

The Observer

East Valley Astronomy Club

Volume 21 Issue 4



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April Events:

- Local Star Party at BTA - April 7
- Public Star Party at Riparian Preserve- April 13
- Deep Sky Star Party at Vekol Road - April 14
- April Meeting at Southeast Regional Library - April 20

Please see the complete list of all events and activities scheduled for a very busy April on page 8 of this issue!

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

This year EVAC was well represented at the annual Messier Marathon. In addition to our participation, we also hosted a very well received midnight snack table.

April is a busy month for EVAC and I encourage you to get involved in club activities. In addition to the regular monthly events - Local Star Party, Public Star Party, Deep Sky Star Party and General Meeting - we also have a few special events.

On April 7 we will be picking up trash on our mile in the Adopt-A-Highway program.

April 10 is Desert Shadows Middle School Star Party.

April 14 has the semi-annual Friends of the Arboretum Star Party and the East Valley Relay for Life event.

April 21 is Astronomy Day.

April 27 is Butler School Star Party.

April 28 is the Scottsdale Stadium Starlight Sleepover.

As you can see there's no shortage of events in which you can participate this month. The club really needs you active involvement! There really is something for everyone!

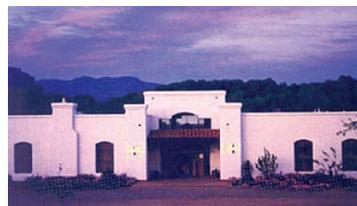
For details on any of our monthly events visit the club website or contact our Events Coordinators - Randy Peterson or Stu Hopper - at events@eastvalleyastronomy.org

Hope to see you at an upcoming event!

The Backyard Astronomer Sierra Vista Revisited by Bill Dellings

In March of this year, my wife Lora and I paid an R&R visit to the Casa de San Pedro (www.bedandbirds.com), a bed and breakfast inn on the outskirts of Sierra Vista along the San Pedro River. Sierra Vista is located about 85 miles southeast of Tucson and was featured in this column in the December 2005 EVAC newsletter ("Sierra Vista Astronomy"). The inn is located on the west side of the wooded shrouded river and is remote and quiet.

The area is well known as a birder's paradise, and indeed we saw a rich variety of birds during our



stay. There are ten rooms, five facing each other separated by a lovely courtyard garden. The rooms do not have TV. A large great room, stocked with books, magazines, and a com-

puter, is available to guests. A refrigerator for storing guests' perishables is located in the laundry room. The kitchen always has coffee, cakes, pies, or cookies on hand to satisfy the munchies. The owners provide a gourmet breakfast at 8:00 a.m. and everyone raved about them - except me. I'm not into gourmet anything. Quiche and stuffed French toast are something you'd shove down my throat to get me to reveal state secrets. I

(Continued on page 2)

The Backyard Astronomer

(Continued from page 1)

settled for coffee, English muffin, and fruit (The thought did cross my mind to smuggle an Egg McMuffin in there but I didn't want to gross everyone out).

Knowing that the skies are dark here, I brought my C-8 to do a bit of stargazing and maybe share the experience with some guests. I did manage to snag a few guests one night. Now we come to the classic irony. This sky is to kill for. I'd give a kidney to have a sky this dark that I could observe from routinely. I could see naked eye: all the stars in the Little Dipper, the Double Cluster, the Beehive Cluster (M44), individual stars in the Coma Berenices Cluster (Mel 111), M46/47 in Puppis, and the winter Milky Way conspicuously running the full length of the sky. Canopus seemed as bright as Sirius looks from Phoenix's latitude. I felt the building's east side would be the best spot to set up my scope. However...the inn is concerned more about bird lovers' comfort than stargazers. Numerous lights from the building flood the east grounds with unwanted, irritating glare. The staff did turn out a couple of lights for me but I was still overwhelmed by others left on for security and safety purposes. I made due that first night by observing to the east with my back to the inn. The facilities parking lot is on the building's south side but unfortunately has two very bright parking lot lights. The north side borders a BLM field of tall grass – I didn't

feel comfortable setting up there. The west faces the access road: the two porch lights and oncoming headlights from traffic preclude observing from there. All this considered, the second night I just did a little binocular observing.



Other notes: One night we dined at the Mesquite Tree restaurant on the south end of town. We had been there many years ago and it was nice to see the place was still doing a good business – they must be doing something right! The Huachuca Astronomy Club has a new web site: www.hacastronomy.com. Not too far away, on the east side of the river, is the San Pedro River Inn (www.sanpedroriverinn.com) which offers kitchen equipped cabins to those wishing to escape the maddening crowds. We stayed there once some years ago. Our cabin was rustic but homey. Some basic food items for a continental breakfast are provided in the rooms and the kitchens have utensils for guests to prepare meals for themselves. While there are lights

about at night, the cabins are spread out enough on this large "ranch" such that one can usually find a dark place to set up a telescope.

Parting thoughts: The Casa de San Pedro is a very pleasant place to spend a few days. If you want to unwind, clear out the old head, watch birds, hike, or use the place as a base to explore the region (which has many attractions), this could be the place for you. It's too bad the management doesn't recognize what a valuable asset they have in their night sky. I'm sure even non-astro types of patrons would appreciate seeing a star-studded sky. And if a dark area were made accessible to stargazers, like Sunglow Ranch (www.sunglowranch.com) south of Willcox (See "Return to Sunglow Ranch", EVAC newsletter, August 2004), the Casa de San Pedro might attract that clientele - good for business, no?



● Full Moon on April 2 at 10:15

◐ Last Quarter Moon on April 10 at 11:04

○ New Moon on April 17 at 04:38

◑ First Quarter Moon on April 24 at 23:36

2007 All-Arizona Messier Marathon

by AJ Crayon

It is safe to say this year's event was an OH WOW! For starters the weather, as forecasted by the Clear Sky Clocks of Canada wasn't good at all. The morning of the event had cloudy skies till 3:00 am MST Sunday. By noon it was reporting clear skies about midnight and, when I left for the site at about 2:00 pm, it was to be clear by 10:00 pm. But two hours later the clearing was predicted for 8:00 pm. Yet by twilight it was clear enough to be of no problem at all.



Marathoners attentively listening to AJ's pre-festivities pep talk.

Next were those in attendance. From counts by Jennifer Polakis we had 85 vehicles, 140 people and one dog, Rascal Polakis, the best astro-dog ever. Out-of-staters came from California, Colorado, Oregon, Washington, Indiana, Illinois, Michigan, Virginia and North Carolina. I hope I've got all of them listed. To that add two observers from Mexico and a visitor from India. The Border Patrol came by, as well as the landowner Ray Farnsworth. Remember that without Ray's cooperation and support we would not have access to this site. So a big thanks, again, goes to Ray. So many people, so little time.

As far as marathoners, there were 61 lists turned in, a new record for the event. This surpasses the 56 from 2001, where all 110 were available.

Here are some highlights that stand out in my mind that were garnered from e-mail messages and notes on the checklists that were turned in.

From the final results (see table on page 4) only one person bagged all 110, Frank Pino, a member of the East Valley Astronomy Club. Butch Miller also found M30, unfortunately he missed M74 which was buried in the bright glow of the Zodiacal Light, stretching upwards to the Pleiades and Venus.

Speaking of M30 there were several others that found M30, but didn't participate in the marathon. They were Tom and Jennifer Polakis, Frank Kraljic and Paul Lind, in a 10"

f5.6 Dobsonian and Bernie Sanden in a 12.5" Dobsonian. Elsewhere several participants were discussing its visibility when they realized they only saw the 5th magnitude star 41 Capricorni, just 23 arc-minutes to its east, instead of the globular cluster. Leaving them with a count of 109 instead of the anticipated 110.

George Robinson, from Auburn, California, and I understand a friend of Don Machholz, did the marathon by memory. He had no Go-to, no push to, no digital setting circles, no analog setting circles and no star chart. Just his mind the telescope and a dark sky. Great job George!

Jim Jackson, from Eugene, Oregon, recorded an SQM reading of 21.59 at 5:00AM Sunday morning. Peter Argenziano got a reading of 21.65 around midnight and his previous nights readings averaged out to 21.49. Not bad for a mediocre Arizona observing site.

This year we seemed to have marathoners of all ages. They ranged from Ken Sikes' son Clay and his grandsons, 11-year-old Ryan and 8-year-old Jacob. Not to be out done was Melvin Harrison's 12-year-old grandson Daniel Butters. To that add 17-year-old Kevin LeGore. Great

job all!

Needing mention is SAC member Al Stiewing who not only observed 109 objects, but also managed to image 108. He missed M103 as it was behind his campers pop-up and M30. He is still reviewing his images and promises to do better in a future marathon.

Jack Jones was busy doing a booming business selling 2007 All Arizona Messier Marathon t-shirts. Who said the economy wasn't doing so well?

We also appreciate the support from EVAC.

President Claude Haynes set up a table and offered midnight snacks for any and all that wanted to show up. Claude said he didn't know how many took part because he was so busy finding 106 objects. Thank you Claude and EVAC.

As for myself, I bagged no Messier objects. I slept through almost all of the marathon observing. Wasn't sick. Wasn't tired. For some reason it just felt good sleeping out under the stars.

As I said, "OH WOW!" What a marathon.



See ya' next year!

2007 All-Arizona Messier Marathon Official Results

NUMBER	NAME	SCOPE	CLUB	NOTES
110	Frank Pino	CPC-1100	EVAC	
109	Bruce Anderson	LX-200	SAC / EVAC	M30
109	Peter Argenziano	25" F5 Dob	SAC / EVAC	M30
109	James Delia Brix	16" Dob	Rio Rico, Az	M30
109	Chris Brownwell	120ED refractor	Calumet Astro Society (IN)	M30
109	Michael Evans	C8	Coconino Astro Society	M30
109	Jack Jones	20" F5 Dob	SAC	M30
109	Kevin Jones	8" SCT	TAAA	M30
109	Scott Leach	LX-200 GPS	Colorado Springs Astro Society	M30
109	Paul Lind	14½" F5 Dob	SAC	M30
109	Butch Miller	LX-90	EVAC	M74
109	John Moschinger	8"		M30
109	Richard Payne	6" F3.3 refractor	SAC	M30
109	Marty Pieczonka	140 mm refractor	EVAC	M30
109	Jimmy Ray	CGC-1100	SAC	M30
109	George Robinson	10" F4.7 Dob	Auburn, CA (AL)	M30, All from memory!
109	Rick Rotramel	12½" F4.9 Newt	SAC	M30
109	Al Stiewing	C8	SAC	M30
109	Julie & Jeff Trogan	8" LX-200 GPS	EVAC	M30
109	Alonzo Villarreal	LX-200	EVAC	M30
108	Salvador Aguirre	8" SCT	Soc. Astro. de Sonora Carl Sa- gan, Mexico	M74, M30
108	Bob Christ	9.25" SCT	SAC	M74, M30
108	Gary Gardner	24" Dob	TAAA	M74, M30
108	Brent Jacobs	10" Dob	EVAC	M74, M30
108	Dan Gruber	18" F4.5 Dob	SAC	M74, M30
108	Jim Jackson	16x70 binos	Eugene Astro Society (OR)	M74, M30
108	Raul Madero	8" SCT	Soc. Astro. de Sonora Carl Sa- gan, Mexico	M74, M30
108	Ken Shaver	16" F4.5 Dob	TAAA	M74, M30
108	Ken Sikes	10" SCT	EVAC	M74, M30

continued on page 5

NUMBER	NAME	SCOPE	CLUB	NOTES
108	Wayne Thomas	11" SCT	EVAC / SAC	M74, M30
108	Shane Tillotson	CPC-800	EVAC	M74, M30
108	Dave Trogan	8" LX-200 GPS	EVAC	M74, M30
108	Christopher Vedeler	12" Dob		M74, M30
107	Melvin Harrison	10" Dob	EVAC	M74, M76, M30
106	Larry Arbeiter		Flossmoor, IL	M2, M72, M73, M30
106	Ed Beggy	CPC-1100	Tucson, AZ	M74, M108, M9, M30
106	Claude Haynes	10" Dob	EVAC	M27, M72, M73, M30
105	John Evelan	20" F4 Dob	EVAC	M33, M103, M72, M73, M30
104	Bill Lofquist	12.5" Dob	TAAA	M77, M74, M2, M72, M73, M30
104	Scott Kroeppler	ST80 refractor	Astronomical League	M2, M72, M73, M74, M75, M30
102	Darrell Edwards	8" SCT	EVAC	M74, M33, M32, M110 M76, M79, M72, M30
102	Thomas Watson	8" Newt EQ	TAAA	M74, M55, M75, M15, M2, M72, M73, M30
100	Joan McGue	8" F6 Dob	SAC	M77, M74, M32, M55, M75, M15, M2, M72, M73, M30
99	John Matthews	LX-200	EVAC	
91	Tim Jones	6" F6 Dob	SAC	
87	Rick Avery	10" F5.6 Dob	SAC	
87	Christy Edwards	8" SCT	EVAC	
87	Cindy Wood	8" SCT	EVAC	
86	Sheryl Gambardella	8" F6 Dob	Tucumcari, NM	
68	Linda Henneberg	10" SCT	NAU Astronomy Club	
68	Bryce McFarland	10" SCT	NAU Astronomy Club	
68	Kevin LeGore	10" Dob		
66	Daniel Butters	10" Dob	EVAC	Melvin Harrison's grandson
62	James Larson		McLean, VA	
62	Ques Zelaya		McLean, VA	
57	Clayton Ryan & Jacob-Sikes	8" F7 Dob		Ken Sikes' son and grandsons
47	Trent Gutterdum			
23	Beverly McCune	9x63 binos	TAAA	
1	Julie Brozio			

Classified Ads

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Tele Vue Panoramic Alt-Az Mount



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Tele Vue Panoramic ash tripod mated with a Telepod head, including the optional Telepod handle.

The ash Panoramic tripod with the Telepod head sells new for \$605, and the handle adds another \$50. The previous owner had drilled a couple of holes in the Telepod head for an encoder project (the holes in no way affect operation), so I'll offer a serious discount to members.

The ash tripod and the Telepod head with handle, all for only \$200. But wait... there's more. I'll also include an Orion padded soft case to carry it all around in (a \$55 value). That represents about a 65% discount from new.

Peter Argenziano 480-633-7479

news@eastvalleyastronomy.org

Your ad here

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.

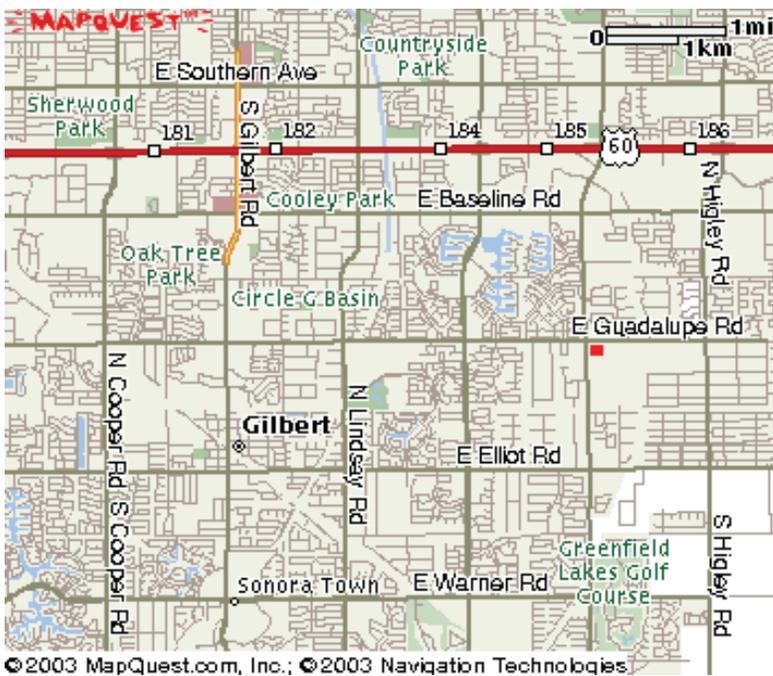
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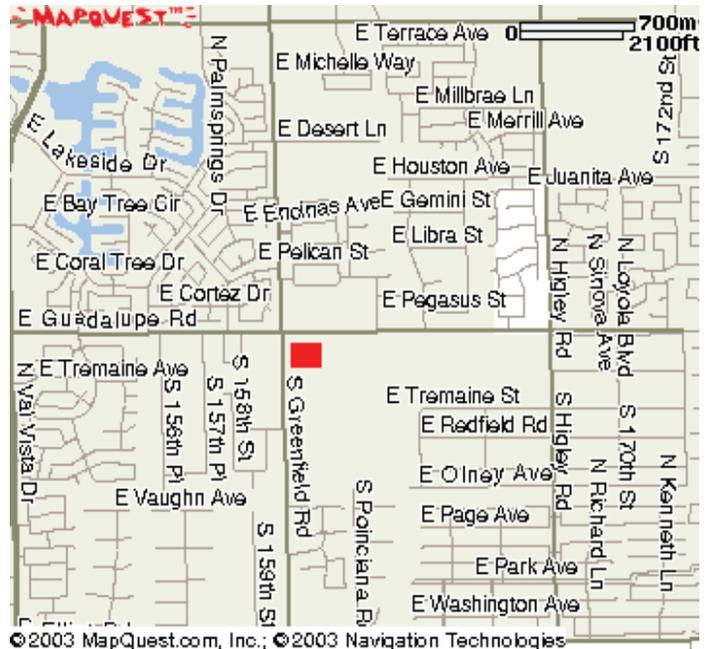
www.starizona.com



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

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



April 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					

Schedule of Events

- April 7 - Adopt-A-Highway
- April 7 - Local Star Party at Boyce Thompson Arboretum State Park
- April 10 - Desert Shadows Middle School Star Party
- April 13 - Public Star Party in Gilbert
- April 14 - Friends of the Arboretum Star Party at Boyce Thompson
- April 14 - East Valley Relay for Life
- April 14 - Deep Sky Star Party at Vekol Road
- April 20 - General Meeting at Southeast Regional Library in Gilbert
- April 21 - Astronomy Day at Riparian Institute
- April 27 - Butler School Star Party
- April 28 - Scottsdale Stadium Starlight Sleepover

Please contact Randy Peterson for details on any upcoming event!

Hubble Pans Across Heavens to Harvest 50,000 Evolving Galaxies

Several hundred images taken with NASA's Hubble Space Telescope have been woven together into a rich tapestry of at least 50,000 galaxies. The Hubble view is yielding new clues about the universe's youth, from its "pre-teen" years to young adulthood.

The snowstorm of galaxies in the Hubble panorama does not appear evenly spread out. Some galaxies seem to be grouped together. Others are scattered through space. This uneven distribution of galaxies traces the concentration of dark matter, an invisible web-like structure stretching throughout space. Galaxies form in areas rich in dark matter.

Among the discoveries so far in this galactic tapestry are a giant red galaxy with two black holes at its core; several new gravitational lenses — galaxies whose gravity bends the light from background galaxies into multiple images; and a rogues' gallery of weird galaxies that should keep astronomers busy for a long

time trying to explain them.

Hubble's wide view — achieved by weaving together many separate exposures into a mosaic — still only covers a comparatively small slice of sky. The entire width of the image, in angular size, is no bigger on the sky than the apparent width of your finger held at arm's length. To astronomers, however, this seemingly small area is a big piece of celestial real estate.

To cover even this much of the sky, Hubble's Advanced Camera for Surveys snapped more than 500 separate exposures, at 63 different pointings, spread out over the course of one year. The final mosaic is 21 images long by 3 images tall. (The dimensions in degrees are about 1.1 by 0.15 degrees. For comparison, the Moon is about 0.5 degrees in angular size).

"These images reveal a wealth of galaxies at many stages of their evolution through cosmic time," said as-

tronomer Anton Koekemoer of the Space Telescope Science Institute in Baltimore, Md., who combined all the Hubble observations to create the final panoramic image, which contains over 3 billion pixels.

The Hubble observation is part of a larger project to study galaxies in a moderately small area of sky, which provides a representative sample of the universe. The study, called the All-wavelength Extended Groth Strip International Survey (AEGIS), utilized four orbiting telescopes and four ground-based telescopes. The five-year project involved the cooperation of more than 50 researchers from around the world observing the same small region of sky in the radio, infrared, visible, ultraviolet, and X-ray regions of the electromagnetic spectrum. A total of 19 papers based on the Groth Strip survey will appear in a special issue of *ApJ Letters*. All currently are posted online at <http://www.journals.uchicago.edu/ApJ/>

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):

- | | |
|---|---|
| <input type="checkbox"/> \$30.00 Individual January through March | <input type="checkbox"/> \$22.50 Individual April through June |
| <input type="checkbox"/> \$35.00 Family January through March | <input type="checkbox"/> \$26.25 Family April through June |
| <input type="checkbox"/> \$15.00 Individual July through September | <input type="checkbox"/> \$37.50 Individual October through December |
| <input type="checkbox"/> \$17.50 Family July through September | <input type="checkbox"/> \$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:

City, State, Zip:

- Publish email address on website

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):

- | | |
|--|---|
| <input type="checkbox"/> General Observing | <input type="checkbox"/> Cosmology |
| <input type="checkbox"/> Lunar Observing | <input type="checkbox"/> Telescope Making |
| <input type="checkbox"/> Planetary Observing | <input type="checkbox"/> Astrophotography |
| <input type="checkbox"/> Deep Sky Observing | <input type="checkbox"/> 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

Early Bird Gets the Worm

by Dr. Tony Phillips

We all know that birds eat worms. Every day, millions of birds eat millions of worms. It's going on all around you! But how often have you awakened in the morning, stalked out in the dewy grass, and actually seen a bird having breakfast? Even though we know it happens all the time, a bird gulping a worm is a rare sight.

Just like a black hole gulping a star...

Every day in the Universe, millions of stars fall into millions of black holes. And that's bad news for the stars. Black holes exert terrible tides, and stars that come too close are literally ripped apart as they fall into the gullet of the monster. A long burp of X-rays and ultraviolet radiation signals the meal for all to see.

Yet astronomers rarely catch a black hole in the act. "It's like the problem of the bird and the worm," says astronomer Christopher Martin of Caltech. "You have to be in the right place at the right time, looking in the right direction and paying attention."

A great place to look is deep in the cores of galaxies. Most galaxies have massive black holes sitting in their pinwheel centers, with dense swarms of stars all around. An occasional meal is inevitable.

A group of astronomers led by Suvi Gezari of Caltech recently surveyed more than 10,000 galactic cores—and they caught one! In a distant, unnamed elliptical galaxy, a star fell into a central black hole and "burped" a blast of ultraviolet radiation.

"We detected the blast using the Galaxy Evolution Explorer (GALEX), an ultraviolet space telescope," explains Gezari. Her team reported the observation in the December 2006 issue of *The Astrophysical Journal Letters*.

"Other telescopes have seen black holes devouring stars before," she adds, "but this is the first time we have been able to watch the process from beginning to end."

The meal began about two years ago. After the initial blast, radiation diminished as the black hole slowly consumed the star. GALEX has monitored the process throughout. Additional data from the Chandra X-ray Observatory, the Canada-France-Hawaii Telescope and the Keck Telescope in Hawaii helped Gezari's team chronicle the event in multiple wavelengths.

Studying the process in its entirety "helps us understand how black holes

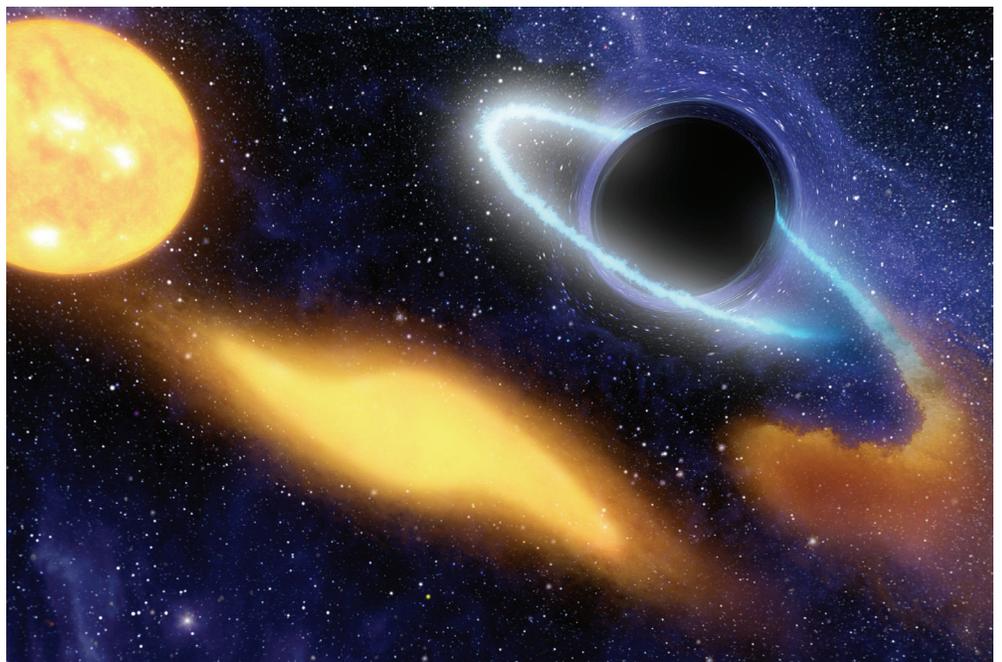
feed and grow in their host galaxies," notes Martin.

One down, millions to go.

"Now that we know we can observe these events with ultraviolet light," says Gezari, "we've got a new tool for finding more."

or more on this and other findings of GALEX, see www.galex.caltech.edu. For help explaining black holes to kids, visit The Space Place at spaceplace.nasa.gov.

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



In this artist's concept, a giant black hole is caught devouring a star that ventured too close.

If it's Clear...

by *Fulton Wright, Jr.*
Prescott Astronomy Club

April 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.

This month, Saturn's rings will be more open (about 15 degrees from edgewise) and easy to observe than any time in the next 5 years. They will be closing slowly, but now is a good time to have a look. The planet is high in the south at dusk.

On Monday, April 2, at 7:11 PM the full moon rises spoiling any chance of seeing faint fuzzies for the whole night.

On Monday, April 2, after midnight, you can see a lot of events with Jupiter's moons. Here is the schedule:

1:10 AM Europa moves in front of Jupiter

1:21 AM Ganymede appears from Jupiter's shadow

1:22 AM Europa's shadow leaves Jupiter

2:20 AM Io moves from behind Jupiter

3:41 AM Europa moves from in front of Jupiter

4:01 AM Ganymede moves behind Jupiter

On Saturday, April 7, about 7:45 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 it 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

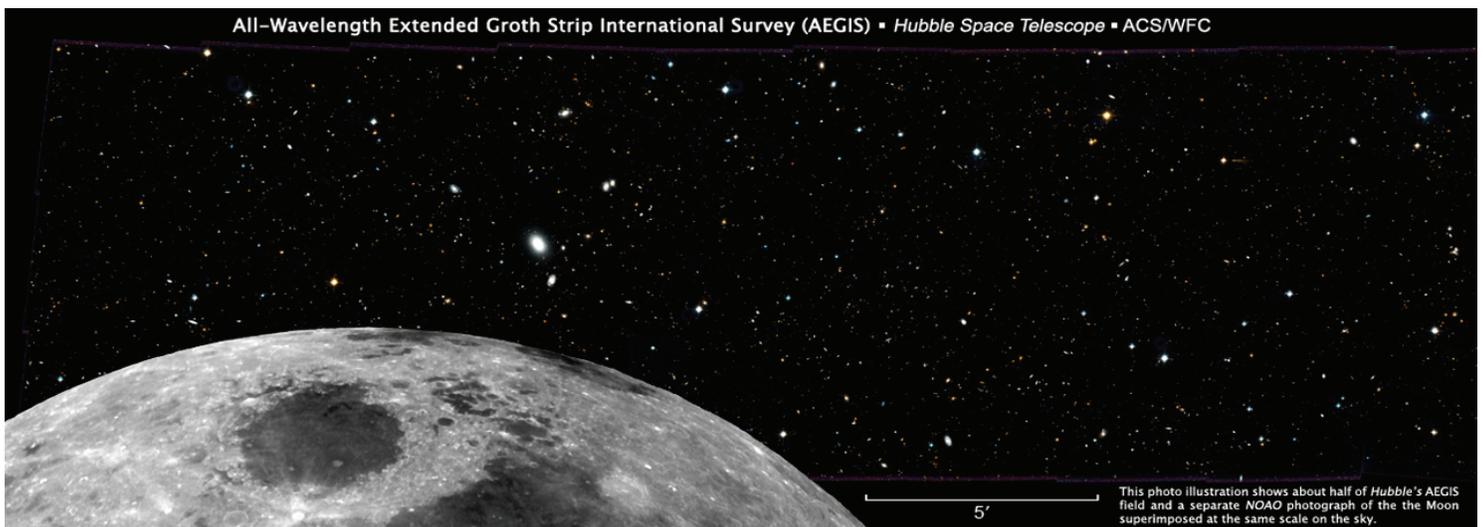
brighten.

On Thursday, April 12, after 8:30 PM you can easily identify Saturn's brighter moons. With a medium (6 inch) or larger telescope look 70 degrees above the south horizon for the planet. All the satellites are on the west side of Saturn. The easiest to see is Titan (mag 8.3) about 4 ring diameters away. Three times further away in roughly the same direction is

Iapetus (mag 10.2). Bunched near the planet, from north to south are Dione (mag 10.4), Tethys (mag 10.2), Enceladus (mag 11.7, the hardest to see), and Rhea (mag 9.7). *Astronomy Magazine*, April 2007, p. 51 has a diagram.

On Monday, April 16, it is new moon, so you can hunt for faint fuzzies all night.

On Thursday, April 26, at 2:50 AM you might be able to see the Moon occult Regulus. This will not be an easy observation because the star will be little more than 1 degree above the horizon when it disappears. If you are further west than Prescott, the star will be higher.



HST Credit: NASA, ESA, and M. Davis (University of California, Berkeley) Moon Image Credit: T.A.Rector, I.P.Dell'Antonio/NOAO/AURA/NSF Illustration Credit: NASA, ESA, and Z. Levay (STScI)

April Guest Speaker : To Be Announced

Originally we had scheduled Dr. David Burstein, from the Department of Physics at Arizona State University, as our guest speaker. Unfortunately, Dr. Burstein has some health issues that will preclude his attendance on the 20th.

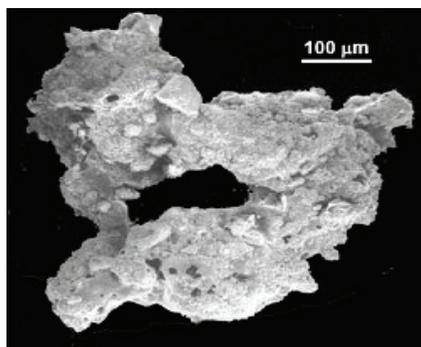
Vice President Howard Israel is working on securing an alternate speaker.

True Fakes: Scientists Make Simulated Lunar Soil

by Dave Dooling

Life is tough for a humble grain of dirt on the surface of the Moon. It's peppered with cosmic rays, exposed to solar flares, and battered by micrometeorites--shattered, vaporized and re-condensed countless times over the billions of years. Adding insult to injury, Earthlings want to strip it down to oxygen and other elements for "in situ resource utilization," or ISRU, the process of living off the land when NASA returns to the Moon in the not-so-distant future.

But, as Robert Heinlein famously observed, "the Moon is a harsh mistress." Living with moondust and stripping it down may be trickier than anyone supposes.



A speck of Moon dirt. The strange shape tells a tale of violence: It results from the welding of rock, mineral and glass by the heat of micrometeoroid impacts. Image credit: David S. McKay, NASA/JSC.

To find out how tricky, researchers would like to test their ideas for ISRU and their designs for lunar rovers on real lunar soil before astronauts return to the Moon. But there's a problem: "We don't have enough real moondust to go around," says Larry Taylor, director of Planetary Geosciences Institute at the University of Tennessee in Knoxville. To run all the tests, "we need to make a well-qualified lunar simulant." And not just a few bags will do. "We need tons of it, mainly for working on technologies for diggers and wheels and machinery on the surface," adds

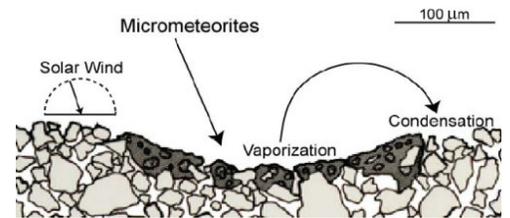
David S. McKay, chief scientist for astrobiology at the Johnson Space Center (JSC).

Taylor and McKay are lead members of a small group of self-styled "lunatics" whose careers have focused on lunar soil and rocks. They are among several consultants to NASA's Marshall Space Flight Center (MSFC), which manages the Lunar Regolith Simulant Development Program.

Carole McLemore is the program manager at Marshall. Back in the 1990s, she explains, researchers used a lunar simulant called JSC-1 developed at JSC. But "there is no more JSC-1 available." So, to get started, researchers at Marshall are working with the Astromaterials Research and Exploration Science office at Johnson to create a replica of the JSC-1 simulant: JSC-1A. It comes in three types based on grain size (fine, medium and coarse). MSFC has also begun work on more demanding simulants representing various locations on the Moon.

Until the Apollo astronauts brought lunar soil samples to Earth during 1969-72, the belief was that the Moon's dry, airless environment left the soil largely undisturbed. Reality is much harsher.

Micrometeorites, many smaller than a pencil point, constantly rain onto the surface at up to 100,000 km/hr (about 62,000 mph), chipping off materials or forming microscopic impact craters. Some melt the soil and vaporize and re-condense as glassy coats on other specks of dust. Impacts weld debris into "agglutinates." Complicated interactions with the solar wind convert iron in the soil into myriads of "nano-phase" metallic iron grains just a few nanometers wide.



The lunar surface is exposed to solar wind and constantly pounded by micrometeorites. Credit: Larry Taylor, Univ. of Tennessee.

These processes form the "regolith" -- Greek for stone blanket (litho + rhegos) -- covering the Moon's surface. What greets astronauts and space-ships is a complex material comprising "sharp, abrasive, interlocking fragile glass shards and fragments," Taylor says. It grinds machinery and seals, and damages human lungs.

"Some of the stuff that got into the Apollo spacecraft was very finely ground," McKay said. Dust was everywhere and impossible to brush off. All the lunar astronauts had lung reactions to this dust, some more than others, like Harrison H. (Jack) Schmitt's "lunar dust hay fever."

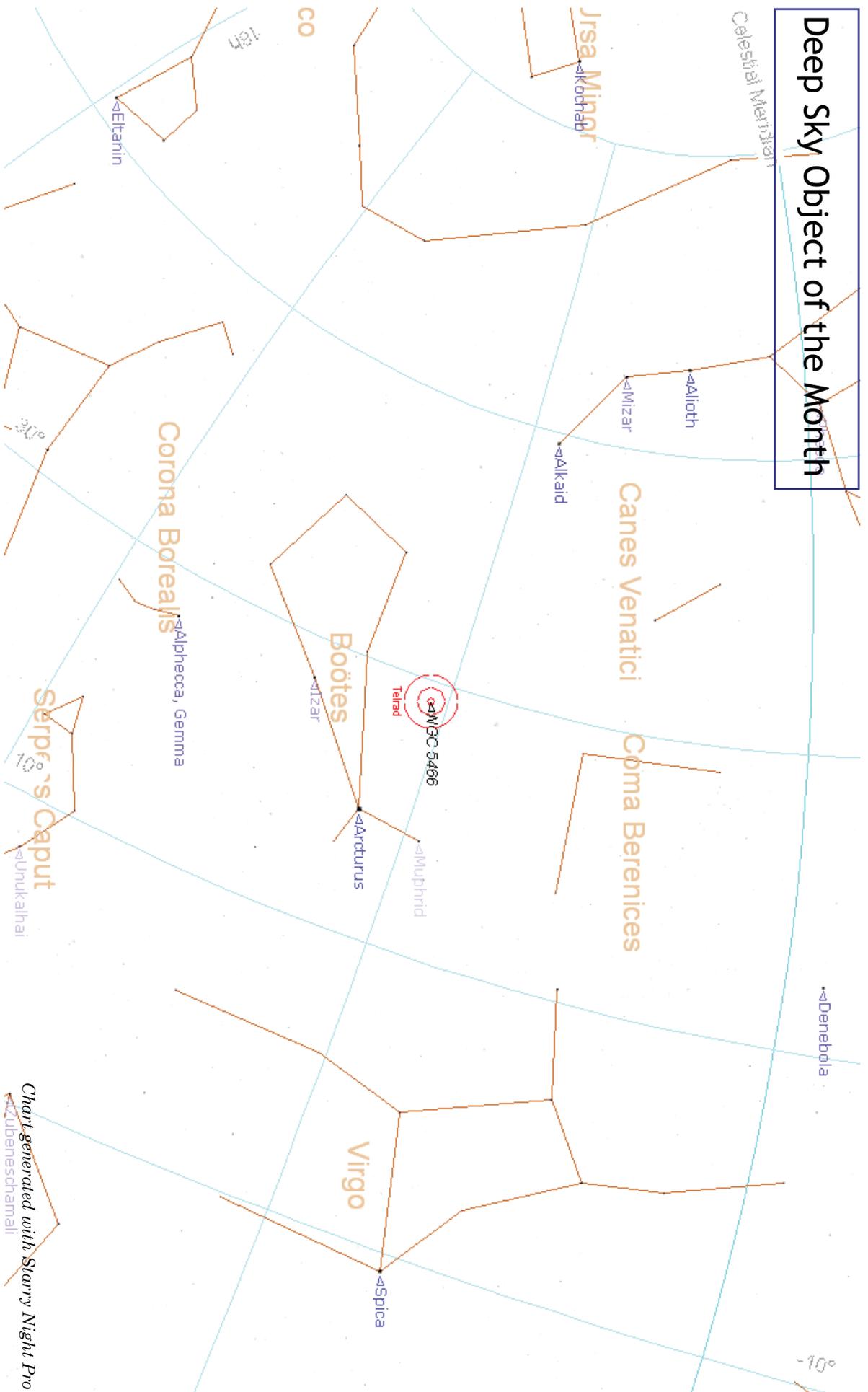
The Apollo specimens are America's Crown Jewels and are doled out in ultra-small samples to scientists who can demonstrate that nothing else will do for high-value experiments. Renewed interest in lunar exploration in the late 1980s meant that lunar simulants were needed to test schemes for building structures on the Moon or for extracting oxygen and other materials.

That led to JSC-1 in 1993, made of basaltic volcanic cinder cone deposits from a quarry near Flagstaff, AZ. The 25-ton lot -- distributed in 50-pound bags -- proved popular.

"We're totally out, but that's soon to be corrected," said McKay. MSFC has a Small Business Innovative Research (SBIR) contract with Orbitec of Madison, WI, to manufacture

(Continued on page 15)

Deep Sky Object of the Month



NGC 5466 Globular Clusters in Boötes

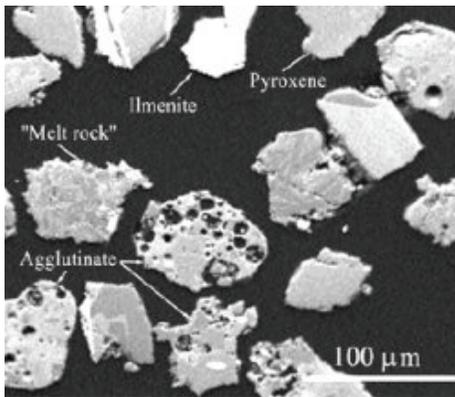
RA 14h 05m 27.3s Dec +28° 32' 04" Magnitude: 9.2 Size: 9.0'

Chart generated with Starry Night Pro
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True Fakes: Scientists Make Simulated Lunar Soil

(Continued from page 13)

about 16 metric tonnes of three types of JSC-1A: 1 tonne of fines (delivered); 14 tonnes of moderate grains (being delivered); and 1 tonne of coarse grains (coming soon). The U.S. Geological Survey in Denver and the University of Colorado at Boulder -- key partners -- are checking the chemical, mineralogical, and geotechnical properties.



This photomicrograph of soil from a lunar mare hints at the underlying variety of genuine Moon dirt and the difficulty of reproducing it.

MSFC is developing three new simulants. Two will represent mare and polar highlands regions. A third will represent the glassy, sharp, jagged edges of regolith that test the best of hardware and humans. But matching every location on the Moon would require large numbers of small, unique, expensive batches.

"Instead, we will develop root simulants and manufacture specific simulants from these, but also enable investigators to enhance the products as needed," McLemore added. "I liken this process to baking a cake: depending on the type of cake you want, you need certain ingredients for it to come out right and taste right. Getting the recipe right whether for a cake or lunar simulants is critical."

For example, the new mare simulant will be enriched with ilmenite, a crystalline iron-titanium oxide. Source materials used to produce

the three simulants will potentially come from locations as diverse as Montana, Arizona, Virginia, Florida, Hawaii, and even some international sites.

Initial lots will weigh just tens of pounds to ensure that the simulant is made correctly. "Eventually we will scale up to larger quantities when we can make sure that there is little variation from batch to batch," McLemore said.

Once NASA understands how to make the various simulants, plans are to farm the work out to companies to produce larger batches. "We will have certification procedures in place for vendors to follow so users know that the simulants meet the NASA standards," McLemore said.

And that will be the best way to tell it's a "true fake." Accept no substitutes.

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Coming in May... our guest speaker will be Steven Desch 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.

The Observer 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!



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