March 2007

The Observer

East Valley Astronomy Club

Volume 21 Issue 3

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March Events:

- *Public Star Party in Gilbert - March 9*
- *Local Star Party at Boyce Thompson - March 10*
- *January Meeting at Southeast Regional Library - March 16*
- *Deep Sky Star Party at Vekol Road - March 17*
- *All-Arizona Messier Marathon - March 17*
- *Globe Centennial - March 27*

From the Desk of the President
by Claude Haynes 2007 EVAC President

Messier Marathon – 3/17

Astronomy Day – 4/21

Renew your Membership

Check the EVAC website

Have Fun!

March is a busy month. I'm looking forward to Gene Lucas' talk on CCD Photometry at this month's meeting. There is more to a telescope than meets the human eye. That was certainly apparent in Jon Christensen's beautiful photography last month. And the next night after our meeting is the Messier Marathon – a great chance to hunt the entire sky for faint fuzzies. EVAC is partnering with the Riparian Institute to celebrate Astronomy Day on April 21. We will need some volunteers with scopes - more info to follow. Our Treasurer, Bill Houston, would love to chat with you over a check at our meeting if you haven't renewed your membership. And speaking of checks, check the EVAC website for school star parties and special events. We just did a party for the Salvation Army. It was so cloudy a fuzzy moon was all that was available, and the kids still had a great time. This is a fun hobby!

The Backyard Astronomer
Finding Winter Messier Objects Lost in the Big Void
by Bill Dellinges

Every winter I have looked with trepidation in finding M46, M47, M48, M50, and M93. I would look up at this giant black hole between Canis Major and Hydra and think, "They're in that 'Big Void' somewhere." So I'd get out the binoculars and star charts and track them down one by one. I finally came up with a few tricks to find these open clusters. Even GO-TO telescope owners might find the following star hopping directions of interest – after the scope has slewed to the object, you can look through your viewfinder to get an idea of where the heck these things are. For reference, I direct you to Will Tirion's Bright Star Atlas, page 4 or his Sky Atlas 2000, Chart 12 and Chart 19 (for M93 only). Let us begin.

Working west to east, our first challenge is M50 in Monoceros. Use the Belt of Orion to take you ten degrees (one fist at arm's length) south-east to Beta (a gorgeous triple star) and Gamma Monocerotis. These are not bright stars at 3.76 and 4th magnitude, respectively. But I find with diligence and dark adapted eyes, I can spot them even from the city. Follow a line through them east 8 degrees with binoculars or finder and bingo, there you are. My 11" SCT at 104x (0.65°) frames this

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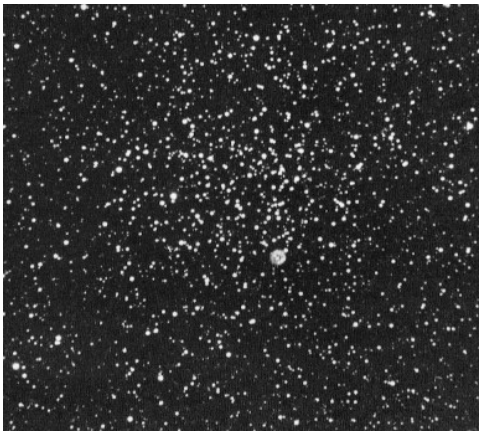
The Backyard Astronomer

(Continued from page 1)

moderately bright cluster nicely. Most of its stars appear to be about the same magnitude. With M46 and M47, we get a two-for-one deal. Who said there's no such thing as a free lunch? Finding these two clusters is not difficult if you notice Gamma Canis Majoris, Sirius, and Beta Canis Majoris point east directly at M46 and M47, just a little more than the space between Gamma and Sirius. Being only 1.5 degrees apart, the double image of two blobs sweeping into your finder's field will jolt you into the realization that you have indeed hit pay dirt. M46, the eastern cluster, is the fainter of the two being five times more remote than M47. M46 has a neat granular appearance and as a bonus, a planetary nebula, NGC 2438, embedded in it (it's actually a background object).



M46 and NGC 2438

At 165x in my 11", I can spot the hole in its center with averted vision, a' la M57. M47 is a large bright cluster. I needed 70x with a 0.93° field to frame this monster. I can see the combined light from these two objects with the naked eye as a smudge in a moderately dark sky.

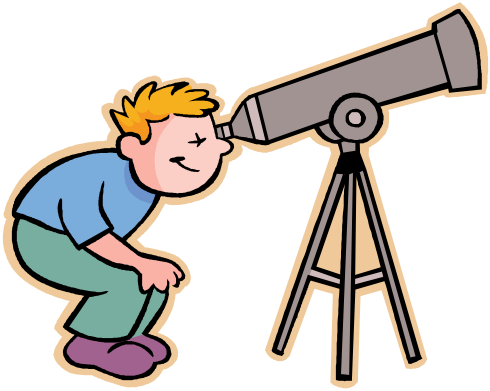
Unlike the others, M93 is actually near some bright stars near the bottom of the Big Void. So it's not quite the challenge to find that M50, 47, 46, and 48 are. Begin by finding the lower part of Canis Major: the Dog's hip, hind leg, and tail. Less than 10 degrees east, you'll notice a scattering of third magnitude stars. Three stars near the top of the group form a triangle not unlike an arrowhead. The western most star of this arrowhead is Xi Puppis (a wide optical double), and 1.5 degrees northwest of it is M93. Like the other clusters discussed here, it will be very evident as a nebulous blob in a finder or binoculars. My best view was at 104x with a 1/2 degree field of view.

To find M48, first locate Canis Minor. You do know where that is, don't you? If you don't, you're in big trouble here! Hey, it only has two stars in it! Anyway, draw a line through Beta (Gomeisa) and Procyon southeast about 11 degrees to a little tight knot of three stars, 1, 2, and C Hydrae. Slightly west is 4th magnitude Zeta Monocerotis. Below these stars is M48. It forms the apex of an equilateral triangle with those stars. The cluster is large, bright, and sparse. I could just barely fit all its stars into my 0.93 degree field at 70x. This grouping reminded me of M44, the Beehive Cluster in Cancer (about 30 degrees to the north).

M48

Image credit: NOAO/AURA/NSF

I hope these pointers help you find these five Messier objects before frostbite sets in. Now you only have to find the other 105.



Full Moon on March 3 at 16:17

Last Quarter Moon on March 11 at 20:54

New Moon on March 18 at 19:44

First Quarter Moon on March 25 at 11:16

STS-118 In-flight Education Downlink Opportunity

NASA is seeking formal and informal education institutions and organizations, individually or working together, to host live, in-flight education downlinks during STS-118, the first flight of an Educator Astronaut, Barbara Morgan. In order to maximize the impact of these events, NASA seeks organizations that will draw large participant numbers and demonstrate large-scale educational impact. STS-118 will have a lasting impression on the education community. The theme of the STS-118 education effort is Igniting the Flame of Knowledge.

The STS-118 mission patch.

Image courtesy of NASA

Opportunity

During the mission, the STS-118 crew will participate in live, in-flight education downlinks with Barbara Morgan and selected crewmembers. Live, in-flight downlinks can happen any day during the mission and are not always scheduled during normal business hours. Downlinks are approximately 20 minutes in length and allow students and educators to interact with a crew on board the space shuttle through a question and answer session. A downlink is essentially a modified videoconference in which participants hear and see the crewmembers live from space. The crew does not see the audience. Downlinks afford education audiences the opportunity to learn first-hand from space explorers what it is like to live and work in space. These events are broadcast live on NASA TV, or NTV.

Background

No earlier than June 28, 2007, the STS-118 crew will launch into space aboard space shuttle Endeavour to continue the extraordinary task of assembling the International Space Station, or ISS. In addition to replacing a Control Moment Gyroscope and delivering the Starboard 5 Truss Segment and the External Stowage Platform 3 to the ISS, the STS-118 mission will be the first flight of an Educator Astronaut, mission specialist Barbara Morgan.

An Educator Astronaut is a fully qualified astronaut who brings expertise in K-12 education. With their education background, Educator Astronauts will help lead NASA in the development of new ways to connect space exploration with the classroom, and inspire the next generation of explorers while ensuring a successful mission. Barbara Morgan is a teacher from McCall, Idaho.

Attired in training versions of their shuttle launch and entry suits, Commander Scott Kelly (left), Pilot Charles Hobaugh, Mission Specialists Tracy Caldwell, Rick Mastracchio, Dave Williams and Barbara Morgan, and Expedition 15 Flight Engineer Clayton Anderson await the start of a training session in the Space Vehicle Mockup Facility at Johnson Space Center, Houston. Image courtesy of NASA

U.S. Navy Cmdr. Scott Kelly will command the seven-person crew of STS-118. U.S. Marine Corps Lt. Col. Charles Hobaugh will be Endeavour's pilot. Veteran astronauts Richard Mastracchio and Canadian astronaut Dr. Dafydd (Dave) Williams will be returning to space for their second missions. Assigned to their first spaceflight, Barbara Morgan and Tracy Caldwell will serve as mission specialists. Clay Anderson will launch to the ISS on board STS-118 to replace Sunita Williams as flight engineer for ISS Expedition 15 crew.

This mission will spark the imagination and nurture the passion of tomorrow's explorers and innovators, and salute the power of teachers and astronauts to inspire our nation and strengthen its future.

Who Can Host an Education Downlink?

Members of the U.S. informal and formal education communities are eligible to host these downlinks. Examples include museums and science centers, local school districts, national and regional education organizations, and local, state and U.S. government agencies. NASA provides this opportunity at no cost to the host. Downlinks support national education standards and initiatives.

What You Need to Host a Downlink

In order to host a downlink, you need NTV and two telephone lines. The audio for the downlink is received through a telephone line. The video is received through NTV. The host organization must receive NTV in order to participate in this event. Access to NTV via the Internet is not acceptable for this transmission.

STS-118 In-flight Education Downlink Opportunity

(Continued from page 3)

Review of Submitted Material:

NASA is committed to inspiring the next generation of explorers. Applications will be reviewed for relevance to the education community, education content, diversity of participants, evaluation, continuity and community involvement. Successful downlink hosts will articulate how they will maximize this limited opportunity for the greater good of the community or region.

Mission scheduling requires the hosting organization to be flexible. Downlink times and dates may shift and are sometimes cancelled. The number of downlinks scheduled during STS-118 is limited.

Application Process and Deadline:

The deadline to submit an application for STS-118 downlinks is March 9, 2007. Applications must be submitted electronically to the Teaching From Space Office. A committee will review all applications. Organizations will be notified of their status. NASA Education will work with the host to plan the downlink.

Interested parties should contact the Teaching From Space Office to obtain information related to program expectations, content, format, audience, application guidelines and forms. Email for application guidelines and form is jsc-nseo@mail.nasa.gov.

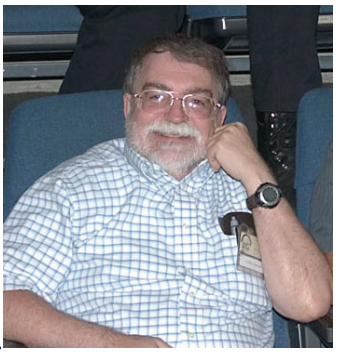
Education/Engagement Opportunities Surrounding the Flight

NASA Education is planning a variety of education activities for students and educators before, during and after the mission. There will be numerous opportunities for formal and informal education communities to be actively engaged in STS-118. Information on the mission and related education activities can be found at http://www.nasa.gov/sts118.

In honor of this month's annual Messier Marathon here is an excellent image of one of the event's challenge objects: the spiral galaxy M74 in Pisces. Image courtesy of Jon Christensen.

Details: October 29, 2005 using 12½"RCOS RC at F/9 and SBIG STL 11000 Camera. 175 Minutes Luminance; R30, G20, B30

March Guest Speaker : Gene Lucas



If you've been involved in the Valley's amateur astronomy scene at all over the past three decades, this month's guest speaker needs no introduction. Gene was involved with the formation of the major clubs, including EVAC. Now that he has recently retired, Gene has more time available to devote to his astronomical interests.

Gene has been quite active in asteroid and lunar occultations and photometry, and this month will give us a presentation on the photometric work he has been conducting with Jeff Hopkins using a Meade DSI camera.

No Safe Place
by Dr. Tony Phillips

Imagine hiking across Antarctica, through ice, cold and bitter wind, enduring months of hardship, and finally arriving at the doorstep of the South Pole itself. At that moment you get hit by a Sahara sandstorm.

That's the analogy scientists are using to describe what happened to the ESA-NASA Ulysses spacecraft last December. "Ulysses was approaching the South Pole of the sun when it was 'sandblasted' by a cloud of high-energy particles—protons, electrons and heavy ions," says Arik Posner, Ulysses Program Scientist at NASA headquarters. The cloud was as foreign to the sun's South Pole as a Sahara sandstorm would be to Antarctica.

The strange tale begins on Dec. 5, 2006.

Astronomers were in a state of excitement due to the sudden appearance of a giant and angry-looking sunspot on the sun's eastern limb—"sunspot 930," says Posner. On Dec. 5th it exploded, producing one of the strongest solar flares of the past 25 years. On the "Richter scale" of solar flares, X1 is considered intense; the Dec. 5th flare was an X9. A flash of X-rays announced the blast to sensors in Earth orbit, and moments later a cloud of protons, electrons and heavy ions came rushing out of the blast site. This is the cloud that pelted Ulysses.

The process repeated on Dec. 6th (X6) and Dec. 13th (X3). Each explosion created its own cloud of high-energy particles. "We call these clouds 'radiation storms,'" says Posner. "They are common after big flares."

What's strange about these storms is where they went—to the South Pole. "All three storms were detected by the Ulysses spacecraft," says University of New Hampshire physicist Bruce McKibben. He is principal investigator for COSPIN (Cosmic and Solar Particle INvestigation), an array of sensors onboard Ulysses that counts high energy particles. "The Dec. 6th event was particularly strong and rich in heavy ions."

The Dec. 6th storm was so strong, in fact, "that if Earth had been where Ulysses was, we would have experienced a full-fledged Ground-Level Event," says Prof. Bernd Heber of the Institute for Experimental and Applied Physics in Keil, Germany. In other words, the particles were capable of tunneling all the way through Earth's atmosphere to reach the ground. Heber is principle investigator for the Kiel Electron Telescope (KET), a sensor onboard Ulysses able to detect such super-energetic electrons, protons and ions.

These observations add up to "a big puzzle," says McKibben. Sunspot 930 was near the sun's equator, while Ulysses was over the sun's South Pole. The sun's magnetic field should have kept the storms bottled up at low latitudes. How did they reach Ulysses?

It's a puzzle NASA is keen to solve. Solar radiation storms can cause communication blackouts on Earth; they can disable satellites in Earth-orbit; and in extreme cases they could be deadly to astronauts. "We need to be able to predict the trajectory of these storms," says Posner.

The key is the sun's magnetic field. Just as Earth's magnetic field guides compass needles, the sun's magnetic field guides radiation storms. "Radiation storms consist of charged particles which naturally follow lines of magnetic force."

To forecast the path of a radiation storm, researchers have in the past relied on the "Parker spiral," a pioneering magnetic model developed by University of Chicago physicist Eugene Parker. According to his work, the sun's magnetic field emerges radially from the sun's surface and spirals outward into the solar system. "The spiral shape is caused by the spinning motion of the sun," explains Posner. "It's like a spiral stream of water from a spinning lawn sprinkler."

The Parker spiral makes a straightforward prediction: Radiation storms that begin near the equator should remain near the equator. A storm might expand into the solar system and hit Earth, which is not far off the sun's equatorial plane, but it should not hit Ulysses over the sun's South Pole.

Clearly, there's more to the story than a graceful spiral. The real solar magnetic field may contain kinks and twists that provide a polar passage, a route storms can travel from equator to poles. There is evidence for the idea: In 2000 and 2001, the last Solar Max, the sun's magnetic field was full of convoluted, non-Parkerian structures. "During that time, Ulysses experienced six high-latitude radiation storms," notes McKibben: data.

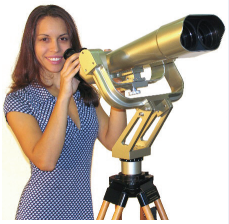
Mapping and understanding these passages, if they exist, is work for the future. Meanwhile, one thing is clear: "There is no place in the inner solar system completely safe from radiation storms," says Posner.

Article reprinted courtesy of NASA@space.gov

Classified Ads

Oberwerk BT-80-45

Oberwerk binocular telescope with 45° angle eyepiece holders. These were purchased brand new about one year ago and are in excellent condition. They feature BAK 4 prisms and fully broadband multi-coated optics. They come with 20x eyepieces which give a 3° FOV, but they can be used with any standard 1¼ inch eyepieces; my eyepiece sets gave magnifications from 17x to 70x. Weight is 16 pounds. The $595 price is for the binoculars only - no mount or tripod included.



Full specifications and photos can be found at bigbinoculars.com - sort by brand and choose 'Oberwerk'; then scroll down to 'Oberwerk BT-80-45'.

I wrote a review on these at cloudynights.com - go to 'Forums', 'Binoculars', 'Links to 240 Minireviews' then scroll down to 'Oberwerk BT80 45 degree binocular telescope dated 1/17/2006'.

Silvio Jaconelli

480-926-8529 (home) or 480-262-2322 (cell)

12" Meade LX-200 GPS

I am selling my 12" LX-200 GPS UHTC in order to fund another project. Everything is in perfect working order. I sent it to Meade for refurbishing in January 2006 and it has all new electronics and metal drive gears. For all practical purposes it's a new scope. Although it's heavy (75 lbs), the Get-a-Grip handles make it an easy lift for two people and a doable lift for one if you are in shape. Performs wonderfully as a visual instrument and it has worked magnificently with a F3.3 focal reducer and a StellaCam-II video camera.

See: http://www.eastvalleyastronomy.org/class-ads.html

Package includes:
12" LX200-GPS UHTC

All Original Equipment
(including Giant Field Tripod, Manual, 26mm eyepiece, original box, etc.)
Upgrades/Extras:
Mounting Plate ($99)

Get-A-Grip handles ($130)

A new 12" LX200R is $4,694, your price is $2,700

Also for Sale:

APT Astro AMF Equatorial Wedge ($650) – Price $450.

The APT wedge is equivalent to the Mittty Evolution Wedge and will handle up to a 14" Meade RCX400

Astrovid Stellcam II ($795) – Price $500

Marty Pieczonka 480-983-0915

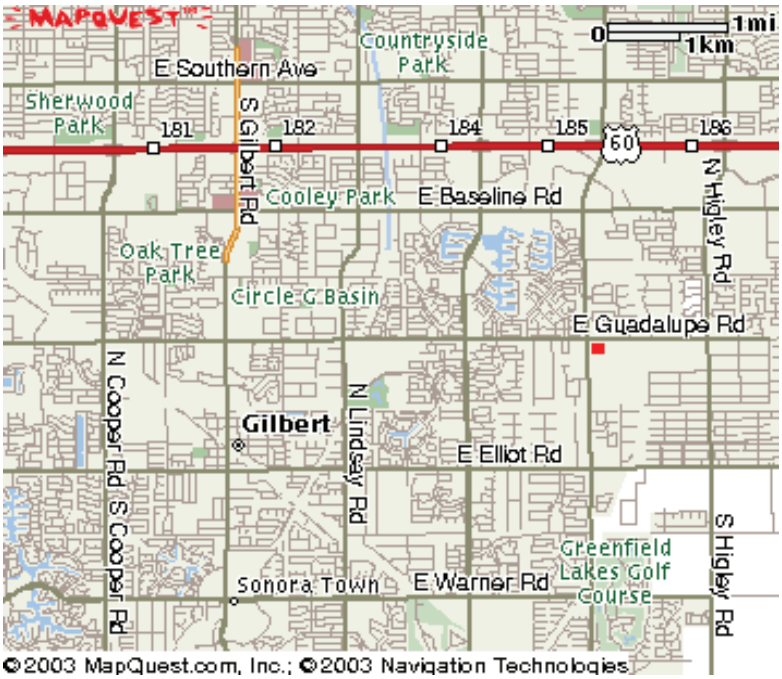
Email: martyp@sybase.com

www.eastvalleyastronomy.org/grco/obs.asp

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!



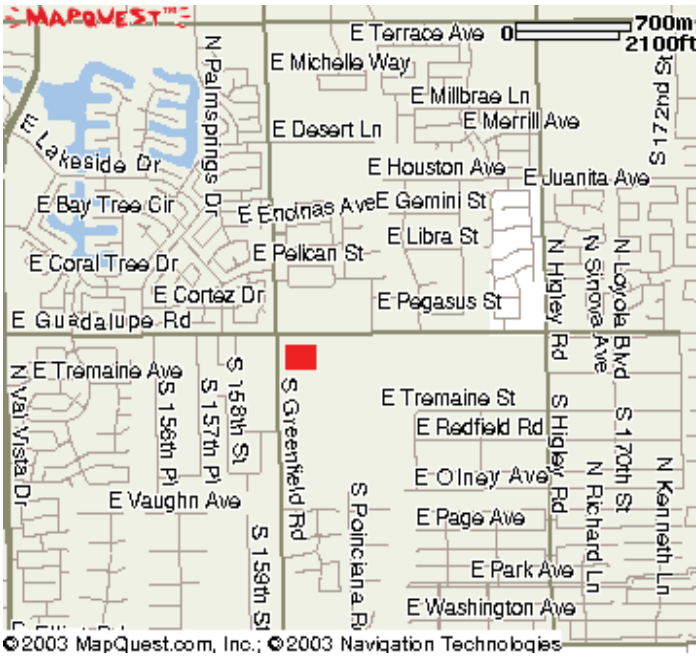
The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

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!

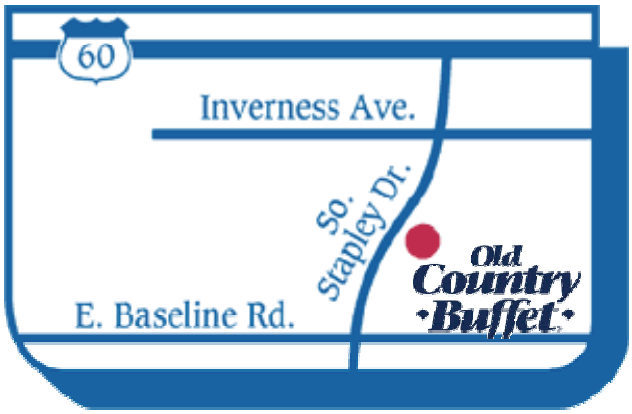
2007 Meeting Dates

March 16
April 20
May 18
June 15
July 20
August 17
September 21
October 19
November 16
December 21



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

Likewise, all are invited to join us after the meeting for coffee and more astro talk at the Village Inn Restaurant located on the northeast corner of Southern and Gilbert in Mesa.

Village Inn 2034 E. Southern Ave in Mesa

March 2007

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 9 - Public Star Party at Riparian Preserve in Gilbert*
- *March 10 - Local Star Party at Boyce Thompson Arboretum State Park*
- *March 13 - Editor's Birthday*
- *March 16 - General Meeting at Southeast Regional Library in Gilbert*
- *March 17 - All-Arizona Messier Marathon at Farnsworth Ranch*
- *March 17 - Deep Sky Star Party at Vekol Road*
- *March 27 - Globe Centennial*

Order in the Messier Marathon

Over the years there has been speculation and discussion regarding the *correct* order for observing all of the objects in the Messier catalog during a Messier Marathon. Rest assured, there is no correct sequence. That is, there is no single sequence that must be utilized - participants are free to observe them in any order they choose. That being said, there are lists available that have stood the test of time, providing their users the best opportunity to bag all of those challenging objects that are mired at low altitude in twilight.

One such tried-and-true list is the one made available by the Saguaro Astronomy Club at the local Messier Marathon.

If you care to conduct your own sequence research the columns to the right contain the objects in the order that many folks will follow. Above all, have fun!

M77	M38	M102	M68	M17
M74	M36	M98	M83	M18
M33	M37	M99	M3	M24
M31	M44	M100	M13	M25
M32	M67	M85	M92	M23
M110	M65	M84	M9	M21
M76	M66	M86	M107	M20
M34	M95	M87	M12	M8
M45	M96	M89	M10	M28
M79	M105	M90	M14	M22
M42	M81	M88	M4	M57
M43	M82	M91	M80	M56
M78	M97	M58	M19	M29
M41	M108	M59	M62	M39
M93	M109	M60	M6	M52
M47	M40	M49	M7	M103
M46	M106	M61	M27	M69
M50	M94	M104	M71	M70
M48	M63	M64	M11	M54
M1	M51	M53	M26	M55
M35	M101	M5	M16	M75

East Valley Astronomy Club -- 2007 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

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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

Even Solar Sails Need a Mast

by Patrick L. Barry

Like the explorers of centuries past who set sail for new lands, humans may someday sail across deep space to visit other stars. Only it won't be wind pushing their sails, but the slight pressure of sunlight.

Solar sails, as they're called, hold great promise for providing propulsion in space without the need for heavy propellant. But building a solar sail will be hard; to make the most of sunlight's tiny push, the sail must be as large as several football fields, yet weigh next to nothing. Creating a super-lightweight material for the sail itself is tricky enough, but how do you build a "mast" for that sail that's equally light and strong?

Enter SAILMAST, a program to build and test-fly a mast light enough for future solar sails. With support from NASA's In-Space Propulsion Program to mature the technology and perform ground demonstrator tests, SAILMAST's engineers were ready to produce a truss suitable for validation in space that's 40 meters (about 130 feet) long, yet weighs only 1.4 kilograms (about 3 pounds)!

In spite of its light weight, this truss is surprisingly rigid. "It's a revelation when people come in and actually play with one of the demo versions—it's like, whoa, this is really strong!" says Michael McEachen, principal investigator for SAILMAST at ATK Space Systems in Goleta, California.

SAILMAST will fly aboard NASA's Space Technology 8 (ST8) mission, scheduled to launch in February 2009. The mission is part of NASA's New Millennium Program, which flight tests cutting-edge technologies so that they can be used reliably for future space exploration. While actually flying to nearby stars is probably decades away, solar sails may come in handy close to home. Engineers are eyeing this technology for "solar sentinels," spacecraft that orbit the Sun to provide early warning of solar flares.

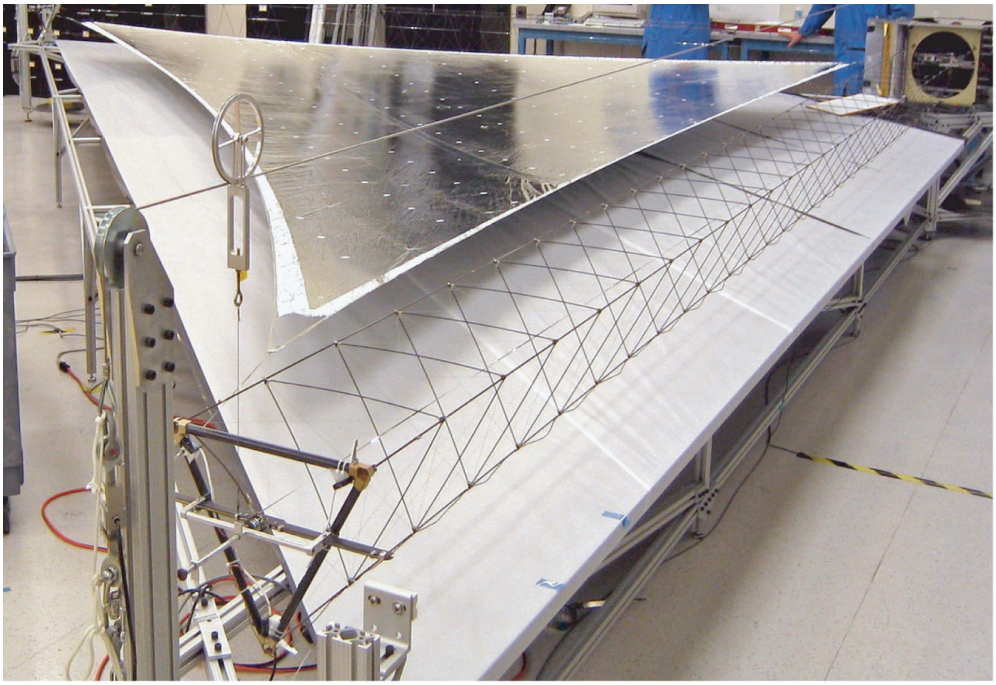
Once in space, ST8 will slowly deploy SAILMAST by uncoiling it. The truss consists of three very thin, 40-meter-long rods connected by short cross-members. The engineers used high-strength graphite for these structural members so that they could make them very thin and light.

The key question is how straight SAILMAST will be after it deploys in space. The smaller the curve of the mast the more load it can support. "That's really why we need to fly it in space, to see how straight it is when it's floating weightlessly," McEachen says.

It's an important step toward building a sail for the space-mariners of the future.

Find out more about SAILMAST at nmp.nasa.gov/st8. Kids can visit spaceplace.nasa.gov/en/kids/st8/sailmast to see how SAILMAST is like a Slinky® toy in space.

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



SAILMAST is the thin triangular truss in front of the picture. It is attached to a section of a silver foil solar sail section shown here in a laboratory test. The mast in the picture is 2m (6 ft) long. The Space Technology 8 mission will test the SAILMAST, which is 20 times longer.

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

March 2007

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 Thursday, March 1, about 6:50 PM, look for Saturn less than 1 degree to the right of (and slightly above) the nearly full Moon.

On Saturday, March 3, at dusk, you might see the last bit of a lunar eclipse. The partial phase ends at 6:12 PM (the Moon is still in the penumbra). The Sun sets at 6:27 and the Moon rises at 6:29. You might be able to see that the top part of the Moon is slightly darker, but it won't be easy. The effect won't last long so you have to look as soon as you can see the Moon. Then take a look with a telescope and notice that you can't see any shadows from craters because the Moon is as close to full as it gets. Although we pretty much miss this eclipse, you will be able to see an entire one on the night of Aug. 27-28, but with all the action after midnight.

On Thursday, March 8, at 4:25 AM (ugh), you can see 4 events with Jupiter's moons happen in 2 minutes (!) With a medium (6 inch) telescope look 25 degrees above the southeast horizon for Jupiter. The events:

1. Io moves into Jupiter's shadow and disappears.

(off to the celestial west of the planet)

2. Europa begins to move in front of Jupiter.

(on the celestial east)

3. Ganymede moves from in front of Jupiter.

(on the celestial west)

4. Europa's shadow leaves Jupiter.

(on the celestial west)

On Wednesday, March 14, about 9:10 PM, you can see Algol at its minimum. This eclipsing binary variable star is usually at magnitude 2.1 (about the same as gamma Andromedae in the constellation next door, check it out the night before or after), but tonight is will be magnitude 3.4 (about the same as Rho Persius, 2 degrees south). It will be near minimum value for around an hour then slowly brighten.

On Sunday, March 18, it is new moon so you can look for faint fuzzies all night. Tonight is the best one of the year for a Messier Marathon (trying to see all the Messier objects in one night).

On Wednesday, March 21, about 7:30 PM, you can see the southeast part of the Moon at its best. With a small (3 inch) telescope, look in the West at the left cusp of the Moon. (The bright point of light below it is Venus, which is at a gibbous phase.)

On Wednesday, March 28, about 11:00 PM, you can see the Moon pass less than 1 degree from Saturn.

On Thursday, March 29, about 7:00 PM, you can see the Moon pass less than 1 degree from Regulus.

All-Arizona Messier Marathon

Please join us out at Farnsworth Ranch for the annual All-Arizona Messier Marathon, sponsored by Saguaro Astronomy Club. Complete details at SAC website: http://www.saguaroastro.org/content/messier2007.htm

March 17-18, 2007

Site Coordinates

North 32° 27 min 45.2 sec

West 111° 43 min 53.2 sec

Elevation: 1800 ft (548.6 m)

Is the Moon Still Alive?
by Dr. Tony Phillips

Conventional wisdom says the Moon is dead. Conventional wisdom may be wrong.

In the journal Nature, a team of scientists led by Prof. Peter Schultz of Brown University announced evidence for fresh geologic activity on the Moon. Although lunar volcanism was supposed to have ceased billions of years ago, there's at least one place on the Moon where "outgassing" may have happened within the past 10 million years--and may still be happening today (Schultz, Staid and Pieters, Nature, 444, 184).

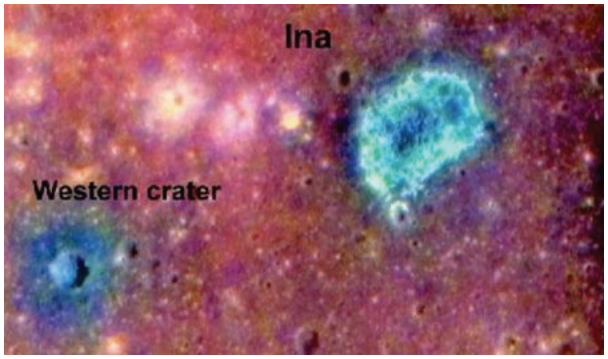
The site is a strange-looking geological feature named "Ina" in Lacus Felicitatis, a lake of ancient, hardened lava located at lunar coordinates 19o N, 5o E. "Ina was first noticed by Apollo astronauts," says Schultz. Pictured right, "it's shaped like a letter D about two kilometers wide."

Three things about Ina point to recent activity:

Ina has mysteriously sharp edges. "Something that razor sharp shouldn't stay around long. It ought to be destroyed within 50 million years," says Schultz. The destroyer of sharp edges on the Moon is a constant rain of small meteoroids that wear down mountains and craters to a nub, given time. Ina's sharp features suggest great youth.

Ina is sparsely cratered. While small meteoroids sandblast the terrain into smoothness, larger meteoroids and asteroids make craters. The older the surface, the more heavily cratered it becomes. "Ina is almost devoid of craters," notes Schultz. "We found only two clear impact craters larger than 30 meters on the 8 square kilometers of the structure's floor." Again, Ina appears young.

Ina is bright and has odd colors. Rocks and dirt on the surface of the Moon grow darker as time passes. The darkening agent is space weather: a nonstop rain of cosmic rays, solar radiation and meteoroids hit the Moon and darken the ground. (The mechanisms are too detailed to discuss here, but the effect is mostly uncontroversial.) Ina, however, is bright, as if fresh dirt has been overturned and newly exposed. Furthermore, the colors of Ina, measured by a spectrometer on the Clementine spacecraft, are similar to the colors of the Moon's youngest craters. Yet Ina is not an impact crater.



A false-color composite photo of Ina and a nearby young crater. Blue denotes freshly-exposed titanium basalts, while green traces immature (relatively unweathered) soils.

It all adds up to outgassing: "We believe there has been a rapid release of gasses, blowing off surface deposits and exposing less weathered materials," explains Schultz. This is not necessarily a sign of active volcanism. "The appearance of the surface at Ina does not indicate an explosive release of magma, which would create visible rays of ejecta surrounding a central crater." Instead, the gasses may have been trapped below ground for millions or billions of years and released by, say, a recent moonquake. This interpretation is appealing because Ina is located at the intersection of two linear valleys or rilles -- like many geologically active areas on Earth.

"Over the years," he adds, "amateur astronomers have reported puffs or flashes of light coming from the Moon's surface." While many professional astronomers insisted the moon was inactive, the amateur sightings kept open a window of doubt. Schultz thinks it's time to start looking in earnest: "A coordinated observation campaign, including both professional and amateur astronomers, would be one way to build additional evidence for activity. A gas release itself would not be visible for more than a second or so, but the dust it kicked up might stay suspended for 30 seconds. With modern alert networks, that's long enough to move a professional telescope into position to see what's happening."

There may be plenty of targets to monitor. The researchers have identified at least four features similar to Ina associated with the same system of rilles, as well as others in neighboring rille systems.

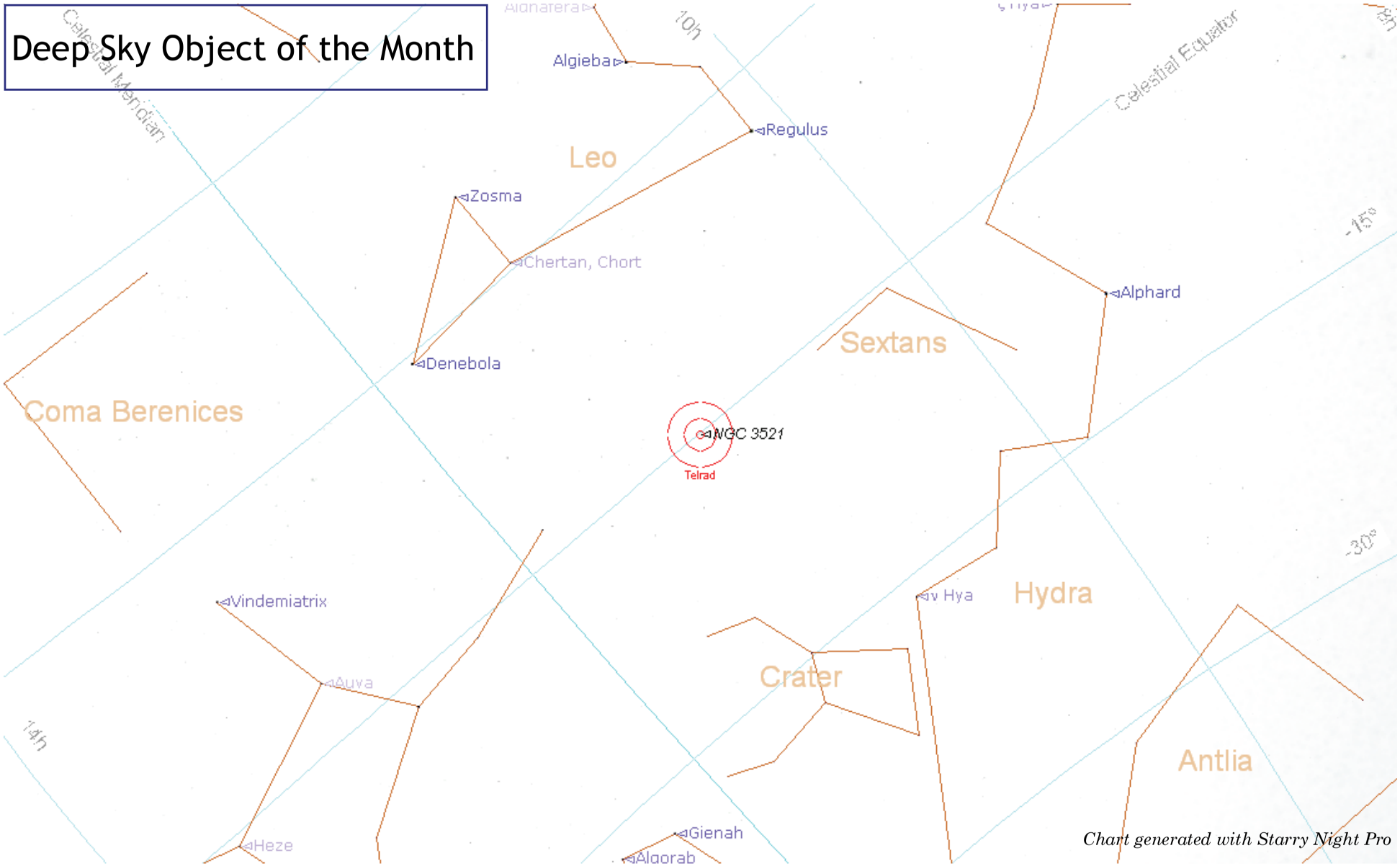
Could these gases actually prove useful to future lunar explorers? Schultz thinks so. "CO2 and even H2O could be coming out of these vents. But first," he cautions, "we have to find out if the outgassing is real--and what the gases are." This makes Ina an intriguing site for future exploration by robots and people.

Says Schultz, "the Moon may not be so dead after all."

This article reprinted courtesy of Science@NASA

This research was supported by NASA. Investigators Peter Schultz and Carlé Pieters are Professors of Geological Science at Brown University. Matthew Staid is a Research Scientist at the Planetary Science Institute.

Deep Sky Object of the Month



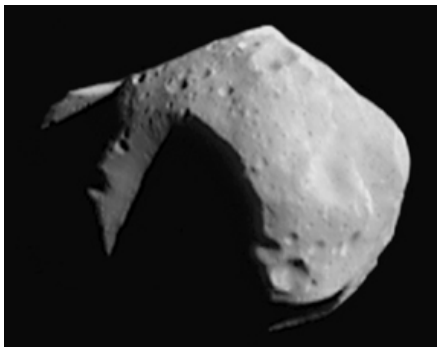
NGC 3521 Spiral Galaxy in Leo

RA 11h 05m 48.9s Dec -00° 02' 15" Magnitude: 9.8 Size: 11.0' x 7.1'

Surface Brightness: 11.8 Position Angle: 163°

Asteroid Occultation at GRCO
by Randy Peterson

After having a good time with great people at EVAC's Holiday party on December 15 (THANK YOU Tom and Jenn!), a handful of us left Tempe and headed for the Gilbert Rotary Centennial Observatory (GRCO). Certified club members operate this observatory every weekend as a public outreach activity. The GRCO opens shortly after sundown, and the scope is in operation until after 9 pm every Friday and Saturday night. By the time we arrived at the observatory on this night, it was approaching midnight, and the for-the-public nightly-run had ended over two hours earlier.

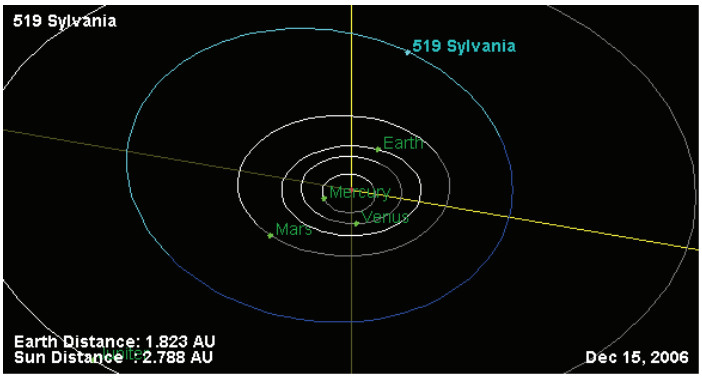


Asteroid image courtesy NASA/JPL

The occasion? We had come to record an asteroid occultation, the passing of an asteroid in front of a star. If the prediction proves to be accurate, and we are lucky, the "shadow" of the event will fall on our position, and the star will disappear when the fainter moving asteroid covers it for a few seconds. If a number of observers at separate locations can precisely record the times of the event, a profile of the asteroid may be determined. Real science by amateur astronomers!

Normally I use a 10" SCT for such attempts, but this particular star was about a magnitude fainter than my scope could record. A bigger telescope was needed, and the 16" was called into service.

We started setting up the equipment in preparation for the event, which was predicted to occur a few seconds before 00:54 MST. Sam Herchak brought a digital time inserter and an extendable antenna, which puts the numeric time accurate to a few thousandths of a second on each video frame as the event is taped. I attached my low-light camera to the telescope, and hooked up a TV/VCR unit to the camera through the time inserter. Win Pendleton used his expertise with The Sky, the program that is used to guide the telescope, to get us aimed correctly. When we were having trouble positively determining the right star, Don Wrigley stepped up to the plate and identified the suspected point of light. However, after pointing out the dim target, he was heard to say "I'm going to get near the door, so if that's not the right star, I'm going to run!"



Orbit diagram courtesy of NASA/JPL

The VCR recorder was switched on, and multiple sets of eyes anxiously stared at the TV screen as the seconds ticked by towards the forecast time of the event. Even with the 16", the target star appeared as a barely perceptible blip among the other brighter stars in the field of view on the screen.

The equipment worked as planned, and due to the team effort by all, we successfully recorded the occultation by the asteroid #519 Sylvania of a 12th magnitude star in the constellation of Auriga. The first successful asteroid occultation recorded by the GRCO! Thanks Sam, Win and Don!

Name: Sylvania

Designation: 1903 MP

Discoverer: Raymond Smith Dugan

Discovery date: October 20, 1903

Discovery site: Heidelberg

Orbital elements

Epoch: August 18, 2005 (JDCT 2453600.5)

Eccentricity (e) 0.186

Semimajor axis (a) 2.789 AU

Perihelion (q) 2.271 AU

Aphelion (Q) 3.308 AU

Orbital period (P) 4.659 a

Inclination (i) 11.016°

Longitude of ascending node (Ω) 44.813°

Argument of Perihelion (ω) 303.107°

Mean anomaly (M) 336.746°

Coming in April… our guest speaker will be Dr. David Burstein from Arizona State University.

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.

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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

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