March 2006

The Voyager

East Valley Astronomy Club

Volume 20 Issue 3

From the Desk of the President
by Steven Aggas, 2006 EVAC President

It's that time of year! March means Messier Marathon, where once again we search from dusk to dawn for all of Charles Messier's entries in his now famous catalog. Each one of these objects are showpiece objects and there is only one time of the year where you can see all 110 of them in one night. This year's marathon will again be held at the Farnsworth Ranch site near Arizona City and is sponsored by the Saguaro Astronomy Club (SAC). The date for the event is March 25 starting at 6:00pm. Arrive early to get set up as there are some challenging objects as the sky darkens. For more information, contact AJ Crayon and Jack Jones of SAC. Their website is: *http://www.saguaroastro.org/*

As our speaker for the March General Assembly meeting we will have Mr. Bill Dellinges speaking on the 'Telescope Industry from 1950 to 1973'. He is one of EVAC's members and has collected/used a large number of telescopes that he'll be speaking about. Join us at the Southeast Regional Library (Gilbert Public Library) on Friday, March 17th at 7:30PM. The GPL is located at the Southeast corner of Greenfield and Guadalupe Roads.

The Backyard Astronomer
Superstition Mountain Mystery Light *by Bill Dellinges*

Solved at a cost

It all began in early December of 2004. It was 1:10 p.m. My wife Lora asked me what that light was up on the mountain. We had lived near the base of the Superstition Mountains since 1994 and always enjoyed the view from our back porch. But this day there was something weird going on up there.

Just to the east of "Flatiron", the ship-like bow jutting out from the west end of the mountain, and eastwards near the top of some "hoodoos" (finger-like rock spires) was a blazing light. Being an amateur astronomer, my eye is trained to see and assess such strange sights. My first thought was "what the hell is that?" It was a point source of light about as bright as you might expect Venus to be at dusk. It did not move. I told her I didn't know what it was and immediately brought out one of my telescopes to examine it more closely. In the scope it was almost too bright to look at. Now reason set in. It must be something metallic reflecting sunlight. A lost canteen? A broken piece of glass? A shiny rock? Whatever it was, it was imbedded in the rock. After 10 minutes it began to dim and was no longer a naked eye object. But in the scope I could still see it and identify exactly where it was, now that it wasn't blinding me.

I began to record my observations of this "mystery light." From December 5th to January 5th, the light would begin to shine at about 1 p.m. as seen in binoculars. It gained naked eye visibility at about 1:10 p.m. Then it would fade away gradually, still visible in binoculars till about 1:20 p.m. Each day the times would advance by about one minute. By January 5th the apparition

(Continued on page 2)

Inside this issue:

March Events:

- *Superstition Springs Elementary - March 2*
- *Taft Elementary - March 2*
- *Powell Junior High School - March 2*
- *Madison Park School - March 3*
- *Local Star Party at Boyce Thompson - March 4*
- *Public Star Party in Gilbert - March 10*
- *General Meeting at Southeast Regional Library - March 17*
- *Messier Marathon at Farnsworth Ranch - March 25-26*
- *Hendrix Junior High School - March 30*
- *Deep Sky Star Party at Vekol Road - April 1*

The Backyard Astronomer

(Continued from page 1)

was no longer evident. While I had no idea what was reflecting the light, I was pretty sure it was simply a matter of the low winter sun angle and my location working together such that the sunlight was shot my way

For two years now, my curiosity was killing me. WHAT WAS CAUSING THIS LIGHT? I knew what had to be done.

To prepare for my mission, I used a Televue 85 at 100x to carefully diagram the area of interest. I was confident I had zeroed in on the terrain and would know where to look should I live to reach the summit. January 5th, 2006 was D-Day.

Starting out at 8:10 a.m., I reached the summit at 1:30 p.m. (a 2800' gain in elevation to 5000'). Making a bee line for my area of interest and consulting my telescope's drawing, I matched up the rocks and bushes and knew I was standing in the right place. I looked up. I saw something. But it was 30 feet straight up a sheer rock formation. I took a look through my 8x32 binos. Ah-ha! A man-made object! Hmmm, let's see, what do we have here?

It was a black plaque, about 12" square. Inscribed on it were the initials E.T.! Oh no, what's this, a joke? I also noticed there was a circular mirror about 3" in diameter attached to the upper left corner of the plaque. The whole works was glued to the cliff (a small outcrop prevented me from seeing the bottom half of the plaque where perhaps there might have been additional text).

I tried in vain to find a way up to it. I REALLY wanted to get closer to that thing – I'd come so far! But no way could I get to it without climbing equipment. I took a picture of it with my point and shoot camera set at its max zoom of 76mm, not nearly what I needed for such a shot. I had assumed I'd be shooting it from only inches away. Wrong. I moved a bit east to get another perspective of the plaque and could see there was a third initial, a "B". So it wasn't "E.T.", it was "E.T.B." Who the heck is that? Well, it seems I solved one mystery only to create another. I now know what was causing the light to shine but who put it there and why?

I wonder if I could get to it from above? I'd have to go around to the north side, up some rocks, and peer down on it to see if I could spot it from there. And if so, maybe I could climb down to it? I took a step. I was on a large flat boulder titled to 45 degrees. My feet went out from under me. THUNK. I landed on my back, slid, tumbled, and spun; I don't know what for sure. Everything was just spinning as seen through my confused eyes. Would I stop soon, I wondered? How bad is this going to be, I thought? After perhaps 15-30 seconds a bush and a prickly pear stopped my slide. Oh boy, I've done it now. Ok, let's move the arms…OK. The legs…OK. Stand up. My hip hurt. My back hurt. My head hurt. My right arm and shoulder hurt. All those areas had nasty abrasions. But I'm alive and in one piece, more or less. OK, let's look for that other possible access. Though battered, I found the spot where I could look down on the plaque. No good, looks way too scary going down that way. Finally I do something smart: I'd quit while I'm ahead. I was very lucky back there. Had I broken anything a helicopter would have been required to get me off of Flatiron.

I began my decent at 2:30 p.m. Going is a bit slower than coming up. It looks like I'm losing the race with sunset. Hmmm, I do the math: 5 hours up. Should be 5 hours down. 5 hours from 2:30 p.m. is 7:30 p.m. Sunset on January 5th is 5:30 pm. Oh-oh. Not expecting to be on the mountain after dark, I didn't bring a flashlight. I'm the last hiker out. With another mile or so to go to reach the trailhead parking lot, I watch the sun set. Soon, it is pitch dark. I can't see the trail. I'm in deep doo-doo.

I used my cell phone to call 911 and explain my embarrassing situation. The Superstition Search and Rescue (SSAR) team is dispatched to come to my aid. In about an hour I see lights approaching. Out of dark appear 3 men and one woman in full rescue regalia. After a brief assessment of my condition I'm escorted a quarter of a mile down the trail to an awaiting Polaris off-road vehicle which whisks me to my car. There is no charge, they are a volunteer organization. Before leaving, I thanked them profusely for their services and arrived home safe and sound at 10 p.m. I give SSAR an A+ for their action that night. They were quick to react, courteous, and professional.

Now I need to find out who (and why) someone put that plaque and mirror up there. Oh yeah, and next time I need to remember to bring a flashlight on a hike – even if it's daytime.

Saguaro Astronomy Club presents

2006 All-Arizona Messier Marathon

March 25 - 26, 2006

Farnsworth Ranch (south of Arizona City)

As luck would have it, all indications are that we will be able to observe all 110 entries in Charles Messier's catalog - weather permitting. And the weather has been favoring us for some time!

Complete details here: http://www.saguaroastro.org/content/messierpaul.htm

Site coordinates: North 32° 27 min 45.2 sec West 111° 43 min 53.2 sec Elevation: 1800 ft

Oberwerk 80mm 45° Binocular Telescope

by Silvio Jaconelli

BACKGROUND

As stated by Kevin Busarow of bigbinoculars.com, this 'Obie' is a serious competitor to the mid-range Mayauchi models. I have already owned bino products from Miyauchi, Takahashi and Denkmeier and I am now firmly in the two-eyed camp, finding that this provides me with a much more comfortable viewing experience in addition to squeezing more detail from a given magnification.

Let me state at this point that working with Kevin at bigbinoculars.com was an exceptionally pleasant experience; for me, he has set the standard for customer service.

SPECIFICATIONS

This new binocular telescope (BT) has 45 degree angled eyepiece holders which accept regular off-the-shelf 1 ¼" eyepieces. Bigbinoculars.com specifies a 520mm focal length for a focal ratio of 6.5, high for binoculars. This was a plus factor for me as my viewing targets from my light polluted Phoenix area backyard are the Moon, sun, planets and double stars.

The weight of the BT is listed at 16 pounds, for a total rig weight of around 25 pounds when a Bogen 3076 tripod and Blaho Stedi-vu mount are included. For $300 extra, a custom fork mount/wooden tripod is available, but I elected to forego this option since I already had a mount/tripod combo from my Takahashi 22x60 days, and since the custom tripod was fixed height. The Bogen tripod has a variable height ranging from 4 feet to 8 feet. I think that I am losing some stability here, but the convenience of the variable height outweighs this for me. This combination of fork mount and 45 degree eyepiece holders allows the BT to easily view at zenith, something that was next to impossible for me to do with the Takahashi 22x60 straight through binoculars.

The 80mm BT is a doublet while the Obie 100mm is a triplet and much heavier at around 26 pounds, with a total rig weight of over 40 pounds. I have read that the combination of weight and size of the 100mm BT makes it not a portable rig. However, the 80mm BT can be moved around my back yard with ease, and I keep it fully set up in my living room so that no assembly/disassembly is required. Set up time is a few seconds. I use an $8 Daisy red dot finder to point the BT, and for really faint targets I look through the Daisy finder with handheld binoculars for a right side up 7x image. I paid $900 for the 80mm; the 100mm sells for approximately $1,500, I believe, without mount/tripod.

EYEPIECES

I already have a selection of eyepiece pairs from my binoviewer addiction. These specs on these as they apply to the BT are:

Orion 32mm Plossls yielding 16x with a 3.3 degree fov and a 5.0mm exit pupil.

Obie 26mm Erfles yielding 20x with a 3.1 degree fov and a 4.0mm exit pupil.

Denk 14mm on back order yielding 37x with a 1.8 degree fov and a 2.2mm exit pupil.

UO 9mm HD Orthos yielding 58x with a 0.7 degree fov and a 1.4mm exit pupil.

Nagler 7mm Type 1 yielding 75x with a 1.1 degree fov and a 1.1mm exit pupil.

I also have a pair of UO 18mm HD Orthos but I need an additional 2mm of in travel to get them to focus!

The eyepieces are friction fit, with a pair of rubber 'o' rings embedded inside each eyepiece holder providing the friction.

The only eyepiece pair that did not deliver sharp images was the 7mm Naglers and I interpret this to mean that the BT's top magnification is in the 70x to 80x range. I guess that I need to try out a pair of later model higher quality eyepieces to see if the image quality improves. The only real downside with this BT that I have encountered is that sometimes it is not easy changing eyepieces due to the overly snug fit – it sometimes takes some muscle to extract eyepieces, and this results in the image moving out of the eyepiece field. One solution might be to use a pair of TV 8-24 click stop zooms giving a magnification range of 22x to 67x – hmmm, that'll set me back $450, and I'm not sure if they will come to focus……
For right now, I'm using just three eyepiece pairs – 26mm Erfles for wide FOVs, the 7mm Naglers for high power, and the 9mm Orthos for when the Naglers are limited by the atmospheric seeing.

(Continued on page 13)

Stardust: A Successful Mission
by Laurice Dee Ph.D.

A Quick Update on Stardust

To those of you that are into robotic solar system exploration: Do you know what's been happening to Stardust?

I am happy to report that the Stardust spacecraft successfully released the sample return capsule which parachuted safely to the desert salt flats southwest of Salt Lake City, Utah during the early morning hours on the 15th of this month.

The landing of the sample return capsule was the final milestone of the Stardust mission. There were other milestones for Stardust since its launch back in February 1999. For those of you that may not be familiar with the mission, the following details will allow you to catch up with what Stardust is really all about, as well as what had occurred during Stardust's entire mission.

The Stardust Mission

There are so many of us that are curious as to how "everything" came to being. Besides, we wonder how our solar system, comprising of the Sun and the planets, was formed. There is an understanding that comets contain the "leftover" materials (i.e., dust, as well as chemical signatures) from interstellar space that probably allowed for the formation of our solar system and that these "building blocks" may possibly hold clues to how our Sun and planets came to being billions of years ago. Not only are we curious about how our solar system was formed, but those of us would be so interested to know how "we" came to existence!

The purpose of the mission was to fly a spacecraft to collect cometary samples so that fundamental questions about our solar system could be answered. The Stardust spacecraft was designed to travel to Comet Wild 2 to collect dust particles and return them back to Earth. In addition to the collection of samples from Wild 2, the plan was for the spacecraft to collect dust particles from interstellar space.

The Stardust Spacecraft

Stardust was well equipped for the mission. The desk-sized spacecraft, outfitted with solar panels and Whipple shields, carried the following instruments on its journey to Comet Wild 2 and back: Cometary and Interstellar Dust Analyzer (CIDA); Dust Flux Monitor (DFMI); and Navigational Camera with Periscope. CIDA intercepted and performed real-time compositional analysis of dust as it was encountered by the spacecraft. DFMI was used to monitor the dust particle impacts and to transmit information directly back to Earth. The camera returned high-resolution images of the comet.

The medium- and high-gain antennas allowed Stardust to communicate with the mission controllers on Earth. Deep Space Network antennas in Goldstone, California, Madrid, Spain, and Canberra, Australia were used to relay information back and forth between Stardust and the flight team at Jet Propulsion Laboratory.

The sample return capsule contained a canister that enclosed the collector tray which was filled with aerogel. Since the particles travel at an extremely high speed (about six times the speed of a rifle bullet), the mission team was able to put aerogel to great use because of its resiliency during the collection of particles. Aerogel is a silica-based solid with a porous, sponge-like structure of which 99.9 percent of the volume is empty space. It is more than 100 times less dense than glass and other silica-based solids. Aerogel can withstand high temperatures, as well as the extremely cold environment, in space. It is strong and can very easily survive the launch, as well as being in the space environment. It had been used for the Mars Pathfinder mission (as an insulation for the Sojourner rover) and other Mars rover missions.

Stardust being so lightweight (less than 1000 pounds) was quite economical for the mission. The sample return capsule was also lightweight and was made out of certain materials that allowed it to enter Earth without burning or breaking up in the atmosphere.

Beginning of the Mission

I started following the Stardust mission when its website first came out in 1997. I was also following the Galileo and Cassini missions at that time. I had the opportunity to view the construction and testing of the Stardust spacecraft via webcam that was shown daily on the website. Both construction and testing took place in 1998, and the launch on a balmy Sunday afternoon, 7 February 1999, was quite successful. Stardust was lifted off into space from the Cape Canaveral Air Station in Florida. The onboard video camera, which was placed on the second stage of the rocket, recorded the launch before the second stage was separated from Stardust which was still attached to the upper stage while in parking orbit around Earth. The upper stage then released Stardust into space.

By the way, Stardust was the only spacecraft that I had the chance to follow its progress from its building blocks (so to speak!) to the final milestone when the capsule landed safely in Utah.

Throughout the Journey

There was a series of milestones during Stardust's travel in space. After flying the first loop around the Sun, the spacecraft flew past Earth on 15 January 2001 for gravitational boost so that it could be in the right position for its rendezvous with Comet Wild 2. Since the Earth swing-by,

the spacecraft opened up the sample return capsule and unfurled the aerogel-filled collector tray to collect particles from interstellar space while taking measurements of dust that floated in space. The spacecraft performed deep space maneuvers, as well as some trajectory correction maneuvers, during the first two loops.

The main event took place shortly after Stardust entered its third loop around the Sun. The event was the fly-through of Comet Wild 2 on 2 January 2004. After performing the final encounter trim, the spacecraft assumed its position so that the coma of Wild 2 could "run over" Stardust. Prior to this occurrence, the collector tray was unfurled and the instruments were on the ready for data collection. The fly-through, or rendezvous, with the comet was quite uneventful

(Continued on page 5)

March Guest Speaker : Bill Dellinges

Bill has been an amateur astronomer since 1955 (12 years old). His first scope was a Criterion 4" Dynascope Newtonian reflector. Bill considers himself to be a general visual observer, having no interest in imaging or doing anything that requires work. He'll gladly leave that to the pros. He does not observe if it is too hot or cold.

Bill's first serious telescope was a Unitron 4" F15 refractor, purchased in 1970. Then followed a C8, C5, C14, Questar 3.5, Astro-Physics 5" refractor, Astroscan 4", Miyauchi 20x100 binoculars, TeleVue Ranger, TeleVue 85, and Coronado PST.

In 1993 he and his wife moved to Apache Junction from the San Francisco bay area for a change in scenery and darker skies. That's the year he joined EVAC. He had a roll-off roof observatory built on his property to house the C14 in 1995.

For a number of years he gave stargazing classes at his observatory through the A.J. Parks and Recreation Dept. and taught astronomy and stargazing to Elderhostel groups through Arizona Central College. He still gives a monthly star talk at Lost Dutchman State park as a volunteer and conducts occasional private star party sessions at his "Roadrunner Observatory." Bill is a regular contributor to this newsletter.

Bill retired from Northwest airlines in 2000 after 35 years of service.

Someday he hopes to get a GoTo telescope because, as he puts it "my back is killing me."

The topic of Bill's presentation is *The Amateur Telescope Revolution, 1950-1970.*

Stardust: A Successful Mission

(Continued from page 4)

ful. The sturdy spacecraft endured particle hits from the comet while snapping the most spectacular images of the nucleus of Wild 2. The collection of particles, as well as data collection, went extremely well, and Stardust escaped from the encounter unhurt, so to speak!

After closing up the sample return capsule and transmitting precious data to Earth, Stardust flew the remaining loop back to Earth and prepared itself for the capsule-return endeavor.

Welcome Back, Stardust!

Upon returning from the 2.88 billion-mile trip, Stardust got itself into a position for the release of the capsule after performing the final trajectory correction maneuver. The release went without a hitch while the spacecraft was close to 69,000 miles above Earth on Saturday night, the 14th of this month. About 15 minutes after releasing the capsule, Stardust performed the divert maneuver, so that it would not follow the capsule to Earth. In the meantime, the entry, descent, and landing of the capsule went as planned during the early hours the following morning. The capsule hit the ground in one piece and appeared to be in great condition. The weather was quite perfect for the event, since there was no rain or snow, and the skies were quite clear. Our Moon was present for the landing in her lovely full-moon phase.

Shortly after landing, the capsule was taken to a temporary clean room so that the sample canister could be removed and packaged in a special container for shipment to Houston, Texas.

After arriving at the curatorial facility at the Johnson Space Center in Houston, the canister was unpacked and taken into a clean room so that it could be opened up for the first time. A group of scientists were on hand to view the collector tray, containing numerous particles that were "buried" in the aerogel. These scientists will have the opportunity to study these extremely tiny particles during the next 6 months and report preliminary findings.

In the meantime, Stardust is extremely healthy and has recently been put to a hibernation mode so as to conserve energy while traveling in space. The spacecraft's solar panels and communications remain powered on while the instruments and other subsystems remain off until Stardust can be used for a future mission or two.

Stardust's Future Missions

I understand that there is a call for proposals by NASA for Stardust's future rendezvous with comets and that the deadline for the submission of proposals is in early April of this year. So, if you guys have an idea or two of what Stardust can do again in space, it would not hurt for you to write out a proposal and show NASA that Stardust has the ability to take on a big encounter with another comet since Wild 2!

Seriously, my real hope is that Stardust will be used in a very meaningful way like it did during its mission with Wild 2. Even though Stardust will not be able to collect particles (hey, the capsule is already here on Earth!), it will still have its instruments to take measurements during its rendezvous with a new comet or two. Stardust is, indeed, very alive and ready to go for its second mission!

(Continued on page 15)

Classified Advertisements

Thousand Oaks Solar Filter

Thousand Oaks white-light solar filter is a 2+ and is nearly new. It comes with a foam-fitted cigar box case. This filter fits the 4.5" newt to the right. Price $50.

If you are interested, please contact Steven Aggas.

Contact info:
president@eastvalleyastronomy.org

16" f4.5 Meade Starfinder Eq. 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! I have $5200 invested in this telescope package, but will sell for $2000

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

6" f4 Dob

This 6" f4 Dob has a plasticast mirror and a 2" focuser. It could use a new coating, but still works great. The 31 Nagler in the photo is not included, cinder blocks are optional. Price $200. If interested, please contact Steven Aggas.

Contact info: president@eastvalleyastronomy.org

4.5" f9 Newtonian Reflector

The 4.5" f9 telescope has a glass mirror and a 1.25" focuser. The tube has some dents as it was used as a guidescope on my 20" for imaging. The equatorial mount (no motors) has new oak legs. Price $150.

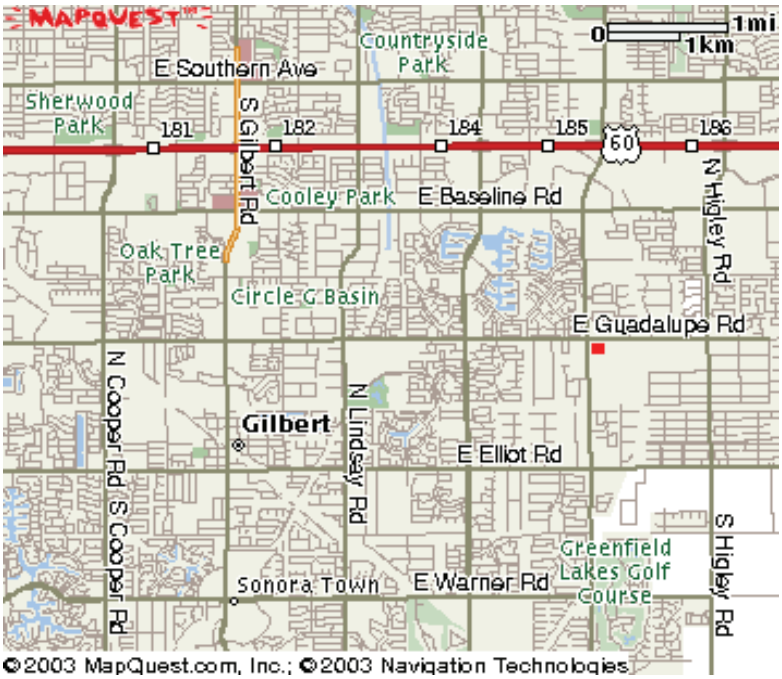
If you're interested, please contact Steven Aggas.

www.RotaryObs.org

Advertisements for astronomical equipment or services will be accepted from current EVAC members only. 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 published until canceled (as space allows), so please inform the editor when your item has sold.

Ads should be emailed to: news@eastvalleyastronomy.org

Support your local telescope dealer!



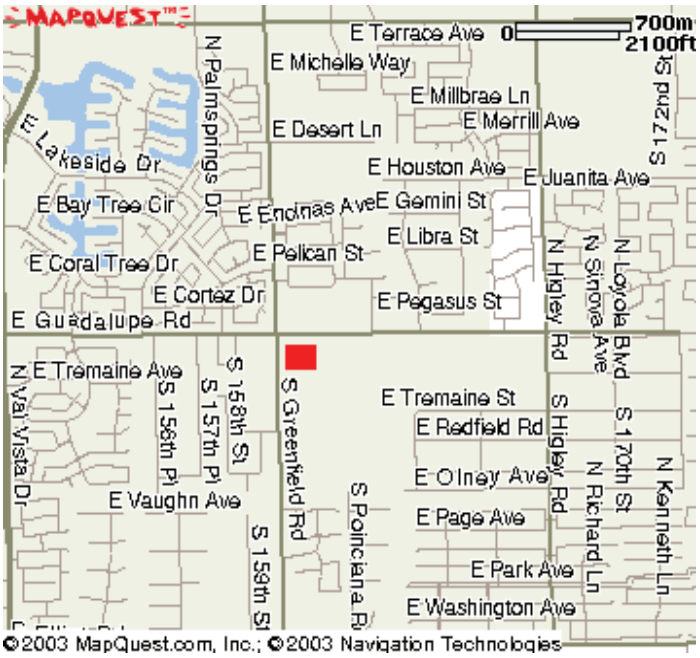
The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

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.

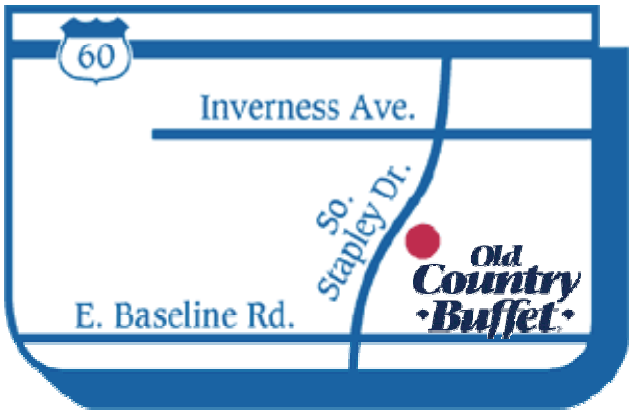
Visitors are always welcome!

2006 Meeting Dates

March 17
April 21
May 19
June 16
July 21
August 18
September 15
***Special Date* October 14**
November 17
December 15



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

March 2006

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

- *March 2 - Superstition Springs Elementary*
- *March 2 - Taft Elementary*
- *March 2 - Powell Junior High School*
- *March 3 Madison Park School*
- *March 4 - Local Star Party at Boyce Thompson Arboretum State Park*
- *March 10 - Public Star Party at Riparian Preserve in Gilbert*
- *March 17 - General Meeting at Southeast Regional Library in Gilbert*
- *March 25-26 - Messier Marathon at Farnsworth Ranch (sponsored by Saguaro Astronomy Club)*
- *March 30 - Hendrix Junior High School*
- *April 1 - Deep Sky Star Party at Vekol Road*

Details for all public outreach events are available on the EVAC website calendar or by contacting the Events Coordinators: Randy Peterson and Butch Miller at events@eastvalleyastronomy.org

Minutes of February General Meeting

Meeting date: Friday, February 17, 2005

Meeting location: Southeast Regional Library in Gilbert

President Steven Aggas opened the meeting, which was attended by approximately 80 people. After visitor and Board member introductions, a hobbled Wayne Thomas presented the Treasurer's report. Event Coordinator Randy Peterson provided an update on the busy EVAC calendar.

For general announcements, AJ Crayon discussed the All-Arizona Messier Marathon, which occurs on the night of March 25 at the Arizona City site. This was followed by member presentations, the first of which was by Tom Polakis, who described Messier Marathon observing windows from various latitudes. Peter Argenziano showed a DVD of highlights of the Cassini Saturn mission.

The main speaker was Ted Bowell. As the principal investigator for the Lowell Observatory Near Earth Object Search (LONEOS), he is well versed in asteroid surveying and risk assessment. His analysis described the probability of the Earth being struck by asteroids of different sizes. He discussed existing surveys and their degree of completeness as well as future efforts to find and characterize orbits of asteroids that may pose a risk.

After the meeting, Dr. Bowell and many members met at the Village Inn on the northeast corner of Gilbert and Southern.

Quick and Easy Astro Calculations

Magnification can be determined by dividing the focal length of the telescope by the focal length of the eyepiece being used. For example, a 9mm Nagler used in a 600mm focal length refractor, like Orion's ED80, yields 67x. [600 ÷ 9 = 66.6666]

The true or actual field of view can be calculated by dividing the apparent field of view of the eyepiece (specified by the manufacturer) by the magnification. In the earlier example, that Nagler provides a true field of 1.22° (about 2½ times the diameter of a full Moon). [82° ÷ 67 = 1.22°]

You can ascertain the exit pupil by either dividing the telescope aperture (in millimeters) by the magnification or by dividing the focal length of the eyepiece by the focal ratio of the telescope. Our example scope and eyepiece yield a 1.2mm exit pupil. [80 ÷ 67 = 1.19] or [9 ÷ 7.5 = 1.2]

It is time well spent to make these calculations for the telescopes and eyepieces in your collection, as armed with this data you can easily decide which eyepiece will provide the optimum observational experience for any given target.

East Valley Astronomy Club -- 2006 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 (dues are prorated, select according to the month you are joining the club):

☐ **$30.00 Individual** January through March

☐ **$35.00 Family** January through March

☐ **$15.00 Individual** July through September

☐ **$17.50 Family** July through September

☐ **$22.50 Individual** April through June

☐ **$26.25 Family** April through June

☐ **$37.50 Individual** October through December

☐ **$43.75 Family** October through December

Includes dues for the following year

Renewal (current members only):

☐ **$30.00 Individual** ☐ **$35.00 Family**

Magazine Subscriptions (include renewal notices):

☐ **$34.00** 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) *Included with membership* ☐ US Mail **Please add $10 to the total payment**

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? _____

PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org

All members are required to have a liability release form (waiver) on file. Please complete one and forward to the Treasurer with your membership application or renewal.

Liability Release Form

In consideration of attending any publicized Star Party hosted by the East Valley Astronomy Club (hereinafter referred to as "EVAC") I hereby affirm that my family and I agree to hold EVAC harmless from any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), which may directly or indirectly be connected to EVAC and/or my presence on the premises of any EVAC Star Party and related areas.

I further agree to indemnify any party indicated above should such party suffer any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), caused directly or indirectly by my negligent or intentional acts, or failure to act, or if such acts or failures to act are directly or indirectly caused by any person in my family or associates while participating in an EVAC Star Party.

My signature upon this form also indicates agreement and acceptance on behalf of all minor children (under 18 years of age) under my care in attendance.

EVAC only recognizes those who are members or invitees and who also have a signed Liability Release Form on file as participants at an EVAC Star Party.

_____ _____

Please print name here *Date*

_____

Please sign name here

PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org

Micro-sats with Macro Potential

by Patrick L. Barry

. Future space telescopes might not consist of a single satellite such as Hubble, but a constellation of dozens or even hundreds of small satellites, or "micro-sats," operating in unison.

Such a swarm of little satellites could act as one enormous telescope with a mirror as large as the entire constellation, just as arrays of Earth-bound radio telescopes do. It could also last for a long time, because damage to one micro-sat wouldn't ruin the whole space telescope; the rest of the swarm could continue as if nothing had happened.

And that's just one example of the cool things that micro-sats could do. Plus, micro-sats are simply smaller and lighter than normal satellites, so they're much cheaper to launch into space.

In February, NASA plans to launch its first experimental micro-sat mission, called Space Technology 5. As part of the New Millennium Program, ST5 will test out the crucial technologies needed for micro-sats—such as miniature thrust and guidance systems—so that future missions can use those technologies dependably.

Measuring only 53 centimeters (20 inches) across and weighing a mere 25 kilograms (55 pounds), each of the three micro-sats for ST5 resembles a small television in size and weight. Normal satellites can be as large and heavy as a school bus.

"ST5 will also gather scientific data, helping scientists explore Earth's magnetic field and space weather," says James Slavin, Project Scientist for ST5.

Slavin suggests some other potential uses for micro-sats:

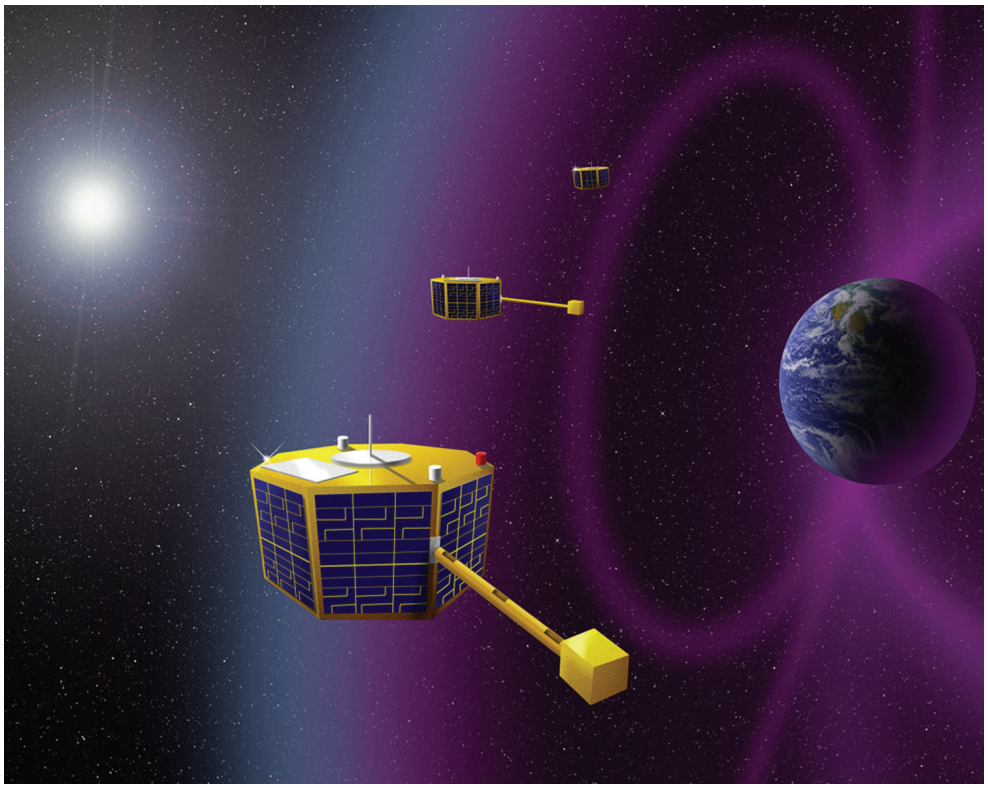
A cluster of micro-sats between the Earth and the Sun—spread out in space like little sensor buoys floating in the ocean—could sample incoming waves of high-speed particles from an erupting solar flare, thus giving scientists hours of warning of the threat posed to city power grids and communications satellites.

Or perhaps a string of micro-sats, flying single file in low-Earth orbit, could take a series of snapshots of violent thunderstorms as each micro-sat in the "train" passes over the storm. This technology would combine the continuous large-scale storm monitoring of geosynchronous weather satellites—which orbit far from the Earth at about 36,000 kilometers' altitude—with the up-close, highly detailed view of satellites only 400 kilometers overhead.

If ST5 is successful, these little satellites could end up playing a big role in future exploration.

The ST5 Web site at nmp.jpl.nasa.gov/st5 has the details. Kids can have fun with ST5 at spaceplace.nasa.gov, by just typing ST5 in the site's Find It field.

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



The Space Technology 5 mission will test crucial micro-satellite technologies.

If it's Clear...

by Fulton Wright, Jr.
Prescott Astronomy Club

If it's clear...

by Fulton Wright, Jr.

Prescott Astronomy Club

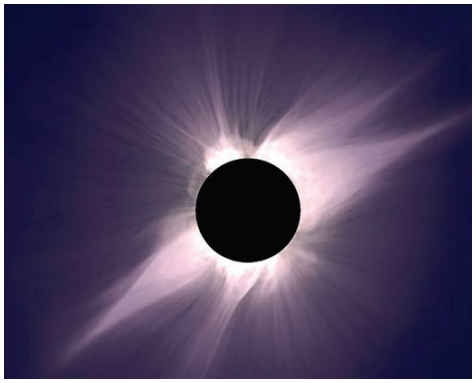
for March 2006

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, March 14, at 6:37 PM (same time as sunset), the full Moon rises, so forget the faint fuzzes for tonight. 2 hours and 2 minutes later, this very full Moon occults a 3.5 magnitude star (Beta Virginis). You will probably want at least a medium (6 inch) telescope and high power to see the star against the glare of the Moon. At 9:27 PM the star reappears.

On Saturday, March 18, about 3:00 AM (ugh) you can see Jupiter's moons in an interesting pattern. I won't tell you what it is, you can find out for yourself. No cheating with a planetarium program.

On Tuesday, March 28, the Moon is new so you have all night to search for faint fuzzes. If you are in Libya or some other places in Africa or Asia, you can see a total solar eclipse.



Solar eclipse photo courtesy of NASA

Up for Vote

In an effort to combat spam - the junk email filling up your electronic in-basket, not the pseudo meat product - a proposal has been approved by the Board of Directors, and will be presented to the membership for ratification at the March general meeting.

One method utilized by spammers is the use of web crawlers to search web sites in order to harvest email addresses. EVAC maintains a web page where members can have their email address listed. This page is susceptible to such actions.

The proposal would eliminate this page altogether. In its place would be a member directory in Adobe's portable document format (PDF). The directory would be updated quarterly. This solution removes the risk of automated email address harvesting while still allowing members to share contact information.

4th Annual Desert Sunset Star Party

April 26-30, 2006

Please check details at our website at http://www.chartmarker.com/sunset.htm

Registration is now open. Caballo Loco RV Ranch gives us a special camping rate for this group event. There is no star party fee this year but we will sell door prize tickets. The residents of Caballo Loco will also be serving breakfast ($3) and dinner ($5) on Saturday. We are located between Kitt Peak Observatory and Whipple Observatory, both excellent day trips.

For more information contact Pat and Arleen Heimann at Chart Markers and More
http://www.chartmarker.com

◐ First Quarter Moon on March 6 at 13:16

● Full Moon on March 14 at 16:35

◑ Last Quarter Moon on March 22 at 12:11

○ New Moon on March 29 at 03:17

Oberwerk 80mm 45° Binocular Telescope

(Continued from page 3)

VISIBILITY FACTOR

Roy Bishop of the Royal Astronomical Society of Canada extols a concept called Visibility Factor which allows comparisons of what can be seen in different binoculars. Simply put, the detail that can be seen is a function of two variables – magnification and aperture. The factor for a particular binocular is computed by simply multiplying magnification by aperture, assuming that the magnification is NOT pushed to excessive extremes. So a 7x50 instrument will have a visibility factor of 350, while a 15x60 instrument will have a visibility factor of 900, almost three times as much. Looking at large binoculars, a 20x100 instrument will have a visibility factor of 2000, and a 25x125 instrument will be at 3125. Pushing the Obie BT to my own magnification ceiling of 75x, yields a visibility factor of 6000 (75x80), almost twice that of a 25x125 binocular. My experience with the Obie BT's bears out this concept – see the 'PERFORMANCE' section below.

ABERRATIONS

I found that the only time that chromatic aberration was very obvious was at 75x on bright objects during the day; there was copious blue fringing around white walls in sunlight, but this fringing was much less at lower powers. And at night, any color fringing was barely noticeable unless I was looking for it. For me personally, the BT has acceptable performance on chromatic aberration. Off axis, I get the usual bending of straight linear objects – expected and nothing unusual.

PERFORMANCE

At lower magnifications, the images were excellent. As usual, the Moon was remarkable. Open clusters and brighter nebulae (Pleiades, Beehive, Double Cluster, M35, Orion Nebula) were very nicely framed against the background sky – Saturn and the Beehive at 2 degrees apart fit in the same low power field of view.

Stars dimmer than 4rd magnitude were tight, while some flaring in brighter stars was evident; this flaring might be due to my eyes rather than the BT – I'm not sure. This flaring interfered with my ability to split double stars with bright primaries and faint secondaries such as Rigel and Theta Aurigae.

It was at the higher powers that the BT really performed. Much of the observing at 75x really was in the province of telescopes rather than binoculars. Then fold in the apparent increase in image scale by using two eyes rather than one eye, and indeed the images were telescope-like. For example:

Saturn – at 75x there was a great deal of black space between the rings and the globe – the nature of this object was totally apparent. In fact, the views at 58x were even better – much sharper and more pleasing with no loss of any detail compared at 75x. However, no surface detail was seen at either magnification, nor was the Cassini division ever resolved. I was using 'deep sky' old vintage Naglers at 75x and using 'planetary' orthos at 58x – I really need high power 'planetary' eyepieces to see if they better the Nagler images. More cash outlays.....!!!!!

Mars was a small orange globe. I thought that I could detect just a trace of a vertically oriented marking in the image but I was not sure what it was. I then checked my Mars chart and guess what – Syrtis Major was on the meridian at that very time. Syrtis Major through binoculars – wow!! Now I need red filters. More cash outlays.....!!!

Sun – I still need to make up some solar filters to allow me to view the sun. The sun is normally like the Moon – spectacular images at 40x to 50x, so I really need those filters. More cash outlays.....!!!

The Moon at 75x showed Rupes Recta (the Straight Wall) so very obviously. And Vallis Schroteri was easily visible although the views were not so crisp. And Catena Davy was observed as a faint fuzzy line running across the Moon's floor. The Moon images were so bright that I need Moon filters. More cash outlays.....!!!

Double star performance was excellent. I was just able to split Rigel (mags 0.1, 6.8; sep 9.5") on one evening although not on another. Flaring and the big magnitude difference in the components is a real challenge. But Iota Orionis was easily split (mags 2.8, 6.9; sep 11.3"), as was the three components of Sigma Orionis (mags 4, 7, 7; sep 13", 42"); the 10th magnitude companion (sep 11") was blotted out by the very bright primary. The Beta Monocerotis triple, on the other hand, was a very easy split (mags 4.7, 5.2, 6.1; sep 7.2", 9.9"). The Trapezium was also a very easy split. Theta Aurigae was like Rigel – the flaring and the big magnitude difference prevented splitting.

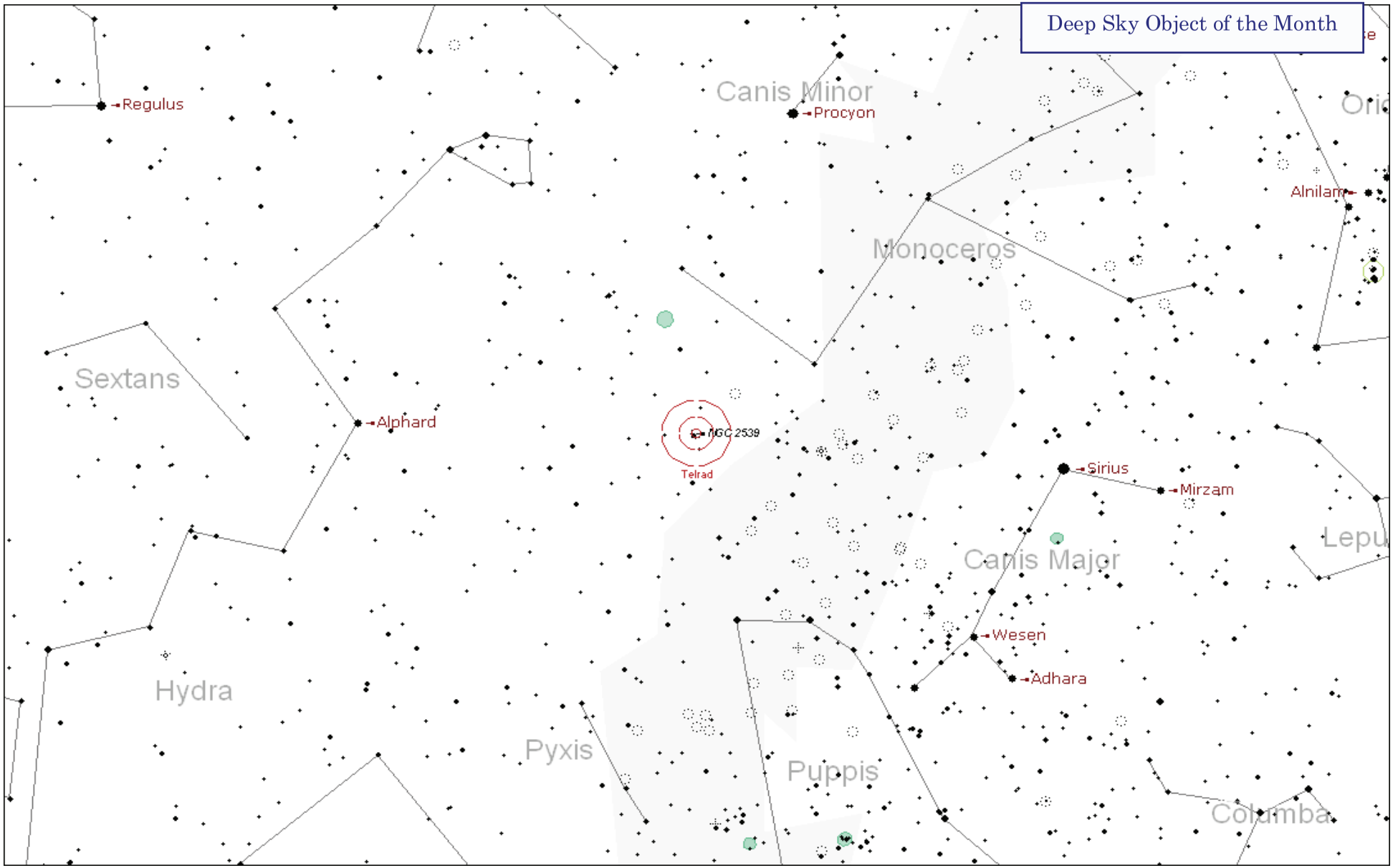
The real surprises were the double stars with tight separations that the BT was able to resolve, targets that I thought were the exclusive domain of telescopes. These included:

65 Piscium – Mags 6.3, 6.3; sep 4.6"

Struve 750 – Mags 6.5, 8.5; sep 4.2"

1 Arietis – Mags 6.2, 7.4; sep 2.9". This one was really tough, seeing elongation only. Through the eye-

(Continued on page 15)



NGC 2539 Open Cluster in Puppis

Magnitude: 8.0 Size: 21’ Distance: 4,200 Light Years Age: 462 Million Years

RA 08h 10m 44.9s Dec -12° 48’ 57”

Chart created with Starry Night Pro software.

Oberwerk 80mm 45° Binocular Telescope

(Continued from page 13)

pieces, I guessed the position angle to be 180 degrees; then I checked my star charts – the position angle was given as 166. Eureka – I was able to break the 3" floor!!!! Well, humour me, everybody – allow me count 'elongation' as 'resolution'!!!

Oh! before I forget, Castor was easy – Mags 1.9, 2.9; sep 3.9".

SUMMARY

I'm delighted with the overall package. The best images I've ever seen through binoculars were the Takahashi 22x60, but these were very expensive, straight through, low power, single magnification units; the Obie BT is much less expensive, has angled eyepieces, and variable magnifications – the image trade off is definitely worth it to me personally. To summarize:

Advantages

Good image quality

Excellent portability.

Easy zenith viewing.

Infinite magnification options.

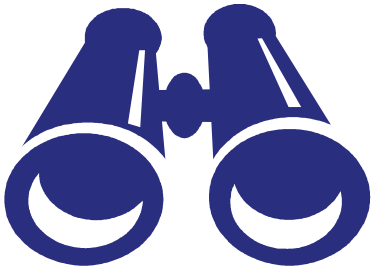
Low cost.

Excellent customer service from bigbinoculars.com.

Disadvantages

Changing eyepieces can be a chore.

Now I need to find the money to pay for all the extras that I want!



Stardust: A Successful Mission

(Continued from page 5)

What a Nostalgic Experience for Me!

Following the progress of Stardust throughout the mission has been a very special experience for me. It is as if I were watching a human grow from birth to maturity. I feel like a proud parent witnessing the growth of her child. It has been extremely interesting for me to follow Stardust from its building blocks to its successful completion of the mission. I even got to watch (via webcam) the technicians install the collector tray into the capsule through the sterilized glass box while the spacecraft was being held in the horizontal position (so that the capsule could be in the box). I consider this to be one of the milestones of the Stardust mission. Stardust has and will always remain a special treasure of mine!

Laurice Dee, Ph.D.

JPL Solar System Ambassador (Arizona Representative)

JPL Solar System Ambassadors Program

Jet Propulsion Laboratory (JPL) - Pasadena, CA

If you have any questions and would like to comment, please do contact Dr. Dee at jplssambassador@wyndtell.com or launchspace@msn.com or send her a fax at 480.890.7878. The website for the JPL Solar System Ambassadors Program is http://www.jpl.nasa.gov/ambassador. The website for the Stardust mission is http://stardust.jpl.nasa.gov/

Coming in April… our guest speaker will be Rogier Windhorst, professor in the department of Physics and Astronomy at ASU. Dr. Windhorst will be speaking on The James Webb Space Telescope: How Will it Explore the Epochs of First Light, Reionization, and Galaxy Assembly?

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