial Handbook, M-99, Observations by Burnham & D.Arrest

4) McGown R. Murray D. 2002 A presentation to the AAS, HAD, History of Astronomy Division

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Allen, Richard Hinckley. Star Names: their lore and meaning.
Burnham, Robert Jr. Burnhams Celestial Handbook (Volume Three) Dover Publications, New York, 1978.
Clerke, Agnes. A popular history of astronomy during the nineteenth century. Edinburgh, A, & C. Black, 1886.
Flammarion, Camille. Astronomy for Amateurs. New York, 1904.
Lowenstein, Steven. The Jews in Oregon: 1850-1950. Jewish Historical Society of Oregon, Portland, 1987.
O'Meara, Stephen J. Deep Sky Companions: Messier Objects. Cambridge University Press, 1998.

Newspaper Articles:

"City to memorialize family", *Enterprise Courier*, Oregon City: Dec. 26, 1972.

Interviews & Correspondence:

Oregon Episcopal School, Lisa Degrace, Assistant Director of Development
(Telephone interviews - Dec. 19, 2002 & Jan. 3, 2003)

Oregon Genealogical Forum, research librarians using Portland City Directories from 1895-1935 & Census Data from 1900 & 1910.
(Primary research - December 20, 2002)

Portland Public Schools, Records Management section, D. Evans.
(Telephone interview & letter- Dec. 18, 2002)

William Rosenfeld, nephew of Frances Jacobs, Portland, Oregon.
(Telephone interview - Dec. 23, 2002)

University of Toronto, Library & Archives. (E-mail – Dec. 23, 2002)

Museum of the Oregon Territory, Patrick Harris, Executive Curator, Oregon City (Personal interview - Jan. 3, 2003)

Internet:
Frances Jacobs' birth, death and social security number – found on www.ancestry.com
Portland High School: http://159.191.40.100/index.pl/lincoln_history
Astronomical data – Colored double stars: http://dvaa.org/

Transcribed by Robert McGown, Dareth Murray & Wes Stone
Presentation, annotation, articles and research by Robert McGown and Dareth Murray

Observational Astronomy

Astronomy Field Notes
Oct. 1898-June 1899

Francis Jacobs

Minutes of the Rose City Astronomers Board September 10th 2012

Held at OMSI Classroom 1

Chair : Sameer Ruiwale
Secretary : Duncan Kitchin

Board Members Present

Sameer Ruiwale (President)
Mark Martin (VP Programming)
Jim Higgs (VP Community Affairs)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Jan Keiski (Library Dir., OMSI & Sister Club Liaison)
David Nemo (Observing Site Director)
Scott Kindt (Special Interest Groups Director)

Steve Jaynes (Guest)
Leo Cavagnaro (Guest)

Call to Order

The meeting was called to order at 7:08pm by Sameer Ruiwale and, there being 9 board members present, the quorum requirement of 9 was declared to be met.

Approval of Minutes

Moved: Approve minutes from the August 2012 board meeting. One change since publication last week; the plan for Johnston Ridge observatory is a master plan, not just for astronomy. Motion: approved minutes as amended. Moved Larry Froberg. Second Sameer Ruiwale. Motion passes 9-0-0.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 9 voting members present.

Treasurer's Report – Larry Godsey: Nominal; all documents distributed at the meeting and available on the website as usual.

VP Programming – Mark Martin: Have books for the meeting in the planetarium this month with Brother Guy Consolmagno. We have 30 copies. Mark has been preparing for Brother Guy's visit; the trip is being conducted in collaboration with the Cascadia Meteorite Laboratory, and also includes a talk at Portland State University on Saturday about the Vatican meteorite collection. Dirk Schulze-Makuch will also be attending the general meeting this month. Mark has found a procedure for getting a discount on Richard Berry's book for his talk in October. Has also resolved scheduling issues for the cosmology SIG; meetings have now been moved to the Friday following each general meeting.

VP Observing: Currently vacant, report from Larry Godsey : We have 30 signed up and paid for Camp Hancock for this coming weekend, so we have made the 25 minimum. Have confirmed a date for April 3rd and 4th for next year for Camp Hancock and possible dates of the first week in September or the first week in October are also under discussion. Need to close on all of these items for the calendar; a date for Kah-Nee-Ta needs to be determined. This could be on the same weekend as Camp Hancock; surveys of attendees in previous years have shown that these two are usually attended by different groups. For now will pencil in Maupin for a Messier marathon.

VP Community Affairs - Jim Higgs: Three events in the last month. Event at Oregon City winery drew about 30 people. Event for the Acupuncture Society attended by about 25-30 people. The group made an unsolicited donation of $100 to RCA. Group of about 20 college students at event at Silver Falls. Two other outreach groups coming up in the next month. The first is with the Boy Scouts organization in the Gresham area on Saturday. The second is at Milwaukie High School next Friday.

VP Membership – Ken Hose: Not present, but membership reports are available on the forum.

Alcor – Ken Hose: Not present.

New Member Advisor – Howard Knytych: Not present, but new member meeting is this month and information is posted on the website.

Media Director – Diana Fredlund: News release went out last week.

Sales – Larry Froberg: Calendar: need to start working on collecting pictures, and getting details of costs from the printers. Need to get everything to the printers by mid-October in order to have them back for the November general meeting. Will look at possibly a larger size for this year, but if the page size is too large, it can no longer be stapled which pushes the cost up considerably. Larry Froberg will get details from the printers. Last month brought in $119. Have put in an order for several large items, including several copies of the Sue French book based on her Sky & Telescope column.

Book Library – Jan Keiski: Nominal.

Telescope Library - David Horne: Not present.

IDA – Dawn Nilson: Not present.

Magazine Subscriptions – Larry Godsey: Nominal.

Webmaster – Larry Godsey: Nominal.

Site Committee – David Nemo: Now have keys to the Haggart Observatory. Have cleaned and reorganized everything at the observatory. Now need to get together a set of eyepieces. Starting to think about organizing events, but not ready to do this just yet.

Youth Director (vacant): No report.

Newsletter Editor – Scott Kindt: Nominal.

SIGs – Scott Kindt: Looking for a replacement for this position.

OMSI –Jan Keiski: OMSI is looking for additional assistance for the Stub Stewart star parties; these are well attended and a few additional telescopes would be very welcome.

Sister Club update – Jan Keiski: Report from Leo Cavagnaro. The club has a new board, consisting of 13 people. Leo is

still VP of observing. This weekend the club is holding its monthly observing meeting at a site about 25 miles north of Mendoza. This September is the 14th anniversary of the founding of the club. There will also be a public star party next month south of Mendoza. This November 13th Leo plans to travel to Chile to view the solar eclipse.

Old Business

RCA generic business cards – Diana Fredlund / Sameer Ruiwale. Quote for 250 is $40, 500 is $44.18, 1000 is $50.54. Propose to order 1000; there will be no dates information on these cards, and it will be useful to have them for public star parties.

Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde No updates.

Stub Stewart Observatory and option for housing club's 12" LX200 scope there – David Nemo. Awaiting a response from Stub Stewart. Sameer to follow up.

Member Packet Updates by board members (several) – Ken Hose - DONE

OMSI / RCA Agreement – 2012-2013, review and signing – Sameer. Larry Godsey was able to get agreement with our insurance carrier on the outstanding items. Item related to cancellation of activities in the event that it is deemed by OMSI to be in conflict with OMSI's mission has been amended to indicate that such a conclusion would be as determined by the OMSI RCA liaison. Copies of amended agreement distributed. Agreement has now been signed as authorized at the August meeting.

Dark Sky Symposium planning update, costs for IDA light pollution board – Dawn Nilson. No updates.

Election committee update – Scott Kindt. Requesting volunteers to be on the committee. This will be in the newsletter and also sent via email broadcast. Still require an additional board member for the committee.

New Business

Vote in Steve Jaynes as VP Observing. Moved: Duncan Kitchin Second: Jan Keiski. Motion passes 9-0-0.

GAMA Sister Club Update – Leo Cavagnaro. Covered earlier.

Volunteer Tshirts (should RCA supply Tshirts for volunteers) – Sameer. Given the number of volunteer events, should we have t-shirts that we provide to those volunteers? We have a good deal on these from our supplier. Could either have the OMSI RCA design, or the RCA design. Suggestion from Jim Higgs: although it probably is not necessary to do this for outreach events, it would be reasonable to do this for major events like astronomy day. Steve Jaynes: possibly could have a special design for volunteer t-shirts that can only be obtained this way. Will table this item for now, and revisit when it gets nearer to the next astronomy day.

Adjournment

There being no further business, the meeting was adjourned at 8:41pm

Elections for RCA Officers

At the November General Membership Meeting we will be voting on the following RCA officers candidates for 2013:

David Nemo	- President
Ken Hose	- Vice President - Membership
Jim Higgs	- Vice President - Community Affairs
Mark Martin	- Vice President - Programming (Communications)
Steve Jaynes	- Vice President - Observing
Larry Godsey	- Treasurer
Duncan Kitchin	- Secretary

We also have the Special Interest Group Leader and other officer positions open for anyone wanting to help shape the future of the club. These are an appointed positions, not an elected positions.

November 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2 Noon Downtowners Luncheon Kell's	3
4	5 7pm Board Meeting OMSI Classroom 1	6 	7	8	9	10
11 	12 7pm Astro Imaging SIG Beaverton Library	13 	14	15	16	17
18	19 **6:30pm** **New Member** **7:30pm** **General Meeting** **OMSI Auditorium**	20 	21 7pm Cosmology SIG	22 	23	24
25	26	27	28 	29	30	Dec 1 10am - 3pm Telescope Work-shop

December 2012

Dec 01	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Dec 03	Monday	Board Meeting	OMSI Classroom 1	7pm
Dec 07	Friday	Downtowner's Luncheon	Kell's	Noon
Dec 10	Monday	Astro-Imaging SIG	Beaverton Public Library	7pm
Dec 17	**Monday**	**Holiday Potluck Dinner**	**OMSI Auditorium**	**7:30pm**
- - -	- - -	Cosmology SIG	No Meeting in December and January	- - -

http://www.rosecityastronomers.org

Rose City Astronomers
Oregon Museum of Science and Industry
1945 SE Water Ave
Portland, OR 97214-3356

The Rosette Gazette

Volume 25, Issue 12 Newsletter of the Rose City Astronomers December, 2012

RCA Members Potluck & Swap Meet
Monday, December 17th, 2012 - 6:30pm

In keeping with our annual tradition, this December's meeting of the Rose City Astronomers will be a holiday buffet and social gathering for all RCA family members. The buffet will be held in the OMSI Auditorium with the Swap Meet in the Lobby. Please note that this starts at an earlier time than the normal meetings.

Each member is asked to bring a dish to serve 10-12 people along with a serving utensil and enjoy the holiday spirit of the RCA membership. Plates, silverware, and beverages/ice will be supplied by the club.

Last Name starts with	Please Bring
A thru K	Main Dish
L thru Q	Side Dish
R thru Z	Dessert

The Holiday Social is also a great event to pick up some excellent holiday deals!

The Swap Meet will be back by popular demand and there will be ample empty tables around the lobby for everyone who is interested in displaying items for the Swap Meet.

Save time to shop at the RCA Sales Table for your favorite astronomy gifts.

All are Welcome! Monday December 17th

Potluck and Swap Meet Begins: 6:30 pm.

Location: OMSI Auditorium

In This Issue:

RCA is a member of the Astronomical League.
http://www.astroleague.org

Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

Last Quarter Moon Dec 5

New Moon Dec 13

First Quarter Moon Dec 20

Full Moon Dec 28

To: RCA members
From: Jim Higgs
Subject: Thank You, Museum Outreach Event
Date: November 19, 2012

Over this last weekend, on Saturday, November 17th, RCA helped Washington County Museum kickoff the opening of their new location at the Hillsboro Convention Center. There were more than 400 visitors to the Center, which was by far their all-time attendance record (they previously were located on the PCC campus). Highlighted was a NASA exhibit on Hubble, which will continue to be at the museum for several months.

Throughout the day, we had several RCA volunteers assisting in showing kids how telescopes work, answering questions about astronomy, and telling people about RCA. I want to thank Steve Huss, Matt Heath, Bernie Kuehn, Peter Abrahams, David Horne, and Mark Dakins for generously volunteering their time.

We also had an area for kids to create pictures about astronomy and space. Kids making a picture were eligible to participate in a random drawing for a small telescope (a 3" Newtonian reflector, from OMSI). At one time, the table was filled with kids industriously making space pictures (we took photos of a few). Particularly after seeing the Hubble exhibit, some of their pictures were very impressive. The kids took home their pictures, but we had a drawing of their parent's names.

This morning I conducted the random drawing (under the oversight of the museum staff!). The winner was a Hillsboro girl of approximately age six whose eyes were beaming when the scope was delivered! [her parents requested the delivery].

Sharing astronomy can certainly be fun for every age!

Reminder—if you want to help out with school presentations about astronomy, please let me know. These are usually reasonably informal within a classroom setting of approximately 30 students, of junior high or high school age.

Also, help with any of the outreach star parties is always appreciated. You don't have to be an expert astronomer to share your enthusiasm or a view through a telescope.

Jim - Head of RCA Outreach

Special Interest Groups

Astro-Imaging Special Interest Group

When: Monday, Dec 10th, 7pm
Location: Beaverton Public Library
12375 SW 5th St - Beaverton

SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/astroimage.htm

Junior Astronomers

When: Monday, Jan 21st, 6:30pm
Location: OMSI Classroom 1
Meets prior to and during the general meeting
Topic: TBD

Note youth program starting back up in January.

Leader: John Oreskovich
Email: youth@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/science.htm

Downtowners Luncheon

When: Friday, Dec 7th, Noon
Location: Kell's
112 SW Second Ave. Portland
SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/downtowners.htm

New Members Special Interest Group

When: Monday, Jan 21st, 6:30pm
Location: OMSI Planetarium
Topic: TBA
SIG Leader: Howard Knytych
Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop

When: Saturday, Jan 26th
10:00am - 3:00pm
Location: Technical Marine Service, Inc.
6040 N. Cutter Circle on Swan Island-Portland
SIG Leader: John DeLacy
Assistant: Don Peckham
Email: tw-sig@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/tmw.htm

Astrophysics / Cosmology SIG

When: Wed, Feb 20th, 7pm
Topic: TBA

Note No Meeting In December 2012 or January 2013

Presented by: TBA
Location: TBA
SIG Leaders: Lamont Brock, Viktors Berstis
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

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Youth Programs Director	John Oreskovich	youth@rosecityastronomers.org
Sister Club Liaison	Jan Keiski	sisterclubs@rosecityastronomers.org

RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is $33 for one year or $66 for two years. The RCA member rate for Astronomy magazine is $34 for one year or $60 for two years. For more information and payment options please see the website.

http://www.rosecityastronomers.org/mags/index.htm

Larry Godsey <magazines@rosecityastronmers.org>

RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director. The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page.

http://www.rosecityastronomers.org/library.htm

Jan Keiski <library@rosecityastronomers.org>

Serendipity: How I Discovered a New Eclipsing Binary

Ken Hose

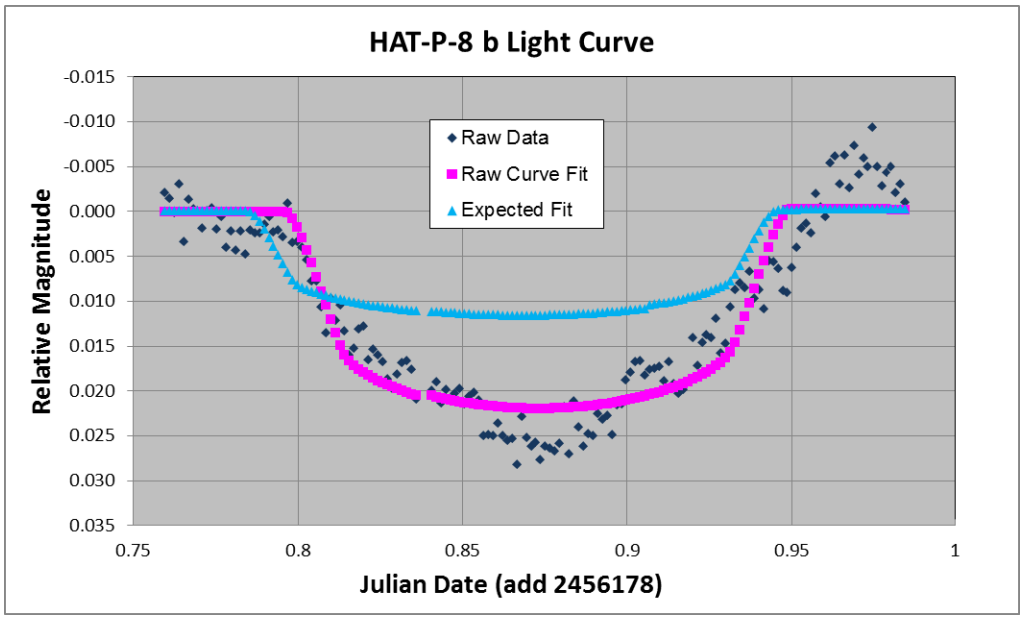
The discovery of a new eclipsing binary system doesn't rank very high as far as scientific discoveries go but it is good to know that there are still new things out there for amateurs to find. The star, otherwise known as BD+34 4783 (or GSC 02757-01212), varies in brightness not because of any intrinsic star properties, but because it is really a two-star system. Previously it was thought to be a single non-variable star. By measuring the properties of eclipsing binaries, astronomers can calculate stellar mass, radii, density, and other physical parameters.

Many stars are actually binary pairs that are so close that they cannot be resolved, even with the largest telescopes. So they appear as a single star. If the two stars are orbiting a common center of mass and the orbital plane happens to go through your line of sight then you may be able to detect changes in brightness (dimming) as one passes between you and its companion; hence the term eclipsing binary or EB for short. It helps if the orbital period is small since there is a higher probability of detection. The period of this pair is 4.11800 days according to my measurements.

Astronomers use a technique called differential photometry to measure the difference in brightness between stars. The brightness of the star under test is compared to a star of fixed brightness. As long as the comparison star is truly fixed, any change in brightness will be due to the star under test. And even if atmospheric conditions change during the night the difference in brightness should remain constant using this method. The brightness is usually defined in terms of astronomical magnitudes.

On September 8, 2012 I was hosting a high school student at my home observatory with the goal of detecting a transit of exoplanet HAT-P-8 b. We detected the transit all right but the light curve we extracted looked weird with an unusual bump in the middle. The expected dimming due to the transit was about 0.012 magnitudes or so but the actual dip was over 0.02 magnitudes. As it turned out, the comparison star we used was actually an eclipsing binary system that just happened to be going through an eclipse during the exoplanet transit. It took me several days to figure this out, but that explained the odd light curve and led to the discovery. Once I realized I was dealing with an EB I tried in vain to find it in the literature and eventually realized it was a new discovery.

I use a 12-inch telescope in my observatory and an astronomical CCD camera. For this work I used a series of exposures of 120 seconds for most of the night over several clear nights. This gives about 250 exposures per night. I used a computer program (AIP4WIN) to measure the brightness difference of the stars of interest for each exposure and to generate a report. This is known as differential photometry. If



one of the stars varies over time I can detect the change by plotting the brightness over time using a program like EXCEL. Such a plot is called a light curve. The chart on the previous page shows the light curve with the strange bump. The horizontal axis is time (days) and the vertical axis is magnitude difference.

When doing differential photometry you can use several stars as a proxy for the single comparison star to reduce scatter in your data. I had successfully used such an ensemble before while detecting a transit of HAT-P-8 b on previous occasions. So at first I didn't consider that one of the comparison stars might be a variable. Finally I used a different known fixed star to compare to each of the comparison stars in the ensemble. I was relieved to see that one of the stars was indeed varying and it looked like I had captured a partial eclipse of a binary pair. So the mystery with the strange light curve was solved but I wanted to find out more about the suspected EB. I wanted to get some help to see if it was really a new discovery and I wanted to capture enough of the light curve to characterize it more fully and to determine the orbital period.

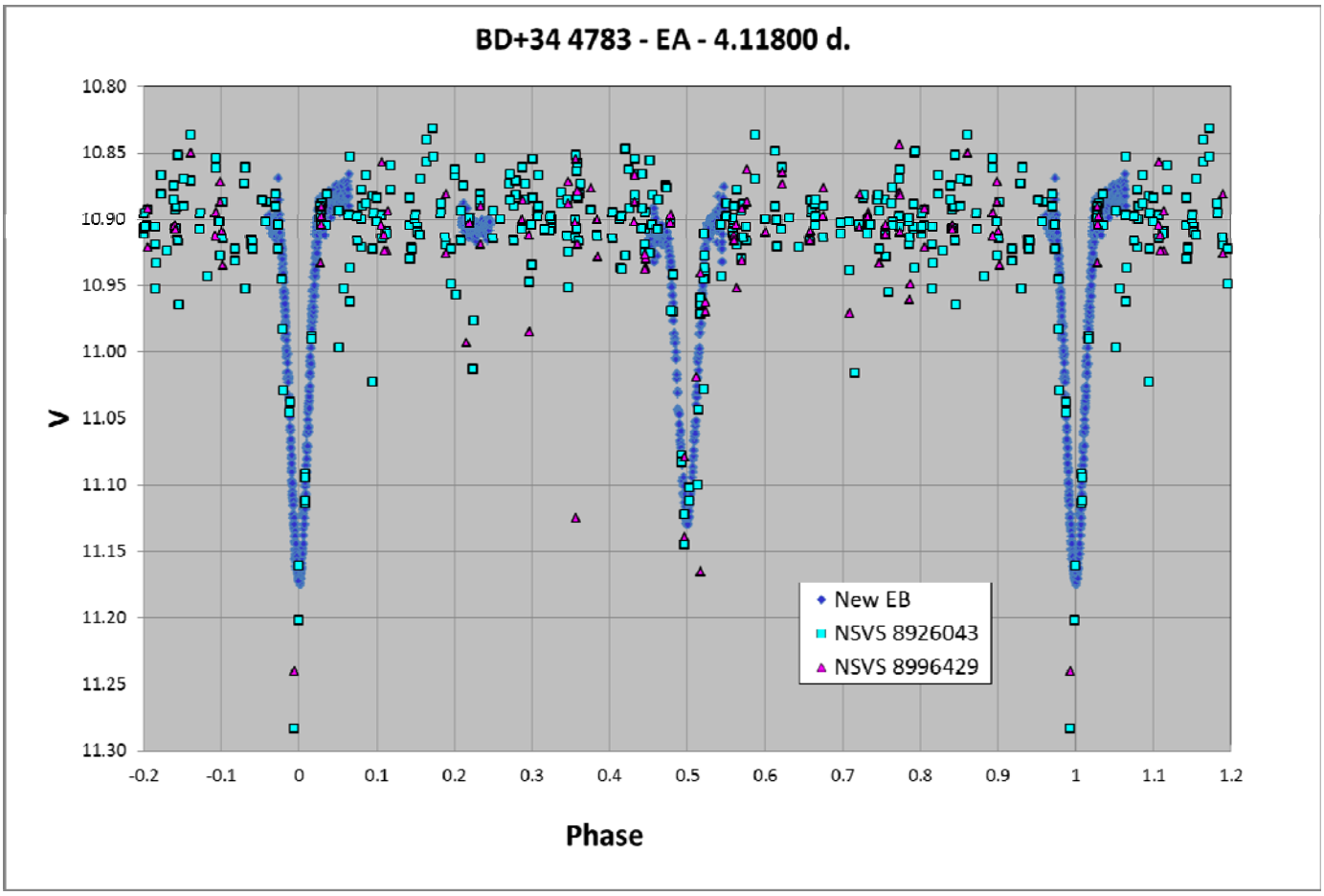
Each clear night I imaged the same star field. Each morning I would check the star using differential photometry. After 4 nights saw no activity and I was ready to give up. On September 30th I gave it one last try and an in the morning I found that I had captured another partial eclipse. So now I had captured 2 partial eclipses but I didn't know if they were primary or secondary eclipses. Encouraged by my success I kept on imaging and 4 nights later I captured a full eclipse that I later determined was a primary eclipse. And 2 nights later I captured another full eclipse that was a shallower secondary eclipse. So now I had enough data to calculate the period of the EB. My first period calculation was 4.117 days. I kept on imaging on clear nights to gather more data until I had captured 2 full primary eclipses.

The next step was to find out for sure if this was really a new EB discovery. I contacted the American Association of Variable Star Observers (AAVSO) by posting a query on one of the discussion pages. Based on my information a patient gentleman looked into the appropriate star catalogs and verified that it was a new discovery. He encouraged me to submit my data to the Variable Star Index (VSX) which is maintained by the AAVSO. He also made me aware of some survey data that could be used to help me refine my period calculations.

The Northern Sky Variability Survey (NSVS) is a temporal survey of the entire northern hemisphere done using robotic telescopes located in Los Alamos NM. There are about 100 to 500 measurements per object in the survey. You can look up any star of interest based on its coordinates. In my case there were 2 sets of measurements taken in 1999. This presented the opportunity to have a 13-year baseline to use for my period calculation to get good accuracy. The data were fairly coarse with only 4 measurements per night. But there were definitely some eclipses in the data.

The next step was to combine my data with the NSVS data and accurately determine the period. Instead of plotting the eclipses against time, it is customary to plot them against phase. Phase 0 is the center of the primary eclipse and phase 0.5 is the center of the secondary eclipse in this case. Also, the data need to be "folded" so that each cycle is plotted on top of each other instead of being strung out in time. You also need to choose a reference time, or epoch, for your calculations. I chose the center of an eclipse on September 3, 1999, or more accurately, Heliocentric Julian Day 2451424.73610. I used EXCEL for these calculations. The calculations were a bit "fiddly" but by varying the period until I was able to get a good curve fit allowed me to determine the period very accurately.

The chart below shows my data (blue diamonds) along with the NSVS data. You can see that the magnitude of the star is about 10.9 and the primary eclipse is about 0.27 magnitudes.

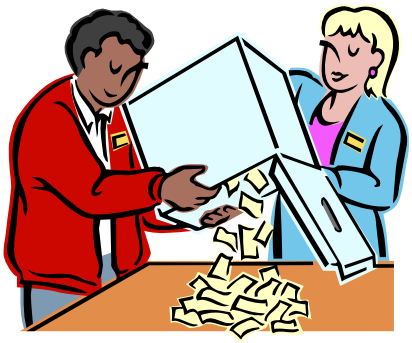


I submitted all my data to VSX and had it accepted as a new discovery. This was a really fun project and I learned a lot. The next phase of the project will be to determine more about the physics of the binary system by modeling using programs like Binary Maker or Phoebe. The idea is to change the model parameters until the model-generated light curve matches my light curve. I have done some preliminary work with Binary Maker but I need better light curve data to get a more accurate model. I am also going to try to find an amateur spectroscopist to take some radial velocity measurements. That will allow much more accurate modeling.

RCA Officers

At the November General Membership Meeting we voted into office the following RCA officers candidates for 2013:

David Nemo - President
Ken Hose - Vice President - Membership
Jim Higgs - Vice President - Community Affairs
Mark Martin - Vice President - Programming (Communications)
Steve Jaynes - Vice President - Observing
Larry Godsey - Treasurer
Duncan Kitchin - Secretary



Disk Galaxies: Settling for Beauty with Age

Today, the majority of local galaxies forming stars are rotating disks, such as our own Milky Way or the Andromeda Galaxy (M31). Disk galaxies are well ordered: there is a defined plane to the galaxy and most stars and gas revolve in one direction around its center.

Many astronomers had thought that disk galaxies had largely finished forming by about 8 billion years ago, as indicated by the rates at which stars are formed in the Universe. Therefore, they assumed that distant, much younger disk galaxies are not all that different from nearby ones.

Spectroscopic observations of distant galaxies taken with the 10-meter telescopes at the W. M. Keck Observatory on Hawaii, when combined with images taken by the Hubble Space Telescope plus supercomputer simulations to help interpret the observations, however, together reveal a surprise. The motions of gas inside distant galaxies has been continuously settling down over the last 8 billion years while galaxies slowly assume the familiar flat disk shape of nearby galaxies.

This finding is announced in an article titled "The Epoch of Disk Settling: $z \sim 1$ to Now" by Susan A. Kassin and 13 collaborators, published in the October 20, 2012 issue of *The Astrophysical Journal*.

From chaos to calm

"Galaxies are like human adults," said Kassin, a postdoctoral fellow at NASA's Goddard Space Flight Center in Greenbelt, MD. "Many have had exciting youths marked by intense interactions with other galaxies, with a lot of growth spurts in mass, new stars, and heavy elements. But chaotic growth slows down as galaxies mature, and they become more organized and calmer inside."

Because looking far out into the depths of space is the equivalent of looking back in time, the redshift z is how astronomers measure both age and distance in the universe. A redshift of $z = 1$ corresponds to about 8 billion years ago, when the universe was about 5 billion years old. "It's almost like a mantra. People say that the Hubble sequence is in place by $z = 1$," Kassin said. The Hubble sequence is a diagram—originally devised by Edwin Hubble in 1926—for classifying the visible shapes of galaxies.

Kassin and her 13 coauthors—six from the University of California—found the observational evidence suggests something quite different. The internal motions of gas within galaxies back in time are far more disordered, moving every which way rather than neatly revolving around the centers of galaxies. Moreover, they found that the Hubble sequence of well-ordered disk galaxies gradually evolved from earlier more chaotic forms over the last 8 billion years. "It is clear the Hubble sequence was *not* in place at a redshift of 1," Kassin said.

Three keys to discovery

"Sample selection can be quite insidious," explained co-author Benjamin Weiner of the University of Arizona. In past studies of galaxy evolution, researchers typically studied only those galaxies that are recognizably disk-shaped, excluding any that are obviously disturbed. But shape criteria can bias the result. In contrast, Weiner said, "we included all galaxies bright enough to give spectra from which the motions inside galaxies could be measured."

Second, past studies examined only the speed at which the stars revolve around the centers of galaxies. "We also measured the disordered motions of clouds of gas in galaxies," Kassin continued.

Third, the coauthors studied more than 500 galaxies, yielding good statistical correlations. The collaborators also performed mock observations on computer-simulated images of merging disk galaxies in various stages of disorder and at various distances. "We followed exactly the same procedures of spectral measurements as with observations of real galaxies," explained collaborator Joel R. Primack of the University of California, Santa Cruz, "to measure the extent to which effects such as the observed sizes of galaxies and the blurring effects of the Earth's atmosphere play in the observations." *–Trudy E. Bell, M.A.*

(Continued on page 8)

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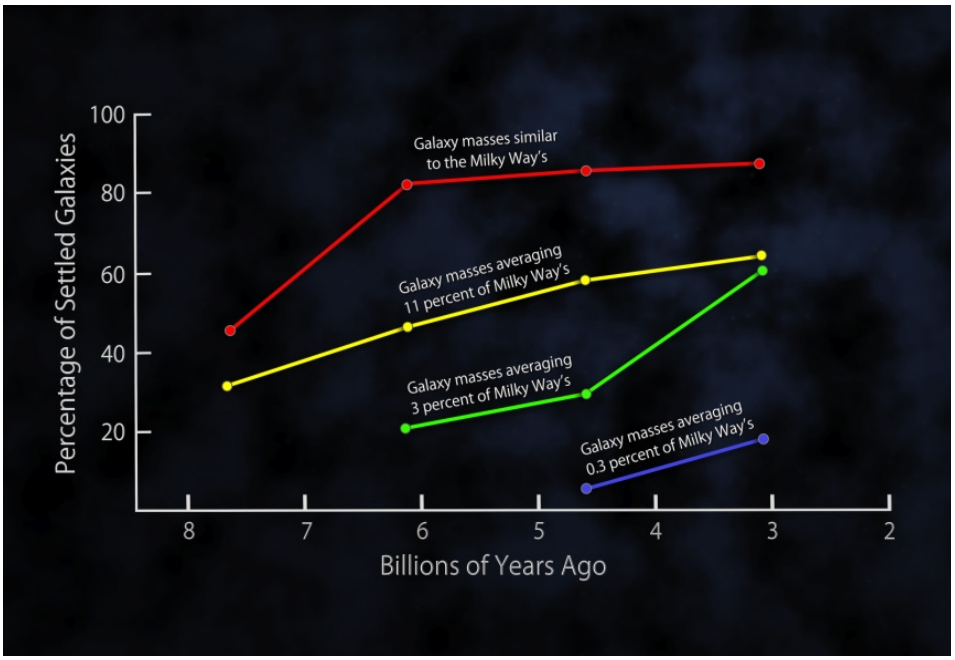


This plot shows the fractions of settled disk galaxies in four time spans, each about 3 billion years long. There is a steady shift toward higher percentages of settled galaxies closer to the present time. At any given time, the most massive galaxies are the most settled. More distant and less massive galaxies on average exhibit more disorganized internal motions, with gas moving in multiple directions, and slower rotation speeds. *Credit: NASA/Goddard Space Flight Center*

Further reading:

Links to the paper in *The Astrophysical Journal* and to several NASA videos appear at: http://hipacc.ucsc.edu/GalaxyDiskSettling.html .

The University of California High-Performance AstroComputing Center (UC-HIPACC), based at the University of California, Santa Cruz, is a consortium of nine University of California campuses and three Department of Energy laboratories (Lawrence Berkeley Laboratory, Lawrence Livermore Laboratory, and Los Alamos National Laboratory). UC-HiPACC fosters collaborations among researchers at the various sites by offering travel and other grants, co-sponsoring conferences, and drawing attention to the world-class resources for computational astronomy within the University of California system. More information appears at http://hipacc.ucsc.edu

Transient Lunar Phenomena (TLP's) and Their Causation

By Robert McGown FRAS

It has always been assumed that Transit Lunar Phenomena are reflections on the surface of the Moon caused by the reflecting of sunlight from the shiny shatter cone rocks caused by meteoritical impacts. The shatter cone impact structures were fused and polished from the meteorite impact and reflect light back to the observer. Could suspended dust and out gassing be a partial mechanism of the TLP?

Recently, there has been increased interest in TLP's and the possibility that they are from suspended dust. A combination of reflected light from dust and the shatter cones may help to explain these unusual phenomena that have been observed since ancient times. In the early 1800's when Herschel and Birt, (John Herschel's researcher) recorded them. I have observed TLP's on the Moon and wondered about the mechanisms that create them.

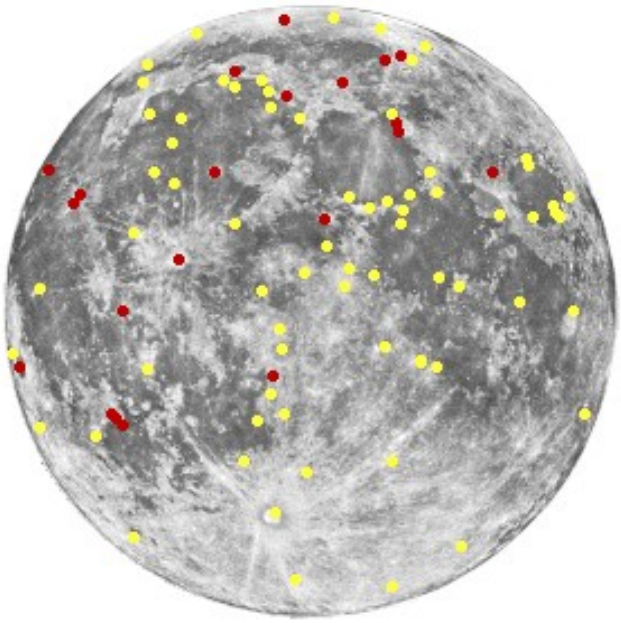
NASA is ready to launch the Lunar Atmosphere and Dust Environment Explorer (LADEE) satellite to study dust and particles on the surface of the Moon in August 2013. Many space researchers speak on the Terminator Wind, which could be a mechanism to transport electrostatically charged lunar dust particles on the surface of the Moon.

(Continued on page 9)

(Continued from page 8)
The instruments in LADEE will be able to detect particles within the Moon's unconfirmed atmosphere.

It makes sense that the volatiles are in the craters and experience out gassing when the sunlight hits. Protons and electrons of the solar wind are hitting or reflecting off the crater walls as the surface heats up with the Sun's energy. The craters may be like great parabolic reflectors that focus the sunlight to the crater floor and amplify the light as much as 10x the surface area of the surrounding average reflection on the crater floor. Like a long focal length mirror, it reflects light back to the observer with possible multiple reflections and bounces.

Barbara Middlehurst and Patrick Moore, made a survey of 300 TLP's that shows an approximated distribution of observed events. Red-hued events are in red; the remainders are in yellow. TLP observations are a popular pastime of amateur astronomers. In the recent decades before Apollo, professional astronomers have thought that there was a possible volcanic eruption on the Moon when observing TLP's.



The angle of the radiation may cause out gassing at certain times as the radiation penetrated the upper dusty layers of the regolith elevating the dust particles. Craters may trap the dust over time and create a dust well. This may be like one of the mechanisms that may mimic the trapping of the dust like in ferry circle craters in South Africa that are 4 to 6 meters across. The lunar craters are massive compared to this, however the trapping process and migration of the dust would take place in the lack of atmosphere for the larger craters are much like the ferry circle craters that trap blowing dust. The ejecta rim of the crater acts as a barrier and over time the heavier dust is trapped inside the lunar crater.

On the poles of the Moon, ice and exotic particles are may be trapped in the craters. There may also be opportunity for particle detectors on the poles of the Moon in the shadow of craters. Physicists and space scientists have wanted to build a parabolic drift scan radio telescope in one of the craters on the Moon.

We may be able to look for signs of deposition or wear inside the crater floor or walls observationally. Perhaps some of the central ejecta of the craters are buried in dust. Younger craters would have more highly polished shatter cones. I have seen shatter cones on Earth that were vaporized highly polished rock, like the Beaverhead Montana impact structure. With radio telescope observations or lunar GPR, it could reveal the underlying ejecta strata through the dusty floor of the crater and confirm this hypothesis.

As the sunlight reflects off at angles from polished surface to polished surface, it radically increases with multiple reflections as the particle is illuminated on multiple sides. The albedo of the trapped suspended dust particles is increased that could cause more heat and thermal inertia of the suspended dust of the TLP, thus amplifying their effect. This is worth modeling and more research.

As a note: Harrison Schmitt noticed on the surface of rocks during his Moon walk on December 1972 that the surfaces of the rocks on the Moon were free of dust. The levitated particle dust may float off into space. However, the surface ejecta rays from some of the craters on the Moon could spread ejecta dust over the surface of the Moon. During the Apollo missions, some of the astronauts reported alpenglow like rays on the lunar limb.

Please link these notes to the other lunar web sites along with your own comments. Once the LADEE satellite measures the particles in the lunar atmosphere, we will have a greater understanding the dust/ particle migration as related to reflectivity of the lunar surface and the possible existence of atmospheric effects or out gassing.

Tiny Tethys

Tethys may not be tiny by normal standards, but when it is captured alongside Saturn, it can't help but seem pretty small.

Even Saturn's rings appear to dwarf Tethys (660 miles, or 1,062 kilometers across), which is in the upper left of the image, although scientists believe the moon to be many times more massive than the entire ring system combined. This view looks toward the unilluminated side of the rings from about 18 degrees below the ringplane. The image was taken in green light with the Cassini spacecraft wide-angle camera on Aug. 19, 2012.

The view was acquired at a distance of approximately 1.5 million miles (2.4 million kilometers) from Saturn and at a Sun-Saturn -spacecraft, or phase, angle of 63 degrees. Image scale is 86 miles (138 kilometers) per pixel.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington, D.C. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging operations center is based at the Space Science Institute in Boulder, Colo.

Image credit: NASA/JPL-Caltech/Space Science Institute

Minutes of the Rose City Astronomers Board October 2012

Held at OMSI Classroom 1

Board Members Present

Sameer Ruiwale (President)
Ken Hose (VP Membership)
Mark Martin (VP Programming)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Larry Froberg (Sales Director)
Diana Fredlund (Media Director)
Howard Knytych (New Member Advisor)
David Horne (Telescope Library)
David Nemo (Observing Site Director)
Steve Jaynes (VP Observing)
Scott Kindt (Newsletter Editor)

Call to Order

The meeting was called to order at 7:12pm by Sameer Ruiwale and, there being 11 board members present, the quorum requirement of 9 was declared to be met.

Directors' Reports

Secretary's Report – Duncan Kitchin: **Quorum (9)** met with 11 voting members present. Minutes from September's board minutes distributed. Move: approve minutes from September. Moved: Sameer Ruiwale. Second: Mark Martin. Motion passes 10-0-0.

Treasurer's Report – Larry Godsey: Reports distributed, and also available on the website. We had 30 attendees at Camp Hancock, easily meeting the minimum commitment of 24.

VP Programming – Mark Martin: Will have promotional material for Richard Berry's talk about his new book by later this week. We have currently pre-sold about as many of Richard's book as Brother Guy's. Matt Vartanian has prepared a talk about atmospheric phenomena; Mark will be scheduling this for a future general meeting.

VP Observing – Steve Jaynes: Steve has prepared a draft schedule for next year's events, which was distributed at the meeting for discussion. Draft in calendar form also available. Kah-Nee-Ta would like a minimum 20 room commitment, but is happy to work with any of our proposed dates. Should we include RCA Rooster Rock & Stub Stewart events? Proposing dates of June 1st and August 31st respectively. Will also continue to support OMSI star parties. Steve will be producing a new revision shortly.

VP Community Affairs - Jim Higgs: Not present.

VP Membership – Ken Hose: We had 12 new members join and 34 renewals in the last month, bringing total membership to 286 member families, compared to 273 at the same time last year and 260 the year before that. Brought in a total of $1147 in dues in the last month.

Alcor – Ken Hose: Have submitted one request for a Messier certificate, awaiting a response. Also tracking down a replacement for a pin and certificate which were lost.

New Member Advisor – Howard Knytych: No new member meeting this month. Howard will include a segment about Alcor in the presentation next month.

Media Director – Diana Fredlund: Will send out news release for this month's meeting using the information that has been posted to the website.

Sales – Larry Froberg: Really good month for sales, bringing in a total of $822. A good portion of sales was accounted for by copies of Brother Guy Consolmagno's book; we had extras on hand for his talk at the general meeting, and sold all of them. Ordered four copies of Sue French's new book, and have already sold three. Have 26 pre-orders for Richard Berry's book, and have ordered a couple of extras.

Book Library – Jan Keiski: Not present.

Telescope Library - David Horne: Have acquired another telescope that is ideal for star parties; a Meade 8" star finder mounted on an equatorial mount with a clock drive. We also had a contact from Asus Computer that wanted to shoot an astronomy themed commercial; David worked with them and the commercial will be completed shortly. David has drafted a valuation letter to go with the telescope that we are donating to our sister club GAMA.

IDA – Dawn Nilson: Not present.

Magazine Subscriptions – Larry Godsey: Nominal.

Webmaster – Larry Godsey: Nominal.

Site Committee – David Nemo: Putting together a calendar for the Haggart Observatory. Planning an event on October 20th, possibly followed by an event in November and December. Working on putting together a set of eyepieces. Will be making an announcement once details are finalized.

Youth Director (vacant): No report.

Newsletter Editor – Scott Kindt: Nominal.

SIGs – Scott Kindt: Nominal.

OMSI –Jan Keiski: Not present.

Sister Club update – Jan Keiski: Not present.

Old Business

RCA generic business cards – Diana Fredlund / Sameer Ruiwale. Will be ordered this week.

Create guidelines for possible telescope award donations to local schools or other organizations – Greg Rohde

Stub Stewart Observatory and option for housing club's 12" LX200 scope there – David Nemo. No updates.

OMSI / RCA Agreement – 2012-2013, review and signing – Sameer - DONE

Dark Sky Symposium planning update, costs for IDA light pollution board – Dawn Nilson. No updates.

Election committee update – Scott Kindt. So far the committee is composed of Scott Kindt, Diana Fredlund, Howard Knytych and Jim Todd. This month we need to present the list of candidates. Currently we have exactly one candidate for each of the elected positions.

Tabled: Volunteer / Astronomy Day T-shirts. Will leave this item tabled for now.

New Business

Honorarium / Donations guidelines for commercial / not non-profit events – Jim, David Nemo, Sameer. Jim Higgs is working on drafting a proposed set of guidelines.

RCA 2013 Calendar. Schedule is on the way. Greg Marshall is collecting images that have been submitted; final selection will take place after this month's general meeting.

Adjournment

There being no further business, the meeting was adjourned at 8:50pm

December 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1 10am - 3pm Telescope Work-shop
2	**3** 7pm Board Meeting OMSI Classroom 1	**4**	**5** 	**6**	**7** Noon Downtowners Luncheon Kell's	**8**
9	**10** 7pm Astro Imaging SIG Beaverton Library	**11**	**12**	**13** 	**14**	**15**
16	**17** **6:30pm Holiday Potluck and Swap Meet OMSI Auditorium**	**18**	**19** No Cosmology SIG Meeting this month	**20** 	**21** Winter Solstice	**22**
23	**24** 	**25**	**26**	**27**	**28** 	**29**
30	**31**					

January 2013

Jan 04	Friday	Downtowner's Luncheon	Kell's	Noon
Jan 07	Monday	Board Meeting	OMSI Classroom 1	7pm
Jan 09	Wednesday	Astro-Imaging SIG	Beaverton Public Library **Note new meeting day**	7pm
Jan 21	**Monday**	**General Meeting**	**OMSI Auditorium**	**7:30pm**
Jan 26	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Feb 20	Wednesday	Cosmology SIG	**No Meeting Until February**	7pm

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