

The

# Rosette Gazette

Volume 21, Issue 12

Newsletter of the Rose City Astronomers

December, 2009



## RCA DECEMBER 21 HOLIDAY POTLUCK!

The December meeting of the Rose City Astronomers will be a holiday potluck and social gathering for all family members to be held in the OMSI Auditorium.

Each member is asked to bring a dish to serve 10-12 people.

If your last name begins with . . .

- A thru E, please bring an appetizer or side dish
- F thru K, please bring a desert
- L thru Z, please bring a main dish

Plates, silverware, and beverages/ice will be supplied by the club. Just bring your dish along with a serving utensil and enjoy the holiday spirit of the RCA membership.

The Holiday Social is a great event to pick up some excellent holiday deals! Save time to shop at the RCA Sales Table for your favorite astronomy gifts. In addition, the Swap Meet will be back by popular demand and there will be ample empty tables around the lobby for everyone who is interested in displaying items for the Swap Meet. There will be music by Howard Knytych. Jan Keiski will present some of her photos in a multimedia slide show with music and effects by Duncan Kitchin.

There will also be tables provided for interesting celestial displays. If you have taken any astronomy pictures this year and want to share them, this is your ideal opportunity. Members also bring their latest inventions and "astro stuff." If you have a fun gadget, item, or tool, please bring it in and show it off to the rest of the membership!

Note that December 21 is the THIRD Monday of the month which is the evening of our normal general meeting. We hope to see everyone there!

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

### All are Welcome! Monday December 21

#### Festivities Begin 6 pm

#### Location: OMSI Auditorium

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

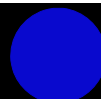
Moon photos below courtesy David Haworth

Full Moon  
December 1

Last Quarter Moon  
December 8

New Moon  
December 16

First Quarter Moon  
December 24



## CLUB OFFICERS

Office	Name	Email
President	Sameer Ruiwale	president@rosecityastronomers.org
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OMSI Liaison	Jan Keiski	omsi@rosecityastronomers.org
Magazines Director	Larry Godsey	magazines@rosecityastronomers.org
SIG Director	Scott Kindt	sigs@rosecityastronomers.org
Youth Programs Director	Jeannie London	youth@rosecityastronomers.org

### RCA MAGAZINE SUBSCRIPTIONS



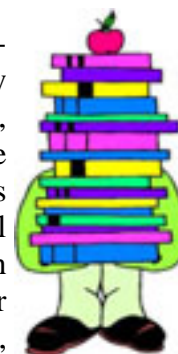
One of the benefits of RCA Membership is a reduced rate subscription to Sky & Telescope and Astronomy magazines. The RCA member rate for Sky & Telescope Magazine is \$32.95 for one year or \$65.95 for two years. The RCA member rate for Astronomy magazine is \$34 for one year or \$60 for two years.

**THIS MONTH ONLY - RENEWALS VIA MAIL IN ONLY**

For more information go to the RCA web site: <http://www.rosecityastronomers.org/mags> Please make checks out to "RCA" mail to the address on the website and allow two months for your subscriptions to be renewed.

### RCA LIBRARY

The Rose City Astronomers maintains a comprehensive club library of astronomy related articles, books, CDs and videos. These items can be borrowed by members through checkout at the general meetings for a period of one month with renewals available by phone or e-mail to the club library director, Jan Keiski.



The RCA library is constantly growing through many donations and the purchase of new materials. A listing of library materials (PDF format) can be found at the library web page:

<http://www.rosecityastronomers.org/library.htm>  
 Jan Keiski <library@rosecityastronomers.org>  
 503-539-4566

# INTERACTING GALAXIES IN THE SOUTHERN SKY

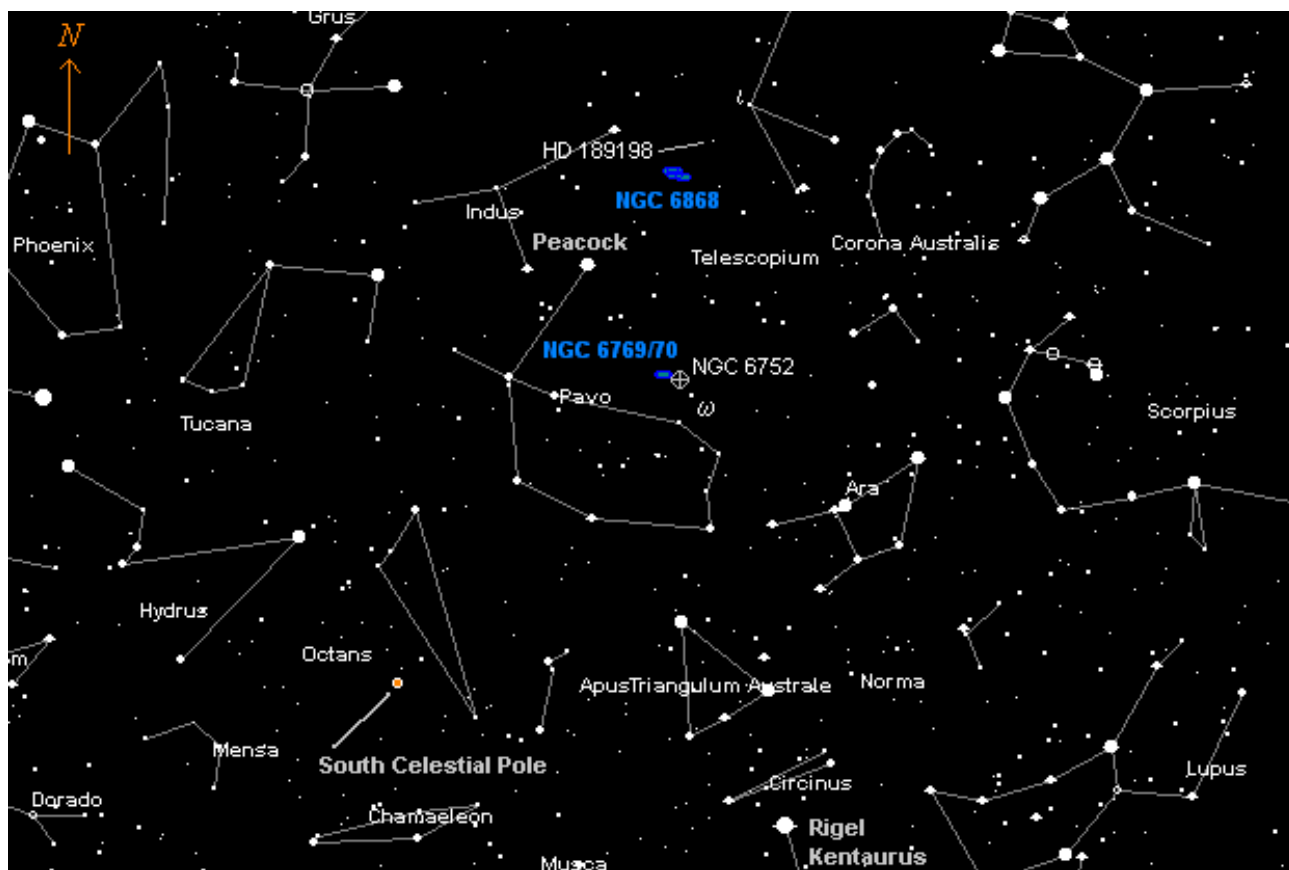
by Leo Cavagnaro

## Part 2. Galaxies in the Spring Southern Sky

On October, 16<sup>th</sup> I went to the mountains to continue with the observations of interacting galaxies, compact groups and galaxy chains I had begun at the end of last year. The reports below are result of the observations I made under a good sky, but not as good as other times in the same place. As I always say, it would be useful to observe these galaxies again under different conditions to compare results.

Last December 2008, I observed some groups of interacting-galaxies situated in some constellations which are home of this kind of objects (e.g. Pavo, Indus, Telescopium, Grus, Piscis Austrinus, Phoenix, Sculptor). In this article I have included reports and information about two groups situated in that area in the sky, namely the GR28 Cluster in constellation Telescopium and a galaxy triplet in Pavo.

### The Disturbed Galaxies NGC 6769, NGC 6770 & NGC 6771



Briefly mentioned in Part 1 of the article “**Interacting Galaxies in the Southern Sky**” appearing in the January 2009 issue of the Rosette Gazette, this small group of three faint galaxies lies in the beautiful constellation Pavo and this time was a target in my observing project because they are better viewed early in the night from here in October.

The observing site was again Villavicencio, a place with dark skies situated about 1,645 meters above sea level, about 31 miles north of Mendoza city.

NGC 6752 is a wonderful globular cluster (see map above)

*(Continued on page 4)*



## Southern Galaxies *(Continued from page 3)*

situated in the north part of constellation Pavo (The Peacock). In my opinion, it is the third most impressive globular after 47 Tucanae and Omega Centauri. This 5.4 magnitude stellar swarm, visible to the naked eye as a faint fussy patch from very dark skies sites, is a neighbor of a small group of three galaxies situated only 1 degree southeast from it.

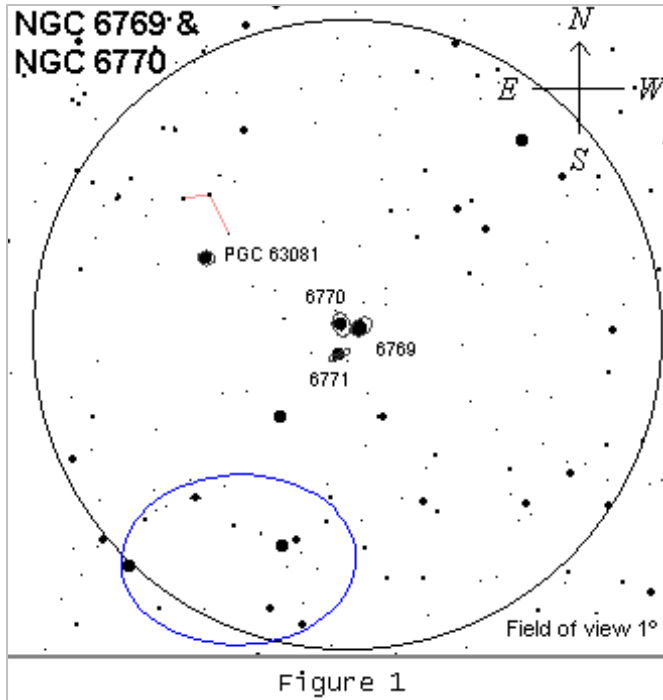


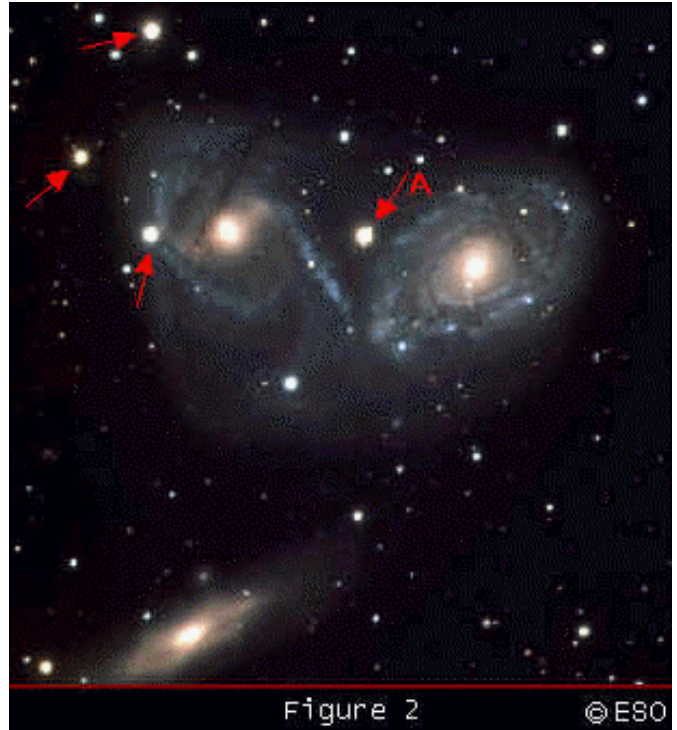
Figure 1

After aiming my telescope at this galaxy triplet I first observed it at low magnification (42x). A very faint and small nebulosity is visible in the region where these interacting galaxies lie. The field shows some relatively bright stars with magnitudes between 8.8 and 9.3 (the brightest in the field which are indicated by a blue ellipse in Figure 1). The pair NGC 6769/6770 looks like a single elongated nebulosity. The galaxy NGC 6771 is barely visible very close to the pair (about 3 arc minutes). Moreover, some very faint stars are visible in the zone of the pair engulfing it. This group is included in Category 3: Interacting Triples in “**A CATALOGUE OF SOUTHERN PECULIAR GALAXIES AND ASSOCIATIONS**” by H. Arp, B. F. Madore and W. Robertson as AM 1914-603.

On the other hand, the small and faint SBb galaxy PGC 63081 (also IC 4845, magnitude 11.9 according to Skymap Pro 6.0) is clearly visible even with direct vision to the northeast of the triplet appearing like a well detached little defocused star. I used the pattern of stars indicated with red lines in Figure 1 to find it.

The use of higher magnification (78x) made possible a better view of the stars surrounding the interacting galaxies. A pattern of four stars was easily identified (indicated with red arrows in Figure 2). This helped me to identify and observe in

detail both galaxies. To the right and very close to the star indicated by **A** in Figure 2 lies the brightest galaxy of the triplet, NGC 6769, an SBb/P galaxy according to the Wolfgang Steinicke's Revised NGC and IC Catalog. Through my 8-inch telescope this galaxy looks round and smooth in brightness. NGC 6770 looks fainter (mag 12.0, SB: 13.2 mag per square arcmin) and the barred galaxy NGC 6771 was very hard to see (higher magnification was necessary).



Using 106x the guide stars and each galaxies are better detected, specially NGC 6771 which is the fainter of the group with a magnitude of 12.6. Always averted vision improved the view.

With even higher magnification (148x) the elongated shape of NGC 6771 comes to the view easily using averted vision. Very close to this galaxy a small group of faint stars looks detached from the field.

### The Cluster GR28 in Telescopium

In the northeast part of constellation Telescopium lies a group of faint galaxies (e.g. NGC 6868, 6861, 6861D, 6851 and 6870) that belong to the cluster GR28 (see Figure 3). At least four (4) galaxies can be observed in the same eyepiece field of an 8-inch telescope when low magnification is used but higher magnification is necessary to see the faintest ones. Other small and faint galaxies with magnitudes around 14 are situated there (see DSS image in Figure 3) but a bigger mirror is necessary to see them.

*(Continued on page 5)*

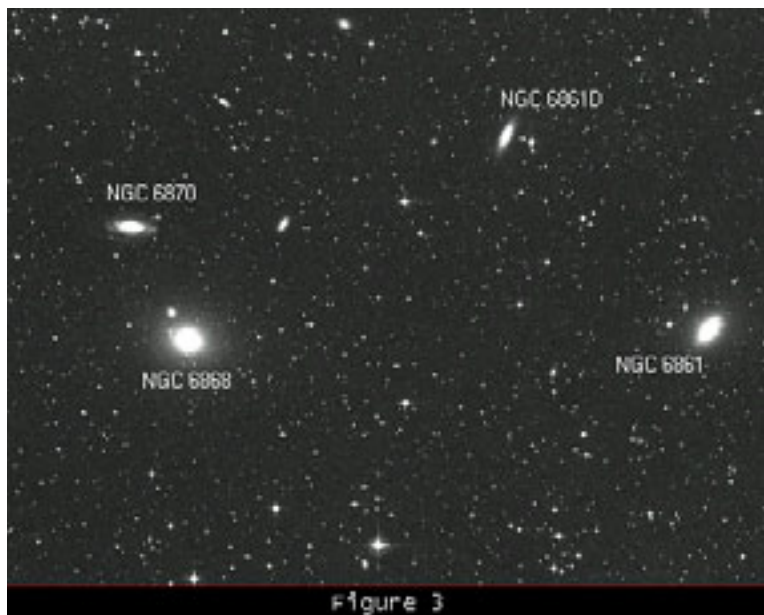


Figure 3

The pattern of stars indicated with the blue ellipse in Figure 4 was useful to find the major galaxy in the group, NGC 6868. Working at low magnification (42x) this elliptical galaxy was visible even with directed vision in an interesting star field appearing small, round and with a bright and sharp star-like core. The brightness of this galaxy drops outward. NGC 6868 is the brightest galaxy of the group. This is an elliptical galaxy (classified as E3 in RC3<sup>1</sup> and E2 by the Revised NGC/IC Catalogue).

Seemingly, the main source of gas ionization in this galaxy is non-thermal suggesting the presence of a LINER at the galaxy center (you can read more on NGC 6868 in the paper **“Star Formation, Metallicity Gradient and Ionized Gas: Clues to the Formation of the Elliptical Galaxies NGC6868 and NGC5903”** M.G. Rickes, M.G. Pastoriza and C. Bonatto Departamento de Astronomia, Universidade Federal do Rio Grande do Sul, Brazil February 2008). LINERs may be the weakest and most common manifestation of the quasar phenomenon, and can be classified as low luminosity Active Galactic Nuclei (LLAGN) **“LINERs AS LOW-LUMINOSITY ACTIVE GALACTIC NUCLEI”** (Luis C. Ho, Harvard-Smithsonian Center for Astrophysics).

According to Savage et al. (1977) it is also a radio source.

The stars GSC-8396-1362 and GSC-8396-0092 indicated with letter **D** in Figure 4 were used to easily find and identify NGC 6861 which was clearly visible at this magnification looking smaller than NGC 6868, round and with smooth brightness.

NGC 6870 was not visible at low power. Surrounding the position where this galaxy lies a line of stars is identified (marked with red lines in Figure 4). The very faint star **B**

(GSC-8396-0396 with a visual magnitude of 13.8) being barely visible with averted vision. At only 1.5 arc minutes from this star the galaxy should be visible but it was impossible at 42x. For very brief moments something seems to be visible but doubtless you need higher magnification in order to get a more clear view of this Sab type galaxy and make a detailed observation of it.

Another faint and small galaxy lies about 18.5 arc minutes northwest to NGC 6868, NGC 6861D which is the faintest member of the group. This E-S0 galaxy was not visible at 42x through an 8-inch telescope. However, you can use the 10.4 magnitude star TYC 8396-1542-1 (**C**) to find the accurate region where this galaxy is visible.

Observing the zone with higher magnification (83x) NGC 6868 is easily observed with its bright inner part. It resembles to me a small globular cluster with a low Shapley-Sawyer concentration class. The stars near NGC 6870 are better seen, specially the star **B**. This made possible the identification of NGC 6870 which was hardly detected. Averted vision was necessary to glimpse this galaxy. NGC 6870 is a good target to know how well your eye works when it is observed through an 8-inch telescope.

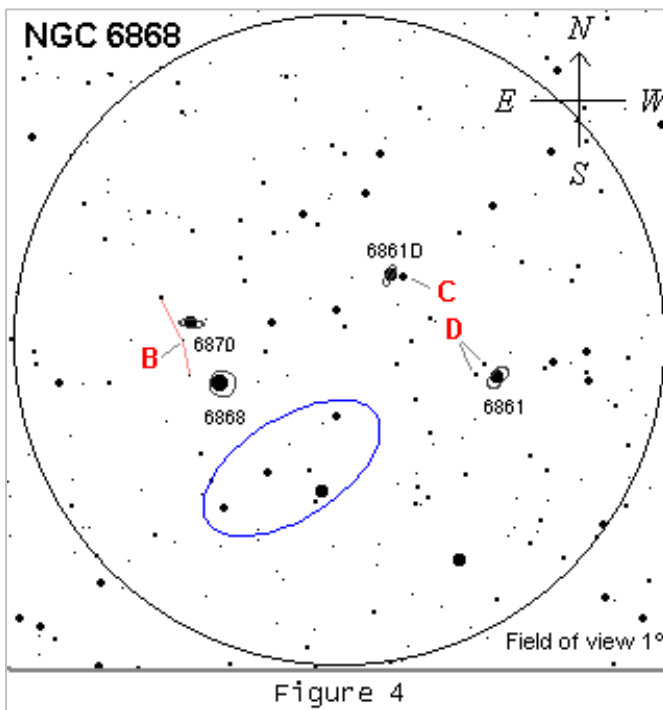


Figure 4

NGC 6861 is easier to see at this magnification appearing round at first glance. Observing carefully with averted vision the galaxy seems to have a little elongated shape.

(Continued on page 6)

## ***Southern Galaxies*** (Continued from page 5)

On the other hand, NGC 6861D is at the threshold of visibility through an 8-inch telescope at this magnification. Very close to the star **C** is visible for moments with averted vision like a faint and small nebulosity. The overall shape was hard to determine, higher magnification is necessary to study this galaxy better.

A last observation of this group of galaxies at even higher magnification (106x) makes it possible to observe NGC 6870 with more details. It shows an elongated shape and smooth brightness. NGC 6861D was also visible with averted vision at 106x looking round in shape.



**This Article Is Dedicated To The Memory Of My Very Dear Mother, April 1939 - September 2009**



*Photo by Jan Keiski*

### **RCA 'Downtowner's' Lunch**

Join us on the first Friday of each month for lunch at a great downtown restaurant (Holidays and such may push us to the second Friday of some months, check the calendar at <http://www.rosecityastronomers.org> ).

The location is announced on the RCA general forum discussion list at <http://www.rosecityastronomers.org/forum> under special interest groups. The meeting is normally Kell's Irish Pub at Second and Ash.

Always great conversation and food.

For more information contact: Margaret Campbell at [secretary@rosecityastronomers.org](mailto:secretary@rosecityastronomers.org)

### **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://www.rosecityastronomers.org/donate/site.htm> for more information.

Or Contact: David Nemo

<[sitefund@rosecityastronomers.org](mailto:sitefund@rosecityastronomers.org)>

### **Telescope Workshop**

When: Saturday, December 5th, 10:00 AM - 3:00 PM

Place: Technical Marine Service, Inc.  
6040 N. Cutter Circle on Swan Island

For more information contact:

Director: John DeLacy [johncdelacy@comcast.net](mailto:johncdelacy@comcast.net)

Assistant: Don Peckham [don@dbpeckham.com](mailto:don@dbpeckham.com)

### **Astro-Imaging Special Interest Group**

The "AI-SIG" is about advancing the skills of beginner, intermediate and advanced astro-imagers. We rely on the skills of our members to bring each other along as we image the beautiful night sky and its many wonders. Whether you use a CCD, DSLR, point-and-shoot or film camera, members of this group can help you achieve better images with less effort and frustrations. Please join us as we learn together to produce "stellar" images!

Next Meeting: Monday, December 14th, 2009, 6:30pm

Beaverton Public Library

In Meeting Room B

12375 SW 5th St, Beaverton

### **Science Special Interest Group (SCI-SIG)**

Next meeting is December 5th at 3pm. Following the Telescope Workshop at Technical Marine Services.

This group is for people who would like to advance their skills in astronomy beyond casual observing. Various projects that some group members are involved in include; variable and double star observing, occultations, photometry and astrometry. A science background is not required, however a curious mind does help.

Location: Technical Marine Service, Inc  
6040 N. Cutter Circle on Swan Island

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

Tom Nathe [sigs@rosecityastronomers.org](mailto:sigs@rosecityastronomers.org)



*This month's theme of the International Year of Astronomy is "Discovering New Worlds"*

## Discovering New Worlds

By Tom Koonce

My Grandfather was born exactly 100 years ago. I remember him telling me that he and his friends used to watch in amazement as early automobiles passed horse-drawn carriages. He was always interested in technology, sometimes wondering if men would ever make it to the moon, and if they did, what creatures might live there, or even if there might be men that already lived there. You may have heard similar stories from your grandparents or great-grandparents from that era. In just 100 years our world has experienced tremendous change. The pace of the transformation is accelerating; a "Moore's Law" for information, innovation, and discoveries unimagined even a few decades before.



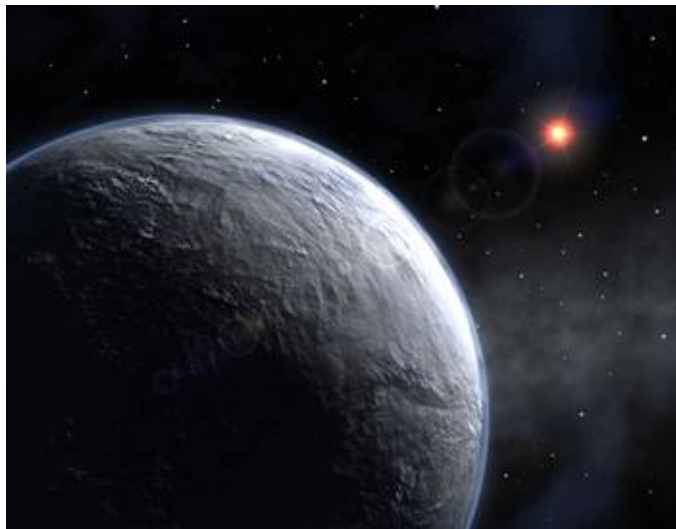
*Image Credit: Library of Congress*

It wasn't that long ago when the universe was imagined to extend beyond our own Galaxy. The rough dimensions of the Milky Way have only been known since the 1920's from the initial work of Kapteyn and Shapely. For that matter, considering how long thinking, rational human beings have existed, the concept that the Earth revolves around the Sun and not the other way around is a relatively recent mental model for our species, only with us since Aristarchus of Samos (310 B.C. to c.a. 230 B.C.) proposed it approximately 17 centuries before Copernicus. In both of these cases, it is interesting that the general public at the time did not immediately react to the revolutionary ideas. These fundamental changes in our models of the universe raised interest in scholarly circles, but were seen as irrelevant information to the everyday lives of the common man and woman.

Mankind is in the midst of yet another fundamental change in

its perception of the universe. Scientists and others interested in astronomy are understandably excited about the discovery of numerous worlds around other stars, but few others outside the astronomical community understand the implications of the discovery. The universe is populated with a great multitude of planets! The variety of these bodies appears to be unbounded. Their sizes and orbits have been unexpected and will one day lead to a definitive understanding of the process by which planetary systems are formed.

We have gone from science fantasy regarding the existence of other planets – Flash Gordon and Star Trek – to scientific fact. The existence of extra-solar planets was confirmed in the 1990's, and now we are stunned in 2009 by the sheer number of planets being detected. Within the past 100 years, we've discovered that there are likely planets around nearly every star. We can assume that this is representative of the rest of our galaxy and logically, the rest of the observable universe. The NASA planet-finding mission, the Kepler Mission, is on the verge of discovering how many Earth-like planets exist in a typical part of the sky. Isn't this exciting stuff?! We've progressed from horse-drawn carriages to discovering Earth-like worlds around distant stars - in only 100 years!



*Image Credit: ESO*

As we wrap up 2009, the International Year of Astronomy, amateur astronomers have gone out of their way to conduct public outreach events to get the general public involved in amateur astronomy and to get them to look through telescopes. Perhaps as we go forward into 2010, we can take it upon ourselves to share our sense of wonder and awe for the heavens, and to make the time to truly inspire young minds with the wondrous changing view of a universe filled with planets... and promise for future adventure. Let's inspire the next generation to challenge our understanding of the universe as we discover endless new worlds.



## BOARD MEETING MINUTES

October 5, 2009

OMSI Classroom 1

Margaret Campbell-McCrea

Attending: Dawn Willard, Diane Fredlund, Dale Fenske, Larry Godsey, Ken Hose, Jan Keiski, Sameer Ruiwale, Matt Brewster, Howard Knytych, Greg Rhode, David Nemo, Margaret Campbell.

Guests: Scott Kindt, Duncan Kitchin

The meeting came to order at 7:10 p.m.

### Board Reports

- Secretary's Report – Margaret Campbell: Quorum (10) met with 12 voting members present.
- Treasurer's Report – Larry Godsey handed out the balance sheets and profit and loss statements. The RCA current assets are \$21,165.91 and the Site Fund current assets are \$19,555.19, for a total of \$40,721.10.
- VP Programming – Matt Brewster reported that our speaker for October is Ken Crosswell, who will speak on the lives of stars. Matt is making plans with Mark Claire for November's program. December's program is the annual potluck, with Howard Knytych providing music. January is our GAMA program, and Lawrence Doyle will come sometime early next year. Matt will send publicity regarding these events to the newsletter, Forum and webmaster.
- There was some discussion of raffling off one or two of our excess scopes as a fund-raiser for the Site Fund at the December potluck. David Nemo and Greg Rhode will decide which scope(s) to raffle, David Nemo will get some tickets and decide how much to charge.
- VP Observing – Matt Vartanian - - No report. Larry Godsey reported that there are two Camp Hancock star parties scheduled for next year, and one at Goldendale coming up in October. Jim Todd has created the OMSI star party schedule for 2010. All OMSI events for 2010 are at quarter moons.
- VP Community Affairs: Dawn Willard reported that there were 250 people at the Jackson Bottom Star Party with 12 volunteers, and there were 60 people and 10 volunteers at last night's event. There are several other events coming up in October. Dave Powell is taking up some of the events, since Dawn's schedule is full. Dawn will report to Larry Godsey the number of volunteer hours we've done so we can report this information to the IRS. There was some discussion about holding a raffle for star-party volunteers next year. Larry Godsey will check if this conflicts with our 501-C3 status.
- Media: Diane Fredlund reported that she gave Matt Zafino's information to Matt Brewster. She has been sending our meeting information to all the regional newspapers. She has contacted Think Out Loud at OPB about the possibility of having a special program on dark sky issues. Margaret will put her in touch with Dawn Nilson about this project.
- Membership: Ken Hose reported that we have 277 member-families. There were 15 new members and 35 renewals in September. We took in \$1,159.00 in dues. Last year at this time we had 254 member-families, and two years ago we had 206.

- Sales – Margaret Campbell: \$381.90 in sales in September.
- New member advisor: Howard Knytych reported that there will be a new members' presentation at the October meeting.
- Book Library – Jan Keiski: Nominal.
- Telescope Library – Greg Rohde: Nominal.
- Webmaster: Larry Godsey - - Nominal.
- Site Fund: Dave Nemo has located a couple of properties in the Goldendale area. He asked for volunteers to go look at them.
- Youth director: Jean London - - No report.
- SIGs: No report.
- ALCOR: Dale Fenske reported that we will pay a little more for our AL membership because our membership numbers were up in December over the year before. Our payment due in June is based on the December membership numbers.
- OMSI –Jan Keiski. Jim Todd has revised the 2010 meeting schedules based on our inquiries. See OSMI meeting calendar attached below.
- Sister Club update – Jan Keiski: Nominal.

### Old Business / Action Items

- Mirror-making machine has been assembled but it's not working yet, so no instructional material has been made yet.
- Jan continues to work on the January meeting program. We have not yet invited an RCA speaker for our portion of the program.
- The striped tape at Stub Stewart is holding up well after several weeks, so Greg will go out and apply the rest soon.
- Warnings about using green lasers have been made at two meetings, and on the Forum.
- The election committee has had three volunteers for our three open positions: Larry Froburg (and daughter) for the Sales Table, Duncan Kitchin for Secretary, and Scott Kindt for SIG director.
- Larry has sent out renewal reminder notices to 178 people. 114 have not renewed, 78 people have been knocked off the Forum, but they can reinstate if they renew.

### New Business

- Appointed Board Positions: Since the SIG director and IDA liaison positions are not elected positions, but appointed, Sameer made a motion to appoint Scott Kindt as our SIG director and Dawn Nilson as our IDA liaison. The motion was seconded by Greg Rhode. The motion carried.
- Adding imaging equipment to the telescope library: There was a very lively discussion about adding imaging equipment to our telescope library. Matt Brewster is going to make a formal proposal regarding this idea to the Board next month. In the meantime, he'll have a committee of astro-imagers to help him with the idea and will continue the discussion on the Forum.

(Continued on page 9)



## August Board Minutes *(Continued from page 8)*

Ken Hose, Sameer Ruiwale and Duncan Kitchin will begin working with Matt Brewster on this proposal.

- Minor Catalogs project: Margaret Campbell reported the inception of this project to raise funds for the Site Fund, and asked to have a monthly update on the project as part of Old Business at future meetings.

The meeting was adjourned at 8:30 p.m

### To Do:

- Matt Brewster will provide publicity information to the Newsletter Editor, the webmaster and to Diane Fredlund. Also, work up proposal regarding on imaging-equipment-in-the-telescope-library, in consultation with Ken Hose, Sameer Ruiwale, and Duncan Kitchin.
- Greg Rohde will decide which scope to raffle off at December's meeting.
- Dave Nemo will get some raffle tickets, determine the price, and begin the publicity.

- Diane Fredlund will follow up with Think Out Loud at OPB. She will create an article about the refurbishing of the 12.5" telescope.
- Dawn Willard will send Margaret Dawn Nilson's email address.
- Sameer will contact Stub Stewart about their policies for impromptu star parties, and work with Matt Brewster, et al on imaging-equipment-in-the-telescope-library idea, and notify Dawn Nilson of her appointment as IDA liaison.
- Ken Hose will work with Matt Brewster, et al on imaging-equipment-in-the-telescope-library idea.
- Duncan Kitchin will work with Matt Brewster, et al on imaging-equipment-in-the-telescope-library idea.
- Larry Godsey will check to see if having a raffle for volunteers at a year-end potluck would conflict with our tax status.

### 2010 OMSI meeting room schedule:

#### RCA Board Meetings: (1st Monday of month)

Jan 4 - Classroom 1	July 12- Parker Room
Feb 1- Classroom 1	Aug 2- Parker Room
March 1- Classroom 1	Sept 13- Classroom 1
April 5- Classroom 1	Oct 4- Classroom 1
May 3- Classroom 1	Nov 1- Classroom 1
June 7 - Parker Room	Dec 6- Classroom 1

#### RCA General Meetings (3rd Monday of month):

Jan 18 - Auditorium	July 19- Planetarium
Feb 15 - Planetarium	Aug 16- Planetarium
March 15 - Auditorium	Sept 20 - Auditorium
April 19 - Auditorium	Oct 18 - Auditorium
May 17 - Auditorium	Nov 15 - Auditorium
June 21 - Planetarium	Dec 20 - Auditorium



## Holiday Fun!

Submitted by By Tom Koonce,  
Antelope Valley Astronomy Club, Lancaster, California

How many star terms can you find hidden in the puzzle? Words may be written horizontally, vertically, diagonally, left to right or right to left. Circle each word as you find it.

### Star Terms:

*hot, atoms, nebula, supernova, neutron, red giant, cycle, sphere, energy, fusion, core, galaxy, hydrogen, evolve, gas, cloud, glow, x-ray.*

N	G	F	C	E	L	S	I	U	A	A
E	N	T	U	L	S	D	W	C	I	L
B	O	N	A	S	S	P	E	O	G	U
U	R	A	I	H	I	M	H	R	D	B
L	T	I	G	Y	E	O	O	E	E	E
E	U	G	A	D	T	V	N	T	R	N
L	E	D	L	R	O	E	L	W	A	E
C	N	E	A	O	R	D	U	O	L	C
Y	A	R	X	G	A	S	Y	L	V	U
C	T	O	Y	E	N	A	I	G	X	E
A	A	V	O	N	R	E	P	U	S	N

# DECEMBER 2009

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

December 4	Friday	Downtowner's Luncheon	Kell's	Noon
December 5	Saturday	Telescope Workshop	Swan Island	10am-3pm
December 5	Saturday	Science SIG	Swan Island	3pm
December 7	Monday	RCA Board Meeting	OMSI Classroom 2	7pm
December 14	Monday	Astro Imaging SIG	Beaverton Public Library	6:30pm
<b>December 21</b>	<b>Monday</b>	<b>Holiday Potluck</b>	<b>OMSI Auditorium</b>	<b>7pm</b>

## January 2010

January 2	Saturday	Telescope Workshop	Swan Island	10am-3pm
January 2	Saturday	Science SIG	Swan Island	3pm
January 4	Monday	RCA Board Meeting	OMSI Classroom 1	7pm
January 8	Friday	Downtowner's Luncheon	Kell's	Noon
January 11	Monday	Astro Imaging SIG	Beaverton Public Library	6:30pm
<b>January 18</b>	<b>Monday</b>	<b>General Meeting</b>	<b>OMSI Auditorium</b>	<b>7pm</b>
January 20	Wednesday	Cosmology SIG	Linus Pauling Complex	7pm
January 30	Saturday	Telescope Workshop	Swan Island	10am-3pm
January 30	Saturday	Science SIG	Swan Island	3pm

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.rosecityastronomers.org>).

<http://www.rosecityastronomers.org>

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