May 2005

The Voyager

East Valley Astronomy Club

Volume 19 Issue 5

From the Desk of the President
by Steven Aggas, 2005 EVAC President

First and foremost I would like to thank the individuals that participated in the roadside cleanup last month. We had a good turnout and it was a very nice day to spend outside. Thank you all, we'll have another opportunity in November if any of you are available. Secondly, I would like to thank Randy Peterson for volunteering to continue where Dave Williams left off as Co-Events Coordinator. Randy, your help is most appreciated. Thirdly, I would like to ask one more time for someone within EVAC to help the club as Secretary. It stands to reason that those who volunteer their time to make a better club, including the meetings, that when one position goes unfilled that the club can suffer. Don't let that happen! The requirements for Secretary are that you will attend the meetings, something that any occur anyway. The extra items are to jot down notes during the meetings and attend the couple of remaining Board of Directors meetings. Please consider helping EVAC maintain the quality we've come to enjoy.

Things just keep gettin' better…it seems the winter rains are gone and we are in for three months of clear skies! (There aren't too many places where you can say that!) Inside

(Continued on page 12)

The Backyard Astronomer
The Lilliputian World of the Refractor *by Bill Dellinges*

An odd thought occurred to me recently. The owner of a refracting telescope lives in a world where his largest telescope is generally the smallest telescope - aperture wise - recommended for the reflector owner! It's often stated that a 6 inch reflector is the minimum size telescope a budding backyard stargazer should consider. It will provide decent views of many of the night sky's wonders. An 8 inch is even better. After a while, the reflector person notes the awesome light gathering power of 10" to 14" scopes. Then he/she looks through a 17" or 20" and WOW!

On the other hand, the refractor people may start out with the venerable 2.4" (60mm) telescope, then move up to perhaps a 3.1" (80mm). Their dream is to someday move up into the fast lane with the big boys and get a 4" or 5" model. The ultimate acquisition would be the Holy Grail of refractorland, the SIX INCH! Refractors tend to be more expensive than reflectors. While a 6" reflector may be had for around $300-$600, a top quality 6" refractor with mount can cost $10,000 (notwithstanding the $1000 Chinese 6" imports of questionable quality). That's over a thousand dollars per inch of aperture compared to $100 per inch for the reflector. Yikes!

It isn't just price constraint that limits the refractor nut to 6". Even with today's short focal ratios of

(Continued on page 2)

Inside this issue:

May Events:

- *Desert Sunset Star Party 5/4*
- *Deep Sky Star Party 5/7 at Vekol Road*
- *Public Star Party 5/13 in Gilbert*
- *Monthly Meeting 5/20 at Southeast Regional Library*
- *Local Star Party 5/28 at Boyce Thompson*

(Continued from page 1)

F7 or so - thanks to new low dispersion glass - a 6” refractor requires a tall massive mount costing $5000 or more.

So what gives with these refractor people? They seem to march to the beat of a different drummer. Like the kind of guy who wears a bow tie. Well, there’s just something very classy about refractors. After all, they were the first type of telescope invented back in 1608, and they look like what you’d think a telescope should look like!

The refractor has many attributes. They are rugged instruments, and rarely get out of collimation. Focusing is smooth with no mirror shift and objects “snap” into focus. The closed tube keeps out dust and tube currents. Their smaller diameters cool off faster and are more forgiving of bad seeing. With no secondary obstruction (as in reflectors) and utilizing internal baffling (lacking in reflectors) images are sharper and have more contrast. Contrast? What’s that? Look at a moon crater shadow with both scopes. The refractor’s image of the shadow will be darker, or blacker than that of the reflector’s image. That’s an example of better contrast. It manifests itself as a richer, sharper image.

I used to think my C-8 gave great views of the moon. After looking at the moon with my Televue 85 (3.3”) or Astro-Physics 5”refractor, I want to take the C-8 to the city dump. There is just no comparison. The refractor view is much more pleasing and impressive. This superior resolution and contrast of refractors also pays dividends on planetary and double star observation. I have seen my C14’s piggybacked Televue Ranger (70mm/2.7”) resolve double stars better than the main scope, albeit dimmer images. The same holds true on Jupiter and Saturn. They’re sharper in the refractors, though dimmer. This is not a problem with Jupiter so much, but I must admit Saturn, at twice the distance of Jupiter, does get a tad dimmer than I’d like at high power in the 5”.

But ohhhh, the double stars! Refractors show pinpoint stars at low power and little BB like Airy disks at high power rather than mushy blobs. Many a night I’ve resolved a double star with the 2.7”, 3.3”, or 5” that my C-8 or C-14 couldn’t handle. Jupiter’s moons show disks rather than starlike images. Often I’m asked by attendees of a star party why my 5” is showing better views of something than the larger scopes nearby (of course it can’t compete with the bigger scopes on faint deep sky objects).

Now, before you trade in your Schmidt-Cassegrain (SCT) or Newtonian scope for a refractor, I have two words for you: Aperture wins.

The top of the line 6” refractor is still only a 6” instrument. By today’s standards, that’s not much light gathering power. It is, as discussed above, superb on *intrinsically bright* objects like the sun, moon, planets, double stars, and a few bright open clusters. But keep in mind you could buy a computerized 10 or 11 inch SCT (with six times more light gathering power) for the same price of a high end 4” refractor with mount.

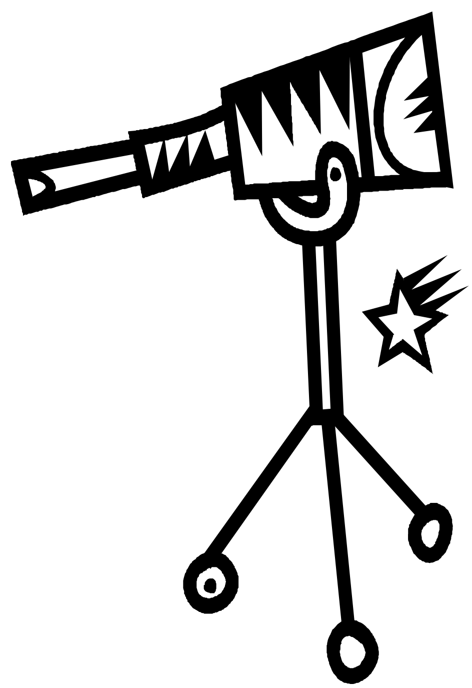
So if you’re after the wow factor in viewing galaxies, globular clusters, and nebulae, you’re better off going with a “light bucket.” On such objects, resolution is not of paramount importance. What is, is how many photons the scope can gobble up. I remember my first view of globular cluster M13 in Hercules in my C-8. With my previous scope, a Unitron 4” refractor, it was an amorphous blob. In the 8 the cluster was resolved to the core. It blew me away.

I find too, I prefer the view of Saturn in my C-14. Its larger aperture insures the image maintains brightness whereas the 5” shows a falling off of brightness at higher powers, as mentioned above. The bigger scope shows its moons more prominently too.

By the way, should you want big aperture *and* resolution, one can use a reflector with a secondary obstruction of 20% of its aperture or less and maintain near refractor- like images according to experts. The typical SCT’s secondary runs about 33% of its aperture. That’s a pretty big meatball to have in the optical path.

If I could have ONLY one telescope, I’d choose an SCT in the 10/11 inch range for its ample lighting gathering ability and portability. They’re hard to beat for a general purpose telescope. In a light polluted city a 4” refractor might be a fine choice.

Even going with the SCT option though, I think I’d find owning a refractor for a second telescope irresistible, perhaps as a “grab and go” instrument. They offer inherent simplicity, fine all metal craftsmanship, and that trademark crystal clear objective lens. In the immortal words of EVAC’s Don Wrigley, “With refractors, it’s all about the purity of the optics.”



Space Quarantine
by Henry De Jonge

Since the space program began, planetary protection has concerned scientists and really became a big issue during the Apollo Program. Defined as the prevention of "human caused biological cross contamination between the Earth and other bodies in the solar system", [1], this includes things like earthly bacteria that could contaminate the spacecraft or interfere with scientific equipment, and microbes that may cause damage to other planetary environments. It also includes microbes that may be brought back to earth from space, and interfere with our planetary environment.

These concerns are classified into two broad categories, one called "forward contamination" which is the transport of terrestrial microbes on outbound spacecraft and the other called "back contamination" which is the bringing back to Earth of life-forms originating from space or other planets, [1].

Planetary Contamination, Microbes, and Life

With no definitive proof life exists beyond Earth we are dealt a major problem. The philosophy followed to date seems to be "better safe than sorry", [1]. Of course, any discovery of back contamination or survivable forward contamination may well alter our thinking about life regardless.

The more we learn about the tenacity and diversity of life on Earth the more we believe life may exist in space and other planets. The discovery of extremophiles (Earth life found in intolerable, hostile, environments) shows how tough and adaptable primitive life forms can be. [4]. We are opening our minds to ideas that extreme environments may be capable of supporting other Earth organisms also, [1]. Current worldwide scares from SARS and mad cow disease have increased our awareness of the consequences of poor or nonexistent contamination and quarantine measures, [2].

We know life can remain dormant for considerable periods and bacteria can endure the extreme cold, dry vacuum, of outer space for months and perhaps even years, [2,4]. In 1995, scientists reported the reanimation of bacterial spores from the digestive tracts of bees that were sealed in amber for roughly 25-40 million years! Other spores have supposedly survived the 3000 degree C temperature of a rocket exhaust and the –269 degree C temperature of liquid He, [4].

One theory explaining the origin of life on Earth maintains it was transferred here from Mars, by meteorites. Some meteorites on Earth have originated from Mars so this theory may have validity, [2,3]. It's a variation of the Panspermia theory that has been around for 100 years, and claims that life on Earth and Mars is closely related. Panspermia theory says life originated by the passing of spores from planet to planet, via meteorites and space dust, [3].

The "garbage theory" is another version of the origin of life, saying it may be possible to seed life on another planet by releasing microbes into the virgin environment, [4]. Some scientists believe viruses released by passing comets may cause massive outbreaks of viral diseases on earth, [4]. In 1987 organic molecules were detected in the dust from Halley's comet by the Giotto probe, [4].

Planetary contamination has been addressed internationally. The UN Outer Space Treaty of 1967 partly says: "States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth, resulting from the introduction of extraterrestrial matter…" [1,4].

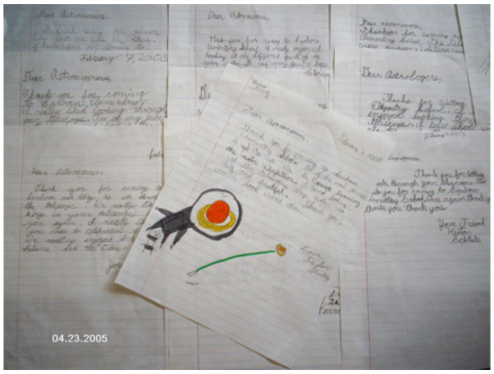
We are taking some contamination precautions, while anticipating new discoveries about life in the cosmos.

Forward Contamination

Together with concerns regarding the global transport of organisms, today's concerns include the transport of organisms from Earth into space and other planets. Mars missions, including the current MER missions, have planetary contamination controls incorporated into mission preparations. NASA even has a Planetary Protection Officer, [1]. How do we incorporate such controls? They are manifest in many of the procedures and measures in mission creation.

One main control measure is the assembly of the components of a spacecraft and final assembly are completed in clean rooms, [1]. The Viking and Pathfinder missions incorporated clean room assembly to help prevent microbes from Earth contaminating Mars, [2]. Clean rooms prevent organisms, dust, and other foreign matter from getting in the spacecraft and its components. This is done using highly efficient HEPA air filters, laminar airflow, rigorous clean room procedures, and covering the human body as much as possible.

During space flight air, water, and surfaces, which have human interaction, must be kept clean. The surfaces are kept clean by wiping. The air is HEPA filtered. The water is disinfected by use of a catalytic oxidator that heats the water to 265 degrees F, after which it is treated with iodine, [5]. The humidity is regulated to keep down fungal and microbe growth, [5]. Heat treatment, (oven baked for 30 hours at 110 degrees C) and sterilization measures can be applied to spacecraft parts to reduce chances of microbe survival. Other measures include designing the trajectories for minimal chance of contact with other bodies, to avoid a crash. We need to consider ejecta and debris from the landing, (and any



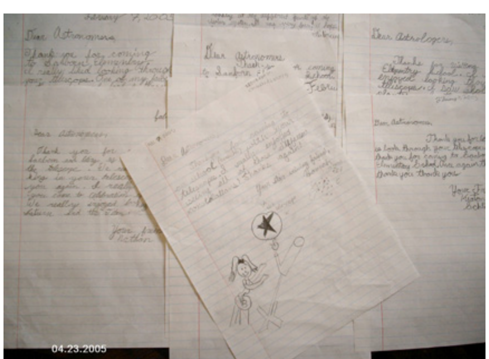
EVAC Reaching Out

We had a great turnout of 6 EVAC members with telescopes at the recent Sanborn school star party. The kids, teachers and parents were very appreciative to look through our telescopes.

They also presented us with a couple dozen letters written a few months ago when we last visited their school. The letters are probably hard to read, but they all start out "Dear Astronomers, thank you for coming to Sanborn school". They then tell their favorite objects that they viewed. A couple even drew pictures - the one featured above is of a kid standing on a step stool looking through a scope at Saturn.

The kids at these events are really happy to look through the scopes! If you are able to help with these events occasionally, the efforts can be very rewarding!

EVAC is very much involved in your community. If you would like to join in on the fun, watch the website calendar for upcoming events, or contact your Event Coordinators (Gwen Grace and Randy Peterson) at events@eastvalleyastronomy.org



Space Quarantine

(Continued from page 3)

crashes!) and the possibility it may be contaminated. Samples taken from the surface for analysis should be well away from this material.

Sophisticated risk analysis models are used to help determine when and what protection measures are to be used. In the early Mars programs models estimated the risk of a microbe replicating on Mars to be less than 1/1000 for unmanned exploration. Given our scant knowledge of space life potential, this probability is very difficult to determine realistically, [7].

An example of forward contamination is that microbes were the first inhabitants of the ISS, [5]. The hardware and assembly crew, despite all the clean room assembly and other precautions, carried them there. Furthermore, we now estimate the Viking Lander on Mars contained an estimated 20,000 microbes that may have been viable for replication in a suitable environment, [7].

Depending on the spacecraft destination, if humans are on board, and what the mission parameters are, determines what measures are applied, and to what degree.

Back Contamination

We hypothesize extraterrestrial life may exist or be supported beyond Earth, with no hard evidence of such. The Earth has been bombarded from its beginning with comets, asteroids, and meteorites which may have contained water and organic chemicals, [2].

According to the SETI Institute there are 2 main types of potential alien pathogens to protect Earth from. These are toxic pathogens and infectious pathogens. Toxic pathogens act like a poison on other organisms, while infectious pathogens are like viruses or bacteria passed between organisms causing illness, [2].

Not all such encounters may be fatal or even contagious to humans, especially if the extraterrestrial microbe is incompatible with human physiology. This is like chicken farmers not becoming infected when a disease wipes out their flocks, [2]. There are many instances of infectious pathogens working across large evolutionary distances on earth. An example is a bacterium that has gone from humans to the devastation of Caribbean coral, [2]. Mars may produce pathogens that are inert to our bodies, or perhaps life on Mars would be highly evolved from life here on Earth and yet may not provide a barrier from infection, [2].

There are plans to bring back samples from Mars in 2016, [2] and in another mission the NASA Stardust mission recently captured some comet dust from the Wild-2 comet, (about a milligram) and will return to Earth in 2006. The NASA Genesis mission has collected particles in the solar wind and returned, (crashed) to Earth. The results of this mission are still under study. The MUSES-C spacecraft is planned to arrive at an asteroid in 2005 and return one gram of material in 2007.

When retuning space or planetary samples, a sample carrier that is extremely durable and cleanly separated from the main spacecraft is designed. It is closely monitored during the trip and opened only in a secure quarantine facility upon return, [1]. Samples like dust and returning equipment can be sterilized, but that involves heating and should be closely monitored and controlled, [2]. Some scientists have suggested that the ISS should handle and inspect samples prior to their return but this is under discussion, [2].

When human missions to Mars take place, planetary protection measures will be employed extensively. These measures will encompass a wide range of mission parameters such as the food supply, the

(Continued on page 10)

May Guest Speaker: Dr. Kevin R. Healy

Dr. Kevin R. Healy received his Bachelors of Science in physics from the New Mexico Institute of Mining and Technology in Socorro, NM. He worked for two years at the National Radio Astronomy Observatory as a Data Analyst, providing operational support for the Very Large Array and Very Long Baseline Array radio telescopes. He then moved to Arizona State University for graduate school and completed his Ph.D. in physics from Arizona State University in 2004.

He will be speaking on the topic of "Low-mass star formation in the H II region environment," or the formation of low-mass (that is, Sun-like) stars in regions of high-mass star formation. This research has implications for the formation of the Sun and Solar System.

Spring Cleaning

Adopt-a-Highway Cleanup Recap

By Martin Bonadio

This year's cleanup was a great success. The weather was fantastic (a little breezy), the wild flowers were in full bloom, and the treasures… well I'll get into that.

First I want to send a big **thank you** to everyone who was able to join me and help. Wayne Thomas and his girlfriend Julie Brozio, Pica Conti, Peri Cline, Jim Fritz, Marty Pieczonka, Jon Christensen, Silvio Jaconelli, Steven Aggas, Bill Dillenges, Randy Peterson, Win Pendleton and Gwen Grace. If I have missed anyone, then thanks also goes out with my apologies for omitting you!

We covered the EVAC mile just west of Florence Junction, and divided into 2 teams – north and south (no this was no civil war re-enactment). In all there were 30 bags collected. The weeds were like trees as we waded through. But as expected there were plenty of treasures. Julie returned with a wonderful Ralph Lauren poster (notice how Silvio is starring at it in the photo above?), while Wayne was clutching what I would like to affectionately refer to as a "hair dryer". But all know this was no hair dryer! In addition a hub cap, water pump, various hardware, and railroad sign were among the top finds. Jon and Silvio rustled a rattlesnake, but unfortunately directed it to the road where it quickly became mincemeat!

After the cleanup we all adjourned to the Village Inn in Apache Junction where we feasted and talked about astronomy. Jon shared some great information about his CCD images, while Silvio, Bill and I discussed binoviewers. Many other side conversations took place and it was clear that everyone had a great time.

I look forward to doing another cleanup in the fall, and again want to thank those who could participate for their help and company on a fine spring morning!

EVAC Cleanup Crew

Classified Advertisements

Two Tele Vue Radian Eyepieces

Focal lengths of 3 mm and 8 mm. Asking $150.00 each. Like new condition in original packages.

An alt-azimuth head from a Tele Vue Gibraltar mount in good condition, just needs legs or permanent pier. Asking $100.00 OBO

Russ (480)554-0815 - days only
rchmela@sedona.ch.intel.com

Meade Pictor 416XT CCD

All components, filters, manuals, adaptors, autoguider and CCD camera are still in their original factory sealed condition and plastic wrap. Why? Well, the Pictor and it's software are intended for use with a Windows computer and I never got around to buying a Windows laptop -- sounds silly -- but that's the fact. The Pictor 416XT uses the Kodak KAF-0400 CCD chip with the extended blue response. As a CCD camera, it's considered among the best available under $5000! The autoguider and camera will connect directly to the control panel jacks of Meade LX50, LX90 (APM) and LX200 telescopes (and probably others with similar electronic relay autoguider ports). See a current ad for this unit at: http://telescopes.net/ccd__cameras.html

The Pictor 416XT normally sells for about $2000 (I paid $2035 with tax), but I'll sell it for $1299 (brand new!!).

John Matthews (602) 952-9808
john-cathy@cox.net

16" f4.5 Meade Starfinder with Equatorial Mount

Optics remounted into a new tube, built by Pierre Schwarr with a JMI focuser. Includes 7, 12.5, 17, 20, and 32mm eyepieces plus 2.8 Klee Barlow, laser collimator and an Olympus OM1 camera.

Many extras! Call or e-mail me for a list. I have $5200 invested in this telescope package, but will sell for $2000

Dave Rainey   602-980-0582   drainey7@cox.net

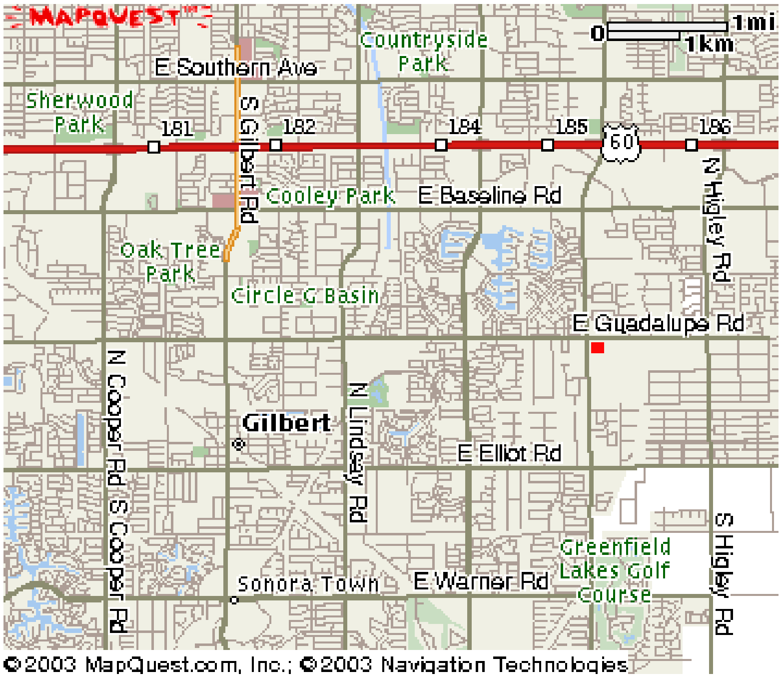
Wanted

2" TV Everbright or equivalent quality diagonal with compression clamp. Must be in excellent condition.

Contact Silvio 480-926-8529 silvioj@msn.com

Only non-commercial advertisements for astronomical equipment will be accepted from current EVAC members. Ads will be published as space permits and may be edited. Ads should consist of a brief text description and must include a current member name and phone number. You may include your email address if you wish. Ads will be run until canceled or until they have appeared in three issues of the newsletter (whichever occurs first). Ads should be emailed to: news@eastvalleyastronomy.org

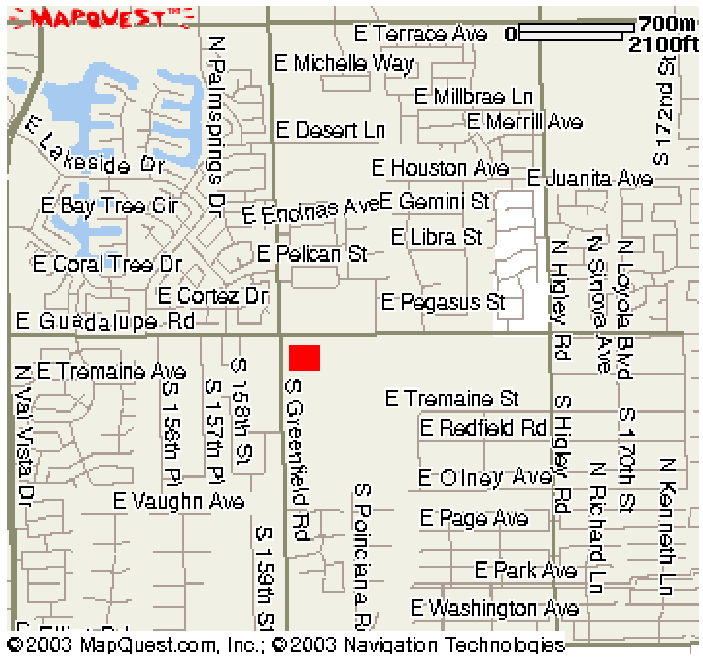
Support your local telescope dealer!



The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

Our meetings are held on the third Friday of each month, at the Southeast Regional Library in Gilbert. The library is located at 775 N. Greenfield Rd., on the southeast corner of Greenfield and Guadalupe Roads. Meetings begin at 7:30pm.

Visitors are always welcome!



2005 Meeting Dates

May 20

June 14

July 15

August 19

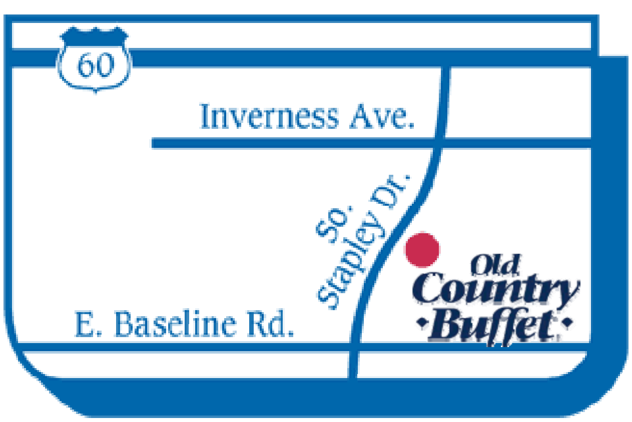
September 16

October 21

November 18

December 16

Southeast Regional Library
775 N. Greenfield Road
Gilbert, AZ 85234



All are welcome to attend the pre-meeting dinner at 5:30 PM. We meet at **Old Country Buffet**, located at 1855 S. Stapley Drive in Mesa. The restaurant is in the plaza on the northeast corner of Stapley and Baseline Roads, (near the Walmart Supercenter) just south of US 60.

Old Country Buffet 1855 S. Stapley Drive in Mesa

May 2005

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**				

Schedule of Events

- *May 4 - Desert Sunset Star Party in Three Points, AZ*
- *May 7 - Deep Sky Star Party at Vekol Road*
- *May 13 - Public Star Party at Riparian Institute in Gilbert*
- *May 20 - Monthly Meeting at Southeast Regional Library in Gilbert*
- *May 20 - Mesa Schools Out-reach Event*
- *May 28 - Local Star Party at Boyce Thompson Arboretum*

Minutes of April General Meeting

Meeting date: Friday, April 15, 2005

Meeting location: Southeast Regional Library in Gilbert.

President Steve Aggas opened the meeting at 7:30 p.m., followed by the introduction of Officers and Board members.

Steven presented a brief overview of the club's financial status.

Steven announced that this year's All-Arizona Star Party will feature an EVAC hospitality tent.

Event Coordinator Gwen Grace spoke of upcoming events.

AJ Crayon presented awards from the 2005 All-Arizona Messier Marathon.

President Aggas announced the need to fill both the Secretary and an Event Coordinator position for the remainder of the year. Randy Peterson was nominated for and elected to the Event Coordinator position. The Secretary position remains open.

Recognition

Richard Jacobs donated his compensation for a recently published photograph (M1 in March issue of Sky and Telescope) to the club, and this money will be used to add to our library.

Member Presentation

Pedro Jane' – His video of the 2005 All-Arizona Messier Marathon was played during the break.

Guest Presentation

Dr. Todd Bostwick, City of Phoenix archaeologist, spoke about local archaeoastronomy. His talk centered on the influence of the Sun on ancient native cultures, and their ability to construct accurate calendars.

East Valley Astronomy Club -- Membership Form

Please complete this form and return it to the club Treasurer at the next meeting or mail it to EVAC, PO Box 2202, Mesa, Az, 85214-2202. Please include a check or money order made payable to EVAC for the appropriate amount.

IMPORTANT: All memberships expire on December 31 of each year.

Select one of the following:

- ☐ New Member
- ☐ Renewal
- ☐ Change of Address

New Member Dues (select according to the month you are joining the club):

- ☐ **$20.00** January through March
- ☐ **$15.00** April through June
- ☐ **$10.00** July through September
- ☐ **$25.00** October through December

Includes dues for the following year

Renewal (current members only):

- ☐ **$20.00** January - December

Magazine Subscriptions (include renewal notices):

- ☐ **$29.00** Astronomy
- ☐ **$33.00** Sky & Telescope

Name Badges:

- ☐ **$10.00** Each (including postage) Quantity: ______

Name to imprint: ____________________

Total amount enclosed: ________

Please make check or money order payable to EVAC

- ☐ Payment was remitted separately using PayPal
- ☐ Payment was remitted separately using my financial institution's online bill payment feature

---

Name: ________ Phone: ________

Address: ________ Email: ________

☐ Publish email address on website

City, State, Zip: ________ URL: ________

How would you like to receive your monthly newsletter? (choose one option):

- ☐ Electronic delivery (PDF)
- ☐ US Mail

Areas of Interest (check all that apply):

- ☐ General Observing
- ☐ Cosmology
- ☐ Lunar Observing
- ☐ Telescope Making
- ☐ Planetary Observing
- ☐ Astrophotography
- ☐ Deep Sky Observing
- ☐ Other

Please describe your astronomy equipment:

Would you be interested in attending a beginner's workshop? ☐ Yes ☐ No

How did you discover East Valley Astronomy Club? ________

All financial matters can be addressed with the Treasurer (Wayne Thomas) at: treasurer@eastvalleyastronomy.org

Space Quarantine

(Continued from page 4)

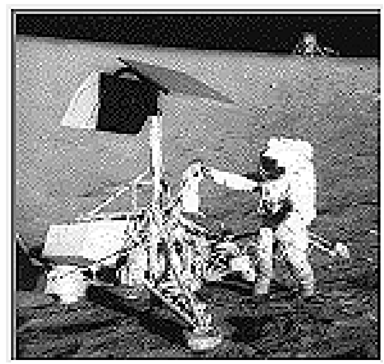
waste handling, rover exploration, spacesuits, scientific testing, and astronaut health, [1].

The only samples to be returned to Earth from space by humans are from the Moon. About 379 kg of rock and soil were brought back to Earth during the Apollo missions and some lunar material was also returned from 3 Russian spacecraft. All of these samples were kept in sealed containers until they were opened in laboratories on Earth, [2]. During the Apollo 11 and 12 missions the astronauts were also quarantined for 30 days after they left the moon, [2]. Despite all this, the quarantine program used in these Apollo missions would be judged a failure today, since Earth could have been contaminated both in the Pacific and in Houston, TX. The older technology used, human error, and difficult reentry and splashdown procedures, all contributed to a potential contamination problem on earth, [8]. Some scientists consider the moon to be a part of the Earth so future measures may be minimized, although this is still under debate, [9].

On one occasion infectious germs were brought back to Earth from the moon. During the Apollo 12 mission in 1969, the crew brought back pieces of Surveyor 3 that had been on the moon for over 2 years, (see photo below). On Earth cultivation of swabs from various pieces gave one very positive result. Streptococcus mitus spores, a common bacterium in the human nose, mouth, and throat, (about 50-100 spores) were detected from inside the camera case. This was a sheltered, interior, location in the robot, [3].

We have retrieved spores from other spacecraft that have been in orbit years. We assume that this spore survived the extreme temperatures of the moon, the radiation, and the vacuum of space!

Some scientists question this result. Although the camera was returned under strict sterile conditions, the technician doing the swabbing violated isolation protocol by laying the new swabs down on a non-sterilized table. These positive results could have been from sneezing on this surface. [3,4].



This picture shows an astronaut examining Surveyor 3 on the moon during the Apollo 12 mission, whereon microbes are thought to have survived, [4].

We see examples where the possibility of back contamination may exist and needs to be considered, [2]. We will encounter more chances in the future.

Conclusions

We should take the threat of space contamination seriously. The best we can do is minimize the probability of any such contamination risk despite all our quarantine measures and contamination procedures.

Implementing such measures is quite technical, impossible to do with 100% accuracy, and usually costly. Achieving a balance in all of this is daunting. It is hard to imagine a cost to life, if something goes drastically wrong, in any scenario. New risk management procedures and models are needed to best determine the right combination of measures and procedures for maximal protection, [6]. The fact that we are developing technology to find ever-smaller traces of life is also a consideration for the future.

In my opinion, any type of life from space sources will be different than normally encountered on Earth. Whether such life can survive, adapt, and thrive on Earth is truly speculation now. Yet if we all are truly cosmic creatures connected by a universal thread of life, then perhaps it is not so unrealistic after all.

References

[1] May 1, 2003 "Planetary Protection: An Integral Part of Mission Preparations"

http://www.space.com/searchforlife/seti_race_protect_0230501.html

[2] March 20, 2004 "Alien Infection" http://www.astrobio.net/news/article570.html

[3] February 4, 2004 "E.T. in Quarantine"

http://abcnews.go.com/sections/science/DaileyNews/oberg990204.html

[4] The Encyclopedia of Astrobiology, Astronomy, and Spaceflight

http://www.daviddarling.info/encyclopedia/B/backcon.html

[5] November 26, 2000 "Microscopic Stowaways on the ISS"

http://science.nasa.gov/headlines/y2000/ast26nov_1.htm?list52260

[6] Summer 2002 "Responsible Exploration: Protecting Earth and the worlds we explore from cross contamination"

http://www.astrosociety.org/education/publications/tnl/58/planetprotect.html

[7] "Limitations, definitions, principles and methods of risk analysis"

http://www.oie.int/eng/publicat/A_RT14.htm

[8] "Lessons Learned From the Quarantine of Apollo Lunar Samples"

http://www.nap.edu/openbook/0309075718/html/60.html

[9] February 27, 2001 "Planetary exploration in the time of astrobiology: Protecting against biological contamination" www.pnas.org/cgi/doi/10.1073/pnas.061021398

Asian Tsunami Seen from Space

by Patrick L. Barry

When JPL research scientist Michael Garay first heard the news that a tsunami had struck southern Asia, he felt the same shock and sadness over the tremendous loss of human life that most people certainly felt. Later, though, he began to wonder: were these waves big enough to see from space?

So he decided to check. At JPL, Garay analyzes data from MISR—the Multi-angle Imaging SpectroRadiometer instrument aboard NASA's Terra satellite. He scoured MISR images from the day of the tsunami, looking for signs of the waves near the coasts of India, Sri Lanka, Indonesia, and Thailand.

Looking at an image of the southern tip of Sri Lanka taken by one of MISR's angled cameras, he spotted the distinct shape of waves made visible by the glint of reflected sunlight. They look a bit like normal waves, except for their scale: These waves were more than a kilometer wide!

Most satellites have cameras that point straight down. From that angle, waves are hard to see. But MISR is unique in having nine cameras, each viewing Earth at a different angle. "We could see the waves because MISR's forward-looking camera caught the reflected sunlight just right," Garay explains.

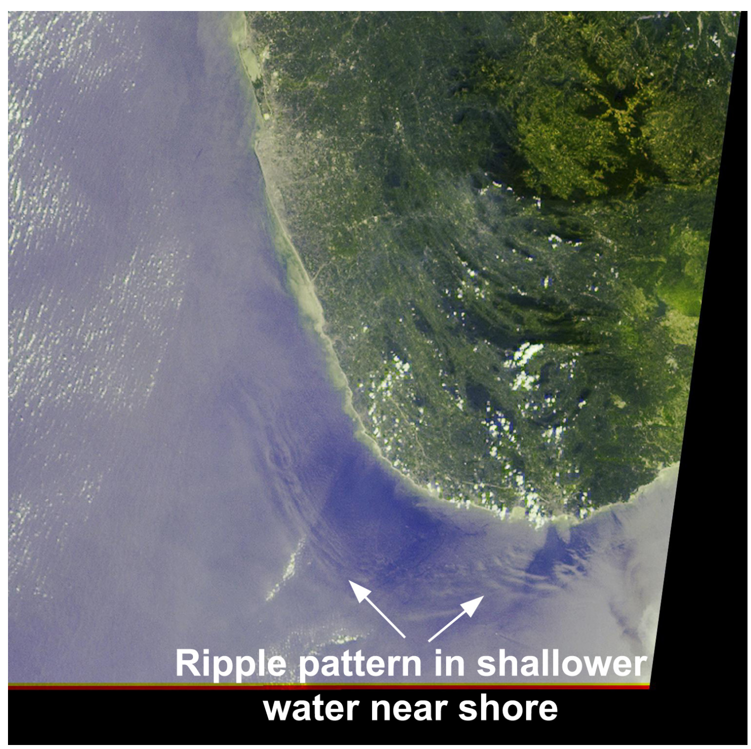
In another set of images, MISR's cameras caught the white foam of tsunami waves breaking off the coast of India. By looking at various angles as the Terra satellite passed over the area, MISR's cameras snapped seven shots of the breaking waves, each about a minute apart. This gave scientists a unique time-lapse view of the motion of the waves, providing valuable data such as the location, speed, and direction of the breaking waves.

Realizing the importance of the find, Garay contacted Vasily Titov at the National Oceanic and Atmospheric Administration's Pacific Marine Environmental Laboratory in Seattle, Washington. Titov is a tsunami expert who had made a computer simulation of the Asian tsunami.

"Because the Indian Ocean doesn't have a tsunami warning system, hardly any scientific measurements of the tsunami's propagation exist, making it hard for Dr. Titov to check his simulations against reality," Garay explains. "Our images provide some important data points to help make his simulations more accurate. By predicting where a tsunami will hit hardest, those simulations may someday help authorities issue more effective warnings next time a tsunami strikes."

Find out more about MISR and see the latest images at www-misr.jpl.nasa.gov/. Kids can read their own version of the MISR tsunami story at http://spaceplace.nasa.gov/en/kids/misr_tsunami .

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



This December 26, 2004, MISR image of the southern tip of Sri Lanka was taken several hours after the first tsunami wave hit the island. It was taken with MISR's 46° forward-looking camera.

If it's Clear...
by Fulton Wright, Jr.
Prescott Astronomy Club

May 2005

Shamelessly stolen information from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find info. When gauging distances, remember that the Moon is ½ a degree or 30 arc minutes in diameter. All times are Mountain Standard Time unless otherwise noted.

In the early evening, all month, you can have a good look at Jupiter, high in the southwest. A small (3 inch) telescope will show cloud belts and up to 4 satellites. A bigger scope will show more detail.

On Saturday, May 7, it is new Moon so you will have a dark sky all night for observing.

On Monday, May 9, at 1:07 AM (sorry about the time) you can see Io move in front of Jupiter. 6 minutes later Europa's shadow leaves the planet.
A medium (6 inch) telescope should show it nicely.

On Tuesday, May 12, at about 8:00 PM you can see a nice grouping of objects. With your unaided eye look about 40 degrees above the west horizon for the crescent Moon, then above it from left to right, Saturn, Pollux, and Castor. While you are there, get out your telescope and look at the southern (left) part of the Moon. Libration tips that part toward us and gives us a good view.

On Saturday, May 21, after 9:00 PM, you can see an asteroid near a star. With a small (3 inch) telescope, look 35 degrees above the southeast horizon for Delta Librae (mag 5). Less than 2 arcminutes (1/15 the Moon diameter) down and to the right is Ceres (mag 7), the first asteroid dis-

covered. Speaking of the Moon, just to make to make size comparisons easy but viewing difficult, the almost full Moon is about 10 degrees down and to the right.

On Saturday, May 21, pretty much all night, you can see the (planetary) west to northwest (lower left) part of the Moon at its best. Libration tips it toward us.

On Monday, May 23, at 7:56 PM the full Moon rises. Later that night, at 12:08 AM, the Moon moves in front of the bright star Antares (mag 1). Because of the glare of the full Moon, you will probably want a small (3 inch) telescope to watch this. At 1:25 AM the star pops back into view.

On Wednesday, May 25, at 1:14 AM (I just can't seem to make it happen earlier in the evening) you can see Europa emerge from Jupiter's shadow. 7 minutes later Io moves out from in front of the planet. The number of visible satellites goes from 2 to 4, and Io's shadow is on the planet while this happens.

On Tuesday, May 31, about 3:00 AM (ugh) you can see Mars and the Moon less than 2 degrees apart low in the east.

(Continued from page 1)

The Voyager newsletter you can find articles on observing different ob-

From the Desk of the President

jects. Take it out under the stars with you next time you go. In the Midwest the true test of an observers guide is if it's dew-proof, but here, we don't have dew so print off a copy and take it out with you. Each month our Newsletter Editor puts' together articles written by members on product reviews, observing challenges, and spacecraft updates. Likewise, if you have an idea for an article, write it up and send it to Peter. We are always looking for good input!

As our speaker for the May General Assembly meeting, we will have Dr. Kevin Healy. Dr. Healy specializes in low-mass star formation in the H II region environment, including the formation of low-mass (that is, Sun-like) stars in regions of high-mass star formation. His research has implications for the formation of the Sun and Solar System. Join us at the Southeast Regional Library (Gilbert Public Library) on the third Friday of the month, May 20th at 7:30PM. The GPL is located at the Southeast corner

EVAC is in need of a Secretary. This elected position is one of four executive offices in the club. The Secretary is responsible for taking minutes at the general monthly meetings, as well as at the quarterly Board meetings.

If you are interested in fulfilling this position, please contact the President at president@eastvalleyastronomy.org

Starting Out Right

Article reprinted by permission of Ad-Libs Advertising, Inc. (dba Astronomics and/or Christophers, Ltd.)

Astronomy can be a lifelong joy . . . or a disappointing fizzle. Which one it is for you often depends on how you start out. Starting out right can lead you to the myriad pleasures that come from seeing with your own eyes once-in-a-lifetime sights that have traveled from the far corners of the Universe.

Starting out wrong can lead to frustration, disappointment, and wasted money. Starting out wrong, for example, means buying the biggest and most expensive telescope on the block *before* you know what you want to see, or how to find it, or whether you can even see it at all. Starting out wrong means expecting the Universe to give up its secrets easily, or expecting to see more through your telescope than our turbulent atmosphere and the laws of optics will allow.

Luckily, starting out right in astronomy is not all that difficult. Here are a few tips to help you start *your* journey to the stars on the right foot.

Start by using your bare eyes and a basic star chart like those published monthly in *Astronomy* and *Sky & Telescope* magazines to become familiar with the sky. That familiarity will pay dividends. A customer of ours once complained that his telescope wouldn't track the stars properly. It took a while for us to realize that he was trying to polar align the telescope on the star Maia in the Pleiades, rather than on Polaris in the Little Dipper. It's very hard for a telescope to properly track objects in the sky when it's polar aligned on a star that's 65 degrees away from the actual celestial pole at which it should be aimed. True, the Pleiades do look like a *very* little dipper, but a star chart and a little familiarity with the night sky before buying a telescope would have saved that new stargazer a lot of frustration. It can do the same for you.

Next, move up to binoculars. You don't have to spend big bucks on giant astronomical binoculars to get started. Even those inexpensive old binos collecting dust in your closet can start you stargazing. That old pair of 7 x 35mm binoculars you take to football games, or those 8 x 42mm binos you use for birdwatching, will have a wide field of view that will make it easy for you to star-hop around the sky to find many deep space gems – Andromeda, the Pleiades, the Great Nebula in Orion, the Double Cluster in Perseus, and many more. And don't forget the Moon. There's a surprising amount of lunar detail to be seen with a steady pair of binoculars. Learn how to find your way around the sky with them and a pair of binoculars can keep you stargazing for a lifetime.

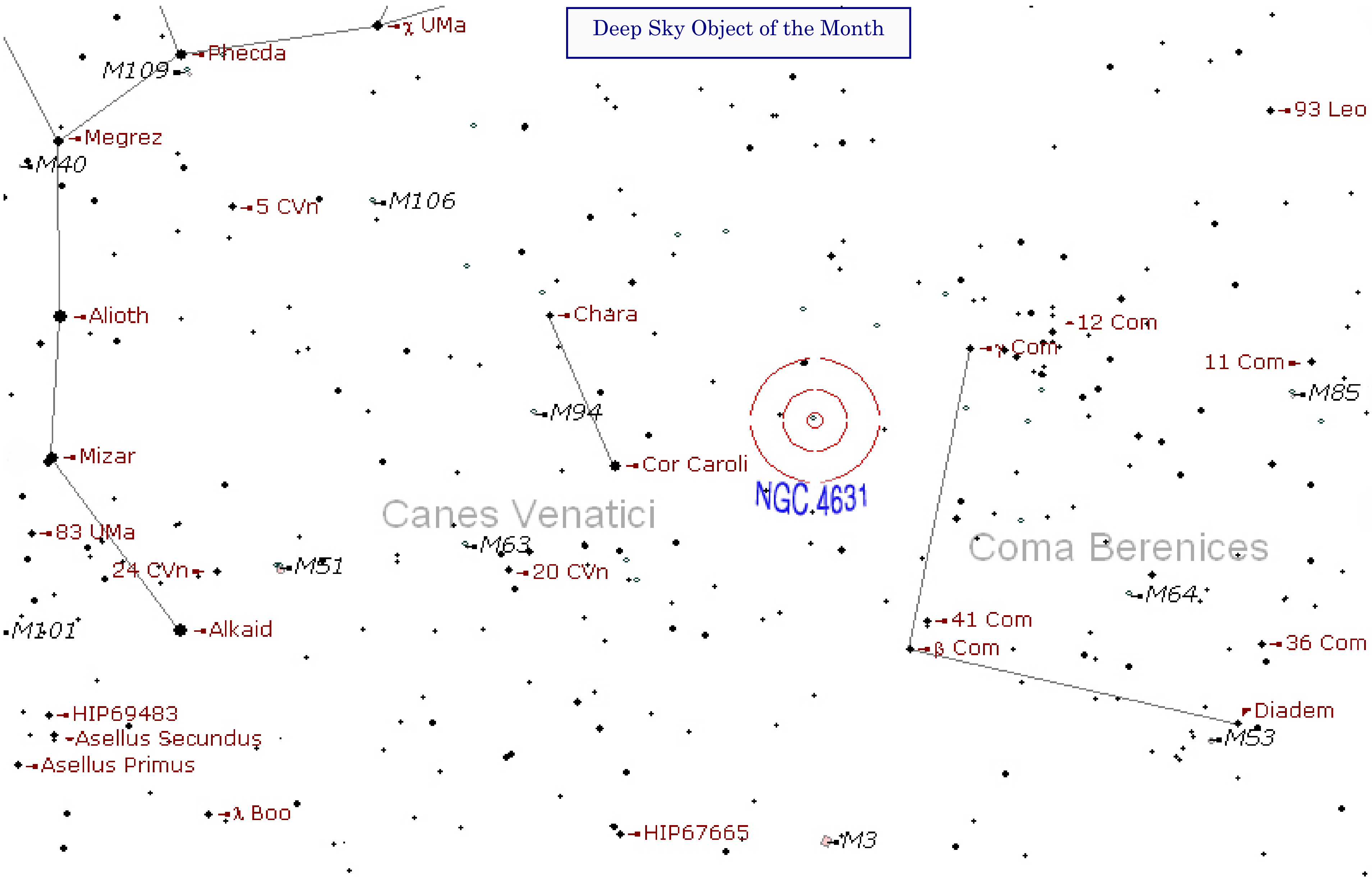
Get a good set of star charts – like the *Tirion Atlas 2000.0* – and a guidebook or two. Using a more detailed star chart than the simple monthly charts in the magazines will let you locate hundreds of deep space objects with your binoculars (and eventually your telescope). Guidebooks – like *Star Hopping, Deep Sky Companions: The Messier Objects, Nightwatch,* or *The Universe from Your Backyard* – will describe those objects for you, help you find them, and give you a feel for what they look like through eyeball, binocular, or telescope. Becoming a regular reader of the monthly sky guides in *Astronomy* or *Sky & Telescope* will keep you alert to the transient sights that are visible in binoculars – things like comets, the day to day changing positions of Jupiter's four Galilean moons, the phases of Venus, the brightening and dimming of variable stars, and more. The skills you develop navigating the sky with binoculars, using star charts and guidebooks, will stand you in good stead when you move up to a telescope.

Seek out other astronomers. Solitary stargazing can be restful and fulfilling, but observing with others will open your eyes to many more starry wonders and increase your observing skills. Join an astronomy club, even if you don't yet own a telescope. Many clubs have telescopes for their scope-less club members to borrow. Attend the club's monthly star parties and look through as many different telescopes there as you can, to get a feel for what telescope types best suit your needs and your budget.

When you're ready for a telescope, use the information in this web site to help you choose the scope that's right for you. When you do get your scope, read the instruction manual before you start assembling it (you can download many of them in advance from this web site). The manual usually will answer many of the questions that are bound to come up. If it doesn't, give us a call. Don't go overboard buying accessories at first. The greater the number of new gadgets that you have to learn how to use all at once, the more easily you can get frustrated. Take astronomy one step at a time.

Finally, once you have your scope, keep in mind that you have to meet the Universe on *its* terms, not yours. There is nothing you can do about clouds blocking your view, or missing the timing of a long-anticipated event, or the extreme distance and faintness of an object you want to see. Patience and persistence are as much a part of an astronomer's observing kit as a set of eyepieces. Remember that most objects within reach of any telescope are *barely* within reach. Much of the time you'll be hunting for objects that are very dim, very small, or both. The challenge of finding them is one of the lures of amateur astronomy. No telescope, large or small, can ever show you everything you want to see, nor can it show you the amount of detail and the vivid colors that you see in long exposure photos taken with large observatory telescopes. So, relax and accept the limitations and imperfections of the seeing conditions, your optics, and your own eyes. You may not see faint deep space objects as well as the Hubble Space Telescope, but you will be able to take great pleasure in those wonders you *can* see.

Deep Sky Object of the Month



NGC 4631 (UGC 7865, PGC 42637)   Spiral galaxy (edge-on) in Canes Venatici

Magnitude: 9.7   Size: 14.8” x 2.6’   Position Angle: 86°   Distance: 39,139,572 ly

RA 12h 42m 7.8s   Dec +32° 32’ 27”   Interaction suspected with NGC 4627 (mag: 13.1 size: 2.1’ x 1.6’)

Do You Give Dew its Due?
by Peter Argenziano

The Second Law of Thermodynamics states that the entropy of the universe increases during any spontaneous process. Or stated in another way, energy will disperse if it is not in some way impeded. Your coffee cools after it is poured from the thermos into a mug; ice cubes melt after being moved from the freezer to a glass of tea. According to this law, objects attempt to achieve thermal stability with their environment.

Our telescopes cannot escape this physical law and in it lie the reasons for both a pre-observing 'cooldown' period and the battle many wage against dew. What is dew and where does it come from? Dew is the atmospheric moisture that forms on the surfaces of objects whose temperatures have decreased to the point where they equate the maximum water vapor present in the air at that temperature and pressure. At this point condensation occurs, changing water vapor into liquid water. The dewpoint is the temperature at which the air becomes saturated. In the context of a simplified explanation this point marks the moment when condensation surpasses evaporation, bringing an end to many an observing session. That's as deep into the physics as both my understanding of weather and this article will delve.

Armed with this rudimentary understanding, what can we do about dew? First and foremost, we can use this knowledge to prepare ourselves for nights when dew may be a problem. Luckily, living in the desert as we do, we have far fewer nights where this will be of concern than do our compatriots in other locales.

As we arrive at the observing site and begin assembling our telescopes, the transfer of heat is already underway. After the sun sets and the air cools, our equipment continues radiating its warmth in an attempt to achieve thermal equilibrium. If we believe that dew may be a problem we can be proactive and employ methods to minimize our risk. Simply stated, we must minimize exposure to the night sky of those parts of the telescope most prone to dewing. Amongst all common telescope types the Schmidt-Cassegrains are the hardest hit, for their corrector plates are thin (and therefore dissipate heat quickly) and they are directly exposed. Conversely, Newtonian reflectors are much less likely to be affected. This is because the optical elements aren't directly exposed and the tube itself serves as a long dew shield.

For all but the worst nights, the SCT user need only employ a dew shield and the truss Dob user a shroud. Theoretically, one could also employ a large umbrella, but that would introduce obvious complications into the hunt for celestial quarry. A portable hair dryer can be called into duty, but usually its use signals the beginning of the end of that observing session. Once dew has formed, removing it is only temporary - prevention is the only way to extend the session. The other method of dew avoidance requires slightly heating the telescope to ensure it remains warmer than the surrounding air. Simple and elaborate systems can be purchased or fabricated to accomplish this objective.

The concern over dew does not end with the observing session. Actual damage may occur if optical components are repeatedly exposed to conditions of condensation and evaporation. So, you should never put a telescope away until it is completely dry. And you should ensure that the conditions are such in its storage location that this process will not become a problem.

Coming in June…
Born in China, educated in California, three decades as a monk, and three decades gazing at stars on sidewalks, we are pleased to present the inventor of the 'Dobsonian' telescope mount and co-founder of the Sidewalk Astronomers, John Dobson. Please note the special night for this meeting, Tuesday, June 14th.

Star Party Disclaimer

The East Valley Astronomy Club (EVAC) is not responsible for the property or liability of any star party participant, nor will the club be held liable for their actions or possessions. EVAC is not responsible for any vehicular damage, theft, or mechanical difficulties that may occur while attending a star party. EVAC strongly recommends adherence to the doctrine of 'safety in numbers' when it comes to remote observing sites. In the interest of safety it is recommended that you don't go to remote sites alone and that someone knows where you have gone each time you go out observing.

The Voyager is published monthly by the East Valley Astronomy Club and made available electronically (PDF) the first week of the month. Printed copies are available at the monthly meeting.

Please send your contributions, tips, suggestions and comments to the Editor (Peter Argenziano) at: news@eastvalleyastronomy.org

Contributions may be edited.

www.eastvalleyastronomy.org

Keep Looking Up!

East Valley Astronomy Club

PO Box 2202

Mesa, AZ 85214-2202