

The Rosette Gazette

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Newsletter of the Rose City Astronomers

July, 2013

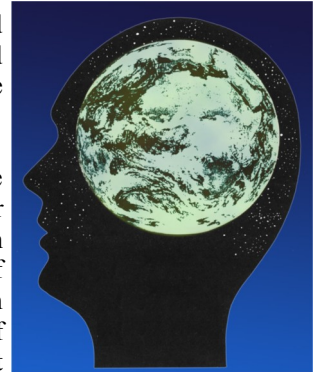


The Human Role in Earth Evolution

David Grinspoon

From the perspective of Astrobiology, David will review Earth history and offer a taxonomy of catastrophe that examines the changing roles of life and so-called intelligence in our evolving planet, and implications for the prospect of advanced life elsewhere in the universe.

Bio: David Grinspoon is an astrobiologist who studies the possible conditions for life on other planets. In November 2012, he began a one-year appointment as the inaugural Baruch S. Blumberg/NASA Chair in Astrobiology at the John W. Kluge Center of the United States Library of Congress, where he is researching and writing a book about the human influence on Earth, seen in cosmic perspective. He is Curator of Astrobiology at the Denver Museum of Nature & Science, and Adjunct Professor of Astrophysical and Planetary Science at the University of Colorado. He is a frequent advisor to NASA on space exploration strategy, and is Co-Investigator on an instrument that is currently operating on the Curiosity Rover on Mars. He serves as Interdisciplinary Scientist on the European Space Agency's Venus Express spacecraft, which is currently in orbit around Venus. Grinspoon was awarded the 2006 Carl Sagan Medal for Public Communication of Planetary Science by the American Astronomical Society. His first book, *Venus Revealed*, was a Los Angeles Times Book Prize finalist. His 2004 book, *Lonely Planets: The Natural Philosophy of Alien Life* won the PEN Center USA Literary Award for Research Nonfiction. Grinspoon's popular writing has appeared in *Slate*, *Scientific American*, *Natural History*, *The Sciences*, *Astronomy*, *Seed*, the *Boston Globe*, the *Los Angeles Times*, the *New York Times* and *Sky & Telescope Magazine* where he is a contributing editor and writes the monthly "Cosmic Relief" column. Dr. Grinspoon has been featured on dozens of television and radio shows. His technical papers have been published in *Nature*, *Science*, and numerous other journals, and he has given invited talks at international conferences throughout the U.S., Europe, Australia and Japan.



For more, see www.funkyscience.net

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

All are Welcome! Monday July 15th
Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

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

New Moon
Jul 08

First Quarter Moon
Jul 15

Full Moon
Jul 22

Last Quarter Moon
Jul 29



RCA Board of Directors			
<i>Elected Officers</i>	<i>Name</i>	<i>Email Address</i>	
President	David Nemo	president	@ rosecityastronomers.org
Secretary	Duncan Kitchin	secretary	@ rosecityastronomers.org
Treasurer	Larry Godsey	treasurer	@ rosecityastronomers.org
VP Communications	Diana Fredlund	media	@ rosecityastronomers.org
VP Membership	Ken Hose	membership	@ rosecityastronomers.org
VP Observing	VACANT	observing	@ rosecityastronomers.org
VP Outreach and Education	Jim Higgs	outreach	@ rosecityastronomers.org
VP Programming	Mark Martin	program	@ rosecityastronomers.org
<i>Appointed Directors</i>	<i>Name</i>	<i>Email Address</i>	
Director, Dark Sky Preservation (IDA)	Dawn Nilson	ida	@ rosecityastronomers.org
Director, Book Library (Books & Videos)	Jan Keiski	library	@ rosecityastronomers.org
Director, New Members	Howard Knytych	newmembers	@ rosecityastronomers.org
Director, Newsletter (Rosette Gazette)	Scott Kindt	editor	@ rosecityastronomers.org
Director, Merchandise Sales (Merchandise Sales)	Herry Tedja	sales	@ rosecityastronomers.org
Director, Telescope Library (Telescope Library)	David Horne	telescope	@ rosecityastronomers.org
Director, Youth Program (RCA Youth Program)	Kathy Kornei	youth	@ rosecityastronomers.org
Other Contacts			
<i>Program / Project / Activity</i>	<i>Name</i>	<i>Email Address</i>	
Astronomical Imaging Special Interest Group	Greg Marshall	ai-sig	@ rosecityastronomers.org
Cosmology Special Interest Group	Viktors Berstis Lamont Brock	cosmology-sig	@ rosecityastronomers.org
Downtowners Lunch Special Interest Group	Margaret McCrea	downtown-sig	@ rosecityastronomers.org
Haggart Observatory	Rusty Baumberger	haggart	@ rosecityastronomers.org
Magazine Subscriptions (Discount Subscriptions)	Larry Godsey	magazines	@ rosecityastronomers.org
Observing Site Fund (Site Fund)	David Nemo	sitefund	@ rosecityastronomers.org
Sister Clubs	Jan Keiski	sisterclub	@ rosecityastronomers.org
Starlight Parade Float	Sameer Ruiwale	starlight	@ rosecityastronomers.org
Telescope Workshop	John DeLacy Don Peckham	tw-sig	@ rosecityastronomers.org
RCA Member Forum	Larry Godsey David Nemo	admin	@ rosecityastronomers.org
Webmaster	Larry Godsey	webmaster	@ rosecityastronomers.org
ALCOR (Astronomical League Coordinator)	Ken Hose	alcor	@ rosecityastronomers.org
Galaxy Groups and Clusters Observing Program	Dareth Murray	ggc	@ rosecityastronomers.org
Herschel 2 Observing Program	Candace Pratt	herschel2	@ rosecityastronomers.org
Local Galaxy Groups and Galactic Neighborhood Observing Program	Dareth Murray	lgggn	@ rosecityastronomers.org

Minutes of the Rose City Astronomers Board

May 6, 2013

Held at OMSI Classroom 1

Chair : David Nemo

Secretary : Ken Hose for Duncan Kitchin



Board Members Present

David Nemo (President, Observing Site Director)
Ken Hose (VP Membership, ALCOR)
Jim Higgs (VP Community Affairs)
Mark Martin (VP Communications)
Diana Fredlund (Media Director)
Jan Keiski (Library Director, OMSI & GAMA Liaison)
David Horne (Telescope Library)
Dawn Nilson (International Dark Sky Liaison)
Scott Kindt (Newsletter Editor)
Kathy Kornei (Youth Director)

Call to Order

The meeting was called to order at 7:05 by David Nemo and, there being 10 board members present, the quorum requirement of 9 was declared to be met.

Approval of Agenda

The agenda was approved ...

Approval of Minutes

David Nemo moved to approve the minutes from the April 2013 board meeting and the motion was seconded by Mark Martin. The motion passed 10-0-0.

Officer Reports

- President – David Nemo. Received donation of telescope gear from a widow. Will put items for sale at May general meeting swap meet. David will start a Forum topic on the budget. Each board member should make a budget proposal and what the funds will be used for.
- Secretary – Duncan Kitchin. Absent. Ken Hose standing-in.
- Treasurer – Larry Godsey. Absent
- VP Programming – Mark Martin. The SBIG president will be the June speaker. The July speaker will be David Grinspoon. He is an astrobiologist and planetary scientist.
- VP Observing – Open
- VP Community Affairs – Jim Higgs. The requests for star parties have been increasing as the weather has improved. Last Tuesday, April 30, 4 RCA members hosted a group of 80 students in Canby. On May 14 Jim gave a talk on meteors. On May 17 there is a star party planned for 20 second graders. On June 20 there is a star party for some Girl Scouts on the west side. Astronomy Day is June 30. Jim raised the question if we should invite folks to bring their telescopes so we could show them how to use them.

- VP Membership – Ken Hose. We had 6 new members join in April and we had 4 renewals. We brought in \$280 in dues. The total member-families now stands at 372.
- ALCOR – Ken Hose. RCA member Gene Schaffer received a Herschel 400 award and Planetary Nebula Club award. Ken will be RCA proxy for AL officers' election.

Discussion Items

- Astronomy Fair. The Astronomy Fair will be the subject at our next general meeting on May 20. David Nemo has assigned roles for the different special interest groups. There will be some 15-minute presentations. One will be on collimation, and one or two will be on astro-imaging. Dawn wanted to see if we could use the planetarium for a short 6-minute IDA film—need to ask Jim Todd. Board members with ideas on how to promote/advertise the fair should coordinate through Diana Fredlund. David Nemo and Jan will work out details for getting name tags for board members. Mark and David Nemo will provide Jim Todd with a floor plan for the fair.
- Bylaws update. We discussed creating a new Student membership category at a reduced dues rate (\$12) for kids in the 5th through 8th grades. After some discussion, we agreed that they should have full membership privileges including voting rights, access to AL awards and The Reflector. AR: David Nemo to update the bylaws with the appropriate verbiage. AR: Ken Hose to create an email list of families with kids.
- OMSI Partner Agreement. We voted to accept the agreement which reads the same as last years'. David Nemo moved to accept, David Horne seconded the motion, and the motion was approved 10-0-0.

Directors' Reports

- SIGs – Vacant
- Telescope Library – David Horne. David Horne requested a key to the planetarium to be able to access telescope gear at odd hours. Jan will give David the key. The club received a telescope donation (13" Coultter) and David suggested we give it to Stub Stewart Park. The idea was approved.
- Observing Sites – David Nemo. The Argo Navis GoTo electronics and hardware have been installed at Haggart Observatory and all is working okay.
- IDA – Dawn Nilson. Dawn has a professionally-made IDA poster she will bring to the Astronomy Fair. She is working on organizing a workshop for decision-makers on drafting model lighting ordinances. She is working with IDA and the Audubon Society. She made a suggestion that the 6-minute IDA film could be shown at Howard's new member meetings.
- Media – Diana Fredlund. News release for next meeting is ready.
- Merchandise Sales – Herry Tedja. Absent. He reported \$340 in sales last meeting.
- New Members – Howard Knytych. Absent
- Book Library / OMSI / Sister Clubs – Jan Keiski. Mark Strand's widow wanted to make some book donations. Jan

wanted to remind folks about the OMSI star parties at Stub Stewart and Rooster Rock on May 25.

- Youth Program – Kathy Kornei. Kathy is in contact with 4 potential mentors/teachers. The plan is to start the youth academy in August and have meetings once per month for 4 months. The venue will be Kennedy School on Saturday mornings. We are being charged \$15/hour for 3 hours per session.
- Magazine Subscriptions – Larry Godsey. Absent
- Webmaster – Larry Godsey. Absent
- Newsletter Editor – Scott Kindt. Scott wondered if we really need the calendar in the back of the newsletter. We decided to eliminate it and see if there is any negative feedback. One option would be a simple list instead of the “calendar” format. Howard Banich and John Siple have articles in the upcoming newsletter.

New Business

None

Adjournment

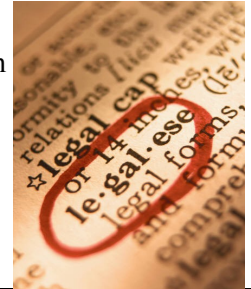
There being no further business, the meeting was adjourned at 8:59PM.

RCA Bylaws Updated

On July 1, 2013, the RCA Board of Directors approved revisions to the RCA Bylaws, following a 30-day review period by members. The Bylaws were last revised in 2000.

Notable changes include the addition of a Vice President of Programming and the addition of a Student Membership. The Bylaws also clarified that the traditional "Family Membership" includes a "Primary Member" who shall have voting rights, and "other" family members who would not have voting rights but would be eligible for all other club resources and benefits. Another change was to create a more streamlined Officer nomination and election process.

The [updated Bylaws are posted](#) on the RCA website.



Special Interest Groups

Astro-Imaging Special Interest Group

When: Wednesday, Jul 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>

Youth Program

When: Beginning Aug. 17th

Location: Kennedy School

Download Flyer: <http://www.rosecityastronomers.org/sigs/YAAFlyer.pdf>

Download Application: <http://www.rosecityastronomers.org/sigs/YAAApp.pdf>

Leader: Kathy Kornei

Email: youth@rosecityastronomers.org

<http://www.rosecityastronomers.org/sigs/youth.htm>

Downtowners Luncheon

When: Friday, July 12th, Noon

Location: India House
1038 SW Morrison Portland

SIG Leader: Margaret Campbell-McCrea

Email: downtown-sig@rosecityastronomers.org

<http://www.rosecityastronomers.org/sigs/downtowners.htm>

Note different meeting location and day for this month.

New Members Special Interest Group

When: Monday, July 15th, 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, July 20th
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, June 17th, 7pm

Topic: TBA

Note New Address
See website for map

Presented by: TBA

Location: 8012 SE Raymond St., Portland, OR 97206

SIG Leaders: Lamont Brock, Viktors Berstis

Email: cosmology-sig@rosecityastronomers.org

www.rosecityastronomers.org/sigs/cosmology.htm

A Treasury of Vintage Eyepieces

Decades of progress in the field of optics is commemorated by many novel and flamboyant designs.

By John W. Siple



Light entering an astronomical telescope follows a predetermined route to the exact area of focus. Eagerly awaiting the opportunity to deftly handle those key photons is a broad assortment of classic ocular devices. Each welcomed eyepiece has its own individual qualities, case histories, aesthetic appeal and price bracket.

A passion for fashionable older eyepieces is prevalent among amateur astronomers. Sources of encouragement are found in attractive magazine reviews and other candid accounts. Gratifying examples presented in period literature showcase an exciting walk through the eclectic world of eyepiece technology.

Salvaged brands from recent decades are extremely varied and plentiful—collectors who dabble in optics sometimes regard them with quasi-artistic awe. Accessory catalogs advertise hundreds of lucky choices depending on an individual's personal taste.

Groundbreaking ideas resulting from stiff competition has produced an irresistible array of historical designs. Major competitors who shared space inside *Sky & Telescope* magazine enticed potential customers with authentic, posh slogans. However, the primary influence to astronomers is from the presen-

tation of accurate, mundane facts about a preferred group of optical accessories. Eye relief, coatings on air-to-glass surfaces and elimination of aberrations are all important in unlocking the secrets of telescope performance.

What defines a good collectible eyepiece? In general, aesthetics, factory origin and barrel width sway more minds than original list price. Serious collectors almost never integrate cheaply-made or “junk” lenses with opulent equipment, a basic tenet obeyed throughout connoisseurship.

Large companies, such as Edmund, predictably sold their lowest-priced refractor and reflector telescopes with conservative numbers of less exotic eyepieces. In certain cases, competing brands look nearly alike. For example, the stylized “volcano-top” or conical head model, available in many different focal lengths, is a prevalent theme in the telescope industry. Internal optics may vary, but the outside construction other than labeling remains remarkably the same.

In sweeping comparison are Meade's patented Schmidt-Cassegrains and other creations, which convey all manner of eyepieces as auxiliary fare. A thirty year retrospective analysis shows a lopsided tendency toward Plössls and wide-angle industrial designs with apparent fields

greater than 67°. The best of all the older “wider is better” inspirations are the epic 84° “ultra-wides”—items created in response to Nagler patronage.

Questar Corporation, maker of “the world's most convenient telescope,” indulged buyers by placing desirable Brandon oculars on its 3½- and 7-inch lens-mirror systems. Their famous com-



(top) A circa 1980's Tele Vue Wide Field eyepiece towers over a smaller Plössl of the same focal length. The Super Plössl 56mm (above) is just one of Meade's many all-star performers. Dakin's superb parfocal 2.4X Barlow lens (left), distributed exclusively by Vernoscope of Candor, New York enhances any eyepiece collection. Unless otherwise noted, all photographs are by the author.

MEADE ORTHOSCOPIC



For eyepiece fans, Meade's 4mm research-grade orthoscopic model is an exemplary performer.

GALOC 16.3MM



A rare commodity in the 0.965-inch size, the "flat-topped" Galoc with its distinctive Saturn logo is a welcome addition to any eyepiece chest.

CELESTRON ULTIMA



Celestron has offered an incredible amount of products through its network of dealerships. Their Ultima series, a German hybrid design of 4 to 7 elements, is rated as the company's best.

compact models first made their appearance in 1954, and the inclusion of Vernerscope eyepieces has helped in the creation of an enduring optical legacy.

Unitron took a slightly different approach in satisfying its clientele. All of their esteemed refractors are outfitted with variable amounts of excellent quality oculars, the simplest instrument containing the fewest number. This marketing strategy has been repeatedly copied throughout the globe by many other companies—bigger or more elaborate (expensive) telescopes are sold with a greater supply of dynamic accessories.

Another clearly obvious way of getting a single or matched set of eyepieces

Extracting the full optical potential of a telescope can only occur when proven top-quality eyepieces and accessories are selected.

is to order them factory direct. A few popular brands are still being produced today, but countless others have fallen into collectible history. Celestron Plössls with their silver tops, Tele Vue "smooth barrel" products from the '80s, and Criterion Crico eyepieces are all examples of discontinued material.

Tokens of the lens maker's art are scattered throughout the pages of *Sky & Telescope*. A regular advertiser was Telescopes, which began selling durable Nikon-based eyepieces in the mid-1950s. Their renowned "Gailand" line, adroitly adorned with a Saturn-GC motif, also included a modified 75° angular field Erfle (billed as a "Galoc").

A long established Michigan company, University Optics, has a constantly rotating inventory of telescope making supplies in its annual catalogs. Königs (a variation on the Erfle) and true 4-element design orthoscopic eyepieces are just a portion of the rewarding miscellany.

Orion Telescope Center is a leading source of cost-effective merchandise for the amateur astronomer. Bestselling iconic jewels were their Ultrascopics,

ORION ULTRASCOPIC



The niche design for sharp, high contrast imagery is demonstrated by Orion's 20mm Ultrascopic.

CLAVÉ PLOSSL



Every planetary observer desires a Clavé ocular. Cross Optics of Los Alamos, New Mexico, was one of the major distributors in America.

MEADE/CAVE ERFLE



These lightweight 20mm Erfles were once advertised by Meade. (Cave listed them in its catalogs as "Orthostars.") The popular series also included 7, 12.4 and 15.5mm focal lengths.



Auxiliary accessories at the observer's fingertips improve and augment a telescope's performance. Choice items become an integral part of stargazing.



Top: Turret holders are designed to switch between different slots at the observer's touch. The selector on the Sears 90mm refractor telescope holds up to six color-coded 0.965-inch oculars. Above: Optica b/c's 8-21mm zoom lens replaces two or more expensive eyepieces. Right: A private collection of 1960's University Optics orthoscopic eyepieces with their original boxes.

MegaVistas and UltraScans, but Orion's discount catalogs have also incorporated nonspecific company items such as full stocks of Vixen Lanthanum and Celestron Ultima eyepieces. Featured prominently for the budget-wise stargazer are Sirius Plössl's and "remarkably affordable" Explorer Series Kellner and Ortho eyepieces.

Mention "Tele Vue" at a club meeting and chances are that at least five designs will spring to mind: Panoptic, Nagler, Radian, Ethos, and more recently Delos. Amateur astronomers covet Tele Vue eyepieces for their beauty and deep-sky performance. Introduced in 1980 by former NASA team leader Al Nagler, he has created what many critics call "the best crafted eyepieces available."

Threads of important local eyepiece history are also available in the advertising memorabilia of Jaegers, Parks, Edmund, and Optica b/c. Overseas, Parisian artistry in optics culminated in the elegant Plössl versions from Clavé. The eyepiece's flowing construction and flawlessly ground glass are described in many reverential reviews.

Telescopes imported directly from Japan, especially mass-produced Sears and Tasco models, are often seen with cheaper Ramsden, Kellner, or Huygenian style eyepieces. A consortium of firms specialized in the worldwide distribution of 0.965-inch accessories. Car-

ton, Takahashi, Nikon, Astro Optical (Optica's supplier), and Asahi Pentax were major sources of countless generic and in-house designs. (In Germany, Zeiss is *the* master lens maker of superior but fairly expensive merchandise.)

Most devotees add auxiliary keepsake equipment, which can range from adjustable zoom lenses to multiple-power Barlows. Revolving turrets, glorified by Unitron's "Unihex," are considered exclusive souvenirs. Of course, right-angle prism or mirror star diagonals are practical aids used in rounding out a particular collection.

What has been presented here is an image gallery that roughly traces the author's lifelong interest in eyepieces, from primitive Sears lenses, acquired along with boxed telescopes of the 1970s, through flamboyant and perhaps unique designs from Tele Vue, Meade, and Telescopic. Like many astronomers, a special fondness for genuine Plössl's has developed—splendid examples that gain attention are 7.4 to 40mm "Circle N" models from Tele Vue.

Organizing an abundant collection of distinguished optical treasures is comparatively easy. Among the myriad types of hobbyist eyepieces, there are many perfect candidates that an interested person can relish owning. For the average cost, eyepieces offer a multi-level opportunity to enjoy simple and tastefully sophisticated designs.





Time for Barnard's Star, Part 2

I wrote the following article about Barnard's Star in June 2003, and despite my best efforts to come up with a better way to write another article about it this month I can't think of anything more appropriate than to re-run this one with a short addendum at the end.

“Barnard's Runaway Star is a faint red dwarf in northeast Ophiuchus that has the largest known proper motion across the sky. According to Burnham's Celestial Handbook, it takes only 351 years to move one degree across the sky. It's only 5.96 light years away, making it the 5th closest star to Earth. That's a tricky way of stating that after the Sun and the three stars that make up the Alpha Centauri system it's the next closest. At least that we know of so far.



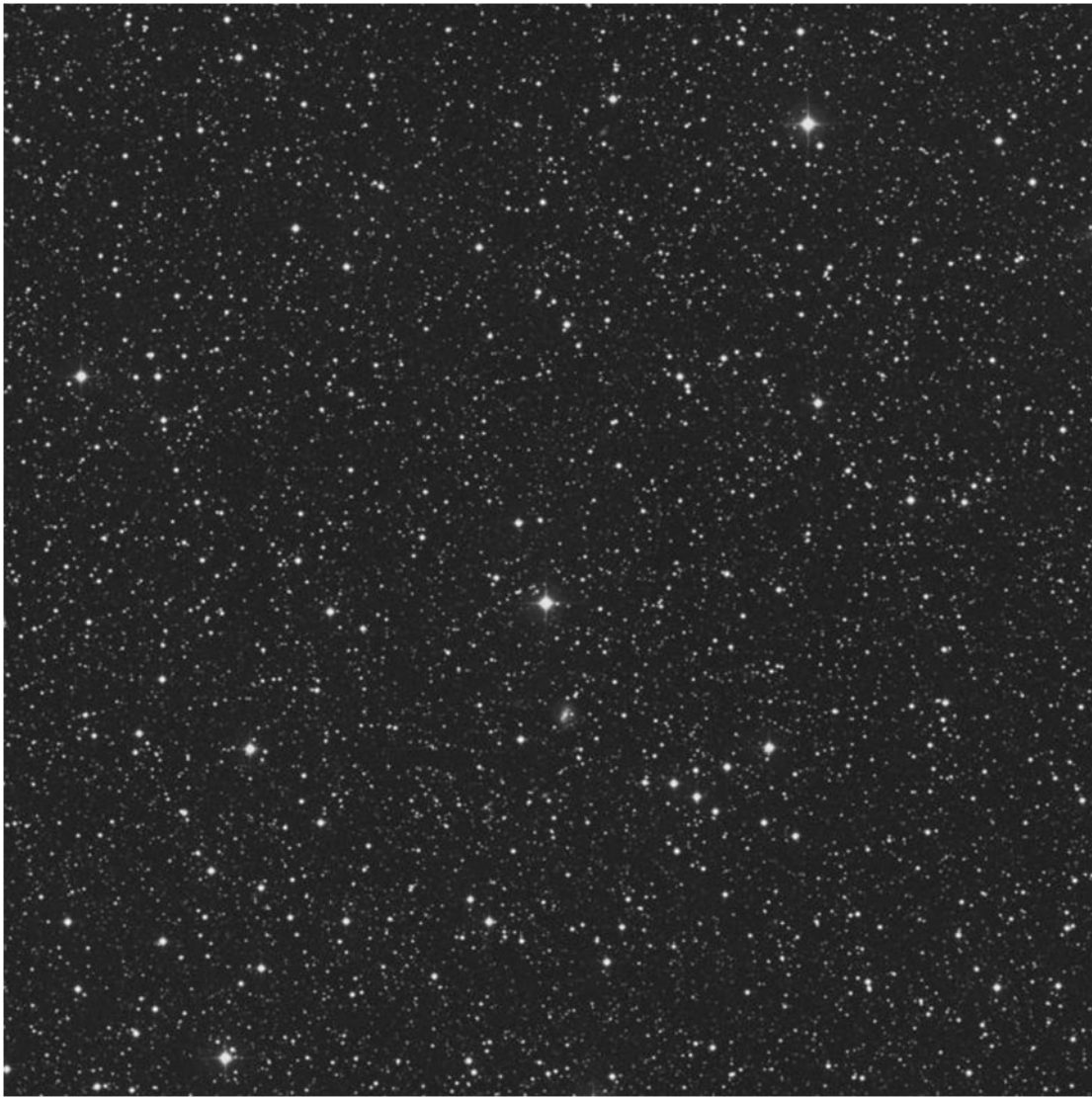
E. E. Barnard discovered it in 1916 by comparing photographs taken in 1894 and 1916, and then finding it on a photo taken by E. Pickering in 1888. The proper motion of Barnard's star is a combination of its closeness and its intrinsic high velocity through space. In about 8000 years it will pass less than 4 light years from the sun.

I first made an observation of this magnitude 9.5 star in 1983 soon after buying the three volume set of Burnham's Celestial Handbook. Using a finder chart from Burnham's I was able to track it down fairly easily and then noted its position on a line marking the stars' proper motion from 1880 to 2040. That chart is on page 1252 of volume two, and page 1253 has a negative photo showing over a degree of sky around the star, making location that much easier. A distinctive “V” shaped asterism helps guide the way. Barnard's Star is also marked on chart 15 of Sky Atlas 2000 with a close up on chart A, which is in the back of the atlas.

And then I didn't make another observation for 20 years.

I thought about it from time to time – it's located less than a degree from 66 Ophiuchi, a magnitude 4.8 star, and well placed for most of the spring and summer – but somehow I couldn't quite swing my telescope over to track it down again. And then on June 4, 2003 I finally made it back. I sketched the field and couldn't wait to compare it to my original observation to see how much it had moved in 20 years. And then I couldn't find my original notes. Argh!

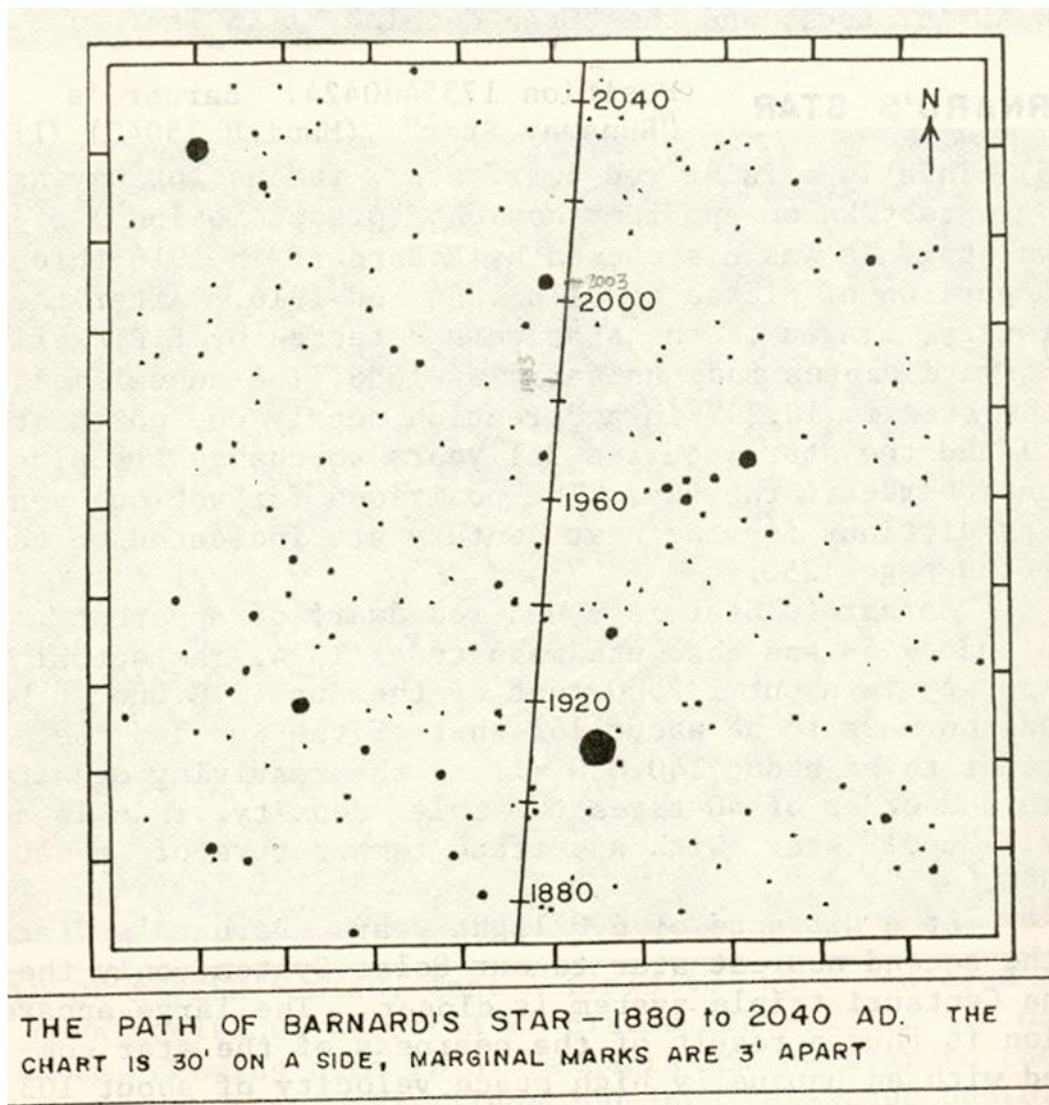
A few days after I remembered that I'd marked its position on the Burnham's chart, and finding that little 1983 mark was about as exciting as an original discovery for me. It was with surpassing pleasure that I marked my 2003 observation on the chart.



DSS image of the field of Barnard's Star. It's the brightest star near the center of the photo, and using the page 1252 chart from Burnham's, the photo seems to have been taken in the mid-1980's.

This was exciting - it had moved a good half inch on the scale of the page 1252 chart! Being able to mark the actual motion of a star through space over the course of 20 years gave me a sense of the starry sky in motion. I've know intellectually that stars swirl through the Milky Way, only too slowly for us to notice on our human timescale. Observing Barnard's Star proper motion gave me a direct and rare connection to this fact that only a significant chunk of my life time could provide.

By the way, as part of my research for writing this article I found my original notes – from June 4, 1983, exactly 20 years before my latest observation. The best I can come up with for that nifty convergence is “whoa – that's flippin cool!”



Page 1252, volume two of Burnham's Celestial Handbook with my 1983 and 2003 positions of Barnard's Star marked on the line of its proper motion. Note the "V" shaped asterism to the right of the 1960 position.

I also like what I wrote in my 1983 notes: "Only six light years distant, this inconspicuous little star is the second closest after the triple Alpha Centauri system – starlight only six years old, and next to the sun the youngest starlight I've ever seen."

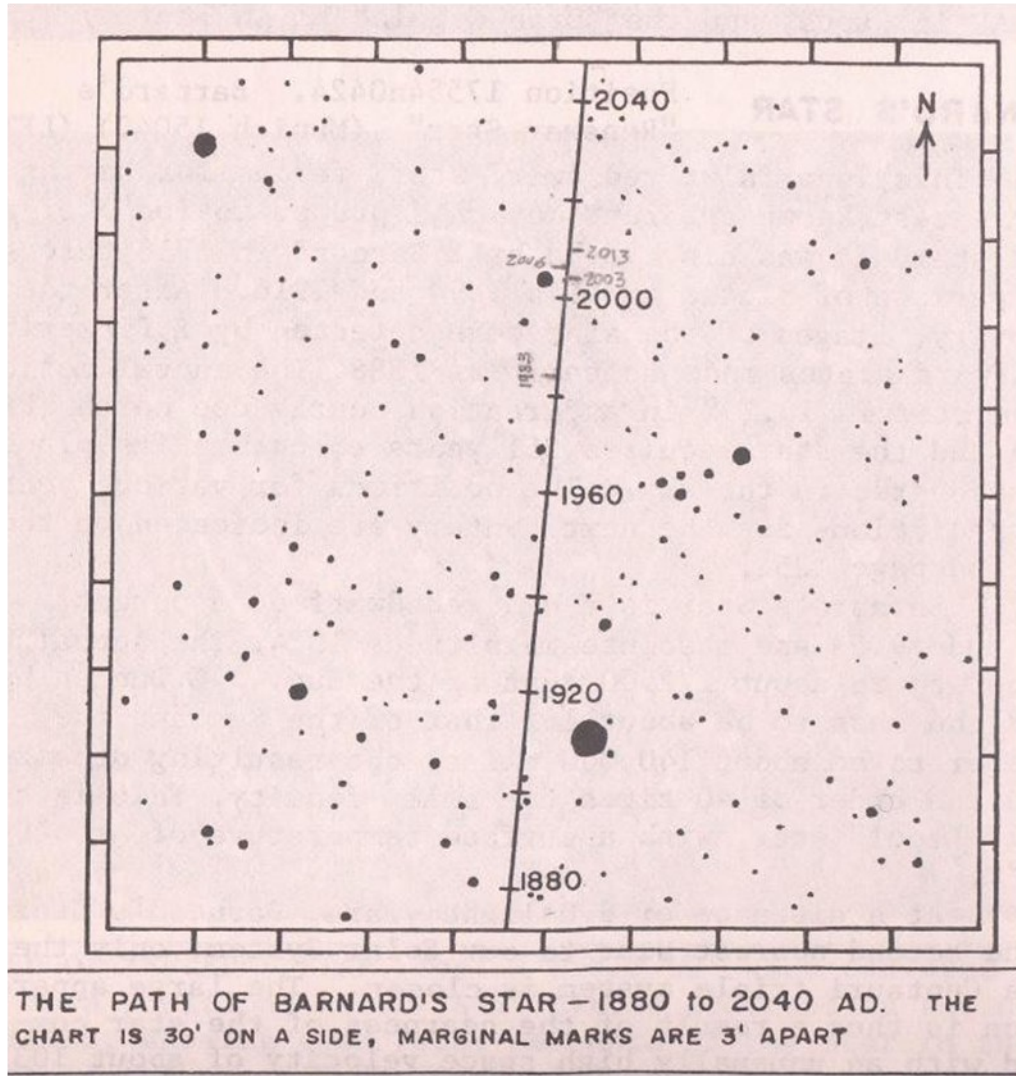
I'm not going to wait another 20 years for my next observation though. However, just out of curiosity I looked up June 4, 2023 - it's on a Sunday. Even though it won't be my next observation of Barnard's Star I do believe I'll have another look at it on that fine and future night. I'll mark its position on page 1252 about a half inch above the 2003 mark, if for no other reason than to note one more tick of the Milky Way's galactic clock."

Back to the present, this is the addendum I mentioned at the beginning of the article. The July 2013 issue of Sky & Telescope, which arrived in late May, has a short article and an excellent color photo of the area around Barnard's Star. It's the most clearly written and illustrated resource for finding and observing Bar-

nard's Star that I've seen. This got me excited to re-observe Barnard's Star and I made a mental note to do it the next time I was able to observe. A couple of weeks later I did.

About a week after my latest observation I looked up my 2003 article and it struck me that I'd observed Barnard's Star pretty close to June 4th again. Checking my notes confirmed that I had – so that's three observations of Barnard's Star separated by 30 years and all on June 4th!

Amazing as that is, I also observed it on June 21, 2006, so the coincidence is striking but not 100%. I imagine my subconscious is keeping track, but nothing's perfect...



Above is a current scan of the Burnham's Celestial Handbook chart that I've been plotting my Barnard's Star observations on. Compare it to the 2003 version and note the 2006 and 2013 marks. These are deeply satisfying observations and I hope everyone reading this is motivated to keep track of Barnard's for themselves – it will take the concept of stellar proper motion and turn it into your own observational reality.

Astrophoto of the Month from Greg Marshall

Target: Antares region (Antares, M4, Rho Ophiuchi, IC4604) Camera: QSI583

Scope: Tamron camera lens (200mm FL) Exposure: LRGB, approximately 4 hours (over 2 nights)



OMSI - Star Parties
July 20th, 2013 - Lunar Viewing

Because Earth's moon will be in a perfect position for viewing on Saturday, July 20, the Oregon Museum of Science and Industry, Rose City Astronomers and Vancouver Sidewalk Astronomers have organized Star Parties at Rooster Rock State Park and Stub Stewart State Park starting at 9:30 p.m. From beginners to experts of all ages, here's your opportunity to view the moon, stars and other celestial objects up close and personal through telescopes. Viewing highlights includes Saturn, the waxing gibbous moon, several clusters, and more! The angle of the sun will cause deep shadows to fall on the moon's surface, making its highlands and craters more easily visible.

On the scheduled day of each OMSI Star Parties, it is suggested that interested visitors call the OMSI Star Parties Hotline, 503 797-4000 Press #3 then #5, or check the OMSI Star Parties web site for possible weather-related cancellations. The event starts at sunset and is free with \$5 parking per vehicle. Warm clothing and a flashlight with red light are recommended. Personal telescopes and binoculars are welcome. See <http://omsi.edu/starparties> for more information or cancellations.



Oregon Star Party

August 6 - 11, 2013

Indian Trail Spring + Ochoco National Forest

For more information or register go to
www.oregonstarparty.org



Trout Lake Star Party
July 12-14, 2013

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

Haggart Observatory Public Nights

Through a partnership with Clackamas Community College, the Rose City Astronomers (RCA) maintains the Observatory and coordinates public access to the Observatory. During 2013, we have scheduled several Public Nights at the Observatory. We invite those interested to visit the Haggart Observatory webpage at: <http://www.rosecityastronomers.org/sp/haggart.htm> to find out dates and times for these sessions.

Star Parties Coming Soon in 2013!

Golden State Star Party	Jul 6-9
OMSI Lunar Viewing Star Party	Jul 20
Oregon Star Party	Aug 6-11
Skyview Acres Star Party	Aug 7-11
OMSI Perseid Meteor Watch	Aug 12
Stub Stewart Star Party	Aug 31
Sunriver Star Party	Sep 4-8
Maupin Star Party	Sep 6-8
OMSI Autumnal Equinox Celebration	Sep 21
Skyview Acres Star Party	Sep 26-29
White River Star Party	Sep 28

July 2013

Jul 01	Monday	Board Meeting	OMSI Classroom 1	7pm
Jul 06	Saturday	Haggart Public Night	Haggart Observatory	Dusk
Jul 10	Wednesday	Astro-Imaging SIG	Beaverton Public Library	7pm
Jul 12	Friday	Downtowner's Luncheon	India House 1038 SW Morrison Portland, OR 97215	Noon
Jul 12-14	Fri-Sun	Trout Lake Star Party	Flatop Sno Park near Trout Lake, WA	
Jul 15	Monday	New Members SIG	OMSI Planetarium	6:30pm
Jul 15	Monday	General Meeting	OMSI Auditorium	7:30pm
Jul 17	Wednesday	Cosmology SIG	Firland Apartments Community Room	7pm
Jul 20	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Jul 20	Saturday	OMSI Star Party	Rooster Rock and Stub Stewart State Parks	Dusk

August 2013

Aug 02	Friday	Downtowner's Luncheon	Alexis Greek Restaurant, 215 W. Burnside St., Portland	Noon
Aug 03	Saturday	Haggart Public Night	Haggart Observatory	Dusk
Aug 03	Saturday	* Silver Falls Star Party	Silver Falls State Park	Dusk
Aug 05	Monday	Board Meeting	***Board Meeting Cancelled for August***	7pm
Aug 06-11	Tue-Sun	* Oregon Star Party	Ochoco National Forest	
Aug 07-11	Wed-Sun	Skyview Acres Star Party	Skyview Acres near Goldendale WA	
Aug 07-11	Wed-Sun	* Table Mountain Star Party	Eden Valley Ranch near Oroville WA	
Aug 12	Saturday	OMSI Star Party	Rooster Rock and Stub Stewart State Parks	Dusk
Aug 14	Wednesday	Astro-Imaging SIG	Beaverton Public Library	7pm
Aug 17	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Aug 19	Monday	General Meeting	OMSI Auditorium	7:30pm
Aug 21	Wednesday	Cosmology SIG	Firland Apartments Community Room *New Location 8036 SE Raymond St., Portland, OR 97206	7pm
Aug 31	Saturday	Stub Stewart Star Party	RCA sponsored star party at Stub Stewart State Park	Dusk

* Not an RCA sponsored event.

<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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Newsletter of the Rose City Astronomers

August, 2013



Remote Observing: Best Practices and Lessons Learned at New Mexico Skies

By Dr. Michael Rice, CEO of New Mexico Skies, Inc.

Have you ever dreamed of observing the pristine night sky at a truly dark site from the comfort of your home in the city? Or dreamed of sending a distant telescope on a mission to collect images of beautiful deep sky objects while you get a full night's sleep and wake up refreshed and ready for an early day at work? Then remote observing may be just what you're looking for. As founder and CEO of New Mexico Skies and Fair Dinkum Skies (Australia), Michael Rice has seen it all. He has 20 years of experience designing, building, operating, and maintaining remote observatories of many sizes – from small, single-user observatories to observatories used by large organizations such as Yale University, Cal Tech, and NASA. In his presentation, Michael will share the secrets of successfully setting up and operating your own remote observatory in ways that will maximize enjoyment and minimize distress.

Mike is Professor Emeritus in Economics and Finance at the University of Alaska. His formal training includes BS and MS Degrees from Florida State University and a PhD from the University of North Carolina at Chapel Hill. He had a 25 year academic career including teaching/research faculty positions at Chapel Hill and Wake Forest University before moving to Alaska in 1983 to become Dean of the School of Management at the University of Alaska Fairbanks.

Mike's first love has always been astronomy which has been a serious affliction since he was 10 years old. Mike has been involved with hands-on astronomy for more than 60 years.

His first serious astro image was Comet West, in 1976, produced on film emulsion through a homebuilt telescope. Mike's first serious CCD imaging in the early 1990s, using home-made cameras, including three variations of Richard Berry's Cookbook Camera.



(Continued on page 2)

In This Issue:

- 1....General Meeting
- 2....Special Interest Groups
- 3....Club Contacts
- 4....RCA Board Minutes
- 5....A Treasury of Vintage Eyepieces
- 8....The Observers Corner
- 12...Astrophoto of the Month
- 13...Star Parties
- 14...Calendars



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

All are Welcome! Monday August 19th
Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

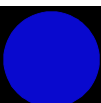
©Copyright 2013 The Rose City Astronomers All Rights Reserved.
Trout Lake Star Party photo above courtesy Michael Minnhaar
Moon photos below courtesy David Haworth

New Moon
Sep 05

First Quarter Moon
Sep 12

Full Moon
Sep 19

Last Quarter Moon
Sep 26



(Continued from page 1)

His first remote observatory, in 1993, was located at Susitna Lake, Alaska, about 60 miles from power and telephone lines...It was controlled by Ham Radio over the highest mountains in North America. During this time, he conducted extensive testing on Bisque GT1100 Paramount serial No. 1 This venture gave him a real appreciation for the challenges of remote imaging in the remote tundra of Alaska.

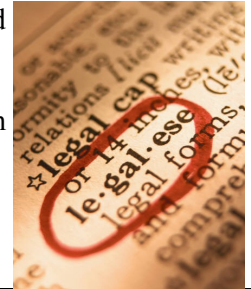
Mike and his wife, Lynn, established New Mexico Skies in 1998 in the Sacramento Mountains of New Mexico at a site described by professionals at Yale and Toronto as the darkest sky site in North America . It started as a "guest" observatory where visitors could use state of the art astronomical equipment with instructional help. Their business model has changed over the years. Now the primary focus is on hosting remote observatories in the wonderfully dark and clear skies of southern New Mexico. New Mexico Skies has become a fabulous laboratory for developing "best practices" in the design, construction, maintenance and use of remote observatories. In 2007 Mike and Lynn opened Fair Dinkum Skies observatory in Australia to host Southern hemisphere remote observatories.

RCA Bylaws Updated

On July 1, 2013, the RCA Board of Directors approved revisions to the RCA Bylaws, following a 30-day review period by members. The Bylaws were last revised in 2000.

Notable changes include the addition of a Vice President of Programming and the addition of a Student Membership. The Bylaws also clarified that the traditional "Family Membership" includes a "Primary Member" who shall have voting rights, and "other" family members who would not have voting rights but would be eligible for all other club resources and benefits. Another change was to create a more streamlined Officer nomination and election process.

The [updated Bylaws are posted](#) on the RCA website.



Special Interest Groups

Astro-Imaging Special Interest Group

When: Wednesday, Sep 11th, 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>

Youth Program

When: Beginning Aug. 17th

Location: Kennedy School

Download Flyer: <http://www.rosecityastronomers.org/sigs/YAAFlyer.pdf>

Download Application: <http://www.rosecityastronomers.org/sigs/YAAApp.pdf>

Leader: Kathy Kornei

Email: youth@rosecityastronomers.org

<http://www.rosecityastronomers.org/sigs/youth.htm>

Downtowners Luncheon

When: Friday, Sep 13th, Noon
Location: Sushi Ichiban
24 NW Broadway Portland

SIG Leader: Margaret Campbell-McCrea

Email: downtown-sig@rosecityastronomers.org

<http://www.rosecityastronomers.org/sigs/downtowners.htm>

Note different meeting location and day for this month.

New Members Special Interest Group

When: Monday, Sep 16 th, 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, Aug 17th and Sep 21st
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, Aug 21st, 7pm

Topic: TBA

Presented by: TBA

Location: 8012 SE Raymond St., Portland, OR 97206

SIG Leaders: Lamont Brock, Viktors Berstis

Email: cosmology-sig@rosecityastronomers.org

www.rosecityastronomers.org/sigs/cosmology.htm

RCA Board of Directors			
<i>Elected Officers</i>	<i>Name</i>	<i>Email Address</i>	
President	David Nemo	president	@ rosecityastronomers.org
Secretary	Duncan Kitchin	secretary	@ rosecityastronomers.org
Treasurer	Larry Godsey	treasurer	@ rosecityastronomers.org
VP Communications	Diana Fredlund	media	@ rosecityastronomers.org
VP Membership	Ken Hose	membership	@ rosecityastronomers.org
VP Observing	VACANT	observing	@ rosecityastronomers.org
VP Outreach and Education	Jim Higgs	outreach	@ rosecityastronomers.org
VP Programming	Mark Martin	program	@ rosecityastronomers.org
<i>Appointed Directors</i>	<i>Name</i>	<i>Email Address</i>	
Director, Dark Sky Preservation (IDA)	Dawn Nilson	ida	@ rosecityastronomers.org
Director, Book Library (Books & Videos)	Jan Keiski	library	@ rosecityastronomers.org
Director, New Members	Howard Knytych	newmembers	@ rosecityastronomers.org
Director, Newsletter (Rosette Gazette)	Scott Kindt	editor	@ rosecityastronomers.org
Director, Merchandise Sales (Merchandise Sales)	Herry Tedja	sales	@ rosecityastronomers.org
Director, Telescope Library (Telescope Library)	David Horne	telescope	@ rosecityastronomers.org
Director, Youth Program (RCA Youth Program)	Kathy Kornei	youth	@ rosecityastronomers.org
Other Contacts			
<i>Program / Project / Activity</i>	<i>Name</i>	<i>Email Address</i>	
Astronomical Imaging Special Interest Group	Greg Marshall	ai-sig	@ rosecityastronomers.org
Cosmology Special Interest Group	Viktors Berstis Lamont Brock	cosmology-sig	@ rosecityastronomers.org
Downtowners Lunch Special Interest Group	Margaret McCrea	downtown-sig	@ rosecityastronomers.org
Haggart Observatory	Rusty Baumberger	haggart	@ rosecityastronomers.org
Magazine Subscriptions (Discount Subscriptions)	Larry Godsey	magazines	@ rosecityastronomers.org
Observing Site Fund (Site Fund)	David Nemo	sitefund	@ rosecityastronomers.org
Sister Clubs	Jan Keiski	sisterclub	@ rosecityastronomers.org
Starlight Parade Float	Sameer Ruiwale	starlight	@ rosecityastronomers.org
Telescope Workshop	John DeLacy Don Peckham	tw-sig	@ rosecityastronomers.org
RCA Member Forum	Larry Godsey David Nemo	admin	@ rosecityastronomers.org
Webmaster	Larry Godsey	webmaster	@ rosecityastronomers.org
ALCOR (Astronomical League Coordinator)	Ken Hose	alcor	@ rosecityastronomers.org
Galaxy Groups and Clusters Observing Program	Dareth Murray	ggc	@ rosecityastronomers.org
Herschel 2 Observing Program	Candace Pratt	herschel2	@ rosecityastronomers.org
Local Galaxy Groups and Galactic Neighborhood	Dareth Murray	lgggn	@ rosecityastronomers.org

Minutes of the Rose City Astronomers Board June 3, 2013



Held at OMSI Classroom 1

Chair : David Nemo

Secretary : Ken Hose for Duncan Kitchin

Board Members Present

Sameer Ruiwale (Past President)
David Nemo (President, Observing Site Director)
Ken Hose (VP Membership, ALCOR)
Jan Keiski (Library Director, OMSI & GAMA Liaison)
David Horne (Telescope Library)
Scott Kindt (Newsletter Editor)
Kathy Kornei (Youth Director)
Larry Godsey (Treasurer, Web Master)
Peter Abrahams (Guest)

Call to Order

The meeting was called to order at 7:15 by David Nemo. We did not meet the quorum requirement of 9.

Approval of Minutes

We decided to wait until the next board meeting to approve the May minutes since there was not a quorum present.

Officer Reports

- President – David Nemo. Discussed the need to fill the VP of Observing vacancy. A potential candidate pulled out.
- Secretary – Duncan Kitchin. Absent. Ken Hose standing-in.
- Treasurer – Larry Godsey. Raised the issue of whether to continue having star parties at Camp Hancock since attendance is way down and we are having trouble meeting the minimum. We will continue for now but we need further discussion.
- VP Programming – Mark Martin. Absent
- VP Observing – Open
- VP Community Affairs – Jim Higgs. Absent
- VP Membership – Ken Hose. We had 21 new members join in April and we had 5 renewals. We brought in \$830 in dues. The total member-families now stands at 395. We are on track to go out of June with record membership.
- ALCOR – Ken Hose. RCA member Louie Robida submitted a log for the Messier award.

Discussion Items

- Bylaws update. The whole meeting was devoted to reviewing the proposed bylaws update presented by David Nemo. Several changes were agreed upon. We reviewed the entire 13-page document. David will add the proposed changes and publish the updated document. The next step is to submit the document to the general membership for suggestions. There is a 30-day window for the general membership to respond. Next we need to ratify the changes by a 75% vote of the board. We also need to meet the ORS requirements. Membership Application Revision. The proposed bylaws add a new youth membership class with a different dues structure and needs to be added to the membership application. There will now be a Family Membership and a Youth Membership. In addition, we want to add lines to the application for donations to the Youth Scholarship Fund and the Observing Site Fund.

Directors' Reports

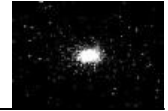
- SIGs – Vacant
- Telescope Library – David Horne. We agreed to give the donated 13" Coultter to Stub Stewart.
- Observing Sites – David Nemo. Nominal
- IDA – Dawn Nilson. Absent
- Media – Diana Fredlund. Absent
- Merchandise Sales – Herry Tedja. Absent. He reported \$90 in merchandise sales last meeting. We lost money on the calendars.
- New Members – Howard Knytych. Absent
- Book Library / OMSI / Sister Clubs – Jan Keiski. Nominal
- Youth Program – Kathy Kornei. Kathy has 6 mentors/teachers lined up for the youth academy. The plan is to start the youth academy in August and have meetings once per month for 4 months. The venue will be Kennedy School on Saturday mornings.
- Magazine Subscriptions – Larry Godsey. Nominal
- Webmaster – Larry Godsey. Nominal
- Newsletter Editor – Scott Kindt. Scott has 2 story submissions this month.

New Business

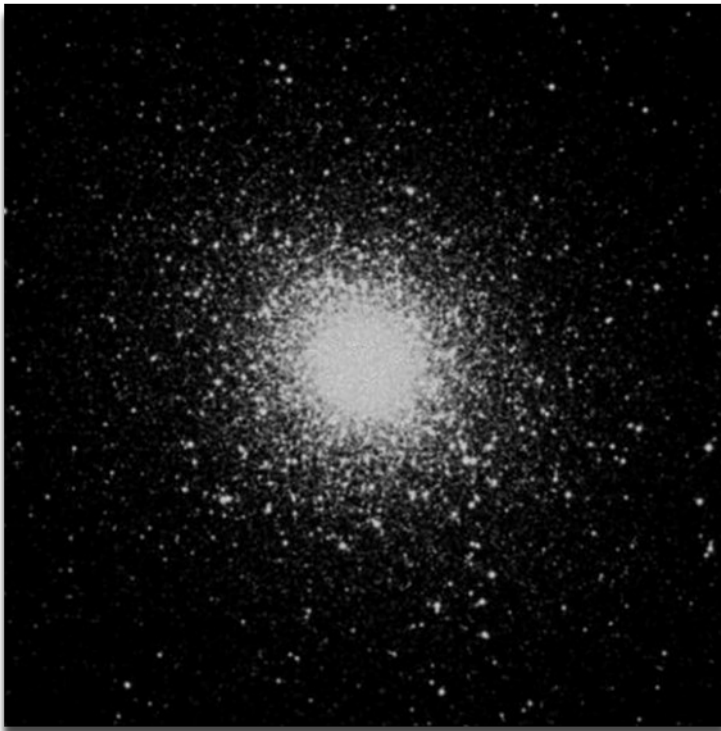
None

Adjournment

There being no further business, the meeting was adjourned at 9:34PM.



V42 and V84 Cepheid Variable Stars in M5



How many times have you enjoyed a sparkling view of M5, the beautiful globular cluster in Serpens? But have you ever noticed two variable stars that are part of the cluster, or even heard that they're there? Until the 2013 Golden State Star Party my answer would have been no on both counts.

DSS M5 photo

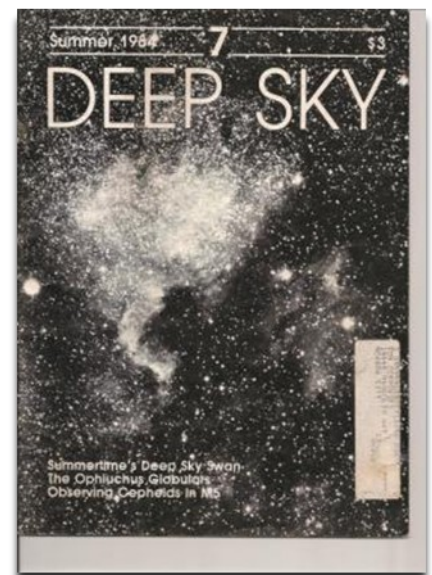
One evening at the 2013 GSSP I was talking with Tom Osypowski (aka Tom O of Equatorial Platforms and Spica Eye Telescope fame) when he asked if I'd seen the two Cepheid variables in M5 lately because they were both near their maximum brightness. Tom O became aware of the M5 Cepheids – called V42 and V84 - from an article in the old Deep Sky magazine (issue 7, Summer 1984) written by Jim Meketa. I'd never

heard of them, or had completely forgotten, but sure enough the two variables stood out as the two brightest stars in M5 in Tom O's 20" scope. It was still twilight too.

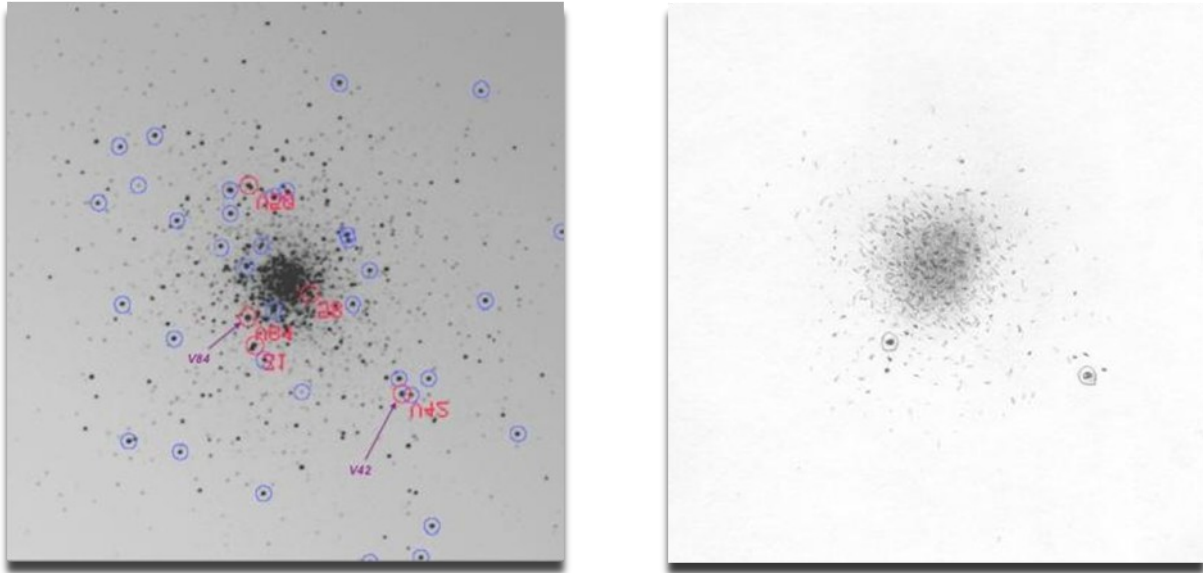
I was astounded. I was soon observing them in my scope and asking those nearby if they'd ever observed or heard of these two Cepheid variables in M5. No one had. Heck, they were as amazed as I was, and this includes some of the very best and prolific visual observers in the world. Even more surprising is that a huge scope, decades of observing experience and the darkest, most transparent skies are not needed to enjoy this sight, as only a modest scope in typical suburban skies are needed.

To illustrate this point, I observed M5 and its Cepheids with my 8 inch scope from my inner southeast Portland backyard the night before July's full moon. Light pollution was about as bad as it gets because I'm only 23 blocks from downtown, and with the nearly full moon pitching in, the sky was as bright as it can be from my place. Before I gave this a shot I wasn't sure I'd see M5 let alone the two Cepheids.

But sure enough, once I got the magnification above 120x I could see both stars. The view was best at 200x, and knowing where to look made a big difference because they were about 12 days past their maximum brightness and only 4 days before their minimums. Even so they were still among the brightest stars in M5, which made them fairly easy to identify.



Knowing where they are in M5 is crucial when they're around minimum light (approximately magnitude 12.4) because they blend in with all the other stars. However, when the two Cepheids are around their maximum brightness (approximately magnitude 10.5) they'll be quite prominent.



So, when is maximum brightness? I can't find a definitive schedule, but the periods for the two Cepheids – V42 and V84 – are slightly different from each other. V42 has a 25.74 day period while V84 period is 26.42 days. Given that they were both near their maximum on July 9th, their next maximums will be around August 3 and 4th. That's just in time for those arriving early at the Oregon Star Party.

Where to look? The negative photo above (from a paper by Christopher Brodtkin, Dan Roth, Ryan Rothrock, and Dr. Andrew C. Layden, **Detecting Long Period Variable Stars in Cluster NGC5904**) here has been flipped to match the orientation in my eyepiece, so pay attention to only the V42 and V84 labels. All the blue circled stars are RR Lyrae stars, which vary over an 8 to 12 hour time frame and are all about 3 magnitudes fainter than V42 and V84. I've circled the Cepheids in my quick eyepiece drawing as well.

My sketch is nowhere near as precise as the photos of course, and was meant to only record the general appearance of the cluster and general locations of V42 and V84.

The rise from minimum to maximum brightness takes about 7 days for both stars, which is when the appearance of the cluster will change the most quickly. Fading from maximum is slower, taking about 18 days or so. That means they should stand out well for the entire OSP.

Also note that because the periods of the two stars are slightly different they won't be in sync like they are now for long. At the GSSP last month both stars were close to their maximums and they'll still be mostly synced up at the OSP. By this time next year they'll be noticeably out of step though.

Visually, V42 is the easiest to locate because it's farther from the crowded core of M5. V42 is part of a small parallelogram of stars, and when it's near its maximum brightness it's by far the brightest of these four stars. Near minimum it's about the same brightness as the other stars – two of which are short period RR Lyrae stars.

V84 is just as bright as V42 at maximum and will be easy to locate then, but around minimum look for a tight double star that makes a nearly 90 degree angle with the center of M5 and V42, but is only about a quarter the distance from the center of M5. Come in slightly closer to M5 from this double star (and make a perfect 90 degree angle with V42) and you'll find V84.

By the way, M5 was discovered in 1702 by Gottfried Kirch and Messier added it to his list in 1764. Neither of these astronomers noticed any stars in M5, and it wasn't until Herschel observed M5 in 1791 and counted around 200 stars that it was seen to be a star cluster. We now know this ball of stars is approximately 165 light years in diameter, and that M5 is one of the largest globular clusters in the Milky Way. At 13 billion years of age it's also one of the oldest, but then that's a fairly typical age for a globular. Interestingly, it's about as far from us as we are from the center of the Milky Way.

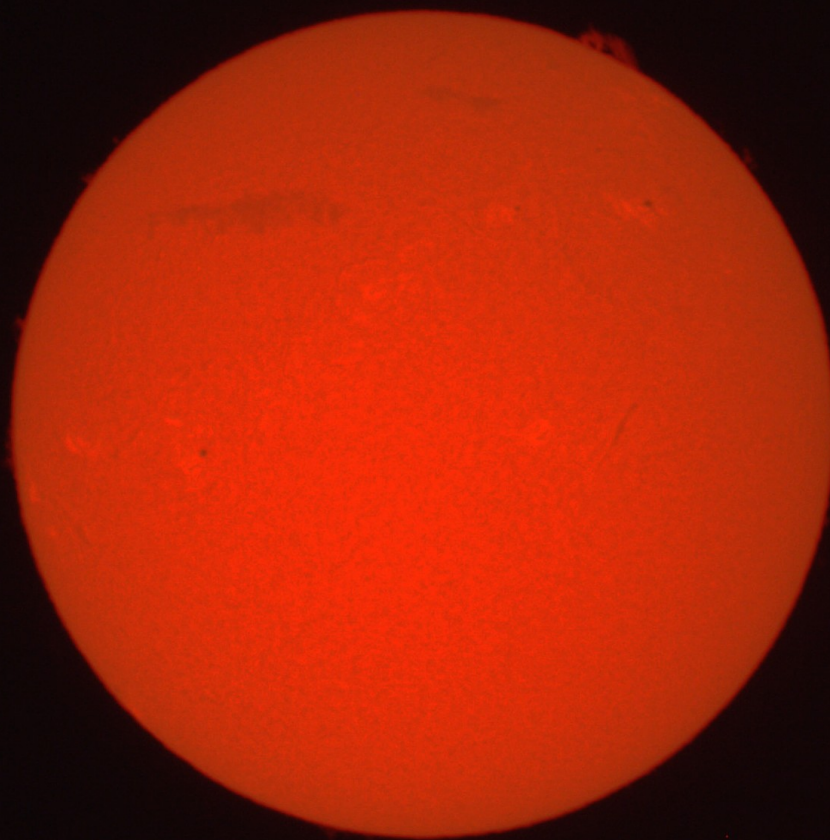
However, it wasn't until 1890 that D.E. Packer, using a 4.5" refractor, noticed the variability of V42 and V84 in two sketches he'd made a year apart. Quite a few famous astronomers along the way missed this variability, but then so has almost everyone reading this article, and quite a few of us have observed M5 many times over the years.

I've seen animations of M5 that show the short period variations of its RR Lyrae stars, which is very cool, but not a long term animation that would also show the variation of its two bright Cepheids. This would be a terrific project for both photography and sketching, although it would take a bit of luck to have clear skies every night for nearly a month. But hey, the prize would be a wonderful record of, and deeper appreciation for the dynamic nature of one of the oldest objects in the universe.

Sun in Hydrogen Alpha

Taken 081813
Lunt 60mm H α Solar Scope
Canon 350D with T-mount
barlow.
Stack of 2 photos:
One at 1/500 sec. for the
surface detail.
One at 1/40 sec for promi-
nence detail.
Stacked and adjusted with
Gimp photo software.

By Scott Kindt



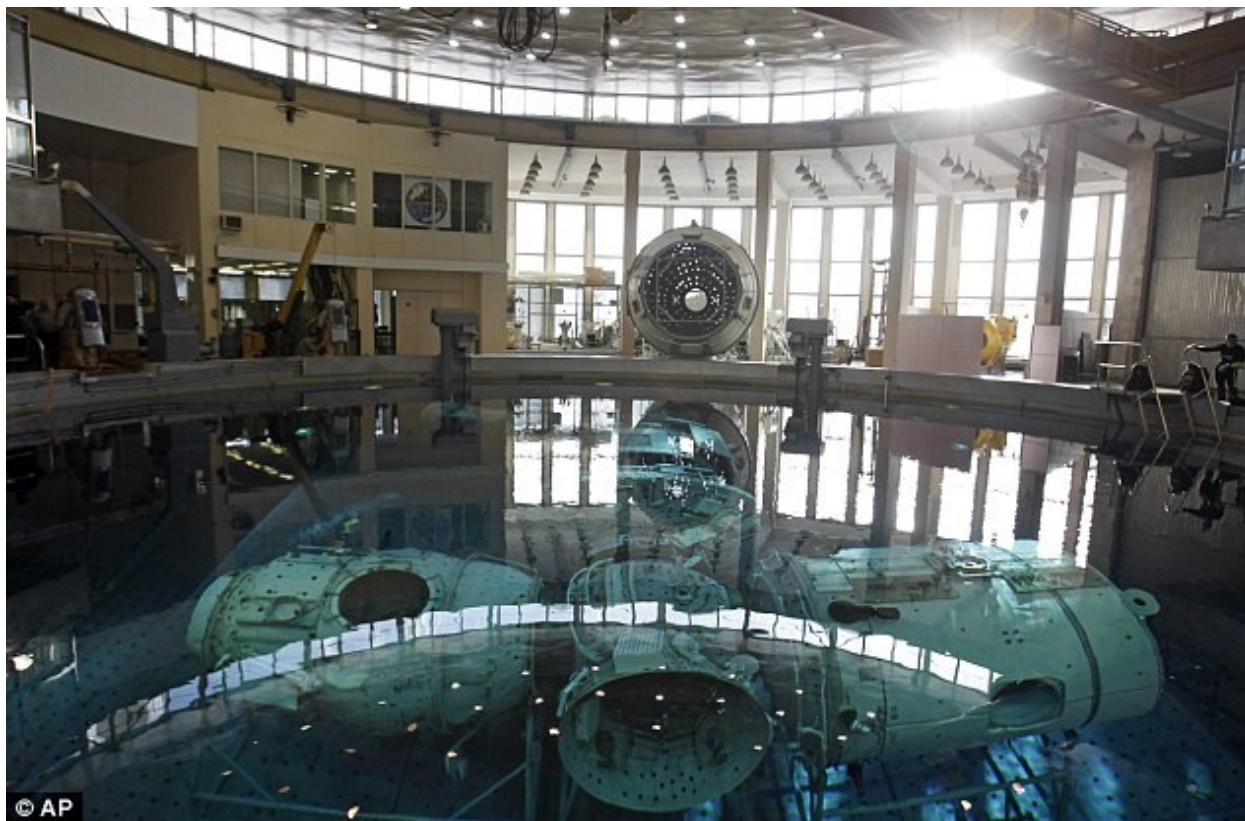
Astronomical Adventures in Russia: The Siberian Eclipse

By Robert McGown FRAS

In 2008, I traveled with Elaina Carlson and some friends from UK traveled to Russia to view a total eclipse in Novoseversk, Siberia northeast of Mongolia. It city was an industrial city with a million people. The trip to Russia was the adventure of a lifetime. We flew into Moscow through Frankfurt Germany then to Moscow and traveled on the Trans Siberian Railroad to St Petersburg. A couple of weeks later, we flew to Novoseversk to the eclipse site. We toured museums, along with the Heritage Museum to see the Da Vinci's and Rembrandt paintings. In St. Petersburg the joke was: when the winters get too cold, at the museum they say that they will have to throw another Rembrandt on the fire. We also toured the Woolly Mammoth Natural History Museum and took a flying boat across the Gulf of Finland at St. Petersburg to Peter the Great's castle known as the Peterhoff. There were numerous battle ships in the river with artists selling their wares at the waterfront, in St Petersburg. We walked around the city on hikes looking at the beautiful historical architecture.

In Moscow, we stayed at the ultra modern Vega hotel. I rode the subways around Moscow and explored the city. We toured the city with the group and alone. Red Square was huge and impressive. I had just learned that a German student landed a plane there and went to jail. This international incident caused Prime Minister Putin to fire his minister of defense. There was the beautiful Kremlin church where I did some building climbing on the back wall. It was a new 5.10+ rock bouldering climbing route on artificial stone. Lenin's tomb was amazing with his very well preserved body protected by solders. It was a long walk across Red Square. Everyone went shopping afterward in a beautiful shopping mall. There was a Russian McDonalds restaurant that we stopped at in both Moscow and St. Petersburg. The one in St. Petersburg was caddy corner from the American embassy; however they didn't take American money, only Rubles. Near the Vega hotel was an out door shopping square, a super market, and a large Kremlin like church on an island where Elaina and I rowed a boat all the way around the island on a moat. It was a lot of fun to tour the shops and swap meets along the outskirts of the city. While I was looking at some of the out door shops I came across an old army surplus shop and picked up a Russian space helmet from a space trader that I brought back for our annual Yuri's night celebration. He also wanted to sell some Russian air planes that we could fly back to Europe and all kinds of space stuff!

Near Moscow still on the first leg of out trip, we took a bus ride toured Star City, Russia and saw the neutral buoyancy space lab at the Mir Space Station. It was large enough to put in the additional MIR space station where the astronauts trained for the Mir space mission. We went aboard the MIR space station as described in the book *Dragonfly!* In the RCA astrophysics discussion group we had spent an evening discussing the book *Dragonfly*.





There was the exercise station next to the notorious oxygen candle canisters that caused the fire aboard the space station Mir. Power cables had to be cut and removed quickly by astronaut Jerry Lininger during the Mir Space station fire. During that mission there actually was also a decompression that happened when an unmanned cargo ship hit the Mir space station having a navigation problem.

We actually were allowed to get a full tour on board the Mir Space station after it was lifted out of the Neutral buoyancy lab!

The Russian space agency has the largest human space research centrifuge in the world at Star City, as well as a satellite collection and space suit collection. There is also a space simulation

swimming pool that the astronauts practiced simulations in the Space station Mir. It was one of the most amazing space research facilities that I have seen. While we were at Star City, I was allowed to plant a maple tree along the corridor.

Also while in the St. Petersburg area, we toured the Polkavo observatory where Wilhelm Struve and Carl Fraunhofer built the first German equatorial telescope called the Dorpat refractor. This was a 9 inch refracting telescope. Struve is famous for his survey of the arc of the meridian measurement and his catalogue of double stars. Fraunhofer is known for Fraunhofer lines, the absorption and emission lines in the electromagnetic spectrum. I think of the electromagnetic spectrum as 50 octaves on a piano keyboard. The visible spectrum is middle C. The absorption and emission lines of the electromagnetic spectrum are the sharps and flats of the keyboard.



The Human Centrifuge at Star City



Polkovo Observatory, Saint Petersburg, Russia

There was a huge traffic jam to get to the Polkovo observatory and we had to get off the freeway and go overland. At the observatory, there were two radio telescopes there, a five meter square dish with unusual receivers and a 40 meter Rutar prototype style radio telescope billboard style with a variable billboard style radio dish. The Rutar was built during the Cold War. I had an open discussion about the Rutar in Zelenchuckskia at the observatory with the Russian observatory staff and American amateur astronomers. There were many displays and meteorites at the observatory. In a central display area, the rotunda, in the large central astronomy dome there were all kinds of astronomy artifacts. In a glass case there was an early atomic clock, the lenses from a .8 meter refracting telescope and a large Sikhote-Alin Meteorite that fell in the Sikhote-Alin Mountains of Russia in 1947. The fall was estimated at 900,000 kilo-

grams and there was a strune field of 26 miles by 6 miles. There are many characteristic deep thumbprints known as regmaglypts on this meteorite and is known for its bullet blue color. The legend at the museum has it that, if you could lift this 25 kilogram piece of meteorite off the pedestal you would always experience good health!

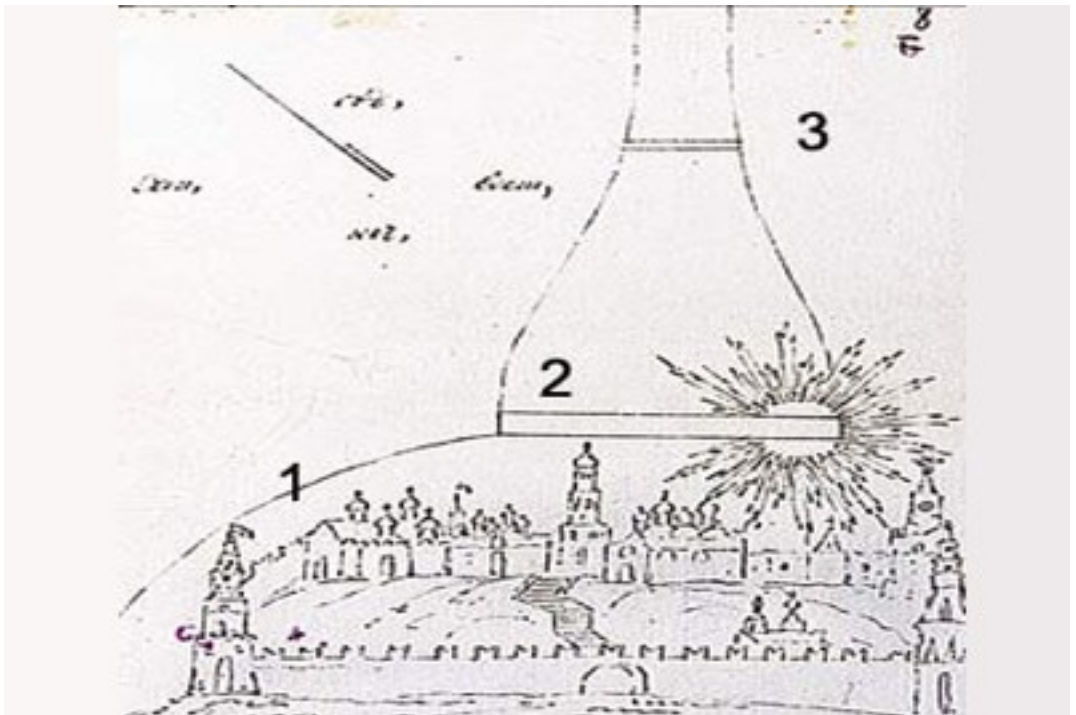
When it comes to Russia, three meteoritical events come to mind: The Sikhote-Alin impact, the Tunguska event and the most recent bolide that exploded near the town of Chelyabinsk. The Chelyabinsk bolide got a lot press because of the damage it created within the city and the videos of the explosion. On February 15, 2013, a spectacular bolide streaked across the morning sky of Siberia and above the town of Chelyabinsk, leaving a smoke and debris trail. The bolide flash was so bright, that many people ran to their windows to look at it - a half a minute later a massive shockwave from the impact hit the Russian city, caus-

ing major damage. The shockwave caused a factory wall to collapse and thousands of windows were broken by the blast pressure. Hundreds of people were injured by flying glass and debris as they observed the bolide.

This meteorite impact in Russia was one of the most devastating since Tunguska shock wave and impact that hit nearly a century ago. This bolide hit a populated area Unlike Tunguska (which was likely an icy comet), struck in a remote wooded region. The Chelyabinsk stony meteorite fragments and meteorites survived the impact and are scattered across a large strewn field that is being mapped. The meteor landed on snow covered ground in the Siberian winter, and all of the easy to find stones that landed on the surface of the snow have been recovered. Once the spring thaw melts the snow, more meteorite specimens will be recovered. However, they will not be as fresh and pristine as these research grade specimens that were collected before the spring snow melt.

Although nearly unheard of, there was a recently achieved report discovered of a bolide that exploded above the Kremlin in 1808. Michael Meo, A astronomer colleague and I were discussing his long term research project called "Evidence for Romanticism in Astronomy in Russia in the first half of the 19th Century" He had recently come across a manuscript in Russian of a meteor that exploded above the Kremlin in 1808. In this Russian text there was a drawing of the bolide exploding above the grounds of the Kremlin. In 1808 there was a lot of religious thought and a meteoritical bolide was unheard of, so the observers

didn't know what this UFO object was. When the observers saw this exploding cloud it may have sent them scrambling back inside to Kremlin into prayer. They also might have thought it was some kind of cannon explosion. In the Russian manuscript, it is a recent account of the bolide that tracks the path of two historians that heard of the bolide and tracked down. They found new information and a sketch of the meteor explosion and the brief historical account that no one had previously known about. The historical account by the Russian professor was purely objective and he interpreted the event as a meteor event.



There is basis to assume that the observation sketch, its description and the image itself was made by Andrei Kharitonovich Chebotaryov (1784-1832), master of physics and mathematics, adjunct of chemistry and technology of Moscow University.

Our tour guide at the Polkovo Observatory was astronomer Markarian Sunyen Zeldovitch Chuby, who did his PhD research on *Differential Rotation of the Sun*. He spoke fluent English, although there seemed to be a major language barrier in Russia everywhere we went. It was certainly not like some of the other astronomical adventures in Europe of South America we experienced.

We also visited a very large book store in Moscow. It had a very small English section and the people were friendly. One of the unique things is that we found was that the Russian nested dolls were for sale everywhere.

In Novoseversk, we toured a fantastic geology museum. At the geology museum we saw the blue gemstones from Lake Baikal, diamond ore, Kimberlite and meteorite collections. There was a collection of tektites and impact glass. We stayed at an old concrete hotel at a beautiful forest preserve next to the Ob River. There was a well groomed nature trail along cabins in the woods. We would hike down to the river and walked on the docks. I gave some constellation tours to the eclipse group at the river under the crisp summer night sky. We also waded in the river to cool off.

There were some clouds the morning of the eclipse and we were worried about missing the eclipse. However, thanks to the Russian Air Force, they seeded the clouds to make better viewing as they jetted around the sky above Novoseversk. From the

shore of the Ob River the group of about 50 gathered for the eclipse. The eclipse was stunning as the Bailey Beads, diamond ring appeared, and the corona of the Sun which showed the Magnetic Sector Boundary lines visible to the naked eye which was astonishing. After seeing the eclipse, it was easy to see why the ancient Egyptians worshiped the Sun God Ra with 24 total eclipses in a 900 year span in the Nile River Valley.

There were many eclipse photographers that carried a variety of photographic equipment and telescopes. Astronomers, Frank Drake and David Levy were at the central square in town. The trip culminated with a great dinner party with the group after the eclipse that we celebrated the 400th anniversary of the telescope. It was a very memorable event, and we all wanted to return to Russia and again and finish our cross Russia on Trans Siberian Railway and return for next years eclipse!

References:

Myagchenkova, O.G. & Ponomaryova
“Nablyudenie boldia nad Kremylom (1808)
(Observation of a Meteor above the Kremlin (1808)
Isteriko – Astronomicheskie Issledovaniia, 2005
Vol 30 pp 151-158 M. Meo

The Eclipse

By Robert McGown

I've come to the eclipse site again
Across the world with my friends
The shadow path slowly creeping
Birds in the woods were sleeping
Traveled across Siberia to his place
Before totality, we won the race
Alignment of the Moon and Sun begin
Darkness of totality makes the wind

Stalin walked this square one day
We arrived for astral play
Dragon Moon would eat the Sun
Observers around the world they came
Camera's lenses imaging the game
Through smoky glass Annular had arrived
Sliver of gold, the darkness thrived

Shimmering corona, the umbra bright
Totality came as if it were night
Strange gestures of birds in flight
Bailey's beads around the disc so bright
Total diamond ring in the sky
Camera shutters clicked as passersby
Einstein's gravity bends light around
Sun and Moon danced our surround

Astrophoto of the Month from Peter Graham

The equipment I used was our 12" LX200 Meade classic (1994/5 so it is older than I am). A tele-compressor was used to bring the f/ratio to about f/6.7. The camera is an SBIG ST200XCM single shot color CCD camera with an AO8 guider. The software used was The Sky for telescope control, CCDSoft for image capture and initial processing (aligning the images, separating the coloring channels, combining), and final processing with Paint Shop Pro (brightness, contrast, softening, and some unsharp masking). Photo taken at the Oregon Star Party 2013.



OMSI - Star Parties
Sept 21st, 2013
Autumnal Equinox Celebration

On Saturday, Sept 21st, the Oregon Museum of Science and Industry, Rose City Astronomers and Vancouver Sidewalk Astronomers have organized Star Parties at Rooster Rock State Park and Stub Stewart State Park starting at 7:30 p.m. From beginners to experts of all ages, here's your opportunity to view the moon, stars and other celestial objects up close and personal through telescopes. Viewing highlights includes Venus, Saturn, Moon and more! On the scheduled day of each OMSI Star Parties, it is suggested that interested visitors call the OMSI Star Parties Hotline, 503 797-4000 Press #3 then #5, or check the OMSI Star Parties web site for possible weather-related cancellations. The event starts at sunset and is free with \$5 parking per vehicle. Warm clothing and a flashlight with red light are recommended. Personal telescopes and binoculars are welcome.

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

Maupin Star Party
Sept 6-8, 2013

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. Please don't camp past approx. 300 feet from the end of the runway). 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>



Stub Stewart - August 31, 2013

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.

The viewing area will be held at the Hilltop Day-Use section of Stub Stewart which does have public restroom, drinking water, limited power, covered picnic area, sidewalk, limited parking, and graveled trails.

There are Tent camping, Trailer, and RV areas at the State Park along with cabins available for a fee. Be aware that they fill up early.

Haggart Observatory Public Nights

Through a partnership with Clackamas Community College, the Rose City Astronomers (RCA) maintains the Observatory and coordinates public access to the Observatory. During 2013, we have scheduled several Public Nights at the Observatory. We invite those interested to visit the Haggart Observatory webpage at: <http://www.rosecityastronomers.org/sp/haggart.htm> to find out dates and times for these sessions.

Star Parties Coming Soon in 2013!

Stub Stewart Star Party	Aug 31
Sunriver Star Party	Sep 4-8
Maupin Star Party	Sep 6-8
OMSI Autumnal Equinox Celebration	Sep 21
Skyview Acres Star Party	Sep 26-29
White River Star Party	Sep 28
Camp Hancock	Oct 4-6
SkyView Acres Star Party	Nov 1-3

August 2013

Aug 02	Friday	Downtowner's Luncheon	Alexis Greek Restaurant, 215 W. Burnside St., Portland	Noon
Aug 03	Saturday	Haggart Public Night	Haggart Observatory	Dusk
Aug 03	Saturday	* Silver Falls Star Party	Silver Falls State Park	Dusk
Aug 05	Monday	Board Meeting	***Board Meeting Cancelled for August***	7pm
Aug 06-11	Tue-Sun	* Oregon Star Party	Ochoco National Forest	
Aug 07-11	Wed-Sun	Skyview Acres Star Party	Skyview Acres near Goldendale WA	
Aug 07-11	Wed-Sun	* Table Mountain Star Party	Eden Valley Ranch near Oroville WA	
Aug 12	Saturday	OMSI Star Party	Rooster Rock and Stub Stewart State Parks	Dusk
Aug 14	Wednesday	Astro-Imaging SIG	Beaverton Public Library	7pm
Aug 17	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Aug 19	Monday	General Meeting	OMSI Auditorium	7:30pm
Aug 21	Wednesday	Cosmology SIG	Firland Apartments Community Room <i>*New Location</i> 8036 SE Raymond St., Portland, OR 97206	7pm
Aug 31	Saturday	Stub Stewart Star Party	RCA sponsored star party at Stub Stewart State Park	Dusk

September 2013

Sep 4-8	Wed-Sun	* Sunriver Star Party	Near Brothers OR	
Sep 6-8	Fri-Sun	Maupin Star Party	Wapinita Airstrip near Maupin	
Sep 09	Monday	Board Meeting	OMSI Classroom 1	7pm
Sep 11	Wednesday	Astro-Imaging SIG	Beaverton Public Library	7pm
Sep 13	Friday	Downtowner's Luncheon	India House 1038 SW Morrison Portland, OR 97215	Noon
Sep 14	Saturday	Haggart Public Night	Haggart Observatory	Dusk
Sep 16	Monday	New Members SIG	OMSI Planetarium	6:30pm
Sep 16	Monday	General Meeting	OMSI Auditorium	7:30pm
Sep 18	Wednesday	Cosmology SIG	Firland Apartments Community Room	7pm
Sep 21	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Sep 21	Saturday	OMSI Star Party	Rooster Rock and Stub Stewart State Parks	Dusk
Sep 26-29	Thu-Sun	SkyView Acres Star Party	SkyView Acres near Goldendale	
Sep 28	Sat	White River Star Party	Near White River on the north flank of Mt. Hood	Dusk

* Not an RCA sponsored event.

<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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Newsletter of the Rose City Astronomers

September, 2013



Stars that go bump in the night -- Stellar outbursts & fades during the time of planet formation

Kevin Covey

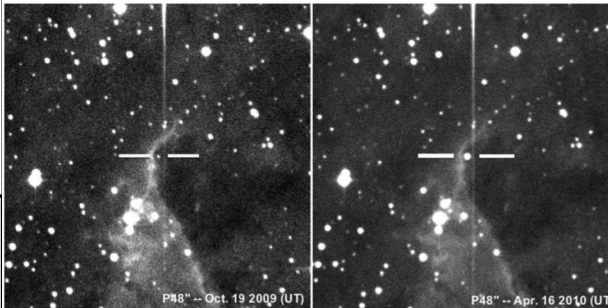
Star and planet formation is highly dynamic: the appearance of the youngest stars can change dramatically in as little as a week. Even by the standards of typically unruly young stars, some *stars* exhibit remarkable changes, increasing or decreasing in brightness by factors of 1000 or more. These brightness changes are thought to be caused by sudden changes in the star's growth rate, or in the structure of the planet forming material in orbit around the star.



Dr. Covey will describe the general properties of these outbursters and faders before recounting the discovery and characterization of several remarkable systems in a long-term study of the North American Nebula. In describing the effort to understand these enigmatic young stars, Dr. Covey will present observations from the largest telescopes on the ground and orbiting above us in space, as well as backyard observations obtained by dedicated hobbyists across the world.

Kevin Covey is a former RCA Member and was born and raised in Portland, Oregon and received his PHD in astronomy from the University of Washington. Kevin was a Spitzer Fellow at the Harvard-Smithsonian Center for Astrophysics and a Hubble Fellow at Cornell University.

Kevin is currently a research astronomer at Lowell Observatory and he is working to clarify how low-mass stars, and the planets they host, form and evolve. Specifically, He studies how young stars gain mass and shed angular momentum without disrupting the planets forming around them. He also tracks how low-mass stars spin down over time: these measurements provide a valuable 'stellar clock' to estimate the ages of individual stars and give clues to how these stars generate magnetic fields and stellar winds. Kevin studies these processes with data from large astrophysical surveys (e.g., the Sloan Digital Sky Survey, the Palomar Transient Factory, and the upcoming Large Synoptic Survey Telescope) as well as his own observations (typically optical and near-infrared spectra).



Optical images of the highly variable young star PTF10nvg/V2492 Cyg, taken with the 48" Schmidt telescope at Mt. Palomar in 2009 and 2010. PTF10nvg/V2492 Cyg became 100 times brighter (or more) in the few months between these two images.

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- 3....Club Contacts
- 4....RCA Board Minutes
- 6....The Observers Corner
- 9....Stub Stewart Star Party Report
- 10...Star Parties
- 11...Calendars



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

All are Welcome! Monday September 16th
Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

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

First Quarter Moon
Sep 12

Full Moon
Sep 19

Last Quarter Moon
Sep 26

New Moon
Oct 04





M101

Photographer:
Peter Graham

Taken on 8/6/13.

4x4 minute
exposures

12" LX200 Classic @
F/6.7

ST2000XCM Camera

Special Interest Groups

Astro-Imaging Special Interest Group
 When: Wednesday, Oct 11th, CANCELLED
 Location: TBA
 SIG Leader: Greg Marshall
 Email: ai-sig@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/astroimage.htm>

Youth Program
 When: In Progress
 Location: Kennedy School
 Download Flyer: <http://www.rosecityastronomers.org/sigs/YAAFlyer.pdf>
 Download Application: <http://www.rosecityastronomers.org/sigs/YAAApp.pdf>
 Leader: Kathy Kornei
 Email: youth@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/youth.htm>

Downtowners Luncheon
 When: Friday, Sep 13th, Noon
 Location: Sushi Ichiban
 24 NW Broadway Portland
 SIG Leader: Margaret Campbell-McCrea
 Email: downtown-sig@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/downtowners.htm>

Note different meeting location and day for this month.

New Members Special Interest Group
 When: Monday, Sep 16 th, 6:30pm
 Location: OMSI Planetarium
 Topic: Fall Observing Highlights
 SIG Leader: Howard Knytych
 Email: newmembers@rosecityastronomers.org
http://www.rosecityastronomers.org/sigs/new_members.htm

Telescope Workshop
 When: Saturday, Sep 21st
 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, Sep 18th, 7pm
 Topic: TBA
 Presented by: TBA
 Location: 8012 SE Raymond St., Portland, OR 97206
 SIG Leaders: Viktors Berstis
 Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

RCA Board of Directors			
<i>Elected Officers</i>	<i>Name</i>	<i>Email Address</i>	
President	David Nemo	president	@ rosecityastronomers.org
Secretary	Duncan Kitchin	secretary	@ rosecityastronomers.org
Treasurer	Larry Godsey	treasurer	@ rosecityastronomers.org
VP Communications	Diana Fredlund	media	@ rosecityastronomers.org
VP Membership	Ken Hose	membership	@ rosecityastronomers.org
VP Observing	VACANT	observing	@ rosecityastronomers.org
VP Outreach and Education	Jim Higgs	outreach	@ rosecityastronomers.org
VP Programming	Mark Martin	program	@ rosecityastronomers.org
<i>Appointed Directors</i>	<i>Name</i>	<i>Email Address</i>	
Director, Dark Sky Preservation (IDA)	Dawn Nilson	ida	@ rosecityastronomers.org
Director, Book Library (Books & Videos)	Jan Keiski	library	@ rosecityastronomers.org
Director, New Members	Howard Knytych	newmembers	@ rosecityastronomers.org
Director, Newsletter (Rosette Gazette)	Scott Kindt	editor	@ rosecityastronomers.org
Director, Merchandise Sales (Merchandise Sales)	Vacant	sales	@ rosecityastronomers.org
Director, Telescope Library (Telescope Library)	David Horne	telescope	@ rosecityastronomers.org
Director, Youth Program (RCA Youth Program)	Kathy Kornei	youth	@ rosecityastronomers.org
Other Contacts			
<i>Program / Project / Activity</i>	<i>Name</i>	<i>Email Address</i>	
Astronomical Imaging Special Interest Group	Greg Marshall	ai-sig	@ rosecityastronomers.org
Cosmology Special Interest Group	Viktors Berstis	cosmology-sig	@ rosecityastronomers.org
Downtowners Lunch Special Interest Group	Margaret McCrea	downtown-sig	@ rosecityastronomers.org
Haggart Observatory	Rusty Baumberger	haggart	@ rosecityastronomers.org
Magazine Subscriptions (Discount Subscriptions)	Larry Godsey	magazines	@ rosecityastronomers.org
Observing Site Fund (Site Fund)	David Nemo	sitefund	@ rosecityastronomers.org
Sister Clubs	Jan Keiski	sisterclub	@ rosecityastronomers.org
Starlight Parade Float	Sameer Ruiwale	starlight	@ rosecityastronomers.org
Telescope Workshop	John DeLacy Don Peckham	tw-sig	@ rosecityastronomers.org
RCA Member Forum	Larry Godsey David Nemo	admin	@ rosecityastronomers.org
Webmaster	Larry Godsey	webmaster	@ rosecityastronomers.org
ALCOR (Astronomical League Coordinator)	Ken Hose	alcor	@ rosecityastronomers.org
Galaxy Groups and Clusters Observing Program	Dareth Murray	ggc	@ rosecityastronomers.org
Herschel 2 Observing Program	Candace Pratt	herschel2	@ rosecityastronomers.org
Local Galaxy Groups and Galactic Neighborhood Observing Program	Dareth Murray	lggn	@ rosecityastronomers.org

Minutes of the Rose City Astronomers Board July 1st 2013

Held at OMSI Board Room

Chair : David Nemo
Secretary : Duncan Kitchin



Board Members Present

David Nemo (President)
Ken Hose (VP Membership)
Mark Martin (VP Programming)
Larry Godsey (Treasurer, Webmaster, Magazine Sales)
Duncan Kitchin (Secretary)
Diana Fredlund (Media Director)
David Horne (Telescope Library)
Scott Kindt (Newsletter Editor)

Call to Order

The meeting was called to order at 7:03pm by David Nemo and, there being 8 board members present, the quorum requirement of 8 was declared to be met.

Approval of Agenda

The agenda was approved by unanimous consent.

Approval of Minutes

Moved: Approve minutes from the May and June 2013 board meetings. Edit: remove "SIG Director" from Scott Kindt's name. Moved: Ken Hose. Second: Mark Martin. Motion passes 8-0-0.

Officer Reports

- President (David Nemo): David has had conversations with two different people about filling the VP Observing post. OMSI agreement has now been fully executed. Astronomy day: not as busy this year as some recent years, but still very well attended. Need to update the RCA handout brochure.
- Secretary (Duncan Kitchin): Nominal.
- Treasurer (Larry Godsey): Four page end of year handout distributed at the meeting. Balance sheet shows us currently a little better than last year. Profit & Loss should be final numbers; not currently expecting any additional bills. Itemized accounts for this month, and yearly expenses by item also provided. Everything came in under budget this year. Need to determine how to move forward with the OMSI telescope rebuilding, for which there is an allocated budget. There is also potentially an observatory being constructed at Camp Hancock where this could be situated. David Horne will make enquiries as to how OMSI would like to move forward. 2 CDs are maturing this month; Larry plans to roll them over. Will also roll \$3000 from the current account into one of the CDs, since we have an excess balance currently. Donations have been made in connection with community outreach; we will need to make a determination as to whether this should be allocated to a specific fund. Consensus is to put all donations into general funds, unless indicated otherwise by the donor, and determine at a later date on what level of funding is required for the scholarship fund.
- VP Programming (Mark Martin): Mark has a list of proposed

invitees for speakers for next year, posted to the forum. The page will be updated as speakers recruited.

- VP Observing (Open): Need to come up with an observing calendar in the next two months. David Nemo will take care of writing a draft. Need to confirm that we have a host for the Skyview Acres weekend coincident with OSP.
- VP Community Affairs (Jim Higgs): Not able to attend, but submitted report: June 13th, DePaul Alternative High School, Inside Event, 30 kids. June 20th, Mountaindale Girl Scout Camp, Inside & Outside Event, attendance = 90 (83 scouts + other adults. Weather was bad, but at least the girls were able to see brief glimpses of Saturn's rings. Jim did an inside presentation before it was dark. Girls received meteorites, which they liked. June 30th, OMSI Astronomy Day. Several volunteers participated (Jim will be sending out a "Thank You" note). Had 87 kids complete "space art" and 12 of them won small meteorites from the random drawing. Jim's guess is that we had about 500 people stop and "engage" with our inside booth [not counting those just in line for the planetarium show], plus another 500 for the sun scopes = Approximately 1,000 contacts for the day. July events scheduled at this time: July 9th, Inside Event at Lake Oswego Springs Retirement Community (JimH). July 20th, Kings Raven Winery, near Oregon City. July 25th, Mountaindale Girl Scouts Camp (different group, but same location at June event).
- VP Membership (Ken Hose): Reached an all-time high of 404 member families at the end of the membership year. Last year we had 389 member families at this time, and 346 the year before that. Brought in \$1184 in dues this month. About 1/3 of the membership has renewed so far.

ALCOR (Ken Hose): Has a Messier award for Louie Robida to be handed out at the next meeting.

Discussion Items

- Director Positions: there are 7 director positions which will have to be appointed once we adopt the new bylaws. Suggested that we appoint these positions as they are now, and then discuss later if we want to make any changes to the board makeup.
- RCA Calendar: Approximately broke even with this year's calendar. Preliminary calendar is on the website, but does not yet have all of the star parties (particularly OMSI).

Action Items Requiring Board Decision

- Approval of budget for FY 2013-14. Budget attached to agenda and distributed at the meeting. Discussion: do we have budget for printing for promotional materials? Add additional line items for printing: media \$300, membership printing \$250. Motion: Approve the budget as amended. Moved: Duncan Kitchin, Second: Mark Martin. Motion passes 8-0-0.
- Approval of revised bylaws. Bylaws distributed with the agenda packet. Bylaws were not previously clear as to what constitutes a "member". Redraft of membership proposed to address this. Motion: Approve Draft 3.0 of the bylaws (distributed with the agenda) as modified by edits distributed at the meeting. Moved: Duncan Kitchin. Second: Mark Martin. Motion passes 8-0-0. David Nemo will distribute the revised bylaws.

Appointment of VP of Programming. Motion: appoint Mark Martin as VP of Programming. Moved: David Nemo. Second: Scott Kindt. Motion passes 8-0-0.

Appointment of VP of Communications. Motion: appoint Diana Fredlund as VP of Communications. Moved: David Nemo. Second: Larry Godsey. Motion passes 8-0-0.

Director Appointments. Already discussed. Motion to appoint 7 directors:

1. Director, Book Library - Jan Keiski
2. Director, Telescope Library - David Horne
3. Director, Merchandise Sales - Herry Tedja
4. Director, New Members - Howard Knytych
5. Director, Youth Program - Kathy Kornei
6. Director, Newsletter - Scott Kindt
7. Director, Dark Sky Preservation - Dawn Nilson

Moved: David Nemo. Second: Duncan Kitchin. Motion passes 8-0-0.

Director/Project/Program Reports

SIGs (Vacant): No report.

Telescope Library (David Horne): Ex club member has an Orion XT12 for sale that David would like to buy for the club for outreach star parties. Inventory has been pared down to a manageable level. Motion: increase telescope library budget to \$600 to cover this. Moved: Larry Godsey. Second: Diana Fredlund. Motion passes 8-0-0.

Observing Site (David Nemo): Nominal.

IDA (Dawn Nilson): Not able to attend, but report provided. There were showings of the IDA video at astronomy day, and there was a also dark skies board set up. Proposed to work with OMSI to make OMSI a light pollution free zone. Also met with ranger from Stub Stewart. State Parks can also pursue a certification from IDA; proposes to work with them to acquire designation.

Media (Diana Fredlund): Working on news release, should go out tomorrow. Also working on news release for Youth

Academy, should go out next week.

Merchandise Sales (Herry Tedja): Not able to attend, but report submitted via Larry Godsey. Brought in \$91 in sales this month.

New Members (Howard Knytych): Not present

Book Library / OMSI / Sister Clubs (Jan Keiski): Not present, but report submitted via email: Nominal.

Youth Program (Kathy Kornei): Not present, but continuing to work on youth academy program.

Magazine Subscriptions (Larry Godsey): Nominal.

Webmaster (Larry Godsey): Planning calendar for next year is on the board website.

Newsletter Editor (Scott Kindt): Scott needs a new roster of directors for the newsletter.

New Business

Cancel August board meeting (due to coincidence with Oregon Star Party). Approved by unanimous consent.

Adjournment

There being no further business, the meeting was adjourned at 9:09pm.

The 2014 Oregon Star Party in one photo. Scott Kindt

Clear dark skies with the Milky Way overhead, the ISS passing by, horizon clouds backlit by lightning, and some red lights from observers.

Canon DSLR, 17mm fl, f 2.8, iso 1600. Stack of 4-30 second exposures using StarStax for the Mac OS.

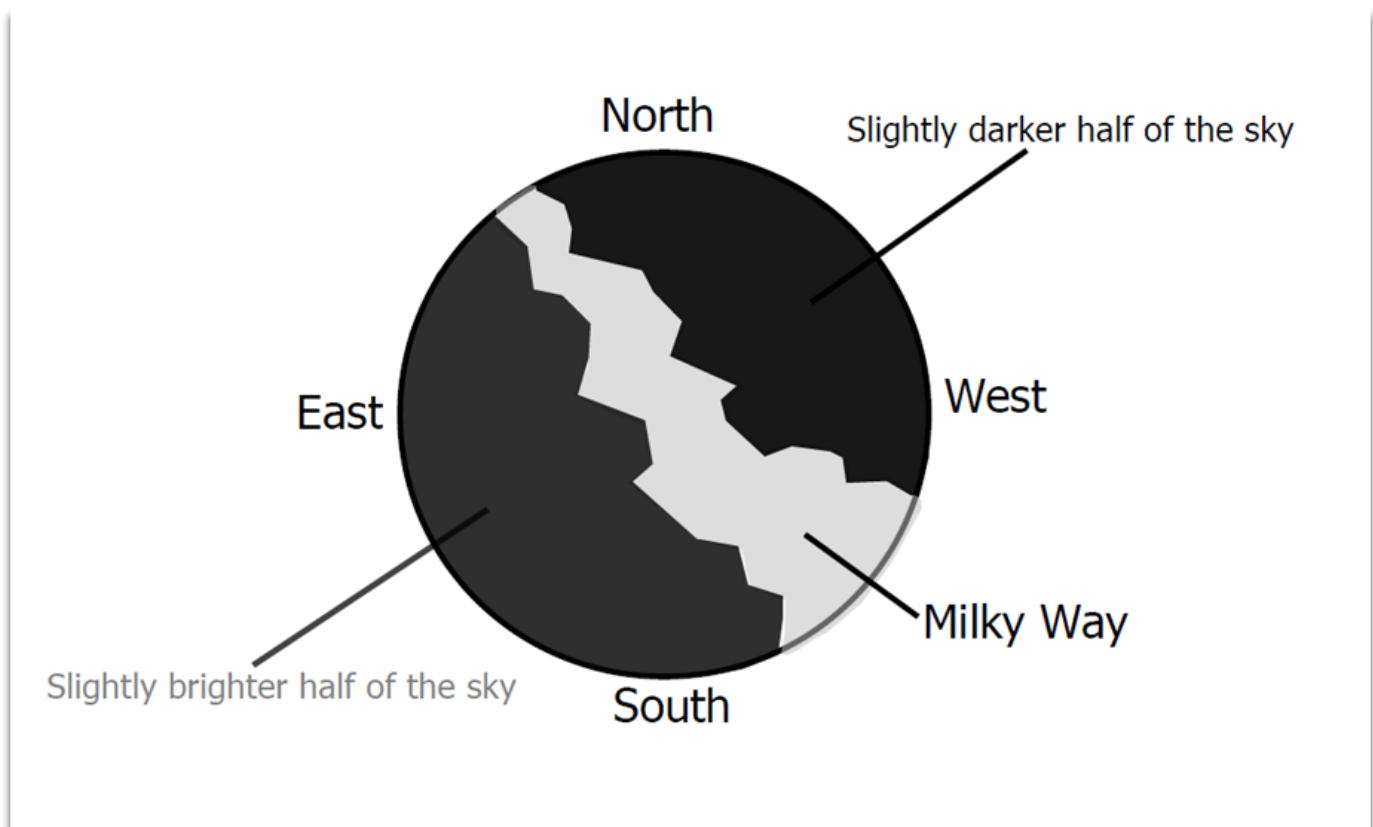




What Causes This Sky Darkness Difference?

Have you ever noticed that the summer night sky seems to be darker in the west-northwest than in the east-southeast? I've noticed this for about the past six or seven years and have wondered what caused this apparent difference, but each time continued with my observing and forgot all about it by the time I got home. I've pointed it out to other observers occasionally, and they would have much the same reaction – "Hey, how about that - I wonder why that is?" In the absence of an obvious explanation that would be the end of it.

What exactly am I talking about though? Imagine the Milky Way splitting the summer sky into two halves, with the half to the west-northwest filled with the constellations Hercules, Bootes, Ursa Major and Minor, Draco, etc. On the other side of the Milky Way is Capricornus, Aquarius, Pegasus, Andromeda, etc. What I've been seeing is that the west-northwest half of the sky looks darker than the east-southeast half of the



sky, which looks slightly washed out by comparison. The all-sky diagram above shows what I mean. Note that it doesn't include atmospheric extinction along the horizon, but it gives a decent idea of the difference I see in sky darkness between the two halves of the summer sky from a true dark sky site like the Oregon Star Party and the Golden State Star Party. I haven't seen it at sites with much light pollution.

I've tried measuring the difference with my Sky Quality Meter (SQM) and generally get about tenth of a point difference between the two sides of the sky – for instance if I get a reading of ~21.7 for the western half of the sky I'll get ~21.6 for the eastern half of the sky. This isn't definitive because I may be getting different amounts of the Milky Way in the readings, which would throw them off, but at least the measurements have been consistent.

This past August 11th, the night after the Oregon Star Party officially ended, was a fabulously clear, dark, steady and transparent night, one of the best nights at OSP in many years. Once again this effect was quite noticeable but the quality of the night was too good to pay this sky darkness difference much attention, as the few of us left at the OSP drank in the gorgeous deep sky sights. But it got me thinking again about what could possibly cause this apparent difference in sky brightness and I resolved to find out when I got home. Somewhat to my surprise, I remembered and started a thread on both the Deep Sky Forum:

(<http://www.deepskyforum.com/showthread.php?428-Summer-northwest-sky-darker-than-southeast-sky>)

...and on Cloudy Nights:

(<http://www.cloudynights.com/ubbthreads/showflat.php/Cat/0/Number/6035239/page/0/view/collapsed/sb/5/o/all/fpart/1>)

Even though there's no definitive answer yet there have been some interesting ideas put forth that might explain what I've been seeing.

First of all, I'm not the only one to have noticed this effect but many excellent observers haven't. My guess is that it takes top-notch observing conditions like we get at the OSP or GSSP for this to be apparent as they are, along with Steens Mountain, the only places I've noticed it.

When I first started looking into this effect I was a little surprised to find no mention of it online. I was expecting to find something that would explain the difference, and that it would have a name of some sort. No such luck, so then I started the threads mentioned above and so far have received several good ideas but nothing definitive – and that's been even more interesting than finding a cut and dried answer.

Here are the leading, plausible ideas:

1. The western edge of the Milky Way has lots of dark nebula that may make the background of the west-northwest sky look darker.
2. The eastern sky has the ecliptic, Gegenschein and zodiacal light, all of which contributes to a generally brighter, washed out looking eastern half of the sky.
3. There are more bright stars in the sky on the western side of the Milk Way, and they add a sense of contrast to the sky background, much like when you first step outside and the sky looks darker than it really is because your eyes aren't dark adapted yet.
4. Our location in the Milky Way is off the center line of the galaxy so we're looking through more faint stars toward the eastern side of the summer sky.

I don't know if any of these ideas or combination of them is the real explanation of this effect but they're all I have so far. Here are my thoughts on each one:

1. Although there are lots of dark nebulae along the western side of the Milky Way, they don't extend over that entire half of the sky.
2. The ecliptic, Gegenschein and zodiacal light are all fairly localized effects of solar system dust scattered along the ecliptic plane, and although they must contribute to the difference in sky brightness they can't explain it entirely because this entire half of the sky is washed out.

3. I'm especially intrigued by the idea that more bright stars in the west-northwestern half of the sky cause an illusory contrast effect. This could be tested by looking at the sky background through a telescope in a fairly empty region on both sides of the Milky Way in quick succession. If the sky background looks the same then this idea would have some legs.
4. It will take some research to see if our place in the Milky Way could make a meaningful difference in sky darkness.

At any rate, time will tell what the explanation(s) may be, but I do think this effect may help explain a comment I've heard consistently at summer star parties for the past 22 years. Sometime around 2am-ish, when the bright center of the Milky Way has set and the whole thing has rotated so it's flowing mostly east to west, someone will say "we're losing the sky now", or "the sky is looking pretty washed out." And it does! The washed out looking half of the sky is now dominant to the south, and the darkest looking part of the sky has shrunk and is now in the northwest.

So here we have a phenomenon that's apparent to the unaided eye under a very dark summer sky and has, as far as I can tell, no accepted explanation. Few people seem to have noticed it directly, but this effect has a cause or causes - do you know what they are?



NGC7331

(The Deer Lick Galaxy group)

By Steve Jacobs

8/4/2013 Sherman Co. RV Park 22x5min exposures, using C8 with 0.63x Focal reducer and SXVR-M25C OSC

Report from the Stub Stewart star party By Mark Martin



The star party we held at Stub Stewart State Park on Saturday, August 31st, was a big success. Both Weather Underground and the Clear Sky Chart were completely wrong. Throughout the night, the conditions were about as good as it gets for Stub Stewart with clear skies throughout the night, relatively warm temperatures, light winds, and only a small amount of dew near the ground. Amazingly, it was still around 60 degrees at 2 a.m. In contrast, the forecasts were for more than 40% cloud cover by 11 p.m. and 50 degree temperatures! Transparency was excellent but seeing was only fair, which limited the usable magnification. Several people remarked that the conditions were much better than those at this year's Oregon Star Party. As always for the location, the trees and hills to the east blocked much of the Portland light dome. But the sky was considerably brightened from the northeast through the southeast. Nonetheless, the Milky Way was visible long before astronomical twilight. I was a little shocked to see how much the trees to the west had grown. They have already obstructed the western horizon quite a bit over just the past few years and will soon become a serious nuisance unless trimmed.

There were around 40 people with approximately 15 telescopes, ranging in size from 3 inches to 18 inches. Several campers stopped by early in the evening to ask for views. There was also a surprising amount of traffic on the road. I don't know whether it was people coming and going from the star party or other people driving through the park. But bright lights from cars frequently sent us scrambling to cover our eyes. I was there until close to 2 a.m. When I left, there was one pair of stalwart souls still waiting to catch a glimpse of Jupiter but everyone else had left.



Stub Stewart Day-Use Area

People seemed to be having a lot of fun. Early in the evening, there were several people peeking at Venus as it disappeared through the trees. Several of us also spent some time looking at Saturn through the thick, turbulent evening air near the horizon. I spent the rest of the night using my 16" Meade Lightbridge to give a friend a tour of some of the most spectacular examples of all the different types of astronomical objects. We started in Sagittarius, Scorpius, and Serpens Cauda with globular clusters M22 and M4, the Lagoon Nebula, the Swan Nebula, the Eagle Nebula, and open clusters M23 and M25 and then worked our way around the sky to view the Hercules Cluster (M13), the Ring Nebula, the Whirlpool Galaxy and its companion (M51 & NGC 5195), Bode's Galaxy and the Cigar Galaxy (M81 & M 82), the Andromeda Galaxy and companions (M31, M32, & M110), the Double

Cluster (NGC 869 & 884), the east and west portions of the Veil Nebula, the Dumbbell Nebula, Albireo (beta-Cyg), Rasalgethi (alpha-Her), and the near-twin globular clusters M10 and M12. We looked at some of these objects with 10.5x70 binoculars as well. We particularly spent some time with the binoculars looking at the Double Cluster, the Running Man, and the Andromeda Galaxy. As always, the Veil's turbulent tendrils were particularly spectacular in my scope.

Multiple star systems don't usually get me very excited. But I very much enjoyed chasing Rasalgethi around with my computer-less, motor-less Dob while cranking up the magnification to 389x to split the star system into its main bright orange and yellow components. In contrast to the orange of the larger, brighter red giant star, the yellow star looked like it had a tinge of green.

After sharing the main sights, I decided to look for a couple of objects that I had never seen before. I hunted down the galaxy NGC 5866, which is thought by some (including our favorite software SkyTools) to be the true M102. The dark dust lane that runs across the center was clearly though subtly visible. We also peeked at the Fireworks Galaxy (NGC 6946) and the nearby open cluster NGC 6939. The Fireworks Galaxy was a large faint smudge. But NGC 6939 was clearly visible and we could resolve quite a few individual stars within it. I later discovered that I had accidentally left my OIII filter on the eyepiece after viewing the Veil, which undoubtedly impaired our views of these last couple of objects.

We finished up the evening with the Saturn Nebula and the Helix Nebula, which were further east than our other targets. The blue color of the Saturn Nebula was quite apparent and I could see some structure within the nebula. Sadly, the Helix was in part of the sky suffering from a fair bit of light pollution. So it just looked like a big, bright blob. Afterwards, we waited around for awhile with our neighbors hoping Jupiter would rise over the trees. They recalled their iPad predicting an imminent appearance. While were doing this, we revisited some of the sights with binoculars and peeked at the Pleiades. We finally gave up around 1:30 and began packing up. We finished loading the car around 2 and headed home. It was great to reconnect with friends and to reconnect with the skies. It had been a beautiful and very pleasant night. If you were there, I hope that you had as much fun as I did and, if you missed it, I hope to see you next time.

OMSI - Star Parties
Sept 21st, 2013
Autumnal Equinox Celebration

On Saturday, Sept 21st, the Oregon Museum of Science and Industry, Rose City Astronomers and Vancouver Sidewalk Astronomers have organized Star Parties at Rooster Rock State Park and Stub Stewart State Park starting at 7:30 p.m. From beginners to experts of all ages, here's your opportunity to view the moon, stars and other celestial objects up close and personal through telescopes. Viewing highlights includes Venus, Saturn, Moon and more! On the scheduled day of each OMSI Star Parties, it is suggested that interested visitors call the OMSI Star Parties Hotline, 503 797-4000 Press #3 then #5, or check the OMSI Star Parties web site for possible weather-related cancellations. The event starts at sunset and is free with \$5 parking per vehicle. Warm clothing and a flashlight with red light are recommended. Personal telescopes and binoculars are welcome.

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

SkyView Acres Star Party
Sept 26-29, 2013
Nov 1-3, 2013

Facilities: Porta-Potty & Ten 8'x8' concrete pads plus a large flat mowed pasture (no animals).

NO water available at the site, but only 5 PAVED miles to Goldendale if you need supplies or want to stay in a motel.

Park in an organized way that leaves access lanes for others who may be coming/going over the weekend.

Tent camping is fine. Propane stoves only and please use them up off the ground on a table or stand. No open fires or charcoal briquettes.

If you plan on leaving the site after dark (e.g., to head to a motel in town) park your car near the entry to the site with your headlights facing opposite the observing field. If you will be arriving after dark, please don't try and navigate your vehicle back to your observing site, tent or trailer. Turn your lights off and park near the entry to the site.

Before you leave, police your area for any litter.

At 2,800', Skyview Acres has similar skies to the RCA Maupin site, but with much less light-bubble to the west. Minor light bubble from Yakima and the Tri-Cities area and some glow from The Dalles. Good horizons.

Nearby points of interest: St John, a Greek Orthodox Monastery's bakery, deli, and gift-shop (about 5 miles north of Woodland Road, on US97), Goldendale Observatory State Park, Maryhill Museum and Stonehenge Peace Memorial

Come and observe your favorite objects and spend a wonderful evening with friends, and friends you haven't met yet.

See <http://www.rosecityastronomers.org/sp/skyview.htm> for more information and directions.

Camp Hancock
Oct 4-6, 2013

Camp Hancock is an OMSI sponsored field station for the promotion of science education, located 2 miles east of the John Day river in NE Oregon in the Clarno Fossil Beds.

Hancock's facility is well-equipped but rustic youth camp with bunkhouses, mess hall, bathrooms (hot water and showers), and limited camping area. There are no planned activities except viewing, eating, napping, chatting, reading, napping, hiking, and did I mention an afternoon nap? The science buildings are not open to us and we have no activities planned for kids.

Because of OMSI requirements we do NOT allow drop-ins or visitors, except those that are registered and spending at least one night.

The facility fee is \$45 per night, per person, meals included.

RVing, Camping or Bunkhouse, same price.

Deadline for registering is September 28th. See the website:

<http://www.rosecityastronomers.org/sp/hancock/index.htm> to register by mail or online, or for more information



Camp Hancock observing area.



Camp Hancock dining area.

Haggart Observatory Public Nights

Through a partnership with Clackamas Community College, the Rose City Astronomers (RCA) maintains the Observatory and coordinates public access to the Observatory. During 2013, we have scheduled several Public Nights at the Observatory. We invite those interested to visit the Haggart Observatory webpage at: <http://www.rosecityastronomers.org/sp/haggart.htm> to find out dates and times for these sessions.

Star Parties Coming Soon in 2013!

OMSI Autumnal Equinox Celebration	Sep 21
Skyview Acres Star Party	Sep 26-29
White River Star Party	Sep 28
Camp Hancock	Oct 4-6
SkyView Acres Star Party	Nov 1-3

September 2013

Sep 4-8	Wed-Sun	* Sunriver Star Party	Near Brothers OR	
Sep 6-8	Fri-Sun	Maupin Star Party	Wapinita Airstrip near Maupin	
Sep 09	Monday	Board Meeting	OMSI Classroom 1	7pm
Sep 11	Wednesday	Astro-Imaging SIG	Beaverton Public Library ** CANCELLED **	7pm
Sep 13	Friday	Downtowners' Luncheon	Sushi Ichiban 24 NW Broadway Portland	Noon
Sep 14	Saturday	Haggart Public Night	Haggart Observatory	Dusk
Sep 16	Monday	New Members SIG	OMSI Planetarium	6:30pm
Sep 16	Monday	General Meeting	OMSI Auditorium	7:30pm
Sep 18	Wednesday	Cosmology SIG	Firland Apartments Community Room	7pm
Sep 21	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Sep 21	Saturday	OMSI Star Party	Rooster Rock and Stub Stewart State Parks	Dusk
Sep 26-29	Thu-Sun	SkyView Acres Star Party	SkyView Acres near Goldendale	
Sep 28	Sat	White River Star Party	Near White River on the north flank of Mt. Hood	Dusk

October 2013

Oct 04-6	Fri-Sun	Camp Hancock Star Party	Camp Hancock near John Day, OR	
Oct 07	Monday	Board Meeting	OMSI Classroom 1	7pm
Oct 09	Wednesday	Astro-Imaging SIG	TBD	7pm
Oct 11	Friday	Downtowners' Luncheon	TBD	Noon
Oct 19	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Oct 21	Monday	General Meeting	OMSI Auditorium	7:30pm
Oct 23	Wednesday	Cosmology SIG	Firland Apartments Community Room 8036 SE Raymond St., Portland, OR 97206	7pm
Oct 26	Saturday	Haggart Public Night	Haggart Observatory	Dusk
Oct 31	Saturday	Stub Stewart Star Party	RCA sponsored star party at Stub Stewart State Park	Dusk

<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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October, 2013



Near-Earth Wonders: A Survey of Atmospheric Phenomena

Matt Vartanian

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- 2....Special Interest Groups
- 3....Club Contacts
- 4....Literary Astronomy
- 5....Camp Hancock Report
- 6....Star Parties
- 7....Measuring Olbers' Paradox
- 8....Calendars



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



overcast. In this survey, Matt will cover common and not so common occurrences in the sky and explain the mechanics behind these often spectacular sights. From Sundogs to St. Elmo's fire, come learn what you can see in the sky.



The sky is home to many visual wonders, some closer to earth than others. When attending a star party sometimes the weather doesn't cooperate. When this happens, the weather itself can be the source of enjoyment for the educated observer. This presentation will explore the many atmospheric phenomena that occur within our atmosphere during both day and night, under both clear skies and



Photo by Diana Todd

Matt Vartanian is an RCA member and the author of the Oregon Star Party's most challenging observing list.

All are Welcome! Monday October 21st
Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Auditorium

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

First Quarter Moon
Oct 11

Full Moon
Oct 18

Last Quarter Moon
Oct 26

New Moon
Nov 03





Cycle Oregon 2013 riders were treated to two nights of star parties near Diamond, Oregon in September, thanks to David and Gail Nemo representing RCA, Jim, Lisa and Diana Todd representing OMSI, and Ron Thorkildson from the Sisters Astronomy Club. Over 150 riders each night took advantage of this special experience under the exceptionally dark skies of SE Oregon (SQM=21.63).

Special Interest Groups

Astro-Imaging Special Interest Group

When: Wednesday, Nov 13th, 7pm
 Location: Oak Hills Church,
 2800 NW 153rd Ave, Beaverton
 SIG Leader: Greg Marshall
 Email: ai-sig@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/astroimage.htm>

Note: New Meeting Location.

Youth Program

When: In Progress
 Location: Kennedy School
 Download Flyer: <http://www.rosecityastronomers.org/sigs/YAAFlyer.pdf>
 Download Application: <http://www.rosecityastronomers.org/sigs/YAAApp.pdf>
 Leader: Kathy Kornei
 Email: youth@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/youth.htm>

Downtowners Luncheon

When: Friday, Oct 11th, Noon
 Location: Pastini Pastaria
 911 SW Taylor St. Portland
 SIG Leader: Margaret Campbell-McCrea
 Email: downtown-sig@rosecityastronomers.org

Note different meeting location and day for this month.

New Members Special Interest Group

When: Monday, Nov 18th, 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, Oct 19th
 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 23rd, 7pm
 Topic: TBA
 Presented by: TBA
 Location: 8012 SE Raymond St., Portland, OR 97206
 SIG Leaders: Viktors Berstis
 Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

RCA Board of Directors			
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Director, Telescope Library (Telescope Library)	David Horne	telescope	@ rosecityastronomers.org
Director, Youth Program (RCA Youth Program)	Kathy Kornei	youth	@ rosecityastronomers.org
Other Contacts			
<i>Program / Project / Activity</i>	<i>Name</i>	<i>Email Address</i>	
Astronomical Imaging Special Interest Group	Greg Marshall	ai-sig	@ rosecityastronomers.org
Cosmology Special Interest Group	Viktors Berstis Lamont Brock	cosmology-sig	@ rosecityastronomers.org
Downtowners Lunch Special Interest Group	Margaret McCrea	downtown-sig	@ rosecityastronomers.org
Haggart Observatory	Rusty Baumberger	haggart	@ rosecityastronomers.org
Magazine Subscriptions (Discount Subscriptions)	Larry Godsey	magazines	@ rosecityastronomers.org
Observing Site Fund (Site Fund)	David Nemo	sitefund	@ rosecityastronomers.org
Sister Clubs	Jan Keiski	sisterclub	@ rosecityastronomers.org
Starlight Parade Float	Sameer Ruiwale	starlight	@ rosecityastronomers.org
Telescope Workshop	John DeLacy Don Peckham	tw-sig	@ rosecityastronomers.org
RCA Member Forum	Larry Godsey David Nemo	admin	@ rosecityastronomers.org
Webmaster	Larry Godsey	webmaster	@ rosecityastronomers.org
ALCOR (Astronomical League Coordinator)	Ken Hose	alcor	@ rosecityastronomers.org

Literary Astronomy

Paper catalogs provide a fascinating glimpse into the earlier works of telescope making.

By John W. Siple

Remember those free or cheaply priced catalogs that were once available in *Sky & Telescope* and other astronomy related publications? After years of steady competition with electronic media, they still remain an ardent source of some of science's best works. Telescope manufacturers' catalogs explore nearly every technical aspect of astronomy, and over time have become valuable paper collectibles and useful reference material.

A charming appearance and the skillful showcasing of classic merchandise have contributed to their overwhelming popularity. Covering the golden years of observational astronomy, they document worldwide trends and aptly provide testimony to novel, innovative products.

Elegant compound models from Questar, the acclaimed Newtonians of Cave, and the classical refractors of Unitron make for striking catalog comparisons. Individuals can partake of the familiar differences between old and new products: Is that brand from Edmund best in meeting your astronomical needs? Or perhaps a fine 6-inch reflector telescope from Criterion?

Period catalogs highlight many individual achievements throughout optics and astronomy, and have evolved into a form of literary touchstone for collectors and enthusiasts. The often frustrating identification of pre-owned or inherited items is easily remedied; also, perplexing questions concerning a

telescope's original cost and integrity are quickly answerable.

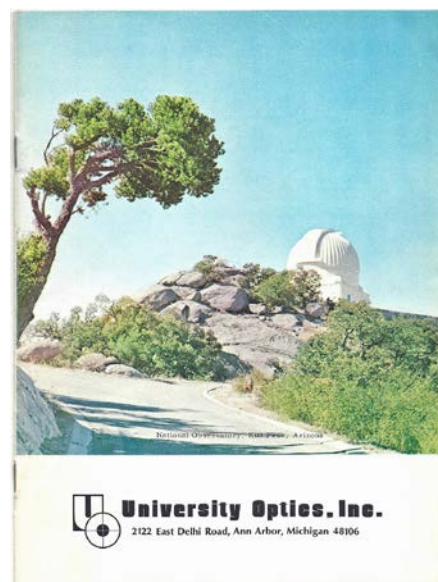
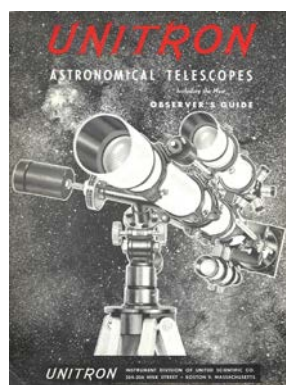
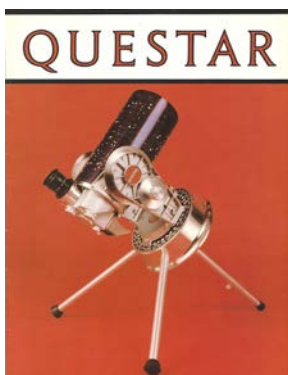
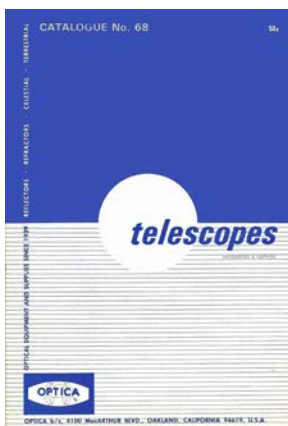
Galleries of practical and sometimes eccentric goods fill their pages. World-class selections of premier eyepieces, focusers, parabolic mirrors, astro-cameras, mountings, and all kinds of telescopes are noticeably dominant, while alternate listings for such sensible items as adapters, collimation tools, and wooden tripods are satisfactorily advertised.

American prowess in commerce is richly represented, as in the enticing portfolios of Orion, Meade, and Celestron International, which depict many of astronomy's greatest

hits. By contrast, the exemplary catalog issues from Germany's Zeiss and Japan's Astro Optical express the spirit of overseas competition.

Procurement of a particular catalog is relatively easy. Most are simply provided free at the customer's request, or included as complementary copies along with an obligatory purchase. (Optica's obscure 30-page "blue" edition, circa 1968, came with a 50 cent price sticker.)

It should be kept in mind that rival catalogs are typically printed for customer review only once per year, and are not sporadic material. Lucidly written and illustrated, they can range in size and thickness—from small brochures and pamphlets to oversized, volu-



minous tomes. Bulletins and foldouts add still more advertising space, and often describe equipment spinoffs or key marketing updates.

Historically, widely published catalog literature garners low cash values, whereas similar stock from local, isolated firms will command greater net prices. Any early pre-growth edition is classified as rare and desirable.

Specialized releases are also highly favored by collectors. An original 1958 *Unitron Astronomical Telescopes Including the New Observer's Guide*, for instance, can bring \$125 or more at auction. Questar's stunning 1989 anniversary brochure, its red cover spotlighting their famous 3½-inch model, is another treasured hallmark publication.

As ephemera, catalog source material can be viewed as a tribute to an impressive line of astronomical gadgetry. Their lasting magic is recounted in the written displays of Star-Liner, Pacific Instruments, Edmund, Tasco, Jaegers, and countless others.

Rediscovering the past works of such long-term companies as University Optics (their catalog from the 1960s is shown at top) conveys a certain thrill, and is an insightful lesson in product history. To many, company-crafted catalogs are essential guides, particularly for people who prefer non-Web versions.

Camp Hancock Report

Mark Martin

The Camp Hancock Star Party, held Friday, October 4th through Sunday, October 6th at OMSI's Hancock Field Station, was a fantastic end to the official RCA star party season. Around 30 people the first night and around 20 the second participated with telescopes ranging in size from 6 to 18 inches. The skies were incredible, as we've learned to expect at Hancock, and I found it hard to go to bed, even after I had packed up my gear for the night. There were fair numbers of both visual observers and imagers; lively, enjoyable discussions about all things astronomical; and lots of opportunities to give or get help with observing and to share views. The Hancock staff was friendly and helpful, as usual, and meals were unsophisticated but well-prepared. The cabins were rustic but comfortable, with 3-inch thick foam mattresses for stretching out sleeping bags and heaters in case it became necessary to fend off a late-night chill. Hancock is also a true dark-sky site, where everyone closely follows star party etiquette and more experienced observers kindly advise people who are less experienced regarding what's required to preserve night vision. There were only a few small infractions on Friday night and conditions were nearly perfect for maintaining optimal dark adaptation throughout the star party. Quiet hours are also observed at Hancock until breakfast is served at 9 a.m. in hopes of giving tired astronomers a little time to recover from their night-time adventures. In addition, there is only enough Internet access to gather essential information and phones are completely useless, which helps make Hancock even more of a haven from ordinary cares and responsibilities.

Since we were there later in the year than usual, the days were warm but not hot and the nights were pretty chilly, with temperatures dropping down to the mid-30's F. Atmospheric conditions were quite good for observing. Both nights, the air was calm near the ground and apparently aloft as well, since seeing was excellent. This made the cool temperatures less forbidding, made it easier to keep track of observing lists and charts, and made the equipment more stable and easier to handle. But, in contrast to what we usually experience at Hancock, there was a fair bit of moisture in the air, especially on Friday night, which compromised transparency and resulted in a lot of dew after midnight on the first night and a smaller amount early in the morning on the second. The Clear Sky Chart was accurate throughout the star party. But the weather forecasts from Weather Underground for nearby Clarno, Antelope, and Fossil were overly pessimistic regarding cloud cover. Aside from a few clouds in the evening on Friday and possibly a small amount of cloud on the southern horizon in the early morning that same night, I don't remember seeing any clouds during either observing session, despite dire predictions of more than 40% cloud cover for some of the time.

Sadly, all of the hiking trails on the national monument surrounding the camp were closed due to the federal government shutdown. But the nearby state recreational areas were open and some people drove a short distance to one of the nearby hiking areas for a Saturday excursion.

I arrived around 3:30 on Friday afternoon and immediately began setting up my 16" Meade Lightbridge telescope on the Ridge. It had been completely clear and spectacular on the drive and I had a strong, excited feeling that it was going to be another great star party. I finished setting up as much as possible in the bright sunshine then sought out a cabin. There were plenty of spots near the observing area. Later, my friend David invited me to share his cabin, which was only halfway down the hill from where we had both set up. At 6 p.m., a long, melodic toot on the conch shell signaled dinnertime and everyone gathered in the mess hall for food and conversation.

Dinner ended near dusk. I hurried to get dressed for the cooler nighttime temperatures and to finish the remaining set-up that required partial darkness. A few clouds lingered from the afternoon but the brighter stars soon became visible. Although my main observing list consisted mostly of dim, relatively obscure objects, I started out before the end of twilight by finding the Ring Nebula (M57), the Hercules Cluster (M13), and the globular cluster M22. It was fun to peek in on these big, bright objects that are relatively easy to find. By the end of twilight, all of the cloud had dissipated, the Milky Way and dimmer stars were clearly visible, and I began focusing on my list. I couldn't find some of the more difficult objects. But I didn't let it bother me too much and interspersed the harder searches with views of some of the more spectacular brighter objects, including Bode's Galaxy (M81) and the Cigar Galaxy (M82), which share the same field of view, and the globular cluster M2. One of the highlights for me was finding some of the globular clusters that belong to the Andromeda Galaxy. These look very small and most are indistinguishable from stars. But it was exciting to know what they are and to find them with my telescope. I also very much enjoy trading views with friends. Everyone on the Ridge was excited about what they were seeing and happy to show what they had found to anyone else who was interested. I especially enjoyed sharing views of the Western and Eastern portions of the Veil Nebula, which are incredible in my scope.

I started feeling tired around 2 and began thinking about packing up for the night. At this point, Taurus and Auriga were well up and Orion and Gemini had cleared the hills to the East. Jupiter in eastern Gemini was almost 30° above the horizon and irresistible, despite how blindingly bright it is in my scope. Although it was still at a fairly low altitude and moist air further compromised the view, it was still amazing. I also decided to look at a few more beautiful Messier objects before heading to bed. I perused the Crab Nebula (M1) and the huge Messier open clusters in Auriga and Gemini (M35, M36, M37, and M38). I especially love M37, which has a bright, orange red giant star nestled among a large number of whiter stars. Most of these clusters were visible with the naked eye as were the Double Cluster and the Andromeda Galaxy. Finally, I peeked at the Orion Nebula (M42) briefly. After refreshing myself with these views, I packed up my eyepieces, lists, notes, charts, and extra clothes and headed to bed. By that time, anything that was close to the ground was pretty wet and I took much of my equipment into the cabin for the night.

The following day, there was a fair amount of discussion about Comet ISON. Everyone agreed that it was almost certain not to live up to the hype and we laughed at some of the outrageous advertising that the comet's arrival is inspiring. (Celestron has even renamed several of their telescopes "Cometrons".) But most people were still interested in seeing it. SkyTools suggested 5:30 a.m. as the optimal viewing time with reasonable views starting around 4:30 and several people made plans to be up early enough to look for it.

I decided to spend less time looking for very dim objects on the second night. I spent some time with Neptune and Uranus. Other highlights included NGC 253, which is huge and known as the Sculptor Galaxy or Silver Dollar Galaxy, its companion galaxy NGC 247, and the nearby Milky Way globular cluster NGC 288. I also observed the Seyfert galaxy M77. It shows some interesting structure in my scope. In addition, I peeked in on the Helix Nebula, which is the largest planetary nebula in the sky and also has nuances that I could see. I looked at the Triangulum or Pinwheel Galaxy (M33) too. The spaces between several spiral arms were apparent and the galaxy had a clearly mottled appearance as it filled one of my lower-powered eyepieces.

Aside from sharing views, one of the things I most enjoy about visiting Camp Hancock is learning about the interesting targets that other people are looking for. David was looking for 324 Bamberga, which is one of the largest asteroids in the asteroid belt. It is currently closer to us than it will be for the next couple of decades. It wasn't very remarkable in the eyepiece but it was fun knowing that we'd seen it. On a previous trip to Camp Hancock, David had noticed that one of Jupiter's Galilean moons was going to emerge from Jupiter's shadow at a very convenient time for viewing. All of us on the Ridge trained our scopes on Jupiter at just the right time and it was amazing to watch the moon move into view, slowly brightening from complete darkness to full illumination in a minute or so.

I again felt like it was time to go to bed at about the same time and decided to revisit the Orion Nebula (M42) before retiring. This time, I traced the glowing gas as far as I could and was amazed to be able to follow it throughout much of southern Orion. The adjacent region of nebulosity M43 glowed very brightly as well. I wanted to see how far I could follow the gas in other parts of Orion too and investigated the nebula M78 in the northern part of Orion and the region around the eastern belt star Alnitak, which contains the Flame and Horsehead Nebulae. I tried this exercise with my 2" 28mm William Optics UWAN eyepiece (65x) and my 2" 9mm Explore Scientific 100° eyepiece (200x) and then borrowed David's 1.25" 14mm Televue Delos eyepiece (130x). The nebulae were amazing in all three eyepieces but the image in the Delos was somehow crisper with a nicer sense of color. What a sight!

I got up relatively early on Sunday morning (7 a.m.) and packed up as quietly as I could before breakfast. At breakfast, I learned that several people had stayed up late enough or gotten up early enough to hunt for the comet. Everyone who had looked for the comet visually was disappointed. One group of observers had found it and recognized it from the pattern of stars in the vicinity. But it was almost indistinguishable from a star and completely unremarkable. Our Vice President of Membership Ken Hose was a bit more fortunate and managed to capture a fairly nice image of the comet, showing a brighter nucleus and extended tail. I think that we'll all be surprised if ISON puts on much of a show later in the year.

After a few melancholy good-byes, I hit the road back to Portland. It was hard to go but I was grateful for such a nice time with great friends and fabulous skies. If you'd like to read more about Camp Hancock and the star party, please see the details described on the RCA web site at <http://rosecityastronomers.org/sp/hancock/index.htm>. We typically hold star parties there twice a year, one in the Spring and a second in the Fall. It's a great place for astronomy and we'd love to have you join us.

**SkyView Acres Star Party
Nov 1-3, 2013**

Facilities: Porta-Potty & Ten 8'x8' concrete pads plus a large flat mowed pasture (no animals).

NO water available at the site, but only 5 PAVED miles to Goldendale if you need supplies or want to stay in a motel.

Park in an organized way that leaves access lanes for others who may be coming/going over the weekend.

Tent camping is fine. Propane stoves only and please use them up off the ground on a table or stand. No open fires or charcoal briquettes.

If you plan on leaving the site after dark (e.g., to head to a motel in town) park your car near the entry to the site with your headlights facing opposite the observing field. If you will be arriving after dark, please don't try and navigate your vehicle back to your observing site, tent or trailer. Turn your lights off and park near the entry to the site.

Before you leave, police your area for any litter.

At 2,800', SkyView Acres has similar skies to the RCA Maupin site, but with much less light-bubble to the west. Minor light bubble from Yakima and the Tri-Cities area and some

glow from The Dalles. Good horizons.

Nearby points of interest: St John, a Greek Orthodox Monastery's bakery, deli, and gift-shop (about 5 miles north of Woodland Road, on US97), Goldendale Observatory State Park, Maryhill Museum and Stonehenge Peace Memorial

Come and observe your favorite objects and spend a wonderful evening with friends, and friends you haven't met yet.

See <http://www.rosecityastronomers.org/sp/skyview.htm> for more information and directions.

Haggart Observatory Public Nights

Through a partnership with Clackamas Community College, the Rose City Astronomers (RCA) maintains the Observatory and coordinates public access to the Observatory. During 2013, we have scheduled several Public Nights at the Observatory. We invite those interested to visit the Haggart Observatory webpage at: <http://www.rosecityastronomers.org/sp/haggart.htm> to find out dates and times for these sessions.

Stay Tuned For Star Parties Coming in 2014!



Measuring Olbers's Paradox

Why is the sky dark at night? That question puzzled centuries of astronomers, including Thomas Digges, Johannes Kepler, and Edmond Halley. After all, if the universe were infinite in all directions, it would be filled with an infinite number of stars, whose collective glow would make the night sky bright. So did a dark sky at night imply that the universe was not infinite? The conundrum was given the name of Olbers's paradox, after the German astronomer Wilhelm Olbers who discussed it in the 1820s.

Well, it turns out that those historical astronomers, working just from first principles, were onto something truly profound—but for reasons they could not anticipate.

Even from deep space far away from the lights of Earth and the stars of the Milky Way, the sky of intergalactic space is *not* absolutely black. It *does* faintly glow with photons from galaxies, both bright galaxies and those too distant to resolve with current instruments. That ever-so-faint glow is called the extragalactic background light (EBL).

Extragalactic background light

Streaming through deep space today in some form is almost all the light that all galaxies have radiated throughout the history of the Universe. Some of these photons are extraordinarily ancient, emitted billions of years ago and red-

shifted (expanded in wavelength) with the expansion of the universe. Other photons are comparatively recent from local galaxies nearby. Together, these photons crisscrossing space suffuse the Universe with a faint background glow in the ultraviolet, visible, and infrared regions of the spectrum, rendering the deep night-black void between galaxies not totally dark.

Capturing those precious ancient photons, carefully measuring and counting them, and learning to read the abundance and patterns of the EBL allows astronomers to deduce details both about the early formation of galaxies like our own Milky Way as well as about the grand story of cosmic origin.

Measuring the EBL directly is difficult, however, because our

solar system and our Milky Way galaxy are themselves awash in light. Only in the past year or so have astronomers succeeded in obtaining actual measurements of the elusive EBL using a clever indirect work-around: observations of gamma rays from blazars—galaxies with supermassive black holes producing jets of gamma rays that happen to be pointed at Earth. The latest results were published in *The Astrophysical Journal* in May 2013 by Alberto Domínguez of the University of California, Riverside, and coauthors.

These pioneering measurements are possible because gamma rays from distant sources collide with lower-energy visible and infrared EBL photons, annihilating both; those collisions with EBL photons thus remove some of the gamma rays. Different energies of the highest-energy gamma rays are waylaid by different energies of EBL photons. Thus, measuring how much gamma rays of different energies are attenuated from blazars at different distances from Earth indirectly gives a measurement of how many EBL photons of different wavelengths exist along the line of sight from blazar to Earth over those different distances.

The new measurements required combining data on X-ray and gamma-ray blazar emissions from space observatories with observations of the highest-energy gamma rays detected by Atmospheric Cherenkov Telescopes on the ground.

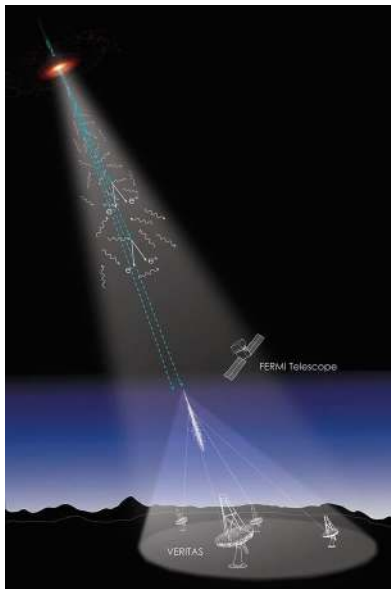
What the measurements reveal

The result? The EBL both nearby and from earlier (more distant) epochs is consistent with expectations from the number of galaxies observed, with little room for additional light from exotic hypothetical sources. This important measurement constrains when and how the universe was reionized during the first billion years.

The EBL measurements also show that the galaxies that were shining at “cosmic high noon”—the period from about eight to twelve billion years ago when stars were forming most rapidly—were unlike most nearby galaxies. Nearby galaxies emit most of their light near visible wavelengths. But at cosmic high noon, exploding stars produced dust (made of heavier elements such as carbon, oxygen, and iron) that enveloped star-forming regions and absorbed much of the ultraviolet and visible light, which was reradiated at much longer infrared. As this dust built up in galaxies over cosmic time, it allowed later generations of stars to form along with rocky planets, including Earth.

Future measurements of the EBL using gamma rays from farther away can help reveal the nature of the first stars and galaxies. —Trudy E. Bell, M.A.

Further reading: A press release summarizing this work is at <http://hipacc.ucsc.edu/PressRelease/CGRH.html>. The paper “Detection of the Cosmic γ -Ray Horizon from Multiwavelength Observations of Blazars,” by Alberto Domínguez and six coauthors in *The Astrophysical Journal* is at <http://arxiv.org/pdf/1305.2162v1.pdf>. A definitive book on the history of Olbers's paradox is *Darkness at Night: A Riddle of the Universe* by Edward Harrison (Harvard University Press, 1989).



Energetic gamma rays (dashed lines) from a distant blazar strike photons of extragalactic background light (wavy lines) in intergalactic space, annihilating both gamma ray and photon. Different energies of EBL photons waylay different energies of gamma rays, so comparing the attenuation of gamma rays at different energies from different spacecraft and ground-based instruments indirectly measures the spectrum of EBL photons. Credit: Nina McCurdy and Joel R. Primack/UC-HiPACC; Blazar: Frame from a conceptual animation of 3C 120 created by Wolfgang Steffen/UNAM

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>

October 2013

Oct 04-6	Fri-Sun	Camp Hancock Star Party	Camp Hancock near John Day, OR	
Oct 07	Monday	Board Meeting	OMSI Classroom 1	7pm
Oct 09	Wednesday	Astro-Imaging SIG	Beaverton Public Library	7pm
Oct 11	Friday	Downtowner's Luncheon	TBD	Noon
Oct 19	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Oct 21	Monday	General Meeting	OMSI Auditorium	7:30pm
Oct 23	Wednesday	Cosmology SIG	Firland Apartments Community Room 8036 SE Raymond St., Portland, OR 97206	7pm
Oct 26	Saturday	Haggart Public Night	Haggart Observatory	Dusk
Oct 31	Saturday	Stub Stewart Star Party	RCA sponsored star party at Stub Stewart State Park	Dusk

November 2013

Nov 01	Friday	Downtowner's Luncheon	Sushi Ichiban 24 NW Broadway Portland	Noon
Nov 1-3	Fri-Sun	SkyView Acres Star Party	SkyView Acres near Goldendale	
Nov 04	Monday	Board Meeting	OMSI Classroom 1	7pm
Nov 13	Wednesday	Astro-Imaging SIG	Oak Hills Church, 2800 NW 153rd Ave, Beaverton	7pm
Nov 16	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Nov 18	Monday	New Members SIG	OMSI Planetarium	6:30pm
Nov 18	Monday	General Meeting	OMSI Auditorium	7:30pm
Nov 20	Wednesday	Cosmology SIG	Firland Apartments Community Room	7pm
Nov 30	Saturday	Haggart Public Night	Haggart Observatory	Dusk

Note: New Meeting Location.

<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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November, 2013



The Lonely Life of Comets: the Mysterious Motions of the Most Beautiful Objects in Our Solar System

Douglas W. MacDougal

Douglas will be focusing on conveying a basic understanding comet orbits, using real examples in historical context, including comets in elliptical, parabolic, and hyperbolic orbits, and showing how energy concepts can be use to characterize comet orbits. Examples will include some of the great comets of history, such as the Great Comet of 1577, the Great Comet of 1680, and Halley's Comet, as well as some illustrative recent comets, as a prelude to a discussion of the hyperbolic orbit of C/2012 S1 ISON. Will ISON survive solar passage? Using mathematical modeling software, Doug will compare the orbit of ISON with some famous "sun grazing" comets to help explore this question. ISON will in fact reach perihelion November 28, about 10 days after his talk, so the topic will be timely!"

Douglas W. MacDougal, an RCA member, observed his first comet at the age of six and has been hooked on astronomy ever since. Some of his memorable experiences include seeing brilliant Comet Bennett rise with its glorious tail in the pre-dawn skies over Koko Head crater in Oahu, from the beach where he was to meet his wife a week later; drawing Comet Halley from his backyard scope as it steadily approached perihelion; and



(Continued on page 2)

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- 1....General Meeting
- 2....Special Interest Groups
- 3....Club Contacts
- 4....Club Elections
- 5....The Observers Corner
- 9....Volcanoes of Io
- 10...Calendars



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

All are Welcome! Monday November 18th
Social Gathering: 7 pm. General Meeting Begins: 7:30 pm.
Location: OMSI Planetarium

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

First Quarter Moon
Nov 10

Full Moon
Nov 17

Last Quarter Moon
Nov 25

New Moon
Dec 02



photographing the unforgettable Comet Hale-Bopp with its twin tails from the stunning 10,000' skies of Haleakala, in Maui.

Doug has a degree in mathematics, with a minor in physics, from the University of Vermont, and is an adjunct professor at Portland State University teaching celestial mechanics and (previously) astronomy. He has taught courses in astronomy and mathematics in Portland's Saturday Academy, whose classes typically include talented middle school and high school students. He is also a lawyer, specializing in water rights and natural resources law in a downtown Portland law firm. He loves crunching numbers in his spare time. In the summer, Doug can often be found showing the stars to students at the OMSI Hancock Astronomy Camp.



Special Interest Groups

Astro-Imaging Special Interest Group

When: Wednesday, Dec 11th, 7pm

Location: Oak Hills Church,
2800 NW 153rd Ave, Beaverton

SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/astroimage.htm>

Note: New Meeting Location.

Youth Program

When: In Progress

Location: Kennedy School

Download Flyer: <http://www.rosecityastronomers.org/sigs/YAAFlyer.pdf>
Download Application: <http://www.rosecityastronomers.org/sigs/YAAApp.pdf>

Leader: Kathy Kornei
Email: youth@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/youth.htm>

Downtowners Luncheon

When: Friday, Dec 6th, Noon

Location: Luc Lac Vietnamese Kitchen
835 SW 2nd Ave., PDX

SIG Leader: Margaret Campbell-McCrea
Email: downtown-sig@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/downtowners.htm>

Note different meeting location and day for this month.

New Members Special Interest Group

When: Monday, Nov 18th, 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, Nov 16th
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 20th, 7pm

Topic: TBA

Presented by: TBA

Location: 8012 SE Raymond St., Portland, OR 97206

SIG Leaders: Viktors Berstis
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

RCA Board of Directors			
<i>Elected Officers</i>	<i>Name</i>	<i>Email Address</i>	
President	David Nemo	president	@ rosecityastronomers.org
Secretary	Duncan Kitchin	secretary	@ rosecityastronomers.org
Treasurer	Larry Godsey	treasurer	@ rosecityastronomers.org
VP Communications	Diana Fredlund	media	@ rosecityastronomers.org
VP Membership	Ken Hose	membership	@ rosecityastronomers.org
VP Observing	VACANT	observing	@ rosecityastronomers.org
VP Outreach and Education	Jim Higgs	outreach	@ rosecityastronomers.org
VP Programming	Mark Martin	program	@ rosecityastronomers.org
<i>Appointed Directors</i>	<i>Name</i>	<i>Email Address</i>	
Director, Dark Sky Preservation (IDA)	Dawn Nilson	ida	@ rosecityastronomers.org
Director, Book Library (Books & Videos)	Jan Keiski	library	@ rosecityastronomers.org
Director, New Members	Howard Knytych	newmembers	@ rosecityastronomers.org
Director, Newsletter (Rosette Gazette)	Scott Kindt	editor	@ rosecityastronomers.org
Director, Merchandise Sales (Merchandise Sales)	VACANT	sales	@ rosecityastronomers.org
Director, Telescope Library (Telescope Library)	David Horne	telescope	@ rosecityastronomers.org
Director, Youth Program (RCA Youth Program)	Kathy Kornei	youth	@ rosecityastronomers.org
Other Contacts			
<i>Program / Project / Activity</i>	<i>Name</i>	<i>Email Address</i>	
Astronomical Imaging Special Interest Group	Greg Marshall	ai-sig	@ rosecityastronomers.org
Cosmology Special Interest Group	Viktors Berstis	cosmology-sig	@ rosecityastronomers.org
Downtowners Lunch Special Interest Group	Margaret McCrea	downtown-sig	@ rosecityastronomers.org
Haggart Observatory	Rusty Baumberger	haggart	@ rosecityastronomers.org
Magazine Subscriptions (Discount Subscriptions)	Larry Godsey	magazines	@ rosecityastronomers.org
Observing Site Fund (Site Fund)	David Nemo	sitfund	@ rosecityastronomers.org
Sister Clubs	Jan Keiski	sisterclub	@ rosecityastronomers.org
Starlight Parade Float	Sameer Ruiwale	starlight	@ rosecityastronomers.org
Telescope Workshop	John DeLacy Don Peckham	tw-sig	@ rosecityastronomers.org
RCA Member Forum	Larry Godsey David Nemo	admin	@ rosecityastronomers.org
Webmaster	Larry Godsey	webmaster	@ rosecityastronomers.org
ALCOR (Astronomical League Coordinator)	Ken Hose	alcor	@ rosecityastronomers.org

RCA Members,

It's time to begin the process for electing 2014 club officers, which will be different this year per our recently revised bylaws.

The nomination and election process will be coordinated by our club Secretary, Duncan Kitchin.

The "registration" process to enter your name into nomination for one of the officer positions is now open, through November 16. The slate of candidates will be announced to the membership via broadcast email on November 17 and the election will be held at the general membership meeting on November 18. Elected officers will begin their one-year term in January, 2014. If any position goes unfilled, The Board is authorized to subsequently make an appointment to the position for the balance of the year.



These are the Officers and their duties:

4.2. The primary duties of Officers shall be as follows. Additional duties and responsibilities may be assigned to Officers from time-to-time by the President or the Board of Directors to meet the needs of the organization.

The President is responsible for managing the overall operations and activities of the organization, presiding over all meetings held per these Bylaws, and ensuring that the organization remains in compliance with these Bylaws and state and federal rules and regulations governing non-profit organizations.

The Secretary is responsible for producing minutes of Board meetings and acting as the organization's record keeper, ensuring that all official records and documents of the organization are up-to-date and securely maintained.

The Treasurer is responsible for managing the funds of the organization and preparing regular reports for the Board detailing income and expenses in relation to the adopted budget; and preparing and filing necessary government tax and organization reports.

The Vice President of Membership is responsible for managing the registration process for new and renewing Members and maintaining a record, including contact information, of current Members.

The Vice President of Observing is responsible for scheduling, planning and supervising star parties and related activities.

The Vice President of Outreach and Education is responsible for organizing and coordinating programs and activities designed to further the education and involvement of Members and the general public in astronomy.

The Vice President of Programming is responsible for planning and coordinating membership meetings and functions.

The Vice President of Communications is responsible for coordinating the production of various information and resource materials for Members and the general public; and coordinating media relations and publicity.

In addition,

4.5.6. To be eligible for the office of President, a Member must have served on the Board of Directors at least one year.

4.5.6. To be eligible for the office of Treasurer, a person must have been an RCA Member for at least one year, and be bondable.

The above is from our newly revised bylaws, which you can read in their entirety at this link: http://www.rosecityastronomers.org/pdf/Legal_Bylaws.pdf

If you would like to run for one of these offices, please send an email to Duncan Kitchin: secretary@rosecityastronomers.org

If you have any questions about any of the positions feel free to ask me or any other Board member. At the moment, the only vacant position on the Board is that of VP of Observing.

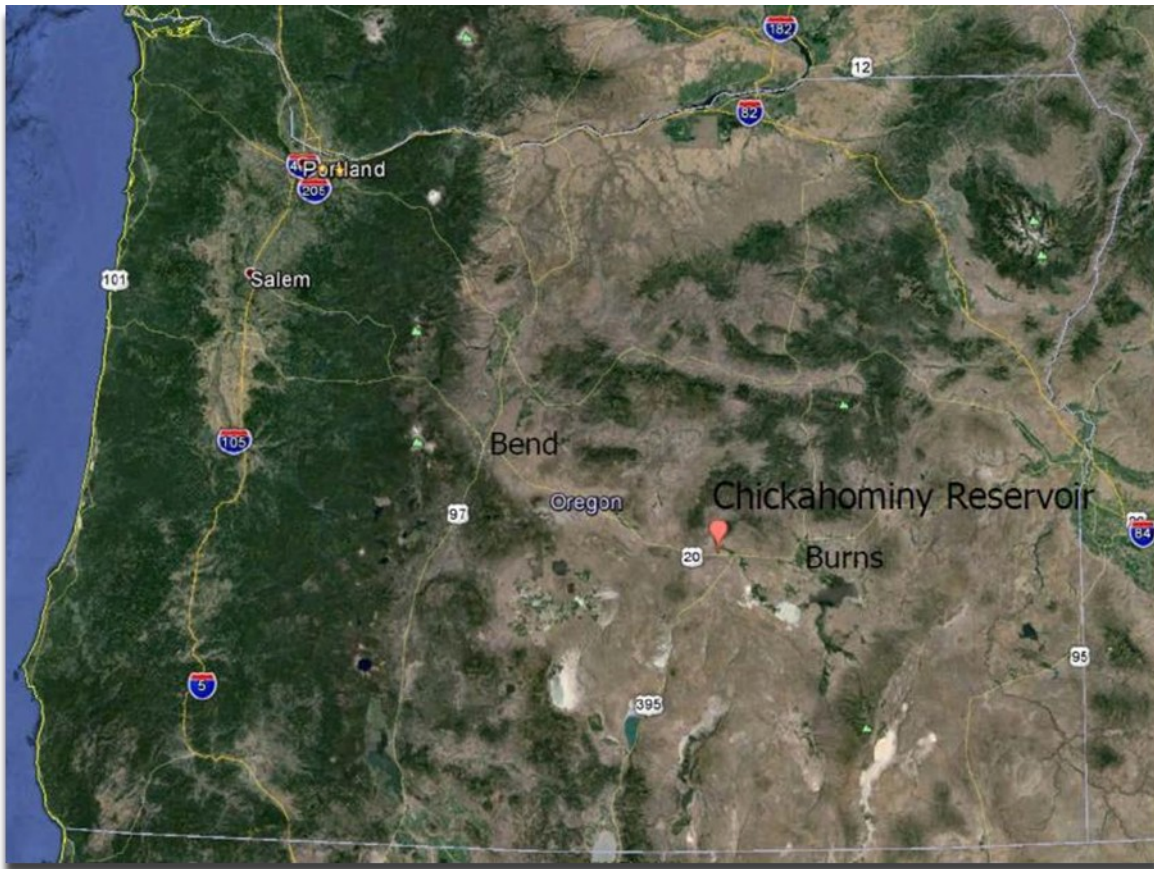
Thank you for your participation in this important process.

.....David



Chickahominy Reservoir

One of the more frustrating parts about being an amateur astronomer in western Oregon is that our weather is pretty lousy for most of the year. Where do you go if you want to get to some really dark skies in central Oregon during the fall, winter and spring?



Google Earth image.

Chuck and Judy Dethloff have found a place that combines year around access with dark skies at Chickahominy Reservoir, 30 miles west of Burns right off Highway 20. The camping areas are only few hundred yards off the highway as you'll see in the following Google Earth images. A heavy snow may temporarily prevent access to the public camping areas in the winter, but then heavy snow at the 4200 foot elevation of the reservoir in central Oregon is fairly rare, and the campground is advertised by the BLM as being open all year.

Chuck, Judy, Rod Shea and myself observed at Chickahominy for a few nights in early October after we couldn't get up to our primary site near Fish Lake on Steens Mountain because of slippery conditions. We've wanted to try out Chickahominy for some time and even though we were disappointed we couldn't get up the Steens it turned out quite well. This is a site everyone should know about.



Chickahominy Reservoir's location just off Highway 20. Google Earth image.

Each night had varying amounts of high thin clouds but they weren't visible at night, an indication of a true dark sky site. Even with these high clouds the Zodiacal band and Gegenschein were both easily visible. When the sky is truly transparent, Chickahominy will be as dark as anywhere in central Oregon. With this in mind, here's a summary of the pros and cons of the sky.

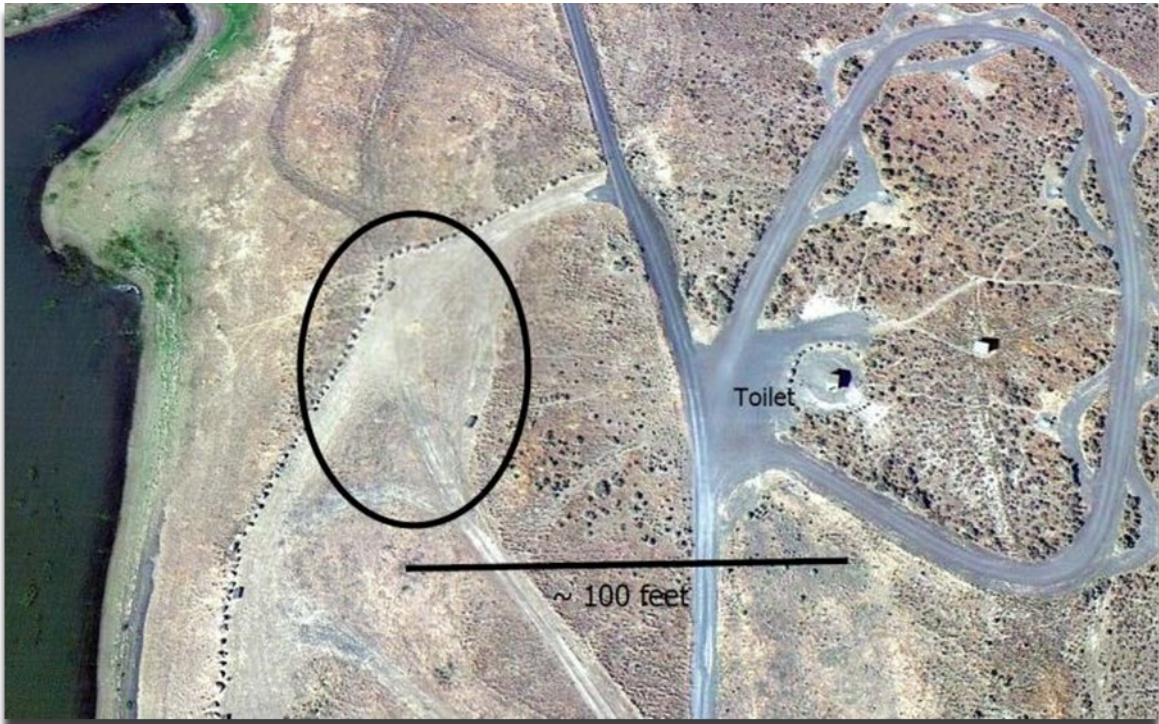
The pros:

1. The sky is very dark. Ignoring the highway and campground lights that come and go, the only noticeable light pollution is the very small light dome from Burns to the east. On light pollution maps, Chickahominy is in a black zone.
2. Excellent horizons all around. No tall mountains or trees to block the view in any direction.
3. The seeing varied from passable to good each night, with the seeing improving as each night went on, but it's unknown how typical that is.
4. The ground is relatively flat and gravelly, excellent for setting up scopes.

The cons:

1. The site is right off Highway 20 and that means you'll see headlights at night from cars on the highway.
2. Most of the other campers are not there for astronomy so some will have relatively bright lights and/or campfires until they hit the sack.
3. Being right next to the reservoir means that the humidity is higher than in most places in the high desert and that may mean dew or frost as the night goes on.

If you have a trailer or a large vehicle like a van, the headlights from the highway can be mostly blocked by carefully positioning your vehicle and scope. The worst of the headlights are from traffic heading east, so blocking them is important. Unfortunately there's not much that can be done about lights from other campers, but they tend to go out fairly early in the evening.



Shoreline Camping Area, with the circled area showing where we camped and observed. Google Earth image.

Please note that it can get quite cold at night. While we were there in early October the temperature got down to the mid 20's one night, and in winter and early spring it's likely to get even colder. Bring all your cold weather gear, and check in advance what the predicted night time lows are going to be. It's also a good idea to check if it will be windy because any wind will magnify the already cold temperatures. Be prepared before you go!



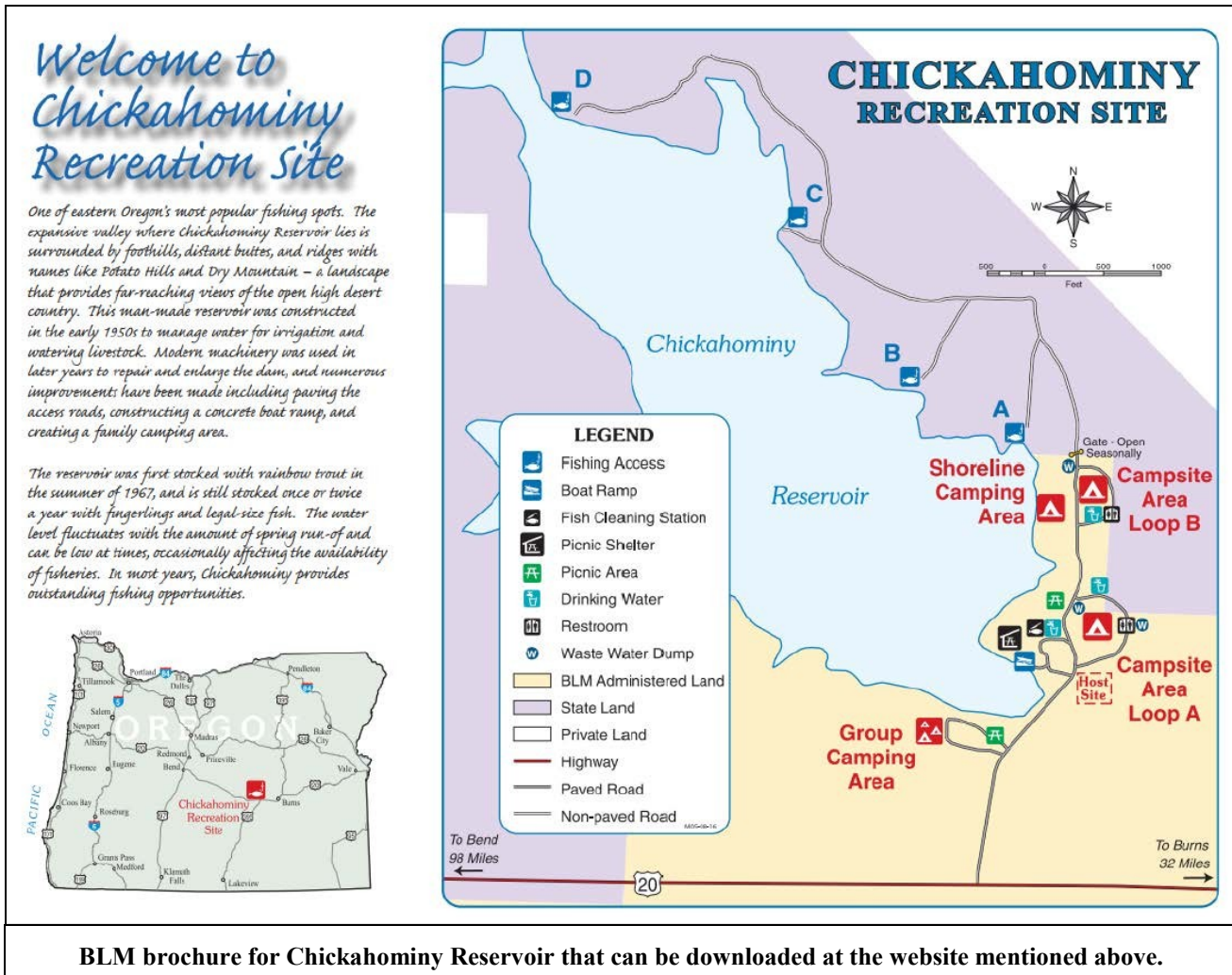
View from the reservoir toward Shoreline Camping Area, looking east. Photo by the author.

You might also want to check out what the BLM has to say about Chickahominy Reservoir at: http://www.blm.gov/or/resources/recreation/site_info.php?siteid=1:

“**Season Dates:** 1/1 - 12/31

Fees: \$8.00 fee is per vehicle, per night

Chickahominy Reservoir has an outstanding trout fishery. In addition to 28 designated camp sites, camping and picnicking are also allowed near the dam. The fishing season peaks in June and resumes in September as the hot summer weather ends. Ice fishing is popular from December to Late February. ****Some years the reservoir will be too low for boating. Please contact the Burns BLM or Hines ODFW for water conditions.****”



It took me about 4.5 hours to drive from Portland to Chickahominy, about the same time it takes to get to the Oregon Star Party site. Even though this isn't a quick trip, and Chickahominy Reservoir isn't a perfect observing site, it does represent an opportunity to find clear, very dark skies within reasonable distance of the Portland area any time of year.

The most volcanically active place is out-of-this-world!

By Dr. Ethan Siegel

Volcanoes are some of the most powerful and destructive natural phenomena, yet they're a vital part of shaping the planetary landscape of worlds small and large. Here on Earth, the largest of the rocky bodies in our Solar System, there's a tremendous source of heat coming from our planet's interior, from a mix of gravitational contraction and heavy, radioactive elements decaying. Our planet consistently outputs a tremendous amount of energy from this process, nearly three times the global power production from all sources of fuel. Because the surface-area-to-mass ratio of our planet (like all large rocky worlds) is small, that energy has a hard time escaping, building-up and releasing sporadically in catastrophic events: volcanoes and earthquakes!

Yet volcanoes occur on worlds that you might never expect, like the tiny moon Io, orbiting Jupiter. With just 1.5% the mass of Earth despite being more than one quarter of the Earth's diameter, Io seems like an unlikely candidate for volcanoes, as 4.5 billion years is more than enough time for it to have cooled and become stable. Yet Io is anything but stable, as an abundance of volcanic eruptions were predicted before we ever got a chance to view it up close. When the Voyager 1 spacecraft visited, it found no impact craters on Io, but instead hundreds of volcanic calderas, including actual eruptions with plumes 300 kilometers high! Subsequently, Voyager 2, Galileo, and a myriad of telescope observations found that these eruptions change rapidly on Io's surface.

Where does the energy for all this come from? From the combined tidal forces exerted by Jupiter and the outer Jovian moons. On Earth, the gravity from the Sun and Moon causes the ocean tides to raise-and-lower by one-to-two meters, on average, far too small to cause any heating. Io has no oceans, yet the tidal forces acting on it cause the world itself to stretch and bend by an astonishing **100 meters** at a time! This causes not only cracking and fissures, but also heats up the interior of the planet, the same way that rapidly bending a piece of metal back-and-forth causes it to heat up internally. When a path to the surface opens up, that internal heat escapes through quiescent lava flows and catastrophic volcanic eruptions! The hottest spots on Io's surface reach 1,200 °C (2,000 °F); compared to the average surface temperature of 110 Kelvin (-163 °C / -261 °F), Io is home to the most extreme temperature differences from location-to-location outside of the Sun.

Just by orbiting where it does, Io gets distorted, heats up, and erupts, making it the most volcanically active world in the entire Solar System! Other moons around gas giants have spectacular eruptions, too (like Enceladus around Saturn), but no world has its surface shaped by volcanic activity quite like Jupiter's innermost moon, Io!

Io. Image credit: NASA / JPL-Caltech, via the Galileo spacecraft.

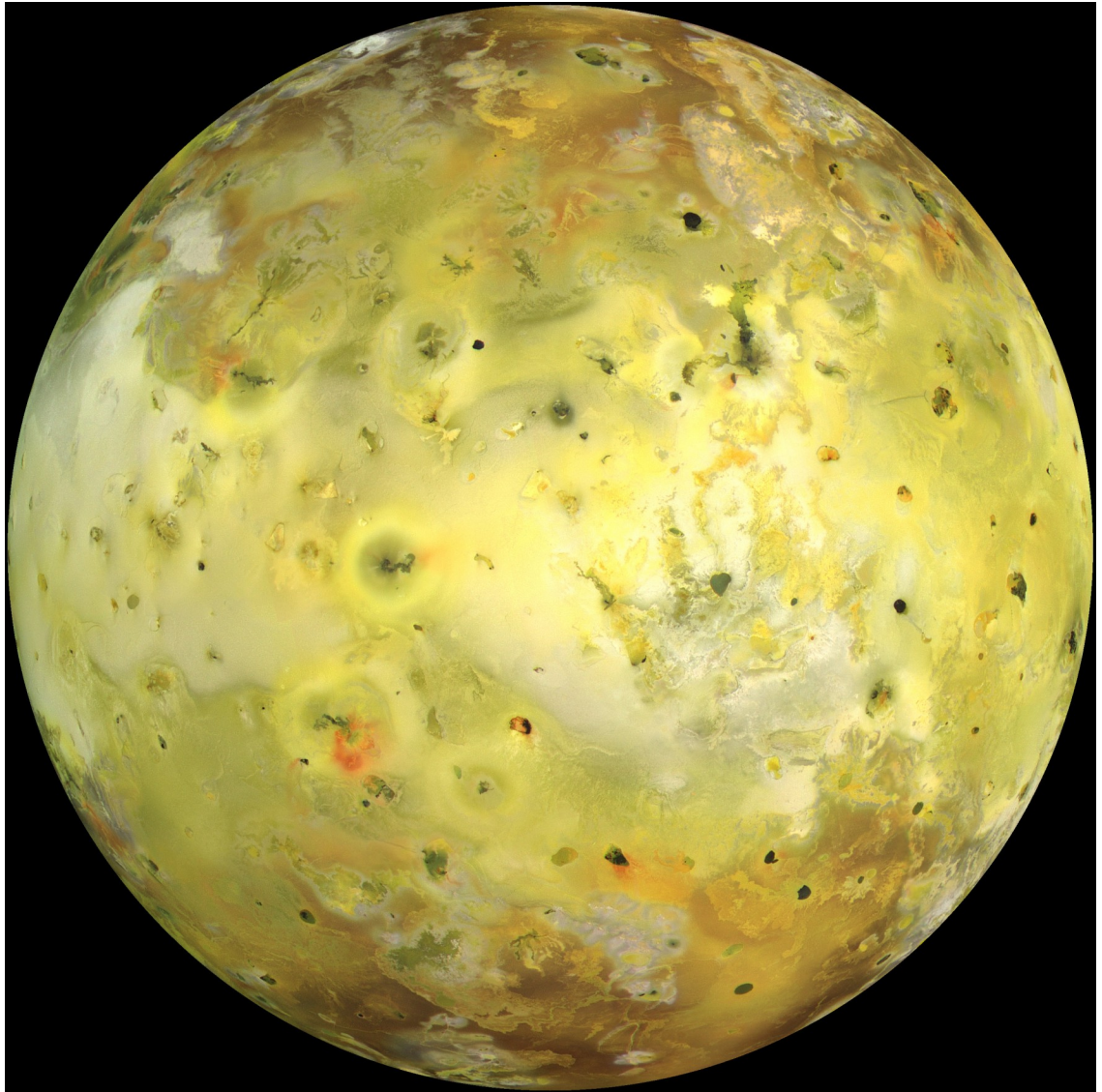
Download photo here:

<http://photojournal.jpl.nasa.gov/catalog/PIA02308>

Learn more about Galileo's mission to Jupiter:

<http://solarsystem.nasa.gov/galileo/>.

Kids can explore the many volcanoes of our solar system using the Space Place's Space Volcano Explorer: <http://spaceplace.nasa.gov/volcanoes>.



November 2013

Nov 01	Friday	Downtowner's Luncheon	Sushi Ichiban 24 NW Broadway Portland	Noon
Nov 1-3	Fri-Sun	SkyView Acres Star Party	SkyView Acres near Goldendale	
Nov 04	Monday	Board Meeting	OMSI Classroom 1	7pm
Nov 13	Wednesday	Astro-Imaging SIG	Oak Hills Church, 2800 NW 153rd Ave, Beaverton	7pm
Nov 16	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Nov 18	Monday	New Members SIG	OMSI Planetarium	6:30pm
Nov 18	Monday	General Meeting	OMSI Auditorium	7:30pm
Nov 20	Wednesday	Cosmology SIG	Firland Apartments Community Room	7pm
Nov 30	Saturday	Haggart Public Night	Haggart Observatory	Dusk

Note: New Meeting Location.

December 2013

Dec 02	Monday	Board Meeting	OMSI Classroom 1	7pm
Dec 06	Friday	Downtowner's Luncheon	Luc Lac Vietnamese Kitchen 835 SW 2nd Ave., PDX	Noon
Dec 11	Wednesday	Astro-Imaging SIG	Beaverton Public Library	7pm
Oct 14	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Dec 16	Monday	Holiday Potluck and Swapmeet	OMSI Auditorium	7:30pm
Dec 18	Wednesday	Cosmology SIG	No Meeting This Month	7pm
Dec 28	Saturday	Haggart Public Night	Haggart Observatory	Dusk

<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 26, Issue 12

Newsletter of the Rose City Astronomers

December, 2013



RCA Members Potluck & Swap Meet Monday, December 16th, 2012 - 6:30pm

Our annual holiday potluck dinner will be held on Monday, December 16th at 6:30 p.m. in the OMSI Auditorium. This is our opportunity to celebrate and enjoy each others' company and is a members-only event. There won't be a speaker and the library will be closed. But there will be a swap meet, a food drive, the Telescope Library will be holding a garage sale, and the Sales Table will be open for the RCA Calendar only. See below for more details.

----- Dinner -----

The club will provide ice, plates, and eating utensils. Please bring your own beverages. But please don't forget that no alcohol is allowed! We will be depending on each other to provide most of the food. So please bring a dish large enough for several people and appropriate serving utensils corresponding to the first letter of your last name in the table below.

If your last name starts with	Please bring a
A through E	Side Dish
F through K	Dessert
L through Z	Main Dish



To be fair, the dishes requested for each range of letters rotates each year. This meeting is usually well-attended. So please bring a generous amount.



----- Swap Meet -----

Please bring any equipment that you would like to sell to other members. There will be plenty of open tables around the lobby for displaying items that you would like to sell. This is a great time to sell those items you no longer want that might be exactly the item someone else is looking for or to acquire that critical piece of equipment you need for your observations in 2014.

(Continued on page 2)

In This Issue:

- 1....Holiday Potluck and Swap Meet
- 2....Special Interest Groups
- 3....Club Contacts
- 4.....2014 Star Party Calendar
- 5....Classic Telescopes: Draco, Guardian of the Pole
- 7....NGC 5907 The Splinter Galaxy
- 9....HAWC-Eye on the Sky
- 10...High-energy Spy
- 11...Calendars



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

All Members Welcome! Monday December 16th
Annual Holiday Potluck and Swap Meet Begins: 6:30 pm.
Location: OMSI Planetarium

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

First Quarter Moon
Dec 09

Full Moon
Dec 17

Last Quarter Moon
Dec 25

New Moon
Jan 01



----- Food Drive -----

We will be conducting a food drive for SnowCap Community Charities (<http://www.snowcap.org/>). SnowCap looks like a very worthy organization and our donations could make a big difference to needy families around the region. To participate, please bring nonperishable food items to donate. Thanks!

----- Garage Sale -----

The Telescope Library will again be selling surplus equipment at generous prices. This will probably mostly consist of smaller accessories. But did I mention the generous prices? Moon filter anyone?

----- Sales Table -----

The Sales table will be featuring the fabulous 2014 RCA calendar y j k e c j c t g available for \$10 each. The calendar features 13 excellent images that skilled photographers in our club have created and marks the dates of all club events and other dates of interest to local amateur astronomers.

Special Interest Groups

Astro-Imaging Special Interest Group

When: Wednesday, Jan 08th, 7pm

Location: Oak Hills Church,
2800 NW 153rd Ave, Beaverton

SIG Leader: Greg Marshall
Email: ai-sig@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/astroimage.htm>

Note: New Meeting Location.

Youth Program

When: New Classes In Planning for 2014

Location: Kennedy School

Download Flyer: <http://www.rosecityastronomers.org/sigs/YAAFlyer.pdf>
Download Application: <http://www.rosecityastronomers.org/sigs/YAAApp.pdf>

Leader: Kathy Kornei
Email: youth@rosecityastronomers.org
<http://www.rosecityastronomers.org/sigs/youth.htm>

Downtowners Luncheon

When: Friday, Jan 3rd, Noon

Location: Kell's
112 SW 2nd Ave, PDX

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 20th, 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, Dec 14th
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, Dec 18th, 7pm~~ No meeting in December

Topic: TBA

Presented by: TBA

Location: 8012 SE Raymond St., Portland, OR 97206

SIG Leaders: Viktors Berstis
Email: cosmology-sig@rosecityastronomers.org
www.rosecityastronomers.org/sigs/cosmology.htm

RCA Board of Directors			
<i>Elected Officers</i>	<i>Name</i>	<i>Email Address</i>	
President	David Nemo	president	@ rosecityastronomers.org
Secretary	Duncan Kitchin	secretary	@ rosecityastronomers.org
Treasurer	Larry Godsey	treasurer	@ rosecityastronomers.org
VP Communications	Diana Fredlund	media	@ rosecityastronomers.org
VP Membership	Ken Hose	membership	@ rosecityastronomers.org
VP Observing	Steve Weiler	observing	@ rosecityastronomers.org
VP Outreach and Education	Jim Higgs	outreach	@ rosecityastronomers.org
VP Programming	Mark Martin	program	@ rosecityastronomers.org
<i>Appointed Directors</i>	<i>Name</i>	<i>Email Address</i>	
Director, Dark Sky Preservation (IDA)	Dawn Nilson	ida	@ rosecityastronomers.org
Director, Book Library (Books & Videos)	Jan Keiski	library	@ rosecityastronomers.org
Director, New Members	Howard Knytych	newmembers	@ rosecityastronomers.org
Director, Newsletter (Rosette Gazette)	Scott Kindt	editor	@ rosecityastronomers.org
Director, Merchandise Sales (Merchandise Sales)	VACANT	sales	@ rosecityastronomers.org
Director, Telescope Library (Telescope Library)	David Horne	telescope	@ rosecityastronomers.org
Director, Youth Program (RCA Youth Program)	Kathy Kornei	youth	@ rosecityastronomers.org
Other Contacts			
<i>Program / Project / Activity</i>	<i>Name</i>	<i>Email Address</i>	
Astronomical Imaging Special Interest Group	Greg Marshall	ai-sig	@ rosecityastronomers.org
Cosmology Special Interest Group	Viktors Berstis	cosmology-sig	@ rosecityastronomers.org
Downtowners Lunch Special Interest Group	Margaret McCrea	downtown-sig	@ rosecityastronomers.org
Haggart Observatory	Rusty Baumberger	haggart	@ rosecityastronomers.org
Magazine Subscriptions (Discount Subscriptions)	Larry Godsey	magazines	@ rosecityastronomers.org
Observing Site Fund (Site Fund)	David Nemo	sitfund	@ rosecityastronomers.org
Sister Clubs	Jan Keiski	sisterclub	@ rosecityastronomers.org
Starlight Parade Float	Sameer Ruiwale	starlight	@ rosecityastronomers.org
Telescope Workshop	John DeLacy Don Peckham	tw-sig	@ rosecityastronomers.org
RCA Member Forum	Larry Godsey David Nemo	admin	@ rosecityastronomers.org
Webmaster	Larry Godsey	webmaster	@ rosecityastronomers.org
ALCOR (Astronomical League Coordinator)	Ken Hose	alcor	@ rosecityastronomers.org

RCA 2014 Star Party Calendar

These are the currently scheduled star parties for the Rose City Astronomers club for 2014. As always, these are weather dependent. Star parties may be rescheduled or cancelled due to various factors. Reschedules may be found here in the newsletter if enough advance notice is given. All updates will be posted to the [online calendar](#) and on the [forum](#). Last minute cancellations are handled through the forum and it's email system. Directions for [star party locations](#) can be found online as well.

January

Jan 3 (Fri) Rooster Rock SP
Jan 4 (Sat) Haggart Public Night
Jan 24 (Fri) Rooster Rock SP
Jan 25 (Sat) Stub Stewart SP

February

Feb 1 (Sat) Haggart Public Night
Feb 28/Mar1 (Fri-Sat) Maupin SP
Feb 28 (Fri) Rooster Rock SP

March

Mar 1 (Sat) Stub Stewart SP
Mar 8 (Sat) Haggart Public Night
Mar 28/29 (Fri-Sat) Maupin SP
Mar 28 (Fri) Rooster Rock SP
Mar 29 (Sat) Stub Stewart SP

April

Apr 5 (Sat) Haggart Public Night
Apr 25/26 (Fri-Sat) Camp Hancock
Apr 25 (Fri) Rooster Rock SP
Apr 26 (Sat) Stub Stewart SP

May

May 17 (Sat) Haggart Public Night
May 23/24 (Fri-Sat) Maupin SP
May 23 (Fri) Rooster Rock SP
May 24 (Sat) Stub Stewart SP

June

Jun 14 (Sat) Haggart Public Night
Jun 27/28 (Fri-Sat) Maupin SP
Jun 27 (Fri) Rooster Rock SP
Jun 28 (Sat) Stub Stewart SP

July

Jul 18 (Fri) Haggart Public Night
Jul 19 (Sat) Stub Stewart SP /
RCA Summer Picnic
Jul 25/26 (Fri-Sat) Trout Lake SP

August

Aug 16 (Sat) Haggart Public Night
Aug 19-24 Oregon Star Party
Aug 29/30 (Fri/Sat) Mt. St. Helens SP

September

Sep 13 (Sat) Haggart Public Night
Sep 19/20 (Fri-Sat) Camp Hancock
Sep 25-27 (Thu-Sat) Indian Trail Spring SP
Sep 26 (Fri) Rooster Rock SP
Sep 27 (Sat) Stub Stewart SP

October

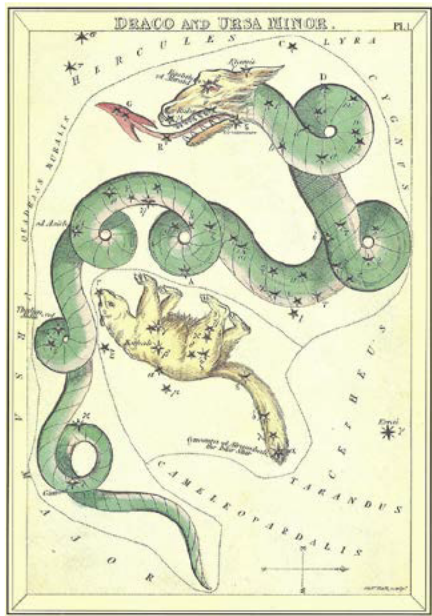
Oct 18 (Sat) Haggart Public Night
Oct 24/25 (Fri-Sat) Maupin SP
Oct 24 (Fri) Rooster Rock SP
Oct 25 (Sat) Stub Stewart SP

November

Nov 15 (Sat) Haggart Public Night
Nov 21 (Fri) Rooster Rock SP
Nov 22 (Sat) Stub Stewart SP

December

Dec 13 (Sat) Haggart Public Night
Dec 19 (Fri) Rooster Rock SP
Dec 20 (Sat) Stub Stewart SP



Draco, Guardian of the Pole

The Dragon's powerful display of deep-sky wonders is brought forth through a classic refractor telescope.

By John W. Siple

Tales of harrowing encounters with scaly, fire breathing dragons have long been the subject of myth and legend. One of the most celebrated of the fearsome beasts is Draco, hideous of aspect and skilled in serpentine magic. Draco was once pitted against the Olympian gods; in locked combat, Athena, goddess of wisdom, hurled him skyward, where he became permanently entangled with the northern axis of the heavens. Today, some might imagine the fiery lizard as one of the ever vigilant dragon creations of George R. R. Martin, who wrote the incomparable *Game of Thrones*.

Since the sprawling constellation winds itself around the north celestial pole, sky watchers can capture views of its vast array of circumpolar splendors on any clear night throughout the year. It is conveniently placed high overhead in the early evening during the long summer months, but dips low in the heavens when the climate turns cold and uncomfortable at the start of winter.

Representations of Draco have been around for centuries and vary according to the pictorial whims of each individual artist. (See the two older illustrated charts on this page.) A consensus shows its expansive form tightly curling around Ursa Minor, but most star groups near Polaris share some kind of bond with the fantasy serpent.

A comprehensive survey of Draco often involves telescopes with apertures greater than about 6-inches. However, many meaningful observations are still possible with much smaller instrumentation. Among the best choices are 1970s and '80s "Circle T" refractor models from Japan—"Towas" that are renowned for their good optics, ease

of operation, and portability—which many amateur astronomers still use nightly.

An important number of observations were collected through a top-of-the-line 3.1-inch (80mm) telescope from Towa. As acknowledged in the literature, the small refractor's performance is little short of stunning. The writer's logbook is overflowing with jotted notes on prized, catalog accessible draconian treasures.

Towa's blueprint for a stargazing journey begins with several very popular binaries.

Since antiquity, people have shown a natural interest in the little quadrilateral that marks the serpent's head, which lies 12° northeast of the brilliant star Vega. The creamy radiance of Nu (ν) Draconis, dimmest member of the Lozenge family, actually comes from two distinct light sources.

"Kuma" can be plainly resolved with even the slightest optical aid as an attractive, wide pair of stars. The magnitude of each component is tabulated at 4.9, with a generous separation of 62".

When coupled with the pronounced ability of the Towa optics, Nu becomes a visionary delight, one that, according to most guidebooks, is "a grand object suitable for all sizes and types of binoculars and telescopes." Utilizing 38x, it is spatially perfect; a beauti-

ful three-dimensional eyepiece image of two identical yellowish-white orbs. Both stars are moving together through space, 120 light-years away from Earth.

While navigating the region around the Lozenge it is prudent to stop for a view of Al Rakis (μ Draconis), which marks his snout or tongue. It forms a triangle with ν and β , positioned about 4° to their west. Described as a challenge object for small instruments, Mu is a deliriously close twinned system that was first studied by William Herschel in 1779.

Much magnification is required to split the tight pair. Just within the ability of the 3.1-inch telescope at 171x, it reluctantly resolves into two spurious disks of dullish, pale amber light. Cataloged with a separation of only 2", both stars share the same F7 spectral class and magnitude of 5.7.

The nice coronal triple 17-16 Draconis is found by sliding 5° southwest of Al Rakis. The little group, whose stars are 5.4, 6.4, and 5.5 in magnitude, has relative distances of 3" and 90".

An astonishing sight, only the lustrous wide pair occupies the Towa view at 38x. Under good seeing conditions, a high power of 250x barely finishes the task of revealing all three sparkling suns—a blaze of pale yellow, fragile blue, and strong white.

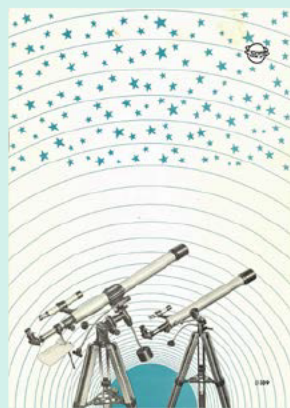


CLASSIC TOWA TELESCOPES

An Extraordinary Optical Legacy from Japan

A wide variety of high precision, easily adjustable achromatic refractor telescopes were once made available by Towa Optical Company. Offered in customary sizes (2.4- and 3.1-inches), they came with several mounting options and a host of standard features.

The growth of the larger model's popularity, and the notable astronomical uses it encompasses, resulted in multiple distributions. Orion, Meade, Sears, Tasco, and Jason all responded with their own labels. Towa direct models carry a No. 339 designation. Value has held steady at around \$250.



Operating instruction booklet



Towa's 3.1-inch (80mm) F/15

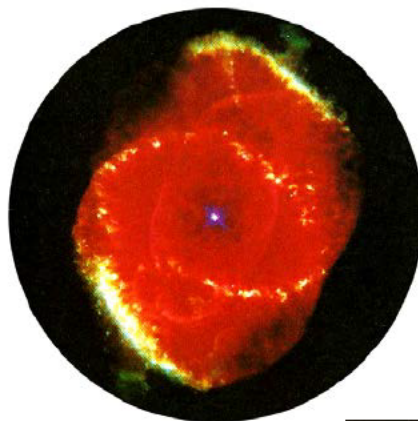
Several noteworthy deep-sky objects inhabit Draco's sharp bend region. Foremost on any list is NGC 6543 (Cat's Eye Nebula), a bright, curious spheroid of luminous material. It has measured dimensions of 22" X 19" and a brightness count of 8.1. The planetary nebula displays a conspicuous 11th-magnitude central star, obscured somewhat by the surrounding glow.

NGC 6543 looks like a little fuzzy dot at 38x, but starts to reveal some structure when higher power is used. Thanks to the Towa refractor's discerning optics the nebula's bluish-green color and indented outline are easily seen, supplemented by glimpses of a shaded central hole. (In the Hubble image specific wavelengths have been enhanced—red is identified with the element hydrogen, blue denotes neutral oxygen and green represents ionized nitrogen.)

A boon to its notoriety comes from a combination of history and sky position. In 1864, William Huggins made a successful attempt at identifying the true spectral nature of the 3,000 light-year distant nebula, which resulted in a major shift of cosmological theory. In the sky dome overhead, it has the prime distinction of lying only 10' away from the ecliptic's north pole.

After leaving the Cat's Eye Nebula we journey slightly northwest in the direction of the Little Bear. This area is crowded with a haunting collection of deep-sky splendors, including numerous pretty double stars.

The imperial stellar duet Psi (ψ) Draconis, mother-of-pearl and lilac in celestial hue, are spaced 30" apart. (In ancient China, the naked-eye star Psi, as part of another asterism in the coils of the Dragon, was named *Niu She*, or "Palace Governess.") The star's reputation as a celestial showpiece is well founded. The two components, magnitudes 4.9 and 6.1, shine with a delicate chromatic brilliance through the Towa refractor at 46x.



Hubble Space Telescope image of the Cat's Eye Nebula (above) taken by the Wide Field and Planetary Camera-2, which highlights certain structural features. Courtesy of J. P. Harrington and K. J. Borkowski (University of Maryland)/NASA. Right: an artist's impressionist view of the "Spindle Galaxy" M102 (NGC 5866). Below: a sequence of multiple star drawings by the author that graphically describe (in order from top left) ν Dra (a), μ Dra (b), 17-16 Dra (c), ψ Dra (d), ϵ Dra (e), and 40-41 Dra (f).



Contrast in star color and differing luminance creates the perfect stage for our next target. Epsilon (ϵ) Draconis is represented by a distinguished pair of light yellow and blue stars that lie only a scant 3" apart. The primary has an estimated magnitude of 3.8, while the minor sun, at magnitude 7.4, is over twenty-seven times fainter.

It's a first-rate challenge that pits observing skill against a disorienting symmetry. Nonetheless, the Towa 3.1-inch telescope does a good job of splitting the pair at 250x. Embedded within the brighter star's first dif-

fraction ring is the bluish blaze of the companion, an exquisite jewel of opposing color.

Hugging the northeastern border with Ursa Minor and lying only 10° away from Polaris is the pretty double star 40-41. Modern binary lore categorizes 40 Draconis as two yellowish-white F7 stars, magnitudes 5.7 and 6.1, in an apparent orbit 19" apart. (A third lone 7th-magnitude sun, listed as 41 on charts, hovers at a wide distance of 222".)

Easy at 92x, the sparkling pair is a near replica of previously described ν Draconis, although the physical geometry needs adjust-

ment in both distance and brightness to get a matching effect.

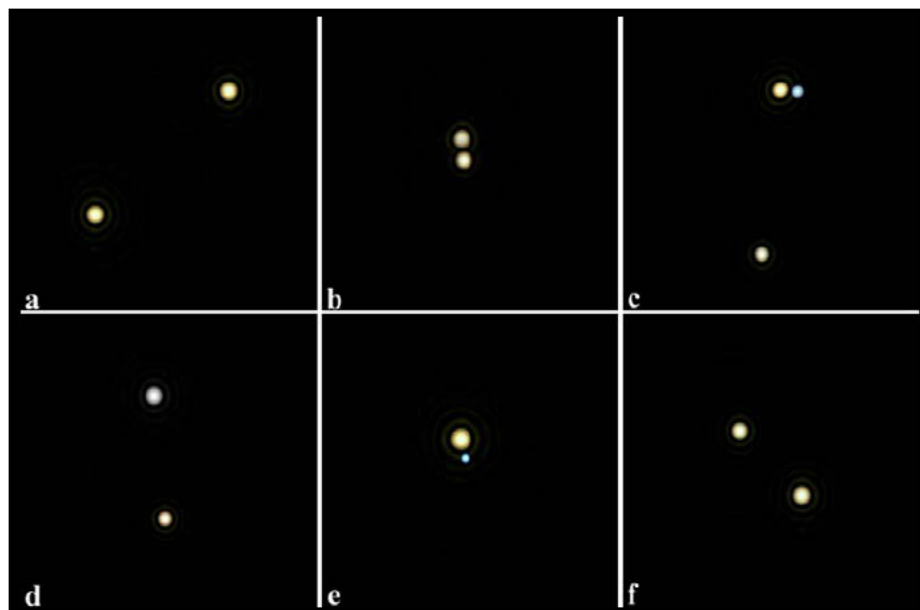
The last of the Towa objects is M102. It was first detected by Messier's colleague Pierre Méchain in 1781, but because of a "clerical error" later became confused with an obscure 10th-magnitude galaxy in Draco.

Associating the mistaken object with the bright elliptical galaxy NGC 5866 is commonplace. Others disagree with this offhand identification. For astronomers long obsessed with his erroneous entries, Méchain's formal letter in the 1786 *Astronomisches Jahrbuch* was suddenly proof of a duplicate observation of Ursa Major's M101, evidence that has existed for centuries.

For the Draco survey we will follow the minority opinion and take a look at NGC 5866. A sweep of the area reveals its solo presence among a distinctive Y-shaped asterism of stars. Photographs show a narrow dust lane crossing the galaxy's midsection, typical of edge-on systems.

The 6' X 3' spindle-shaped object fares well under increased magnification. At only 63x, it displays a broad bright core and northwest-southeast elongation. Moreover, close to the shallow northwestern tip is the interstellar gleam of an 11th-magnitude star.

Universal acceptance of Towa's 3.1-inch F/15 refractor telescope as an important astronomical tool is unwavering. Draco, the Dragon, with its wide range of iconic deep-sky treasures, is the perfect constellation to discover the tough durability of once idled "Circle T" equipment.



NGC 5907

The Splinter Galaxy is one of Draco's top treasures.

By John W. Siple

Found within a short distance of the bright Draco galaxy NGC 5866 (also known as M102) is a visually intriguing group of deep-sky objects. Garnering top comments is the superlative edge-on system NGC 5907, a magnitude 10.3 spiral galaxy with highly extended dimensions of 12.9' X 1.3'. An outcome of its slender form is the nickname "Splinter Galaxy," one that is easily previewed in photographs.

Visual detection stalls only in the smallest of instruments. Spontaneous observation is possible in a good pair of 7 X 50 binoculars operating far away from city lights, but its true galactic attractiveness culminates only in 6-inch and larger telescopes.

A wafer thin sculpture of silvery-white light, it's dotted with fragmented, shadowy bands of nebulosity. The prominent dark streaks are actually vast clouds of dust in the flat equatorial plane of the galaxy, tilted and twisted edgewise in our eyepiece view.

This elongated galaxy calls out for comparisons. Digging into contemporary literature reveals many humble analogs. Most astronomy writers reward the Splinter Galaxy as a close cousin of NGC 4565, a celebrated edge-on spiral found in the springtime constellation Coma Berenices. A thoughtful inspection also shows a strong, lingering resemblance to the often neglected NGC 5746 in Virgo.

The Splinter Galaxy's popular appeal is several-fold. Individuals earning their Messier certificates must stop at neighboring M102, which lies only 1.4° to the west-southwest. Consequently, a very short crossover in the proper direction brings the needle-like shape of NGC 5907 into centered view.

By geometry, all manner of galactic orientation in the universe is possible. However, odds dictate that only a very small number of distant galaxies will be seen exactly edge-on by an Earth observer. This prestigious celestial fact, coupled with a relatively strong brightness, puts Draco's Splinter Galaxy in a category of seldom encountered deep-sky splendors. Its majestic architecture makes a nice contrast to M102, which with an overall length of 6' X 3' looks decidedly stunted.

At the middle of the galaxy is the central hub or bulge. NGC 5907's pancake thin core

region has greater illumination than the outlying areas, providing a false daybreak to the otherwise evenly lit galaxy. Variegated patches are visible on the western border of the nucleus, long angled projections that help define the galaxy's dark dust lane.

Physical symmetry and spatial rotation from our line of sight is slightly imperfect. One luminous end, facing north-northwest in



The slender form of NGC 5907 is apparent in this fine image by Brad Ehrhom and Adam Block (NOAO/AURA/NSF), which stresses the appearance through 10-inch or larger backyard telescopes. South is up in this view.

the sky, is noticeably broader and has a shredded vignette or outline.

Pinpoints of light that mark field stars are scattered along the major axis. Registering without averted vision are two tiny 14th-magnitude stars; one shines 1' west of the galaxy's center, while the other nudges the halo's outer edge toward the northeast.

NGC 5907 is part of a bigger group of gal-

axies that inhabit the area around the double star Iota (ι) Draconis, or Edasich. None of the identified members are reclusive, meaning that detail can be glimpsed in any moderate-size telescope. There are two separate pockets of sky that hold seven additional 10th- to 13th-magnitude island universes.

An especially interesting association is found in one of these designated areas, just a short hop 1.8° east-northeast from Edasich. Occupying the cluttered eyepiece field are three unmistakable objects: NGC 5981, a slender arrow that covers 3' X 0.6'; the nearly round 2' globular glow of NGC 5982, centrally located and equidistant from the other two members; and NGC 5985, a grandiose inclined 5' X 3' spiral that possesses an eerily beautiful arm structure.

The remaining narrow pocket contains NGC 5907 along with a quintessential mix of spirals: NGC's 5879, 5905, and 5908. (Most guidebooks portray oddball M102 as a spindle-shaped class E6 galaxy.)

Amateur astronomers can take advantage of this propitious juxtaposition, the combination of dynamic orientation with actual form, to help understand the appearance of most galaxies. Acolytes usually confer with the standard Hubble classification scheme, one that was proposed during the last century by noted cosmologist Edwin Hubble.

Astrophysical studies of NGC 5907 provide some information about its structure and place in the cosmos. The edge-on Sb spiral is spinning in slow-motion fashion about its own center, taking an epochal 300 million years for one complete rotation cycle. Distance measurements place the striking system 50 million light-years away from Earth.

Nature rarely displays such an extravagant deep-sky object as the Splinter Galaxy. Stretching almost half the Moon's apparent diameter, Draco's edgewise showpiece is clad with silhouetted light and shadow—a tempting circumpolar target through most any backyard telescope.

While scanning this part of the sky be sure to hunt beyond NGC 5907's boundaries and explore many of the constellation's other top treasures. Trophies include the Spindle Galaxy (M102), Cat's Eye Nebula (NGC 6543), and the Lost-In-Space Galaxy (NGC 6503).

HAWC-Eye on the Sky

The most violent phenomena in the Universe—blazars and gamma-ray bursts—are in the sights of a brand new wide-field telescope that began monitoring the heavens high in the mountains of Mexico on August 1, 2013.

Called the High-Altitude Water Cherenkov (HAWC) Observatory, the brand new instrument will observe gamma rays (the Universe's most energetic photons) and high energy cosmic rays (protons and nuclei with energies higher than 100 billion electron volts, or 100 GeV).

For comparison, visible light at a green wavelength of 532 nanometers has an energy of slightly more than 2 electron volts (2 eV). "The photons we are looking at are 100 billion to 100 trillion times more energetic than visible light," explained Gus Sinnis, the physicist at Los Alamos National Laboratory in New Mexico who is overseeing the scientific analysis of HAWC data. Their wavelengths are smaller by the same enormous factors.



"At these energies, photons behave more like particles than waves," he continued. "Looking at the cosmos at such extraordinarily high energies filters out normal stars and galaxies, letting us see only the most extreme objects imaginable." Blazars are active galactic nuclei—supermassive black holes a million times more massive than the sun that generate intense radiation as material falls into them—with jets pointed at us. Gamma-ray bursts originate from a class of supernovae (exploding stars) with jets pointed at us, or from merging neutron stars.

A telescope made of water

Extraordinary energies call for extraordinary detectors—and HAWC looks like no ordinary telescope. For one thing, it does not form an image, so there are no lenses or mirrors. Instead, the instrument consists of an array of gigantic corrugated steel tanks—each 4.5 meters deep and 7.3 meters across—filled with ultrapure water. At the bottom of each tank are four photomultiplier tubes sensitive to ultraviolet light, one in the center and three more in an equilateral triangle around it.

Here's the basic idea: When an energetic gamma ray or cosmic ray plows into Earth's atmosphere, it collides with a nucleus of an air atom or molecule. The collision produces energetic electrons, positrons, muons, and other charged subatomic particles traveling downward through the air at nearly the speed of light, which in turn hit other nuclei. In an instant, the shower multiplies to millions of subatomic particles, spreading out to a pancake shape a few hundred meters across when it reaches the ground.

When such a pancake of subatomic particles sweeps across the array of HAWC water tanks, the charged particles are traveling faster than the speed of light in water. Thus, inside the tanks, they produce a cone of Cherenkov radiation: mostly ultraviolet light beamed in the forward direction. "Basically, Cherenkov radiation is the electromagnetic equivalent of a sonic boom (from a plane traveling faster than the speed of sound in air)," Sinnis explains. It is these flashes of ultraviolet light that the photomultiplier tubes detect.

What can be learned

Timing the order in which the photomultiplier tubes detect the Cherenkov radiation to less than a nanosecond reveals essential astronomical data. For example, gamma rays tend to produce flashes of light that are brightest near the center of a particle shower and decrease in intensity radially, whereas cosmic ray air showers tend to create a messy or blotchy "footprint." And although HAWC observes the entire sky 24/7 and there is no steering or pointing mechanism, it is possible to determine the direction from which a pancake of particles came to within an angular accuracy as fine as 0.2 degree (about half the diameter of the full moon).

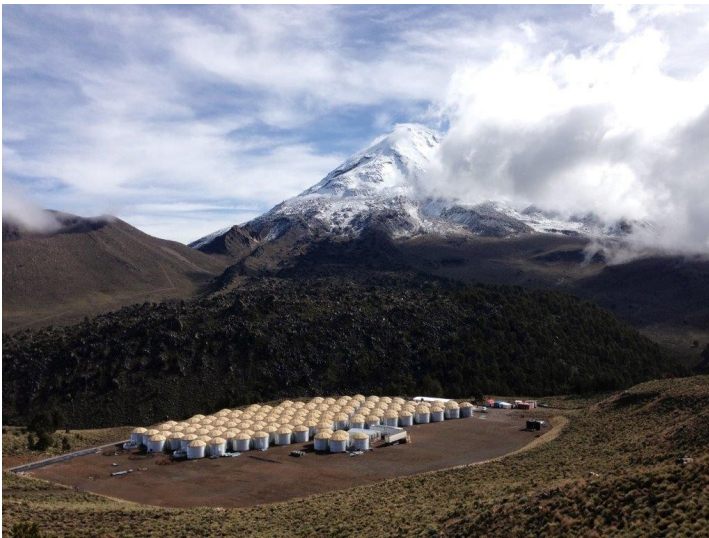
(Continued on page 9)

HAWC's wide field of view and continuous operation are essential to capture rare, short duration phenomena such as gamma-ray bursts. When all the tanks are completed in 2014, HAWC will detect 20,000 cosmic ray air showers each second, which requires recording 500 megabytes of data each second. HAWC runs continuously, so data are calibrated, reconstructed, and analyzed in real time by a farm of computers at the remote, high-altitude site, sending out prompt alerts to astronomers observing at other wavelengths worldwide in the event of a transient.

Why and how do astronomical objects emit such energetic radiation and particles? Replied Sinnis: "This is a great question and one we are seeking to answer!" –*Trudy E. Bell, M.A.*

Further reading: Construction and operation details about HAWC appear at the HAWC website at <http://www.hawc-observatory.org/> and the sensitivity is described in a soon to be published paper [arXiv:1306.5800](http://arxiv.org/abs/1306.5800).

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>

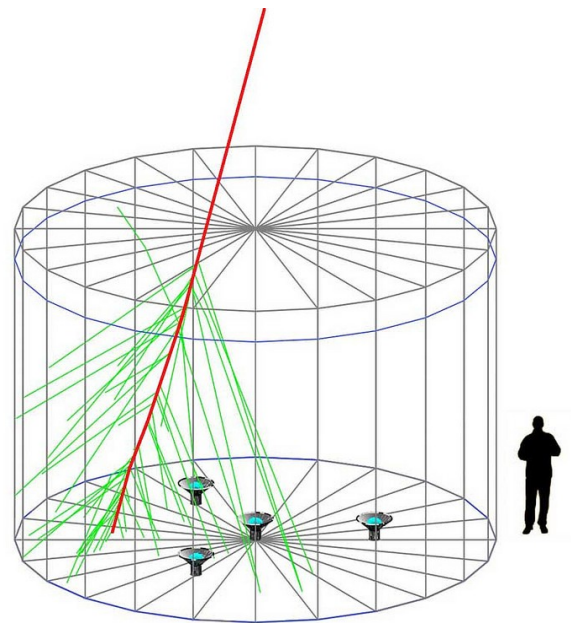


Array of 115 water tanks of the High-Altitude Water Cherenkov (HAWC) Observatory as it appeared on September 13, 2013. When completed in early 2014, it will have 300 tanks. HAWC is at an altitude of 4,100 meters on the flanks of the Sierra Negra volcano near Puebla, Mexico. It is an international collaboration of over 20 institutions in the U.S. and Mexico. In the background is Pico d'Orizaba, a dormant volcano with an elevation of 5,635 meters (the highest peak in North America outside of Alaska).

Credit: Benemérita Universidad Autónoma de Puebla

Each corrugated steel tank in HAWC is 7.3 meters across and 4.5 meters deep. It contains a bladder filled with ultrapure water. At the base are four photomultiplier tubes. This diagram shows a charged particle (red line) passing through a tank and emitting Cherenkov radiation (green lines).

Credit: Image created by Brian Baughman of the University of Maryland and Segev Benzvi of the University of Wisconsin using the GEANT4 detector simulation code.



High-energy Spy

By Dr. Martin C. Weisskopf

The idea for the Chandra X-Ray Observatory was born only one year after Riccardo Giacconi discovered the first celestial X-ray source other than the Sun. In 1962, he used a sounding rocket to place the experiment above the atmosphere for a few minutes. The sounding rocket was necessary because the atmosphere blocks X-rays. If you want to look at X-ray emissions from objects like stars, galaxies, and clusters of galaxies, your instrument must get above the atmosphere.

Giacconi's idea was to launch a large diameter (about 1 meter) telescope to bring X-rays to a focus. He wanted to investigate the hazy glow of X-rays that could be seen from all directions throughout the sounding rocket flight. He wanted to find out whether this glow was, in fact, made up of many point-like objects. That is, was the glow actually from millions of X-ray sources in the Universe. Except for the brightest sources from nearby neighbors, the rocket instrument could not distinguish objects within the glow.

Giacconi's vision and the promise and importance of X-ray astronomy was borne out by many sounding rocket flights and, later satellite experiments, all of which provided years-, as opposed to minutes-, worth of data.

By 1980, we knew that X-ray sources exist within all classes of astronomical objects. In many cases, this discovery was completely unexpected. For example, that first source turned out to be a very small star in a binary system with a more normal star. The vast amount of energy needed to produce the X-rays was provided by gravity, which, because of the small star's mass (about equal to the Sun's) and compactness (about 10 km in diameter) would accelerate particles transferred from the normal star to X-ray emitting energies. In 1962, who knew such compact stars (in this case a neutron star) even existed, much less this energy transfer mechanism?

X-ray astronomy grew in importance to the fields of astronomy and astrophysics. The National Academy of Sciences, as part of its "Decadal Survey" released in 1981, recommended as its number one priority for large missions an X-ray observatory along the lines that Giacconi outlined in 1963. This observatory was eventually realized as the Chandra X-Ray Observatory, which launched in 1999.

The Chandra Project is built around a high-resolution X-ray telescope capable of sharply focusing X-rays onto two different X-ray-sensitive cameras. The focusing ability is of the caliber such that one could resolve an X-ray emitting dime at a distance of about 5 kilometers! The building of this major scientific observatory has many stories.

Learn more about Chandra at:

www.science.nasa.gov/missions/chandra.

Take kids on a "Trip to the Land of the Magic Windows" and see the universe in X-rays and other invisible wavelengths of light at spaceplace.nasa.gov/magic-windows.

Dr. Weisskopf is project scientist for NASA's Chandra X-ray Observatory. This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Caption:

Composite image of DEM L50, a so-called superbubble found in the Large Magellanic Cloud. X-ray data from Chandra is pink, while optical data is red, green, and blue. Superbubbles are created by winds from massive stars and the shock waves produced when the stars explode as supernovas.



December 2013

Dec 02	Monday	Board Meeting	OMSI Classroom 1	7pm
Dec 06	Friday	Downtownner's Luncheon	Luc Lac Vietnamese Kitchen 835 SW 2nd Ave., PDX	Noon
Dec 11	Wednesday	Astro-Imaging SIG	Beaverton Public Library	7pm
Oct 14	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Dec 16	Monday	Holiday Potluck and Swapmeet	OMSI Auditorium	7:30pm
Dec 18	Wednesday	Cosmology SIG	No Meeting This Month	7pm
Dec 28	Saturday	Haggart Public Night	Haggart Observatory	Dusk

January 2014

Jan 03	Friday	Downtownner's Luncheon	Kell's 112 SW 2nd Ave, Portland, OR 97204	Noon
Jan 03	Fri	Rooster Rock Star Party	Rooster Rock State Park	Dusk
Jan 04	Saturday	Haggart Public Night	Haggart Observatory	Dusk
Jan 06	Monday	Board Meeting	OMSI Classroom 1	7pm
Jan 08	Wednesday	Astro-Imaging SIG	Oak Hills Church, 2800 NW 153rd Ave, Beaverton	7pm
Jan 18	Saturday	Telescope Workshop	Technical Marine Service Building	10am-3pm
Jan 20	Monday	New Members SIG	OMSI Planetarium	6:30pm
Jan 20	Monday	General Meeting	OMSI Auditorium	7:30pm
Jan 22	Wednesday	Cosmology SIG	No Meeting This Month	7pm
Jan 24	Fri	Rooster Rock Star Party	Rooster Rock State Park	Dusk
Jan 25	Sat	Stub Stewart Star Party	Stub Stewart State Park	Dusk

Note: New Meeting Location.

<http://www.rosecityastronomers.org>

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