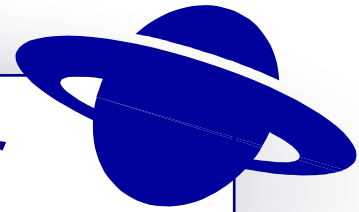


The Voyager

East Valley Astronomy Club



Volume 19 Issue 2

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

Due to the cancellation of the January meeting at SCC, there has been much activity to find a suitable meeting place for EVAC. After I sent out a request to all members for input on their favorite location, the list grew to 13 different places! I want to thank all of you for the input. There are about 5 that look promising that will meet the future needs of the club.

There is one however that offered free use of their auditorium to the club with no strings attached. This offer gives us the time needed to pursue the other science or

scholastic related locations. Starting with this month's General Assembly meeting, we will have the meeting at Three-Five Systems, Inc. located at 1600 N. Desert Dr. in Tempe. The cross-roads are approximately Priest and Washington.

Our Featured Speaker this month is Dr. Jay Melosh, a Principal Scientist on the Deep Impact Space Mission to rendezvous with comet 9P/Tempel 1. He is the recipient of the Barringer Medal of the Meteoritical Society for his work on the physics of impact, the Gilbert award of the Geological Society of America,

and is a member of the US National Academy Sciences. He is a Fellow of the Meteoritical Society, AGU, GSA and AAAS.

Hope to see you there! There are several maps available on our website which has the exact location. There is also one showing TFS relative to the Home Town Buffet, where we meet for dinner before the meeting. If you would like to show up around 5:30pm to 6pm, the food is always good and hot!



The Backyard Astronomer Astro Potpourri - Part One by Bill Dellings

OK, here's the deal. I have a whole bunch of snippets I've gleaned over the years that are just hanging around doing no one any good and for whatever reason have not found their way into any

of my articles. With your permission, I'd like to dump them on you now.

Let's start with a few mnemonics. One of the more famous astronomical ones is, of course, the seven basic spectral types

of stars: OBAFGKM. Or, "Oh be a fine girl, kiss me." In these politically correct days, we might prefer, "Oh boy, an F grade kills me." By the way, our Sun is a G2 V

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February Events:

- *Deep Sky Star Party 2/5 at Vekol Road*
- *Monthly meeting 2/9 at Three-Five Systems at 7:30*
- *Public Star Party 2/11 in Gilbert*
- *Local Star Party 2/12 at Boyce Thompson*
- *Science Fair 2/17 at Lowell Elementary School*

The Backyard Astronomer

(Continued from page 1)

star (V= luminosity class Roman numeral 5, a Main Sequence dwarf star).

To remember the sequence of the nine planets in order from the sun: **“My very educated mother just served us nine pizzas”** (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto). Or: **“Mary’s Violet eyes makes John stay up nights pining.**

Here’s one to help in recalling the six largest constellations which are: Hydra, Virgo, Ursa Major, Cetus, Hercules, and Eridanus: **Hate viewing under clouds hounding Earth.**

It had been difficult for me to remember the star names in the Pleiades. So I worked out a system. First, imagine a picture of them before you and think of them as a small dipper (and many folks mistakenly think it is the Little Dipper). The “handle” is to your left, the open “bowl” facing upwards. I use a modified mnemonic method and do the following working left to right: the handle is composed of two stars, Atlas, the brighter of the two and Pleione (above Atlas). In mythology, they are actually the parents of the Seven Sisters. Now let’s use the mnemonic “am me” (you are you, right?) for the bowl stars. The top star is Alcyone, the bottom star Merope (=“am”). At the far side of the dipper from the handle we have Maia and Electra (=“me”). Just beyond the bowl there are three stars running north to south. Think “ATC”, Air Traffic Control to you pilots and delayed passengers. Asterope, Taygeta, and Celaeno (=“ATC”). Two notes here. Sometimes Asterope is spelled without an A. There are nine stars involved

here, not seven. If you see seven stars with the naked eye, you’re likely spying five of the sisters and the two parents and missing the dim 5th magnitude sisters Asterope and Celaeno.

Moving on...

Here’s a statistic that always blows my mind. Think about the distribution of material in our Solar System. The Sun, 9 planets, 100,000 asteroids, 136 moons, and a trillion comets. Now suppose I told you the Sun represents 99.8% the mass of the solar system. Does that make Earth and its 6 billion people seem a little bit insignificant?

While on the subject of the Sun, here are a few stats on old Sol: diameter, 865,000 miles or 109 Earth diameters. Volume, 1,300,000 times that of the Earth. Mass, 330,000 times the mass of Earth. Feeling smaller? The sun will live for 10 billion years. We are half way through that now. In 5 billion years it will be a Red Giant swelled out to about the orbit of Venus and frying the Earth. We are doomed. “Professor, did you say 5 billion years or 5 million years?” Professor: “I said 5 billion years.” Student: “Whew! Man, I thought you said 5 million years, for a minute there I thought we were in trouble!”

Nuclear fusion is the power source of the Sun and other stars. Deep down in the core of the Sun, 600 million tons of hydrogen is converted into helium each second. In that process, 4 million tons of hydrogen is converted into energy which we eventually see as light and heat. Thus the Sun weighs 4 million tons less each second (this is where $E=MC^2$ comes into play). It has been doing this for 5 billion years. (The energy the Sun puts out in one second is equal to 100

billion 1 megaton nuclear bombs).

The other day I was trying to find Venus during the day with binoculars. I’ve done it many times. I failed that day. But! I did just happen to see a satellite traveling north in my binoculars. I was stunned as I never really thought about whether you could see a satellite at day with binos. Amazing.

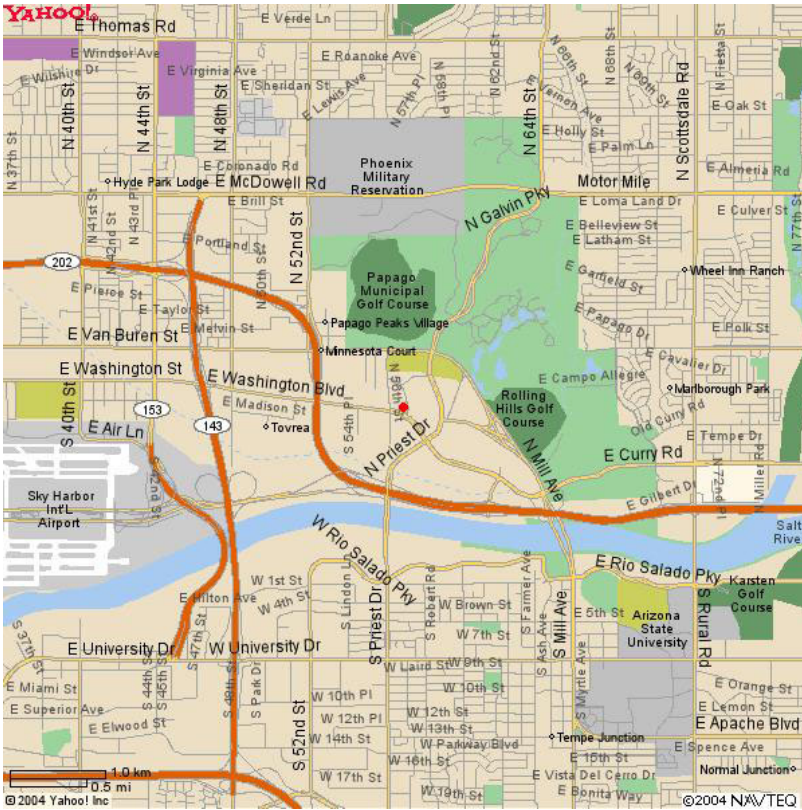
History books tell us William Herschell discovered Uranus in 1781. Johann Galle discovered Neptune in 1846 from calculations of John Adams and Urbain Leverrier. There is evidence that these planets were seen before those dates. John Flamsteed, the first Astronomer Royal in England spotted it three different times in 1619, 1712, and 1715. John Bradley, third Astronomer Royal saw it in 1748 and 1750. Johann Mayer saw it on 1756. Pierre Lemonnier saw it 12 times between 1768 and 1769. They thought it was just another star (ref: Moore and Tombaugh, *Out of the Darkness*, p.43).

Neptune was seen by Johann von Lamont in 1845 and 1846. J. deLalande found it in 1795. Even our old friend Galileo recorded it in 1612! Again, it was thought to be just a background star (Ref: Timothy Ferris, *Seeing in the Dark*, p. 204).

Psst, looking for a good cheap eyepiece? A guy in our club showed me a Celestron X-Cel eyepiece, a somewhat new line out. It looked nice with a huge eye lens and super eye relief (20mm) for eyeglass wearers, fully multi-coated, ED glass, 6 element, blackened lens edges, and a 55o apparent field. They only run \$64 (made in China) so I bought

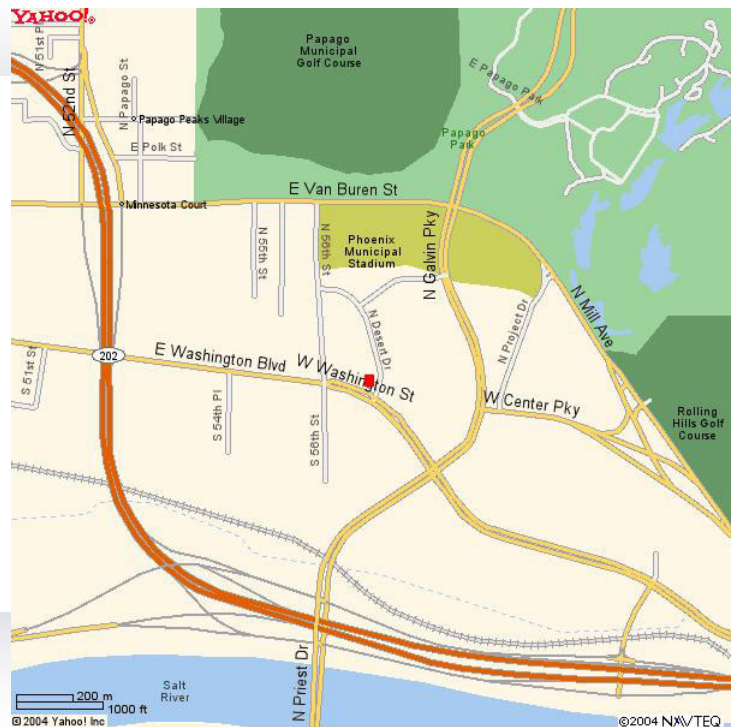
(Continued on page 7)

As the club continues it's search for a permanent meeting site for the monthly general meetings, we are relocating to an interim site beginning with the February meeting. We will meet in the auditorium at Three-Five Systems in Tempe.



February 9
March 9
Meetings to be held
at this location

TFS is situated on the northwest corner of Desert Drive and Washington Street. Access to the facility is on Desert Drive.



Three-Five Systems, Inc. 1600 N. Desert Drive in Tempe, Az, 85281

The Fiscally Responsible Astronomy Club

By *Wayne Thomas and Peter Argenziano*

In many respects our club is no different than any other hobby club. Our members attend meetings and club events, enjoy (hopefully) reading a newsletter, and interact with other people who share a similar interest. But how does it all happen?

EVAC was formed in 1987 and was incorporated six years later. In these litigious times, incorporation is necessary to protect those willing to volunteer their time to serve as club officers. As of this writing the club is a for-profit corporation, but we are in the process of applying for tax-exempt status under the provision of section 501(c)(3) of the Internal Revenue Code. Attaining non-profit status is highly desirable for a club such as EVAC.

The sole source of income for the club are the dues collected from its members. Currently our dues are \$20 annually, and are prorated for new members. If we average a membership of 200, we have an annual income of \$4,000. This entire amount is not available at the beginning of the year, but trickles in as new people join or current members renew. This highlights the absolute necessity for current members to renew early, preferably in the fourth quarter of the year instead of waiting until the new year begins. As of this writing not quite a third of 2004's members have sent in their dues - if you haven't renewed yet, now is the time! As an aside worthy of mention: EVAC has not increased its dues in 18 years; a feat almost unheard of today.

Like any other entity, we must efficiently use our resources to meet our obligations. Next, let's have a

closer look at our obligations.

As we closed out 2004, our single biggest expense was the site for our monthly meetings. To remain at Scottsdale Community College would consume slightly over 50% of our income in 2005. Clearly our budget couldn't support such an expenditure. The Board is currently evaluating alternate sites to address this issue. Our President, Steven Aggas, has secured a new site that we will begin using immediately (details on page 8). This interim site is being made available to us without charge!

Our second biggest expense is incurred by publishing a monthly newsletter. We spend about \$1,200 annually on printing and mailing the newsletter. Our monthly printing costs are about \$75 and the postage adds another \$20. Please consider switching from a mailed copy to electronic delivery if at all possible. We are implementing actions to reduce our printing costs by about \$300 this year, while still providing a monthly publication.

If you just consider these first two expenses, they account for 80% of our income alone!

It should come as no surprise that EVAC has an insurance policy to limit our liability. This is a requirement of any facility that we use for meetings or events. Our policy provides one million dollars in aggregate liability, and costs us about \$375 annually.

Hosting our truly wonderful website and the listserver costs us about \$350 annually. Given the amount of traffic our site sees, and the new members it generates, this

represents a very worthwhile expenditure.

We are most fortunate to live in an area with so many professional astronomers. We call upon this community to speak at our meetings, and we pay a small honorarium (\$50 to \$75) for those who make a presentation. This represents an annual expense of about \$700 on average.

Another expense that we incur is the acquisition of equipment. Since this isn't a recurring expense, it varies as to the amount expended each year. Items like a slide projector or a telescope for the loaner program fall into this category.

The remaining expenses, although modest individually, add up and must be considered in the budget. A couple of examples include the refreshments served at the conclusion of our meetings (about \$225 each year) and the Porta-Potties we provide at the All-Arizona Star Party (about \$125 for the weekend).

The authors hope this article served two purposes: to educate you on the expenses of operating a club such as ours and an attempt to raise awareness of the dynamic environment in which we operate.

Keeping a club the size of EVAC going is no easy undertaking. It doesn't just happen, it takes real work from a body of dedicated individuals committed to ensuring amateur astronomers in the East Valley have access to such an organization and the amenities it affords.



February's Guest Speaker: Dr. H. Jay Melosh



This month we are pleased to welcome Dr. H. Jay Melosh, from the Department of Planetary Sciences, Lunar and Planetary Laboratory at the University of Arizona in Tucson.

Professor Melosh specializes in impact cratering, planetary tectonics, and the physics of earthquakes and landslides. He is responsible for numerical simulations and models of the impact for the Deep Impact mission. He is the author of more than 150 papers on various aspects of planetary science and the book "Impact Cratering: A Geologic Process". He is the recipient of the Baringer Medal of the Meteoritical Society for his work on the physics of impact, the Gilbert award of the Geological Society of America, and is a member of the US National Academy Sciences. He is a Fellow of the Meteoritical Society, AGU, GSA and AAAS.

Dr. Melosh will provide an informative and entertaining talk on his role in the Deep Impact mission.



A topic that has been discussed at length recently is the relative safety of attending star parties at remote sites such as that used by EVAC for its Deep Sky Star Party: Vekol Road. Unfortunately, the Vekol Road site lies in a general area that has become a corridor for illegal activities from south of the border.

Since EVAC has no ownership of this site, we cannot control these activities. Further, we cannot guarantee the safety of our members using this, or any, remote site on public land.

To this end it is the responsibility of each of us individually to take adequate safety precautions and use common sense to ensure we are not placing ourselves unnecessarily at risk.



The club maintains a library of books and other useful resources, including a couple of telescopes. Contact the Properties Director, Dave Williams, for complete details.

Club memberships are \$20 annually and are prorated quarterly. See page 11 of this issue for a membership form.

The club hosts at least three star parties each month: a public event on the second Friday at the Riparian Institute in Gilbert; a local event at Boyce Thompson on the Saturday nearest last-quarter Moon; and a deep sky event on the Saturday closest to New Moon. The local and deep sky events are for members and invited guests.

Club meetings are held on the second Wednesday of each month (unless otherwise noted).



EVAC

will participate in a Science Fair at Lowell Elementary School in Mesa on Thursday, February 17. We will need to have about six telescopes to accommodate the 500 attendees expected for this event. Setup time is at 5:00 PM and the fair is scheduled to last until 7:30 PM.

Sunset is at 6:14 PM. A waxing gibbous Moon (67% disk illumination) will not set until 3:40 AM on Friday, so plan your list of celestial showpieces accordingly - Luna is certainly a good target for this event.

The school is located at 920 E. Broadway (Broadway and Horne). Please contact your Event Coordinators - Gwen Grace and Dave Williams - for further details. They can be reached at events@eastvalleyastronomy.org

As always, thanks for your support of the club's outreach efforts!

Classified Advertisements

Set of four Tele Vue Radian Eyepieces

Focal lengths of 3, 5, 8 and 10mm
Asking \$150.00 each or \$550.00 for all four. 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 with a JMI focuser built by Pierre Schwarr. Includes 7, 12.5, 17, 20, and 32mm eyepieces plus 2.8 klee Barlow, laser collimator and OM1 camera.

Many extras! Call or e-mail me for a list.
\$5200 invested, but will sell for \$2600

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

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

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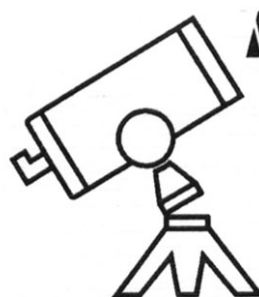
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Contact the Editor for details!

The Backyard Astronomer

(Continued from page 2)

two, a 12.5mm and 25mm. I'm very happy with them. Note: I bought the first one from Adorama because it was a few bucks cheaper but later noted a dust speck within the lens' assembly which produced a false sunspot on the sun. I returned it for a refund and bought the two I have from Anacortes. They seem to be fine.

Thank you for allowing me to clear my desk of astro detritus. Next month, part two of Astro-Potpourri.

FEBRUARY 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					

Schedule of Events

- February 5 - Deep Sky Star Party at Vekol Road
- February 9 - Monthly Meeting at Three-Five Systems Inc, 1600 N. Desert Drive, Tempe
- February 11 - Public Star Party at the Riparian Institute in Gilbert
- February 12 - Local Star Party at Boyce Thompson Arboretum State Park
- February 17 - Lowell Elementary School Science Fair

A Place to Call Our Own

As was introduced in this space last month, the club has begun searching for a new meeting site for 2005. Our old location on the campus of Scottsdale Community College has recently become cost prohibitive.

President Aggas has arranged for the use of a facility in Tempe - at no cost to the club - as we sort through our options. Beginning this month (February) we will relocate to a new meeting site at Three-Five Systems, located conveniently off of the Loop-202 at 1600 N. Desert Drive. Please see the maps on page 3 of this issue and on our website at: <http://www.eastvalleyastronomy.org/mtg.html>

We will use an auditorium at

Three-Five System's building that has seating for up to 75, so this will be about the same size as our old digs at SCC. I understand that the seats are cushioned, so that is an upgrade from our old classroom.

We will also have use of a video projector at this interim site, much as we did at SCC. The interim site also offers plenty of free parking.

Our meetings will still begin at 7:30 PM on the second Wednesday of each month.

We will continue to meet at this interim site until a final decision is reached on a more permanent location.

As the Board processes all the

specifications and requirements for each of the locations being considered, they welcome any input you may wish to contribute. You can email the EVAC governing body at board@eastvalleyastronomy.org

The sites being evaluated are, in no particular order:

- Scottsdale Community College in Scottsdale
- Arizona Science Center in downtown Phoenix
- Southeast Regional Library in Gilbert
- University of Phoenix campus in Tempe or Chandler

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:

City, State, Zip:

Publish email address on website
 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

The Minutes: First Quarter 2005 Board Meeting

The EVAC governing body recently convened at the Presidential palace for the first quarter's meeting. Following is a summary of that session.

In attendance were Steven Aggas, Howard Israel, Diane Cook, Wayne Thomas, Peter Argenziano, Dave Shafer, Marty Pieczonka, John Holmquist and Joe Goss.

President Steven Aggas opened the meeting at 7:00 PM.

The first item on the agenda was the club's search for a new meeting site. This issue is unresolved, with several individuals researching our options. An auditorium at Three-Five Systems will be used for at least the February and March meetings. A move to a permanent site could happen as early as April.

Next up was a discussion of an upcoming EVAC Town Hall meeting. The date is undecided at this time.

The Vice President reports that he has booked speakers for six meetings already.

The Treasurer will obtain an insurance quote from our current carrier to increase our liability coverage from \$1M to \$2M.

A discussion on star party safety resulted in the recommendation that a list of medical facilities within close proximity to star party sites be developed. It was further recognized that the club has no means to guarantee attendee safety at any event held at a remote location; and that attendees assume the risk of such attendance. This discussion was primarily in the context of an ongoing dialogue relative to the Vekol valley in general, and the Vekol Road observing site in particular. Our website carries a

disclaimer to this effect on the star parties page.

The Board voted to proceed with seeking nonprofit status in the eyes of the IRS.

Article II of the club's Constitution and Bylaws (mission statement and purpose) was reviewed and determined to be appropriately worded, and to remain intact.

Discussion on an EVAC-sponsored scholarship was tabled for later discussion.

An occultation timing event was discussed as a possible group activity, as was a summertime cookout.

The group discussed the financial status of the club. Several ideas were presented as ways to control or reduce expenses. The concept of an increase in annual dues was also discussed. No one present could recall a time in the club's 18 year history when dues had been increased... apparently they have always been \$20. Dues will remain the same for 2005, and the Board will revisit this topic at the next meeting to determine the status for 2006.

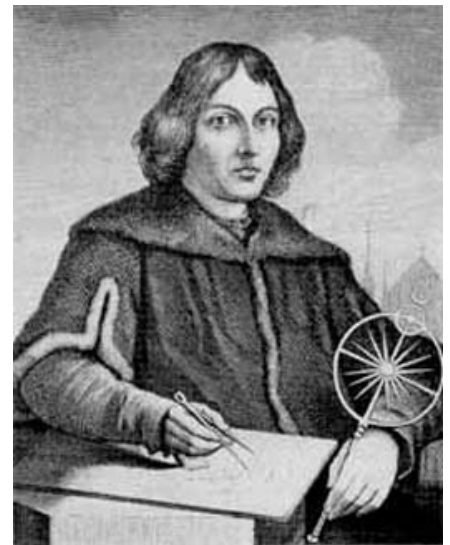
The President closed the meeting at 10:00 PM.

February 2: Last-Quarter Moon at 12:27

February 8: New Moon at 15:28

February 15: First-Quarter Moon at 17:16

February 23: Full Moon at 21:54



Mikolaj Kopernik aka Nicolas Copernicus born on 19 February, 1473 in Torun, Poland

You looking at me? You looking at me?

Isn't it time to begin (or complete) one of the EVAC Observing Programs!

<http://www.eastvalleyastronomy.org/observe.html>

Stardust Up Close

by Patrick L. Barry and Dr. Tony Phillips

Like discarded lumber and broken bricks around a construction site, comets scattered at the edge of our solar system are left-over bits from the "construction" of our solar system.

Studying comets, then, can help scientists understand how our solar system formed, and how it gave rise to a life-bearing planet like Earth.

But comets have long been frustratingly out of reach -- until recently. In January 2004 NASA's Stardust probe made a fly-by of the comet Wild 2 (pronounced "vilt"). This fly-by captured some of the best images and data on comets yet ... and the most surprising.

Scientists had thought that comets were basically "rubble piles" of ice and dust -- leftover "construction materials" held together by the comet's feeble gravity. But that's not what Stardust found. Photos of Wild 2 reveal a bizarre landscape of odd-shaped craters, tall cliffs, and overhangs. The comet looks like an alien world in miniature, not construction debris. To support these shapes against the pull of gravity, the comet must have a different consistency than scientists thought:

"Now we think the comet's surface might have a texture like freeze-dried ice cream, so-called 'astronaut ice cream': It's solid and can assume odd, gravity-defying shapes, but it's basically soft and crumbles easily," says Donald Brownlee of the University of Washington, principal investigator for Stardust.

Scientists are currently assembling a 3-D computer model of this surface from the photos that Stardust took. Those photos show the sunlit side of the comet from many angles, so its 3-dimensional shape can be inferred by analyzing the images. The result will be a "virtual comet" that scientists can examine from any angle. They can even perform a virtual fly-by. Using this 3-D model to study the comet's shape in detail, the scientists will learn a lot about the material from which the comet is made: how strong or dense or brittle it is, for example.

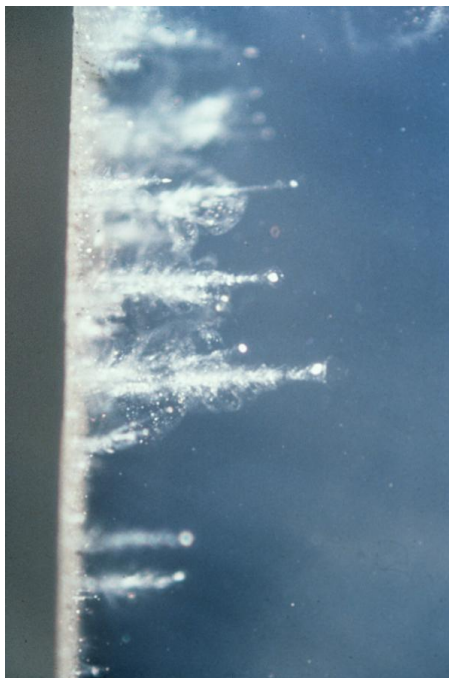
Soon, the Stardust team will get their hands on some of that material. In January 2006, a capsule from Stardust will parachute down to Earth carrying samples of comet dust captured during the flyby. Once scientists get these tiny

grains under their microscopes, they'll get their first glimpse at the primordial makings of the solar system.

It's heading our way: ancient, hard-won, possibly surprising and definitely precious dust from the construction zone.

Find out more about the Stardust mission at stardust.jpl.nasa.gov. Kids can read about comets, play the "Tails of Wonder" game about comets, and hear a rhyming story about aerogel at <http://spaceplace.nasa.gov/en/kids/stardust/>.

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



The Stardust spacecraft used a grid holding aerogel to capture dust particles from comet Wild 2. In this test, high velocity dust particles are stopped unharmed at the end of cone shaped tracks in a sample of aerogel

If it's Clear...

by *Fulton Wright, Jr.*
Prescott Astronomy Club

February 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 1/2 a degree or 30 arc minutes in diameter. All times are Mountain Standard Time unless otherwise noted.

On Tuesday, February 8, the Moon is new so you have all evening to look for faint fuzzes.

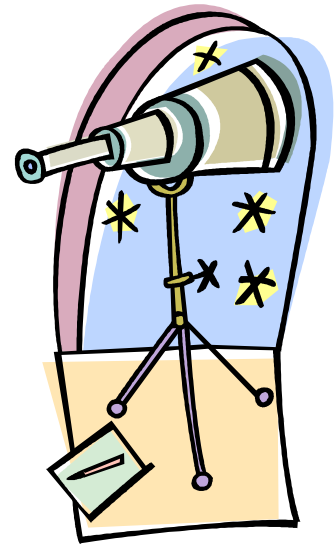
On Tuesday, February 15, from 7 PM to 1 AM you can see the Moon near the Pleiades. With binoculars look for the half illuminated Moon about 2 degrees from the bright star cluster. They will be closest about 11 PM.

On Saturday, February 19, all night, you can see a nice grouping of objects. With your unaided eye look high in the east for the almost full Moon. Early in the evening the star Castor is to the left, the star Pollux is to the lower left, and the planet Saturn is to the lower right.

On Monday, February 21, after 11 PM, you can use a bright star to help you find an asteroid. With binoculars or a small telescope look 20 degrees above the east horizon for Porrima (gamma Virginis, mag 4). Half a degree below it is a pair of "stars". The one on the left is actually a star (mag 6). The one on the right is 2 Pallas (mag 7), the second asteroid discovered. You can confirm your sighting by looking again the next evening and noticing that Pallas has moved up and to the left,

crossing the line between the mag 6 star and Porrima.

On Wednesday, February 23, at 6:04 PM, the full moon rises (20 minutes before the sun sets). You can see albedo (light and dark) features on it all night.



Workshop for Beginners

Are you new to observational astronomy? Don't know a refractor from a Cassegrain? Collimation got you feeling uneasy? If any of this sounds vaguely familiar, relax... you're not alone.

The club has members at all experience levels, so you're sure to find someone who can answer your questions. For starters, have a look at the Beginner's FAQ (Frequently Asked Questions) on our website here:

<http://www.eastvalleyastronomy.org/vbeginnerlab.htm>

Many people find it easier to learn something new with hands-on experience. For that kind of assistance you may want to attend a star party. Even if you don't bring a telescope, you'll see many there and can ask their owners a question or two.

Clip the form below and bring it to the next meeting:

✂

Yes, I am interested in attending a members-only EVAC Beginners Workshop!

Type of telescope:

Here's what I would like to cover during a workshop:

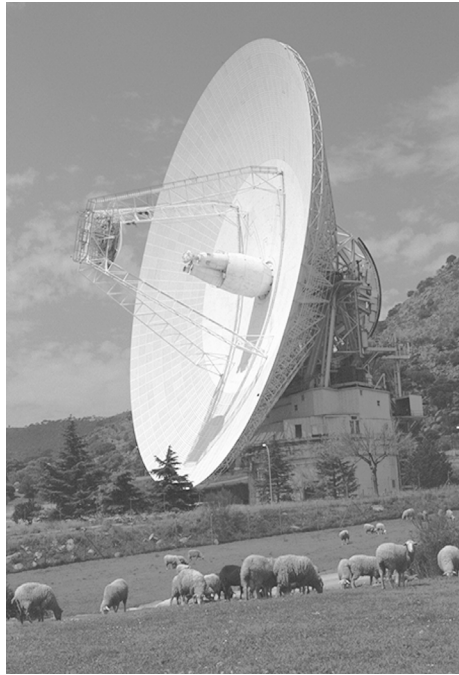
Name: _____

Workshop date and location to be announced soon!

Capturing a Whisper from Space

The National Aeronautics and Space Administration (NASA) has been sending robotic spacecraft out into the solar system for more than four decades.

These mechanical explorers have ventured out to study Mercury, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune. These amazing robots have been our eyes and ears on their journeys to far-off planets and even to the edge of the solar system, sending wondrous images and fascinating information back to Earth. But none of these missions of discovery would have been possible without the Deep Space Network — a worldwide system of sensitive antennas that communicates with NASA's interplanetary spacecraft. Signals to and from the spacecraft travel millions, even billions, of kilometers. Yet spacecraft communications equipment transmits signals at very low power, usually about 20 watts, about the same as a refrigerator light bulb. As the signal travels to Earth, it continues to lose energy and signals arriving at the antennas on Earth can be as weak as a billionth of a billionth of a watt — that is 20 billion times less than the power required for a digital wristwatch. How is it possible to hear the tiny whisper of a signal from a spacecraft so far away? The Deep Space Network is made up of complexes of antennas in three locations on the globe — Goldstone, California (in the Mojave Desert); near Canberra, Australia; and near Madrid, Spain. This arrangement compensates for Earth's rotation so that a distant spacecraft is in view of one of the Deep Space Network's antenna complexes 24 hours a day. The



spacecraft signals are received at one site; as Earth turns, the spacecraft “sets” (like the Sun setting each night) and the next site picks up the signal, then the third site, and then the first again. The largest antennas in the Deep Space Network are the 70-meter-diameter dishes — there is one at each of the three complexes. This one is in Spain. All the complexes have additional antennas of varying sizes. To hear the low-power spacecraft signal, receiving antennas on Earth must be very large, with extremely sensitive receivers.

The signal from the spacecraft travels in a straight line, and it can be focused by a curved reflector dish (parabolic antenna), so large antenna dishes with precisely shaped surfaces are crucial. The Deep Space Network's parabolic dishes are focusing mechanisms that concentrate power when receiving data and also when transmitting commands. The antennas must point

very accurately towards the spacecraft, because an antenna can “see” only a tiny portion of the sky (as though looking at the sky through a soda straw).

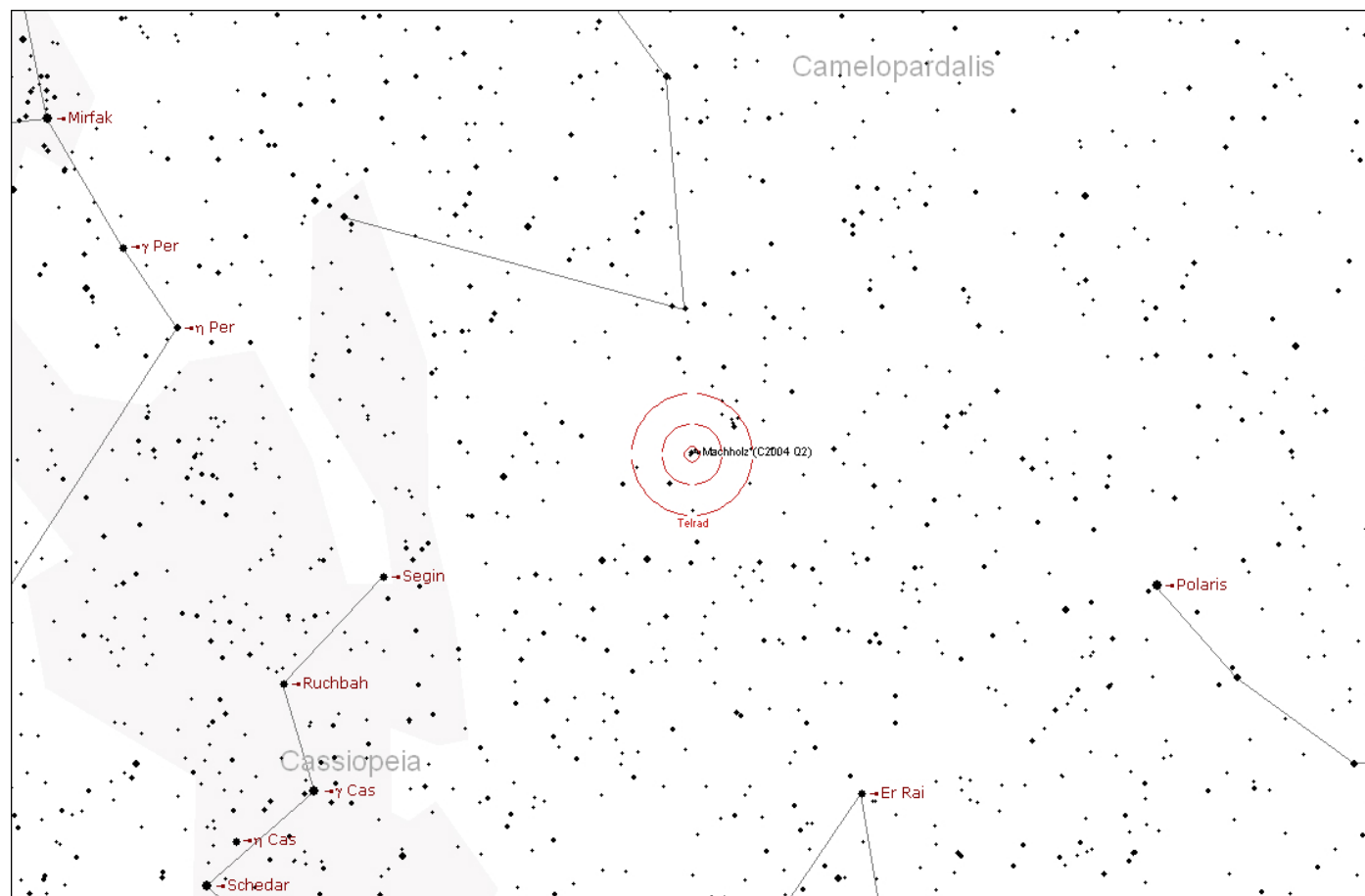
To hear the spacecraft's faint signal, the antennas are equipped with amplifiers, but there are two problems. First, the signal becomes degraded by background radio noise (static) emitted naturally by nearly all objects in the universe, including the Sun and Earth. The background noise gets amplified along with the signal. Second, the powerful electronic equipment amplifying the signal adds noise of its own. The Deep Space Network uses highly sophisticated technology, including cooling the amplifiers to a few degrees above absolute zero, and special coding techniques so the receiving system can distinguish the signal from the unwanted noise.

New space missions bring new challenges. NASA's Deep Space Network is continually improved and enhanced to provide communications, navigation, and tracking for distant spacecraft — our robot explorers of the cosmos.



Chart for locating comet C/2004 Q2 (Machholz) from the Local Star Party on February 12 at Boyce Thompson Arboretum State Park

RA: 02h 53m 51.4s DEC: +73° 20' 09" Magnitude: 4.9



Dorrance Planetarium Needs You

Over the past couple of years EVAC has held special meetings in Dorrance Planetarium at the Arizona Science Center in downtown Phoenix. Planetarium director Christine Shupla has usually made such usage complimentary, but even when we have paid for the facility it was at a deeply discounted rate. Now it's our turn.

The planetarium is in need of volunteer ushers for shows on Saturdays and Sundays. The hours would generally be from 10:30 AM to 4:30 PM with a two-hour break between 11:30 and 1:30. There are four shows per day, each lasting about 40 minutes. Duties include taking tickets at the door, assisting show presenter before show begins, keeping an eye on the audience during the shows, and assisting folks who might want to leave during the show. You can volunteer as often as you would like: every weekend, once per month, once per year... it's up to you!

Besides just helping out our friends at the Science Center and the community at large, your generosity also helps the club. By helping to maintain a pool of volunteers, we would be able to use the facility for special meetings during the year.

If you are interested in volunteering, please talk to VP Howard Israel or send an email to info@eastvalleyastronomy.org

Spring Adopt-A-Highway Cleanup

by Martin Bonadio

It's time again to have some fun picking up trash! We have scheduled our semiannual cleanup of the EVAC Mile for Saturday, April 2nd starting at 8:00 AM. Our task is to pick up trash from the shoulder of the highway to the right-of-way fence (State crews are responsible for the median dividing the highway). Look for a sign up sheet at the February meeting, or call Martin and let him know you want to attend. For example, with 10 volunteers, we can finish by around 10:30 AM. We will meet near Florence Junction (Intersection of Highway 60 and 79) on the south side of the US-60 about ½-way through our mile. The mile begins about 2 miles before you reach the interchange. A sign is posted with "EVAC" on it where the mile of road we are responsible for begins. As you travel along US-60 You will approach a large electronic traffic alert billboard, and see a large dirt field near the opening to a fenced property. We will meet there.

Your reward for helping will be a free, club-sponsored lunch at the Village Inn in Apache Junction following the cleanup! These cleanups have always been a great time. On

every one someone manages to find a very *interesting treasure!* So, come out, get some exercise, and get to know each other in the daylight. As well, the conversations at lunch revolve around telescopes, telescopes, and more telescopes. Oh, and of course you can keep any of these treasures that you find if you *really* want to. Hopefully, we'll have some first-timers. They need to know:

Participants must be at least 12 years old and work in groups, facing oncoming traffic. Dress appropriately; long pants, sturdy shoes/boots, long sleeves and/or sun block, hat, and heavy gloves. Safety vests must be worn and will be provided. Please bring some water too, as you'll work up a sweat.

Pick up bags and other litter with caution-it could contain hazardous material, be hiding a snake, etc.

- A stick with a nail or hook is recommended to use instead of your hands, while a large bucket cuts down trips to the trash bags.
- Few large objects are found out there, but if lifting one, keep your back as straight as possi-

ble, the object close to your body, and let your legs and arms do the work.

- Don't let anything surprise you-our fellow citizens dispose of everything imaginable along our roadsides. If anything looks odd or is really heavy, leave it alone! Note its location and we'll notify the State about it afterwards.
- When a trash bag becomes full, place it on the very edge of the pavement, not in the pullout lane.

As with any government program, there are a few requirements to complete before starting. One is a briefing from the cleanup coordinator, Martin immediately preceding the cleanup. The second is to sign the usual waiver for the State saying participants won't sue if something happens. The forms are kept on file so one signature covers you for all future cleanups.

Contact Martin at 480-570-7163 or email: mbonadio@cox.net if you want to help or have questions. Thank you.

March meeting preview...

The March general meeting will held on March 9th in the auditorium at Three-Five Systems, beginning at 7:30 PM. All are welcome to attend the pre-meeting dinner at Hometown Buffet at 5:30 PM. The restaurant is located on the west side of Scottsdale Road, just south of McDowell Road.

Our guest speaker will be Dr. John Morse of the Physics and Astronomy department at ASU.

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 a published monthly by the East Valley Astronomy Club and made available the week preceding the monthly club meeting. An electronic version (Adobe PDF) is available online.

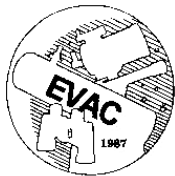
Please send your contributions, tips, suggestions and comments to the Editor (Peter Argenziano) at:

news@eastvalleyastronomy.org

Contributions may be edited.

www.eastvalleyastronomy.org

Keep Looking Up!



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