

The

# Rosette Gazette

Volume 18, Issue 7

Newsletter of the Rose City Astronomers

July, 2006



## In This Issue:

- 1 .. General Meeting
- 2 .. Board Directory
  - .... Magazines
  - .... Membership Renewal
  - .... New Observing Clubs
- 3 .. Telescope Sampling #15
- 6 .. The Observer's Corner
- 7 .. Oregon Star Party!
- 8 .. RCA Library
  - .... Cosmology SIG
  - .... Telescope Workshop
  - .... Meteor Watch Change
- 9 .. Board Minutes
  - .... Obs. Site Committee
- 10. Calendar



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

## RCA JULY GENERAL MEETING

# "Studying the Formation of the Milky Way"

Presented by Dr. Fabio Governato  
Research Professor of Astronomy  
University of Washington

This image is generated from modeling simulations performed using parallel supercomputers by Dr. Fabio Governato.

**All are Welcome! Monday July 17**  
**Social Gathering: 7 pm. Meeting Begins: 7:30 pm.**  
**Location: OMSI Planetarium**

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Hubble Deep Field above courtesy R. Williams (STScI), the Hubble Deep Field Team and NASA.

Moon photos below courtesy David Haworth

**First Quarter Moon**  
July 3

**Full Moon**  
July 10

**Last Quarter Moon**  
July 17

**New Moon**  
July 24



Club Officers			
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OMSI Liaison	Jan Keiski	503-539-4566	jikeiski@comcast.net
Youth Programs Director	Jenny Forrester	(503) 504-8070	jenny@theforrest.org



### RCA MAGAZINE SUBSCRIPTIONS

One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is \$32.95 for one year. The RCA member rate for Astronomy magazine is \$34 for one year or \$60 for two years. For more information go to the RCA web site and click on any of the links for magazines. Larry Godsey, 503-675-5217, Subscription Coordinator, will be taking renewals and new subscriptions at the Magazine Table before General Meetings. Please make checks out to "RCA" and allow two months for your subscription to be renewed.

## 2006-2007 MEMBERSHIP RENEWAL

**Your RCA membership is active through June 30, 2006. Please renew your membership for the year July 1, 2006 through June 30, 2007.**

**You may renew your membership for \$24 at the July 17th RCA General Meeting or by mail. Send to:**

**RCA Membership, OMSI, 1945 S.E. Water Ave., Portland, OR 97214.**

**Make check payable to: RCA. Thank you for your support and participation.**



### New Observing Clubs

The Astronomical League is pleased to announce three new observing clubs and a public outreach club.

The Lunar II, Planetary Nebula and Open Cluster Observing Clubs have been added for your observing enjoyment. As of June 6, 2006, the Open Cluster Observing Club will accept Negative Observations. See paragraph 6 of the Rules and regulations section for more details.

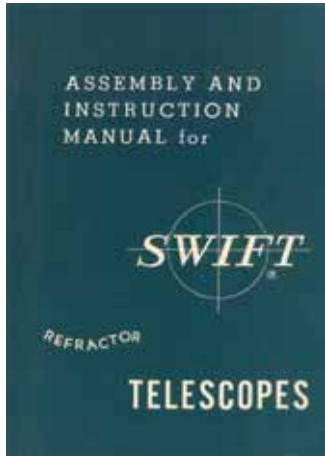
The Outreach Club gives recognition to those that extend our hobby to the general public.

Please go to the main Observing Clubs web page where you will find useful information on all of the Astronomical League's Observing Clubs:

<http://www.astroleague.org/observing.html>

## A SAMPLING OF TELESCOPES FOR THE AMATEUR ASTRONOMER—PART 15

By John W. Siple



Swift Instruments, Inc. is America's oldest optical company, having been founded in 1926 by Robert W. Swift. The Boston firm is known for developing and importing beautifully made and technically advanced scientific products. Over the past 80 years Swift has sold quality spotting scopes, binoculars, microscopes, telescopes, and weather monitoring instruments. A branch office was established in San Jose, Calif. in the early fifties, which today serves as the company's headquarters. During the 1960s Swift marketed three astronomically significant refractor telescopes, which were promoted as instruments for performing "serious amateur work" and as an opportunity to view "space spectaculars" in regal style.

An advertisement on page 348 of the December 1961 issue of *Sky & Telescope* magazine has them attractively priced: Model 831—79mm, 167x, \$290.00; Model 839—60mm, 135x, \$148.00; and Model 838—50mm, 116x, \$116.50. They could be purchased directly from Swift's Dept. S-12, 952 Dorchester Ave., Boston 25, Mass. According to the Swift literature, these refractor telescopes were the brainchild of Dr. Shusuke Kojima, of Tokyo, Japan, one of the world's foremost authorities on the design of observatory instruments. The telescopes were manufactured to the highest standards of mechanical and optical precision by one of Japan's leading optical equipment manufacturers. A key characteristic, common to each of the scopes, is distinctive brown enamel on the majority of exposed metal surfaces, which are triple-coated and oven-baked for maximum durability. The air-spaced, achromatic objective lenses are precision-ground from center-pot optical glass, cold-polished and hard coated. Furthermore, their literature states that "proof of the excellence of Swift telescopes can be found in their remarkable resolving power or ability to show as separate objects distant pairs of lines or dots which inferior telescopes of equal magnifying power show as a single object."

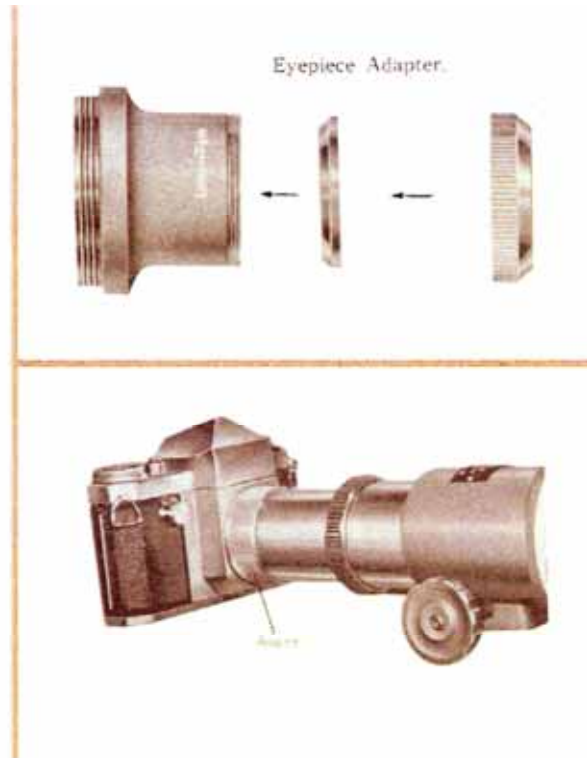
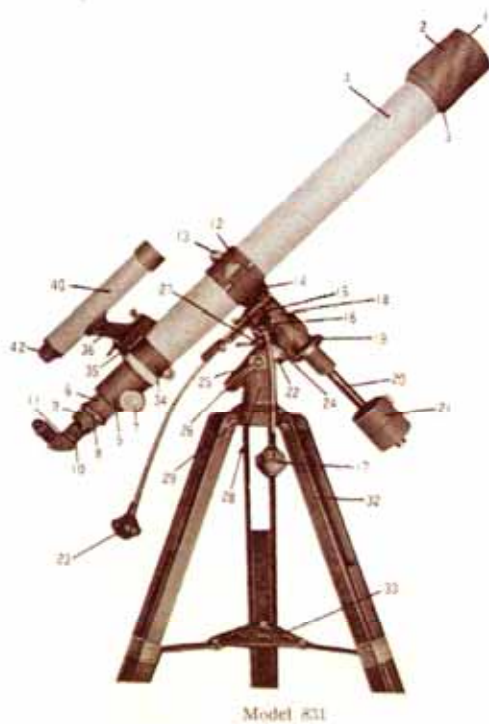
Swift refractors really excel in optics—star tests on the 60mm and 79mm scopes show textbook Airy disks with highly suppressed aberrations. Images are sharp and clean, with excellent color rendition and contrast. (The Model 831 with an effective aperture of 77mm operates at  $f/13.0$ , so some secondary color is to be expected on bright bluish-white stars such as Vega.) The optics tend to stay in collimation, and upkeep is essentially zero. Each telescope is loaded with 0.965" observing accessories, from erecting prisms for terrestrial use to Barlow lenses for doubling magnifications. The ingenious use of compression or retaining ring technology at all accessory joints provides for secure locking and prevents scratching the barrel of that favorite eyepiece. Three quality oculars for a wide range of observing applications were standard issue on the 79mm Model 831: 6mm and 9mm Huygenian Mittenzways, and a 40mm Achromatic Huygenian. The smaller refractors have two, a 6mm Huygenian Mittenzway and 20mm Huygenian. Model 831's 10X40mm and 839's 6X30mm viewfinders are both overbuilt and have unusual elevation and azimuth adjustments. However, these two telescopes have dissimilar mounting head designs; the 60mm unit can be easily held in one hand, while the 79mm mounting head (with cwt.) weighs in at 11 lbs. The third refractor in the series, Model 838 with an objective diameter of 50mm and a focal length of 700mm ( $f/14$ ), is similar in appearance to the 839 (the 50mm and 60mm tubes are white—Model 831 has light tan main body and viewfinder optical tubes). An interesting feature on the 79mm mounting is the use of flexible slow motion cables with "space-balls" as knobs. Optional eyepieces and accessories, such as a 6mm Triplane ocular, an eyepiece turret with four openings, or a telephotography adapter could be added at a later date by the owner of a Swift instrument. In keeping with the color theme, each refractor was sold along with its own masterfully-crafted brown wooden storage case.

*Continued on page 4*



A fine pair of Swift equatorial refractor telescopes from the early 1960s. Model 831 (Serial 643117), pictured at left and assembled in position for terrestrial use, has specifications  $D=77\text{mm}$   $F=1000\text{mm}$  ( $f/13.0$ ). Model 839 (Serial 60408) is smaller with  $D=60\text{mm}$   $F=810\text{mm}$  ( $f/13.5$ ). Both telescopes have superlative optics. From the author's collection.





**PARTS LIST**

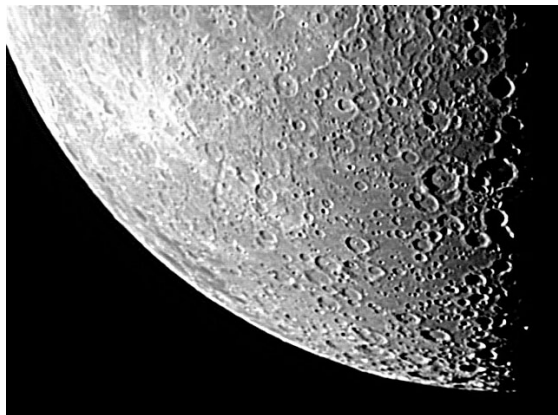
- |  |   |
|--|---|
| <p>1. Dust Cap<br/>                 2. Lens Hood<br/>                 3. Objective Head<br/>                 4. Main Tube<br/>                 5. Eye-end<br/>                 6. Focusing Drawtube<br/>                 7. Focusing Pinion Handle<br/>                 8. Retaining Ring for Secondary Drawtube<br/>                 9. Secondary Drawtube<br/>                 10. Eyepiece Adapter<br/>                 11. Retaining Ring for Eyepiece Adapter<br/>                 12. Holding Band<br/>                 13. Nut for Holding Band<br/>                 14. Base for Holding Band<br/>                 15. Declination Clamp<br/>                 16. Slow-motion Device in Declination<br/>                 17. Flexible Handle in Declination<br/>                 18. Declination Axis<br/>                 19. Declination Circle<br/>                 20. Shaft for Balance Weight<br/>                 21. Balance Weight<br/>                 22. Slow-motion Device in Right Ascension</p> | <p>23. Flexible Handle in Right Ascension<br/>                 24. Right Ascension Circle<br/>                 25. Polar Axis<br/>                 26. Right Ascension Clamp<br/>                 27. Polar Axis Clamp<br/>                 28. Mounting Pillar<br/>                 29. Tripod Head<br/>                 30. Tripod Head Clamp<br/>                 31. Washer Ring for Tripod Head<br/>                 32. Tripod<br/>                 33. Accessory Tray<br/>                 34. Holding Band for Finder Scope<br/>                 35. Finder Scope Base<br/>                 36. Finder Scope Leg<br/>                 37. Elevation Adjusting Screw<br/>                 38. Retainer for Elevation Adjusting Screw<br/>                 39. Windage Adjusting Screw (or Lever)<br/>                 40. Finder Scope Tube<br/>                 41. Retaining Ring for Finder Eyepiece<br/>                 42. Eyepiece for Finder Scope</p> |
|--|---|

©1961 Swift Instruments, Inc. Layout created from the Assembly and Instruction Manual (numbers 30, 31, 37-39, and 41 are missing).

*Continued on page 5*

## A SAMPLING OF TELESCOPES *continued from page 4*

Cutting a wedge of our night sky 20 degrees across in the direction of the constellations Libra, Scorpius, and Serpens encompasses some stunning double and multiple star systems, and includes one of the finest globular star clusters in the heavens. The journey begins by visiting Earth's closest neighbor in space. The ecliptic, or the path of the Sun against the background stars during the course of the year, passes directly through Libra and Scorpius. The Moon is often found among the stars of those zodiacal constellations during late spring and summer nights. Swift's achromatic refractors provide tack sharp imagery of Luna, and the globe shimmers with the opalescent sheen of moonstone.



**The Moon's heavily cratered Southern Highlands at 162x in the 60mm Swift 839 refractor.**

The half-a-billion mile distant Jupiter has been wandering among the stars in Libra much of this past year. In good seeing conditions, up to six cloud bands along with the Great Red Spot are visible in the 831 scope. The Jovian world, in its continuing movement around the Zodiac, has been passing between the stars  $\alpha^{1,2}$  and  $\beta$  Librae (known as the "Gateway Stars"). The wide, colorful double star  $\alpha^{1,2}$  Librae or Zubenelgenubi (mags. 2.8, 5.2; sep. 231.0"), the southern guidepost, is an attractive sight in both the 60mm and 79mm refractors. Using a 40mm ocular (25x) in the larger instrument, the primary star appears as a yellowish orb while its relatively distant companion is a pale bluish-grey. This fine system is found 57 light years from Earth. The journey continues by visiting the 2.6 magnitude star  $\beta$  Librae or Zubeneschamali, the famous "Emerald Star." Observers throughout the centuries have been enchanted by its striking pale green hue. Examining this stellar beauty in the Model 839 refractor with a 10mm Clave' Plössl eyepiece (81x), the amateur astronomer is immediately struck by the intense emerald radiance, a sight not soon forgotten after the observing session ends. Mystery surrounds this star, since Eratosthenes and later Ptolemy catalogued it as luminous as 1.1 magnitude Antares. Zubeneschamali is 120 light years from our point of departure.

1.9° to the north of Zubenelgenubi is the difficult double star  $\mu$  Librae (mags. 5.8, 6.7; sep. 1.8"). This object is a tough test for the 79mm refractor optics, since the separation is close to Dawes Limit of 1.51 arc-seconds for the telescope. High magnification is needed to resolve the pair, so a 9mm eyepiece combined with a 2X Barlow lens (222x) were applied to the Mu Librae system. The Model 831 revealed two yellowish-white diffraction disks nearly in contact separated by dark sky, a testimony to the superb optical figuring by Swift! This pretty pair of stars is 540 light years from our Solar System. Pausing just inside the northwestern Scorpius border, we come to the 68 light year distant multiple star system  $\xi$  Scorpii (AB: mags. 4.8, 5.1; sep. 0.9", and AC: mags. 4.8, 7.3; sep. 7.6"). Although the tight pair, currently at 0.9" in its highly eccentric orbit, is beyond the small refractors' capability to resolve, the wider pair in the system is an easy target in both telescopes. At 111x in the 79mm refractor, the primary is a yellowish-white and the 7.6" distant secondary an attractive grey.  $\Sigma$ 1999 (mags. 7.4, 8.1; sep. 11.6"), another fine double 283" to the south in the same field of view and physically related to Xi, adds to the beauty of the scene. One of the sky's famous double-doubles for small telescopes!

The trip ends 24,500 light years from Earth at one of the grandest star clusters that the northern sky has to offer. A visual treat for the telescopic observer is the globular star cluster M5 (NGC 5904), found 22' to the NNW of 5 Serpentis. Shining at magnitude 5.7 and with a diameter of 17.4', it is possible to see this splendid deep-sky object at dark-sky observing locations with the unaided eye. Swinging the 79mm telescope to its location, a Tele Vue 19mm Panoptic eyepiece (53x) shows M5 as an impressive ball of light with a large, bright core and a fainter irregular outer halo of partially resolved suns. A 10th magnitude foreground star is conspicuously visible on the southwest side, 2.8' from the globular's center. In larger telescopes, where the cluster is resolved into thousands of points of light, the author has always seen M5 as a giant celestial rose. The star cluster has over 500,000 members and with an age of 13 billion years ranks as one of the Galaxy's oldest known inhabitants. Contemplating our journey home and looking back toward Earth, our Sun is visible in M5's sky as a very dim 19th magnitude star.

Swift's Models 831, 838 (not in the author's collection) and 839 set a standard of optical excellence among their peers. They meet every discriminating lunar, planetary and double star observer's most stringent requirements: *par excellence*. Although extremely well-made by Japanese standards for the time, Swift refractors tend to fall short in mechanical comparison with the more expensive Unitron brand refractors (Swift's top-of-the-line Model 831 was priced \$145.00 lower than Unitron's equivalent Model 142—quite a tidy sum in the 1960s). The Model 831 is a highly sought-after collectible telescope, with few examples ever leaving private collections.

An excellent condition 79mm telescope is worth \$500-650, while the 50mm and 60mm versions can bring \$200 and \$275, respectively. These three fine vintage refractor telescopes are wonderful instruments for both the novice observer and dedicated amateur astronomer alike, and recall an era of telescope making of superior craftsmanship at very affordable cost.



**Image of M5 courtesy Hillary Matthes, REU Program/NOAO/AURA/NSF.**



## Time for Barnard's Star

Barnard's Runaway Star is a faint red dwarf in north-east 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.



*E.E. Barnard*

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 later 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.

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 known 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.



*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.*

*(Continued on page 7)*

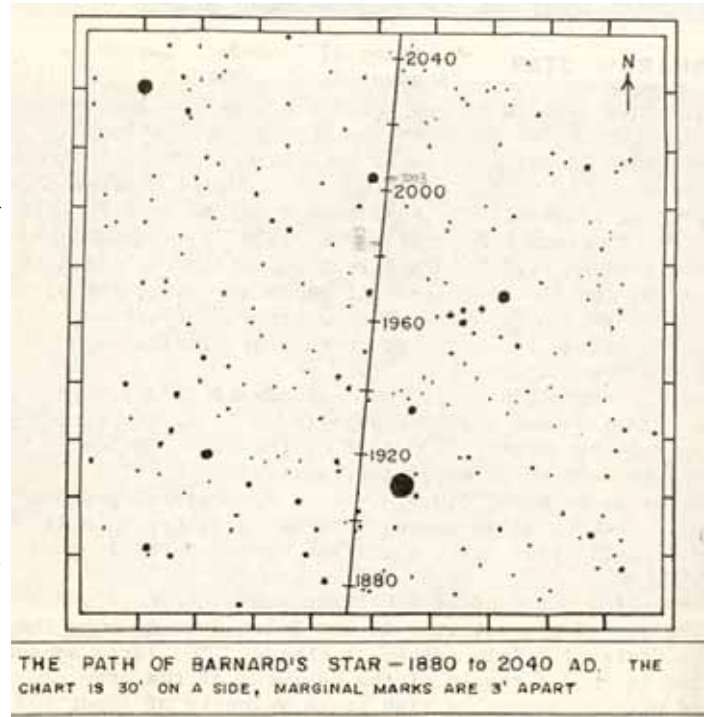


*The Observer's Corner* (Continued from page 6)

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!”

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.



*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.*



**The OREGON STAR PARTY** is held in the isolation and darkness of the Ochoco Mountains in Eastern Oregon located four hours from Portland and 50 miles east of Prineville, Oregon. At 5000 feet above sea level, the star party takes place in a 40 acre clearing and is accessible most of the way from Prineville via a paved road, with only the last 4 miles on a graveled road. Come join us August 24th through August 27th for the darkest skies in the Northwest. Information, directions, registration, activities are listed on the website at <http://www.oregonstarparty.org>.

REGISTRATION - Pre-Registration closes on July 28th and

must be in our hands by then. So if you didn't pre-register before July 28th, you'll have to register at a higher fee on-site at the star party in the Registration Tent. You can only order T-shirts, Sweatshirts and Dinners on the Pre-Registration Form. The only on-site sales of t-shirts and sweatshirts will be on Saturday in the Volunteer/OSP Information Tent if there are any extras left over after people who Pre-Registered get theirs.

**HOODED SWEATSHIRTS** - This year we also have hooded sweatshirts available. Because we didn't get the information in time to put it on the registration forms, you can pre-order them, then pick them up and pay for them at the Registration Tent on Thursday and Friday. See the website for more information.

**SPEAKERS** - We've managed to get a great list of speakers again this year. There will be great presentations by Mark Martin on Dark Matter and Dark Energy, Jack Semura on "From the Big Bang to OSP", Miles Paul and Bob McGown talking on Observatories and observing from Africa. There will also be an interesting talk by Jeff Kaufman on "The Allen 1cm Telescope Array". Dave Haworth, Howard Knytych will be talking about observing and imaging, just to mention some of the speakers.

**ACTIVITIES** - Don't forget the Telescope Walk-about, the Mars Rover Races, the Meteorite Hunt, the Solar System Walk, the Kids vs. Adult quiz, the Swap Meet, the Limiting

*(Continued on page 8)*







## BOARD MEETING MINUTES

June 5, 2006

OMSI Classroom 1

Andy Phelps

Meeting called to order by Carol Huston at 7:05pm.

Board members present: Carol Huston, Peter Abrahams, Matt Brewster, Jeff Sponaugle, Ken Hose, Matt Vartanian, Ed Epp, Greg Rohde, Bob McGown, David Nemo, Andy Phelps, Patton Echols, Dareth Murray, Jan Keiski, Larry Godsey, Jenny Forrester.

### Board Reports

- Secretary's Report – Andy Phelps: Quorum (11) met with 14 voting members present.
- Treasurer's Report – Ed Epp: \$22,553.79 total liabilities and equity. Astronomical League still needs to be paid for this year, and Ed will get the bill from Dale Fenske. Depreciating telescopes was discussed. This probably wouldn't help, due to our tax-exempt status. The proposed budget for fiscal year 2006-2007 was reviewed at length. Items added to last year's activities were \$200 for awards and \$200 for youth programs. Many entries were reduced to balance the new budget to estimated annual income so we wouldn't plan a deficit budget. Motion: Dareth moved to accept the budget as modified; seconded by Matt; and accepted unanimously. Question: In the future, should dues be raised to cover a budget deficit? It was decided that this discussion is too big to take place during a budget review. Ed announced his plans to resign as treasurer at the end of his term in December. Since the treasurer job is such a key role and needs some training to transition, the board should be looking for a new candidate earlier that can step in and spend some time training with Ed.
- VP Observing – Matt Vartanian: June 10 is OMSI star party at Rooster Rock, June 24 is fund raiser star party at McMenamian's Grand Lodge in Newberg (benefits site fund).
- VP Community Affairs – Jeff Sponaugle: MDA has requested a star party on July 9; we successfully put one on for them last year. We also received a request to put on a star party along the Deschutes River in September.
- New Member Advisor – Jim Reilly: (via email) will hold new member orientation on June 7.
- Media Director – Patton Echols: Press release sent out for McMenamian's Star Party; it will be mentioned in Bob Duke's column.
- Book Library – Jan Keiski: Has found new library software. Has added several new books.
- Telescope Library – Greg Rohde: Nominal.
- IDA – Bob McGown: Has been meeting with neighborhoods about light shielding. Matt would like Bob's help in preparing a proposal to Tri-Met about Max-line lighting.

- Magazine Subscriptions – Larry Godsey: May subscriptions were \$457.50
- Webmaster – Dareth Murray: David & Larry will be updating web site for ALCON 07.
- Site Committee – David Nemo: June 24 event at McMenamian's Grand Lodge. Will be holding a "big ticket" raffle in the next few months. Saw a site near Hagg Lake – will hold an evaluation star party. Site fund stands at just over \$9000 in pledges and donations.
- OMSI – Carol and Jan: June, July, and August general meetings will be held in planetarium. Agreement with OMSI will be signed.

### Old Business

- Action Item: Dave and Bob to work up guidelines for lifetime membership. Develop guidelines for targeting donations – property, cash and acknowledging donors. Tabled for now.
- Phone Line Report: June 6 through July 10: Greg Rohde, July 11 through August 7: Patton Echols

### New Business

- ALCON Committee Report – Dareth: Very productive meeting: Account was set up at Bank of the West; PSU is the venue for the event; in process of arranging Star-B-Que and Gala banquet; speakers are being contacted via mail.
- SETI Institute – Bob McGown: Bob would like to represent RCA on a team of astronomers in the SOFIA project, a 100-inch infrared telescope mounted in a plane. Motion: Dareth, second: Greg, motion passed unanimously.
- JRCA Summer Program – Jenny Forrester: Will hold youth program June, July and August for ages 6-16. Wants to facilitate "Sky Puppies" program from AL for kids 10 and under and "Universe Sampler" program for kids 11 and older. Approved.

Adjourn: 9:18pm.



## Observing Site Committee

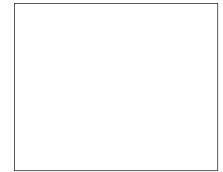
To lead and coordinate efforts of the Rose City Astronomers (RCA) in securing and managing a variety of observing sites for private use by members, and for community outreach and special events organized by the RCA.

Please Check

<http://nemoworld.com/RCA/sitehome.htm>  
for more information.

Or Contact: [David Nemo](mailto:david6366@msn.com) <david6366@msn.com>

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



July 2006						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
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2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

**July 2006**

July 7	Fri	Downtowner's Lunch			Noon
July 8	Sat	Telescope Workshop	Swan Island		10am—3pm
July 10	Mon	RCA Board Meeting	OMSI Classroom1		7pm
July 17	Mon	RCA General Meeting	OMSI Planetarium		7:30pm
July 20	Thurs	Astrophysics/Cosmology SIG	Linus Pauling House		7pm

**August 2006**

Aug 4	Fri	Downtowner's Lunch			Noon
Aug 5	Sat	Telescope Workshop	Swan Island		10am—3pm
Aug 7	Mon	RCA Board Meeting	OMSI Classroom1		7pm
Aug 21	Mon	RCA General Meeting	OMSI Planetarium		7:30pm

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

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