

# THE OBSERVER

## East Valley Astronomy Club

### From the Desk of the President

by David Douglass

As an officer of EVAC, it seems as though there is always something to do. Most pressing on our list currently, is the need to find a new winter observing site for our deep sky star party night. We need to establish a search committee to make recommendations.

It is not really a simple task. First, we need to establish the basic requirements for the site. Among these requirements, will be that the site is within a 90 minute drive time from US87 (County Club Rd) and US60. There is nothing special about that location other than it is a

central point from which to measure.

The second requirement is that the site be darker than Picketpost Mountain Trailhead, and third that it can accommodate at least 15-20 of our members and their equipment. Ideally, there will be little or no light dome from Phoenix, Tucson, and any other populated area.

It is not really known if we can meet those requirements, or if there should be others, but at least that is a starting point. The committee is not formed yet. That is something else to do, and I want to run it by the Board too. Some-

thing else to do.

The Boy Scout Eagle project at the GRCO building the brick steps from the pump house to the observatory is well under way. The hope is to have the project completed by July 10<sup>th</sup>. We will have to see about getting some pictures posted somewhere. There are still lots of bricks available for sponsorship. Excess funds will be channeled to the GRCO Improvement Project.

It was good to see our Events Coordinator, Randy Peterson, at the June meeting. He reports that he is

*Continued on page 12*

### Upcoming Events:

*Local Star Party - July 3*

*Public Star Party - July 9*

*Deep Sky Observing Night - July 10*

*Monthly General Meeting - July 16*

*Local Star Party - July 31*

*Check out all of the upcoming club events in the Calendars on page 8*

### INSIDE THIS ISSUE:

*Disintegrating Spacecraft* 3

*July Guest Speaker* 5

*Classified Ads* 6

*Meeting Maps* 7

*Calendar* 8

*Membership Form* 9

*NASA's Space Place* 11

*If It's Clear...* 12

*GRCO Attendance* 13

*Deep Sky Object of the Month* 14

*Strange Martian Spirals* 15

### The Backyard Astronomer

#### A Night at the Shooting Star Inn

by Bill Dellenges

For several years I've wanted to check out the Shooting Star Inn, so I booked a night following two nights at the Grand Canyon Star Party

Before I describe my visit to the Inn, let me say a few words about my brief GCSP experience. After ten years at the GCSP North Rim, my wife and I decided we needed a break from it, notwithstanding its attributes. Thursday, our first night, went well. Mostly clear skies with 37 telescopes set up. The largest was Dennis Young's 28" Dobsonian which of course had the longest line (a law of physics). The only thing more astounding than his monster scope is that he transports it

in a short Caravan minivan. There was a C14 stored on the passenger seat. He also pulled out a Sky 90 refractor and mount. This spectacle reminded me of a circus act where 15 clowns emerge from a compact car.

I spotted EVAC's Don Wrigley there with a large Dob and Jim and Vickie Palmer with their C11. Some may know Jim and Vickie as followers of the Valley's Professional Stargazer, Tony LaConte.

Friday night didn't go well. In the west after dusk, we had a small hole which closed after about one hour. Everyone began packing it in.

Onto the Inn! The

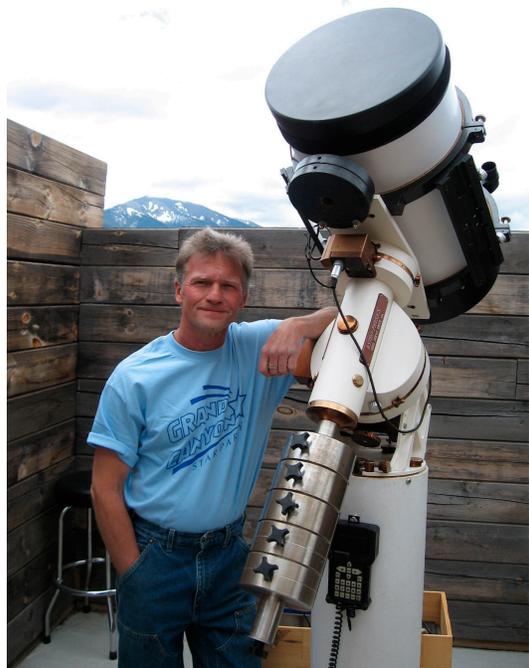
*Continued on page 2*

# The Backyard Astronomer

*Continued from page 1* Inn is conveniently located along Highway 180 between Flagstaff and the Grand Canyon. Tom Taylor, the innkeeper, got the idea for his bed and breakfast stargazing inn from his association with the late Dr. Eduardo Vega and his Sky Watcher's Inn in Benson, Arizona.

Tom found a dark sky site 18 miles north of Flagstaff and built a 4200 square foot log home. Being so remote, he relies on solar power with a backup generator and must truck in water. The home is beautifully appointed. You have your choice of three astronomically themed guest rooms: the Galileo, Cassini, and Einstein. The huge great room also sports a photographer's studio and loft with a complete recording studio and band set up (keyboards, guitars, and drums)! Next

to a grand piano on the main floor is a 1908 6", F13 Dann brass refractor. Tom is a man of varied interests. The observatory is just a few steps from the house. It's a simple affair, a 12'x12' log building containing a Meade 14" ACF Schmidt Cassegrain telescope on an Astro-Physics 1200 mount. There is one unique aspect to his observatory – there is no roll-off roof or dome! There are four walls and a



*Innkeeper Tom Taylor*

pad - that's it. To protect the instrument, he throws a large tarp over it when not in use. He told me this arrangement works fine.

Even though the previous night at the Canyon was clouded out as a result of a cold front passing through the area, we were blessed with clear skies and observed from 10pm to midnight. The site is at 8,000 feet and the night sky was glorious. There is a small amount of light pollution to the south from Flagstaff. Most of that is blocked by Mount Humphrey, the highest point in Arizona (12,633'). But a little light leaking through a dip on the horizon dimmed lower Scorpius, but did not affect the rest of the sky.

In short order, we knocked off: Saturn, M7, 8, 11, 13, 17, 27, 51, 82, NGC 4565, 6543, 6231, Albireo and Epsilon Lyrae. I was quite impressed with M13 at 160x. I don't recall seeing it so bright and well resolved at such a



*Shooting Star Inn*

modest power in a 14". On M51, I was first confused as to which bright nucleus belonged to M51 or NGC 5195 – both were so bright. M51's ghostly spiral arms were just tantalizingly apparent. M17 looked like one of its photographs, a large bright swan shaped nebula contrasted against a black background sky – stunning.

Tom's house is only about ¼ mile off highway 180. You can hear cars driving by on it. During the night's observing, the headlights of southbound cars briefly shined on the observatory. While the observatory walls would normally block these lights, there is a small west facing window and a north facing glass panel door on the observatory that allow light from car headlights to shine into the building. I found it a slight distraction. This could easily be corrected with black curtains. Fortunately, the passage of cars was infrequent.

In the observatory, I'd like to see the two dim yellow lights replaced with red ones. On the deck between the observatory and house, two somewhat dim yellow lights on a wall were a little too bright to my liking. When I went outside the observatory to admire the entire night sky, I found them distracting as well. While



*Shooting Star Observatory*

you need to illuminate the deck for safety, perhaps low full cutoff trail-like red lights would enhance the observing experience. Yeah, I know, I'm very picky about lighting. But with a sky like that, I want as little lighting around me as possible.

We had an enjoyable time at Tom's inn. He is a friendly, interesting, affable fellow. I look forward to going back, especially when his proposed 36" telescope is up and running.

# Students Record Spellbinding Video of Disintegrating Spacecraft

by Dauna Coulter

Last year, high school science teacher Ron Dantowitz of Brookline, Mass., played a clever trick on three of his best students. He asked them to plan a hypothetical mission to fly onboard a NASA DC-8 aircraft and observe a spacecraft disintegrate as it came screaming into Earth's atmosphere. How would they record the event? What could they learn?

For 6 months, they worked hard on their assignment, never suspecting the surprise Dantowitz had in store.

On March 12<sup>th</sup>, he stunned them with the news: "The mission is real, and you're going along for the ride."

In early June, Dantowitz and the teenagers traveled halfway around the world to help NASA track Japan's Hayabusa spacecraft as it plunged into Earth's atmosphere at 27,000 mph and shattered over the Australian outback. After boarding the DC-8 and flying to 41,000 feet, their hard work finally paid off when they successfully recorded the fiery re-entry: <http://science.nasa.gov/medialibrary/2010/06/25/reentryvideo.mp4>.

"As it came into our camera's field of view, Hayabusa looked like a little white dot at first, and we all followed it for a few seconds without uttering a sound," says young James Breitmeyer. "Then it exploded into a big orange fireworks display, with pieces flying off. Everyone crooned 'Ooooo' at the same time!"

The recording was made as part of the Hayabusa Re-entry Airborne Observing Campaign. Dantowitz and his students Breitmeyer, Brigitte Berman, and Yiannis Karavas were invited to join the effort because of Dantowitz's expertise in optical observations, tracking, and spectroscopy.

Launched on May 9, 2003, Hayabusa became the first space mission to make physical contact with an asteroid and attempt to return samples to Earth. Its 7 billion mile round trip to asteroid Itokawa ended with the June 13, 2010, re-entry. Researchers are hoping that bits of the asteroid's surface are sealed inside the sample-return capsule, which parachuted safely to the ground as bits of the mother ship fell in flaming smithereens, with three spellbound teenagers looking on.

The observing campaign was designed to measure the conditions the capsule's heat shield had to endure as the capsule plummeted through Earth's atmosphere.

"We had flown several practices, but when we took off for the real thing, I felt a surge of adrenaline," says Breitmeyer. "I was on the edge of my seat, anxious for our plane to arrive at the right place

at the right time."

"We got to the rendezvous area 30 minutes ahead of time," says Dantowitz. "So we practiced the rendezvous to make sure everyone knew which stars to line the cameras up with to capture Hayabusa's re-entry. By the time we finished the trial run, we had only 2 or 3 minutes to go."

"It was quiet and cold and dark as we waited," says Breitmeyer. "We were all a bit jittery. We knew all our hard work over the past year came down to this moment. A voice on the intercom broke the silence – 10, 9, 8, ...3, 2, and then someone shouted 'there it is!'"

"As our screens lit up with the burning bus and the small capsule I was so excited I could have jumped right out of my chair," says Berman. "But I didn't. I knew I needed to concentrate in case something went wrong with our cameras or monitors; if I was in an uncontrollable frenzy this would not be possible."

"After the main bus deteriorated you could see the capsule still intact," says Breitmeyer. "Then the capsule decelerated, and we lost sight of it. It was over. We all started yelling and cheering – we practically rocked the plane! The same people who had been biting their fingernails minutes ago were now shouting and laughing."

Except for Berman: "My stomach was jumpy and I couldn't wait to congratulate my other team members but I was frozen in place. I, Brigitte Berman, in a NASA flight suit, on a NASA airplane, had just successfully helped image the reentry of a spacecraft during a NASA mission! I sat stunned in disbelief."

One of the student-run cameras streamed the re-entry video directly to the world below via satellite. Ames Research Center posted the video to the internet; by the time the plane landed the video had been downloaded over 100,000 times.

"In addition to the incredible video and images of the spectacle, the students collected data on the brightness and spectra of the plummeting sample return capsule and pieces of disintegrating spacecraft," says Dantowitz. "This will reveal how the capsule's thermal protection system fared during re-entry -- critical information for researchers designing next generation spacecraft."

"Without these students, we could not have collected the level of data we got," says NASA's Peter Jenniskens, the re-entry mission's principal investigator. "I was very impressed by how well prepared they were. I'm happy about that – these teenagers will be our replacements."

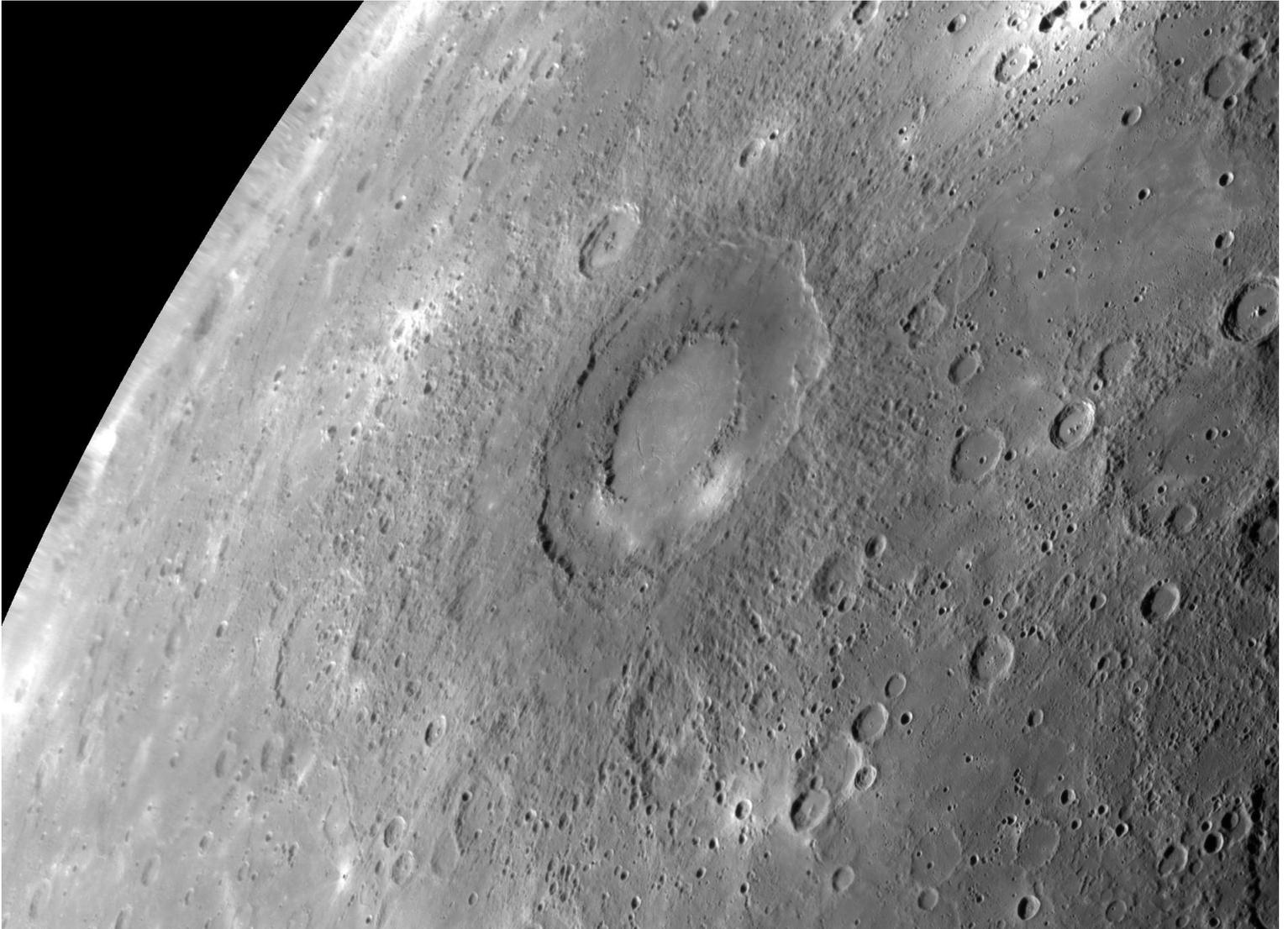
The teenagers are happy too. "I have always dreamed of being on a NASA mission," says Berman. For her and the others, this could be just the beginning.



James Breitmeyer, Yiannis Karavas, and Brigitte Berman during their training for recording the reentry of Hayabusa.

Article courtesy of Science@NASA

## Rachmaninoff on Mercury



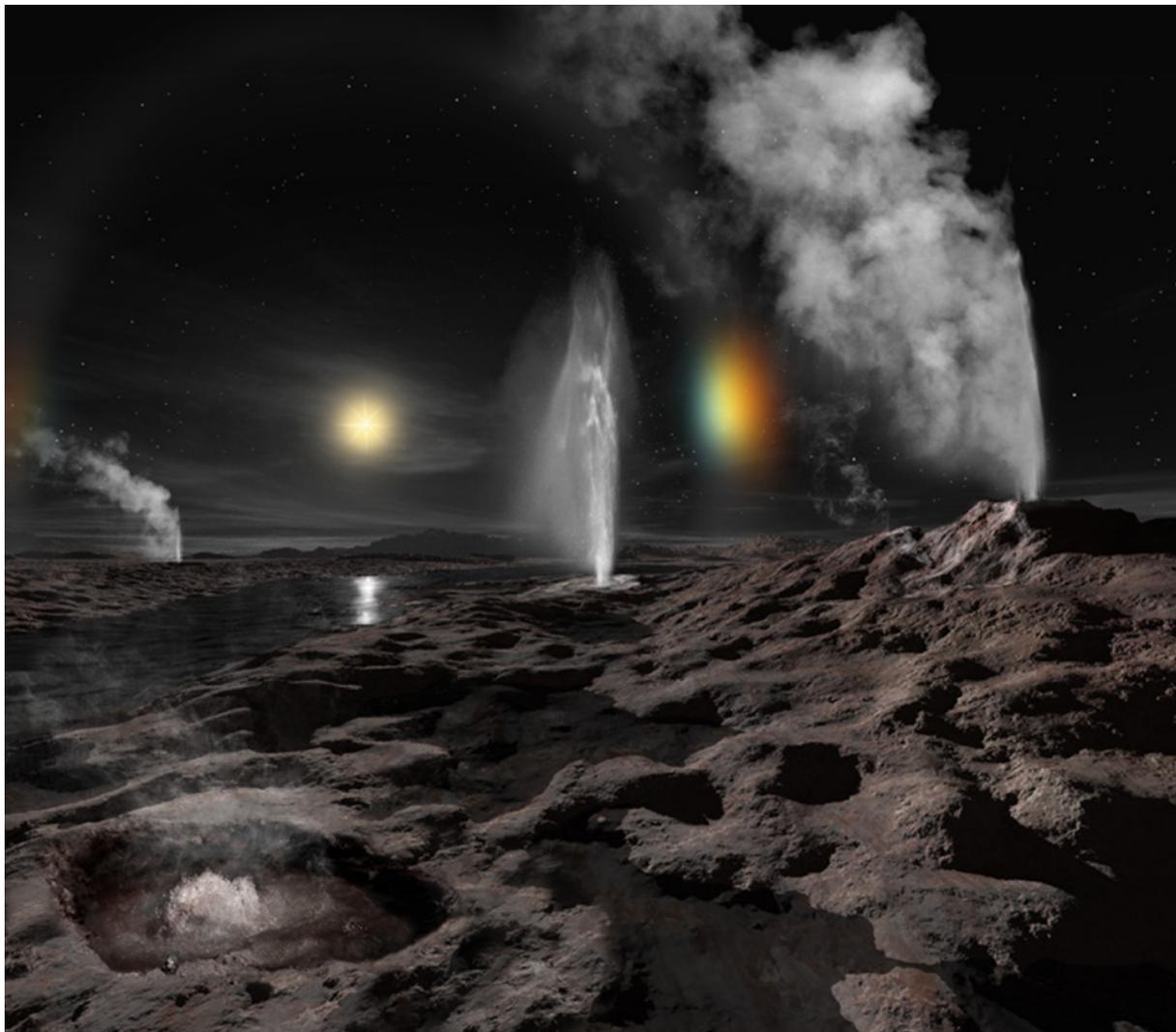
The International Astronomical Union (IAU) recently approved the name Rachmaninoff for an intriguing double-ring basin on Mercury. This basin, first imaged in its entirety during MESSENGER's third Mercury flyby, was quickly identified as a feature of high scientific interest, because of its fresh appearance, its distinctively colored interior plains, and the extensional troughs on its floor. The basin's name honors the Russian composer, pianist and conductor, Sergei Rachmaninoff (1873-1943).

IAU names craters on Mercury after "deceased artists, musicians, painters and authors who have made outstanding or fundamental contributions to their field and have been recognized as art historically significant figures for more than 50 years." The process of proposing a new crater name includes gathering fundamental information about the crater, such as the crater's central latitude, central longitude, and diameter. Justification is provided as to why the crater is of sufficient scientific importance to be named, and details are provided about the name choice, including sources that support the worthy contributions made by that individual. Ten newly named craters join 42 others named since MESSENGER's first Mercury flyby in January 2008.

*Image Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington*

## July Guest Speaker: Rik Hill

For 12 years, starting in 1979, Richard (Rik) Hill operated Warner & Swasey's Burrell Schmidt telescope located on Kitt Peak. From 1992 to 1999 he worked for the UofA's Lunar & Planetary Lab after which he joined The Catalina Star Survey (CSS), a Near Earth Asteroid research project. His CSS work has led to the discovery of many asteroids that passed closer than the Moon as well as 21 comets.



*Space artist Ron Miller's concept of hypothetical geysers and sundogs on Pluto.*

☾ **LAST QUARTER MOON ON JULY 4 AT 07:36**

○ **NEW MOON ON JULY 11 AT 12:40**

☽ **FIRST QUARTER MOON ON JULY 18 AT 03:11**

● **FULL MOON ON JULY 26 AT 18:37**

## *Julian Starfest 2010*

August 5<sup>th</sup> - 8<sup>th</sup>

Menghini Winery, Julian Ca.

Please join us at 4,300 feet up in the beautiful San Diego County mountains from August 5 to 8, 2010.

<http://www.julianstarfest.com/>

We're committed to making the Julian Starfest one of the greatest astronomy events on the West Coast and we're hoping to have your help. Located just 35 miles east of the San Diego Wild Animal Park via CA State Highway 78, near the historic Gold Rush Community of Julian, CA. Many of the major astronomy vendors will have special sales tents and booths.

Camping information: <http://julianstarfest.com/participant/participant.htm>

Read about the historic town of Julian: <http://www.julianca.com/>

Luxury lodging in Julian: <http://www.julianca.com/lodging/index.htm>

Please join us! We appreciate your neighborly support!

Kurt Barnhart, Julian, California

[Julianstars@expresswire.com](mailto:Julianstars@expresswire.com)

Message line: 650-618-1544

*Got some astro kit to sell?*

contact Editor to advertise here!

## PHOTON

### INSTRUMENT LTD.

SALES REPAIR SERVICE RESTORATION

### ASTRONOMICAL TELESCOPES

### WARREN & JUDY KUTOK

122 E. MAIN STREET MESA, AZ. 85201

480-835-1767 800-574-2589

[www.eastvalleyastronomy.org/grco/obs.asp](http://www.eastvalleyastronomy.org/grco/obs.asp)

**SUPPORT  
YOUR  
LOCAL  
TELESCOPE  
DEALER**



5757 N. Oracle Road Tucson, AZ 85704 520-292-5010

[www.starizona.com](http://www.starizona.com)

# Upcoming Meetings

July 16  
August 20  
September 17  
October 15  
November 19  
December 17

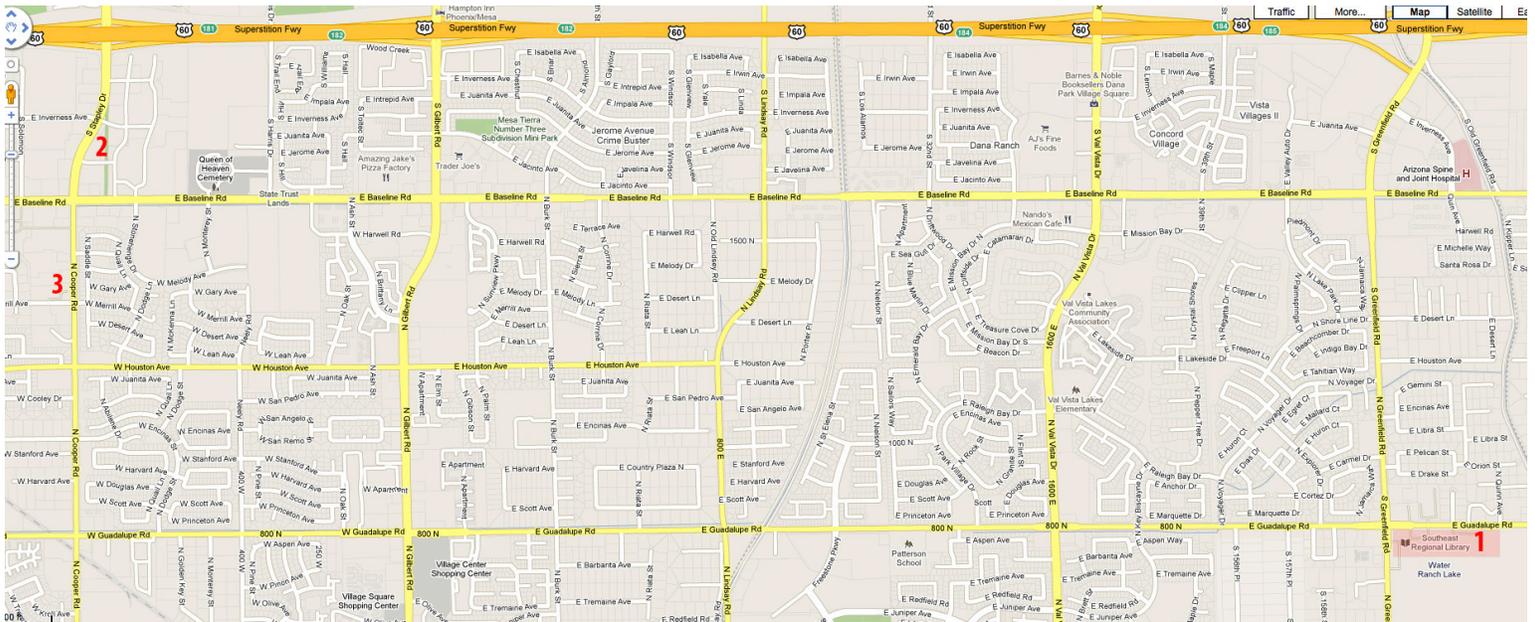
The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

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 Road; on the southeast corner of Greenfield and Guadalupe Roads. Meetings begin at 7:30 pm.

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, just south of US60.

Likewise, all are invited to meet for coffee and more astro talk after the meeting at Denny's on Cooper (Stapley), between Baseline and Guadalupe Roads.

*Visitors are always welcome!*



2

**Old Country Buffet**  
1855 S. Stapley Drive  
Mesa, Az. 85204

1

**Southeast Regional Library**  
775 N. Greenfield Road  
Gilbert, Az. 85234

3

**Denny's**  
1368 N. Cooper  
Gilbert, Az. 85233

## JULY 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	<b>3</b>
4	5	6	7	8	<b>9</b>	<b>10</b>
11	12	13	14	15	<b>16</b>	17
18	19	20	21	22	23	24
25	26	27	28	29	30	<b>31</b>

**July 3** - Local Star Party at Boyce Thompson

**July 9** - Public Star Party & SkyWatch at Riparian Preserve

**July 10** - Deep Sky Observing Night (as of now the club doesn't have a replacement site)

**July 16** - General Meeting at SE Library

**July 31** - Local Star Party at Boyce Thompson Arboretum

The Deep Sky Star Party is held on the Saturday closest to new moon. For many years, EVAC has supported the use of a location known as Vekol Rd. This location was East of Gila Bend, and South of I-8. Due to recent events in the Arizona news, and out of caution for our members safety, EVAC is not recommending the use of this location at the present time. A permanent replacement location for the EVAC Deep Sky Star Party has not yet been selected.

## AUGUST 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	<b>7</b>
8	9	10	11	12	<b>13</b>	14
15	16	17	18	19	<b>20</b>	21
22	23	24	25	26	27	28
29	30	31				

**July 31** - Local Star Party at Boyce Thompson

Arboretum

**August 7** - Deep Sky Observing Night (as of now the club doesn't have a replacement site)

**August 13** - Perseids Meteor Shower

**August 13** - Public Star Party & SkyWatch at Riparian Preserve

**August 20** - General Meeting at Southeast Regional Library

# East Valley Astronomy Club -- 2010 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"/> <b>\$30.00 Individual</b> January through March	<input type="checkbox"/> <b>\$22.50 Individual</b> April through June
<input type="checkbox"/> <b>\$35.00 Family</b> January through March	<input type="checkbox"/> <b>\$26.25 Family</b> April through June
<input type="checkbox"/> <b>\$15.00 Individual</b> July through September	<input type="checkbox"/> <b>\$37.50 Individual</b> October through December
<input type="checkbox"/> <b>\$17.50 Family</b> July through September	<input type="checkbox"/> <b>\$43.75 Family</b> 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: <input style="width: 300px;" type="text"/>	Phone: <input style="width: 300px;" type="text"/>
Address: <input style="width: 300px;" type="text"/>	Email: <input style="width: 300px;" type="text"/>
City, State, Zip: <input style="width: 250px;" type="text"/>	<input type="checkbox"/> Publish email address on website URL: <input style="width: 300px;" type="text"/>

**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](http://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 I and my family 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](http://www.eastvalleyastronomy.org)**

## Black Holes No Joke

by Dr. Tony Phillips

*Kip Thorne: Why was the black hole hungry?*

*Stephen Hawking: It had a light breakfast!*

Black hole humor - you gotta love it. Unless you're an astronomer, that is. Black holes are among the most mysterious and influential objects in the cosmos, yet astronomers cannot see into them, frustrating their attempts to make progress in fields ranging from extreme gravity to cosmic evolution.

How do you observe an object that eats light for breakfast?

Black holes are creatures of gravity," says physicist Marco Cavaglia of the University of Mississippi. "So we have to use gravitational waves to explore them."

Enter LIGO - the NSF-funded Laser Interferometer Gravitational-wave Observatory. According to Einstein's Theory of General Relativity, black holes and other massive objects can emit gravitational waves - ripples in the fabric of space-time that travel through the cosmos. LIGO was founded in the 1990s with stations in Washington state and Louisiana to detect these waves as they pass by Earth.

The principle is simple," says Cavaglia, a member of the LIGO team. "Each LIGO detector is an L-shaped ultra-high vacuum system with arms four kilometers long. We use lasers to precisely measure changes in the length of the arms, which stretch or contract when a gravitational wave passes by."

Just one problem: Gravitational waves are so weak, they change the length of each detector by just 0.001 times the width of a proton! "It is a difficult measurement," allows Cavaglia.

Seismic activity, thunderstorms, ocean waves, even a truck driv-

ing by the observatory can overwhelm the effect of a genuine gravitational wave. Figuring out how to isolate LIGO from so much terrestrial noise has been a major undertaking, but after years of work the LIGO team has done it. Since 2006, LIGO has been ready to detect gravitational waves coming from spinning black holes, supernovas, and colliding neutron stars anywhere within about 30 million light years of Earth.



*Laser Interferometer Gravitational-wave Observatory in Livingston, Louisiana. Each of the two arms is 4 kilometers long. LIGO has another such observatory in Hanford, Washington.*

So far the results are ... nil. Researchers working at dozens of collaborating institutions have yet to report a definite detection.

Does this mean Einstein was wrong? Cavaglia doesn't think so. "Einstein was probably right, as usual," he says. "We just need more sensitivity. Right now LIGO can only detect events in our little corner of the Universe. To succeed,

LIGO needs to expand its range."

So, later this year LIGO will be shut down so researchers can begin work on Advanced LIGO - a next generation detector 10 times more sensitive than its predecessor. "We'll be monitoring a volume of space a thousand times greater than before," says Cavaglia. "This will transform LIGO into a real observational tool."

When Advanced LIGO is completed in 2014 or so, the inner workings of black holes could finally be revealed. The punchline may yet make astronomers smile.

Find out more about LIGO at <http://www.ligo.caltech.edu/>. The Space Place has a LIGO explanation for kids (of all ages) at <http://spaceplace.nasa.gov/en/kids/ligo>, where you can "hear" a star and a black hole colliding!

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with NASA.*

# If It's Clear...

by *Fulton Wright, Jr.*

## Prescott Astronomy Club

JULY 2010

*Celestial events (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) customized for Prescott, Arizona. Remember, the Moon is 1/2 degree or 30 arcminutes in diameter. All times are Mountain Standard Time.*

This month, about 9:00 PM, watch in the west for Mars (magnitude 1.4) traveling east among the stars and approaching Saturn (magnitude 1.1) while Venus (magnitude -4) looks on from below. On July 31 Mars and Saturn are only 2 degrees apart and Venus has almost made it to half phase.

On Friday, July 2, about 3:30 AM, you can watch Callisto skim just north of Jupiter. Also notice Europa's shadow leave the planet at 3:57 PM just as Europa itself moves in front of the planet.

On Saturday, July 3, the Moon is at third quarter phase and doesn't rise until 11:41 PM.

On Sunday, July 11, it is new moon and you have all night to look for faint fuzzies. Some people in the south Pacific get to see a total solar eclipse.

On Friday, July 16, about 9:00 PM, you can see the Serpentine Ridge snaking vertically across the planetary eastern (right hand) part of Mare Serenitatis on the Moon.

On Saturday, July 17, the Moon is at first quarter phase and sets

at 11:25 PM. Look for a straight line of small craters in the north-western part of Mare Serenitatis. See Astronomy Magazine, July 2010, p. 41, for more details.

On Monday, July 19, you might see comet 10p Temple 2 at its best. The magnitude 8 comet rises at 11:35 PM and is best seen before twilight at about 3:50 AM on July 20. It will also be good viewing a few days before and after this date. See Astronomy Magazine, July 2010, p. 42, for a finder chart.

On Sunday, July 25, at 7:27 PM (10 minutes before sunset) the full Moon rises, spoiling any chance to hunting for faint fuzzies for the night.

On Tuesday, July 27, about 8:00 PM, you might be able to see Mercury (magnitude 0) and Regulus (magnitude 1) near each other. With binoculars look 10 degrees above the west horizon for the pair about 1/2 degree apart. This will be a difficult observation because sunset was only 24 minutes ago.

On Thursday, July 29, those eager to view events with Jupiter's moons will have a chance. Jupiter rises at 10:10 PM with Gany-mede in front of the planet. At 11:22 PM Io's shadow falls on the planet. At 12:26 AM (July 30) Ganymede moves from in front of the planet. At 12:32 AM Io moves in front of the planet. At 1:36 AM Io's shadow leaves the planet. At 2:43 AM Io moves from in front of the Planet.

## From the Desk of the President

*Continued from page 1* working on his Herschel 400 list, with about 45 or so remaining targets to find. An excellent project to be working on.

I have just completed the EVAC Galaxy Observing Program, and hope to finish the Globular Cluster, and Planetary Nebulae programs later this summer. Are you working on an EVAC Observing Program? If not, have a look at the EVAC web site, and see if you can find one to peak your interest. Our new Observing Program Coordinator, Marty Pieczonka, would love to process your observing logs and award you the plaque and certificate.

There was a nice article on MSNBC about the summer triangle the other day. That would be the triangle formed by Vega (Lyra), Altair (Aquila), and Deneb (Cygnus). Do you know where this object got its name? Or when? Or by whom? It seems to be a very recent occurrence. Try and check it out, both in research, and visually. It really is a wonderful sight.

Lets all "Keep Looking Up!"

## New EVAC Members in June

**Gene Crist - Peoria**

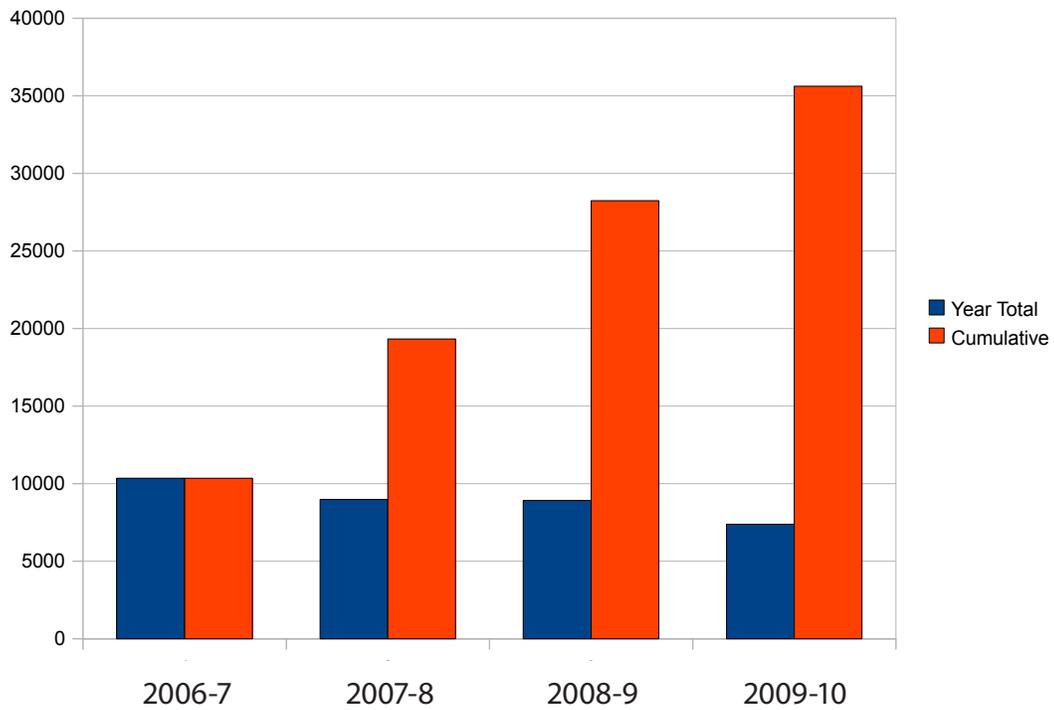
**Sean Dogar - Higley**

**Tiffany Hall - Gilbert**

**Jerry Midzinski - Mesa**

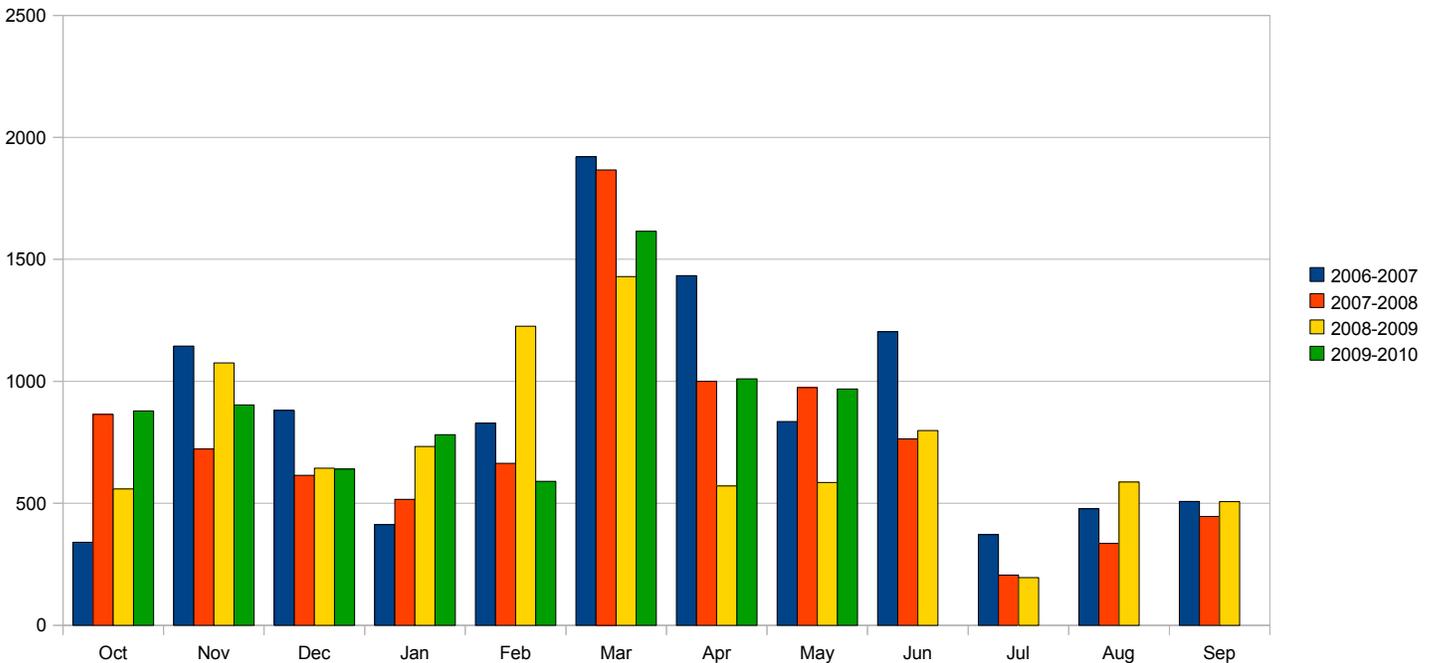
# GRCO Attendance 2006-2010 Has Totaled 35,625 Visitors!

## GRCO Annual Attendance



	2006-7	2007-8	2008-9	2009-10
<b>Annual Total</b>	10,353	8,974	8,910	7,388
<b>Cumulative</b>	10,353	19,327	28,237	35,625

## GRCO Monthly Attendance



# THE DEEP SKY OBJECT OF THE MONTH

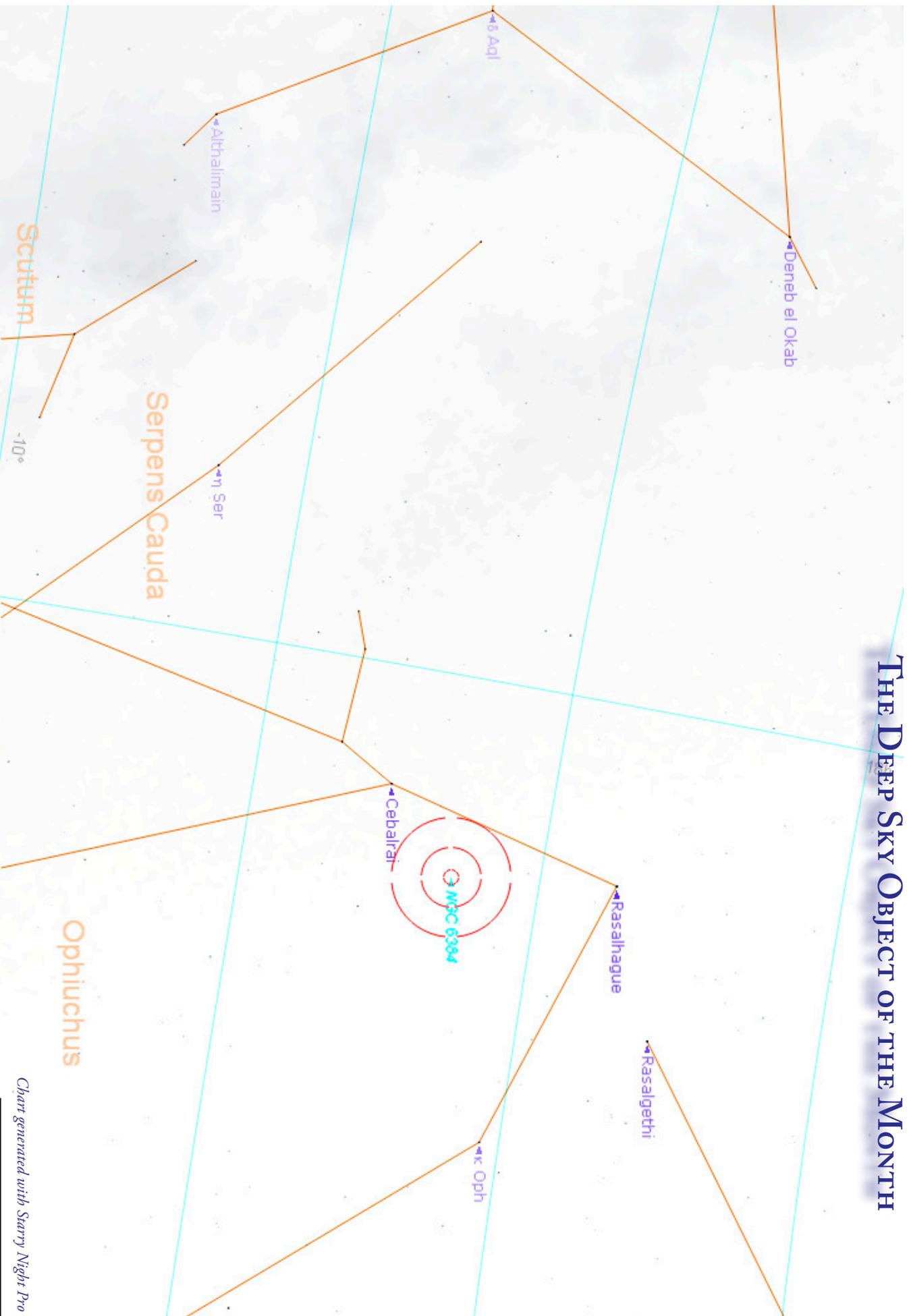


Chart generated with Starry Night Pro

NGC 6384 (PGC 60459) Spiral Galaxy in Ophiuchus

RA: 17h 32m 24.1s Dec: +07° 03' 38" Magnitude: 11.50 B Size: 3.1' x 1.5'

# Strange Martian Spirals Explained

by Dauna Coulter

Almost 40 years ago, NASA's Mariner 9 spacecraft relayed to Earth the first video images of Mars' northern polar ice cap, revealing a strange pattern of spiral swirls that has puzzled scientists ever since. Using new data from the Mars Reconnaissance Orbiter (MRO), researchers have finally uncovered the secrets of the troughs that snake through the ice cap like a spiraled maze.

Jack Holt of the University of Texas and his graduate student Isaac Smith used radar data from MRO's Shallow Subsurface Radar to crack the case. Examining the details of this new data set has laid open the ice cap's internal structure, revealing clues to the massive ice troughs' formation.

Apparently, the wind did it.

"Radar cross-sections reveal layers of ice deposited throughout the ice cap's history," says Holt. "The size and shape of those layers indicate that wind has played a key role in creating and shaping the spiral troughs."

Not only does wind shape the spirals, but also it causes them to move. They rotate around the north pole, turning like an excruciatingly slow pinwheel, curiously enough, against the wind.

Smith explains the process: "Cold air from the top of the ice cap sweeps down the slope, gaining speed and picking up water vapor and ice particles along the way. As this wind blows across the trough and starts up the other slope (the cooler side, facing away from the sun), it slows and precipitates the ice it holds. All of this ice is deposited on this cool slope, building it up, so the trough actually grows and migrates, over time, against the wind."

The Coriolis force generated by Mars' rotation twists the winds sweeping down from the ice cap.

"That explains the troughs' spiral design," says Smith.

Similar formations can be found in Antarctic regions of Earth, but without the spiral shape.

"You don't see spirals in Earth's Antarctic ice sheet because local topography there prevents the winds from being steered by the

Coriolis force."

The radar data have solved another icy mystery, too--the origin of Chasma Boreale. Chasma Boreale is a Grand Canyon-sized chasm that slashes through the midst of the spiraled troughs. Theories to date suggested that either wind erosion or a single melt event excavated Chasma Boreale within the past 5 to 10 million years.

"Not so," says Holt. "The MRO data clearly show the chasm formed [long before the spirals did] in a much older ice sheet dating back billions of years. Due to the shape of that ancient ice sheet, the chasm grew deeper as newer ice deposits built up around it. Winds sweeping across the ice cap likely prevented new ice from building up inside the chasm [so it never filled up]."

The radar data also revealed a second chasm matching Boreale in size.

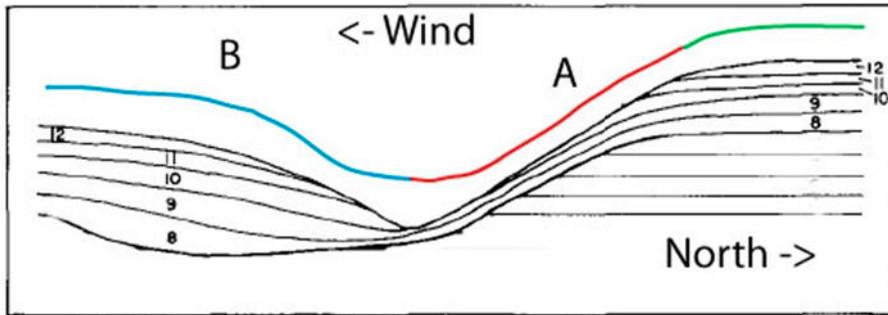
"This chasm's never been seen before -- unlike Boreale, it did fill up with ice, probably because it's in a different location. Boreale is closer to the highest points of the ancient ice cap, where the winds are stronger and more consistent."

By discovering that both Chasma Boreale and the ice troughs were shaped by similar processes over different timescales, Holt and Smith answer some questions about Martian climate history. But they're also sparking new ones.

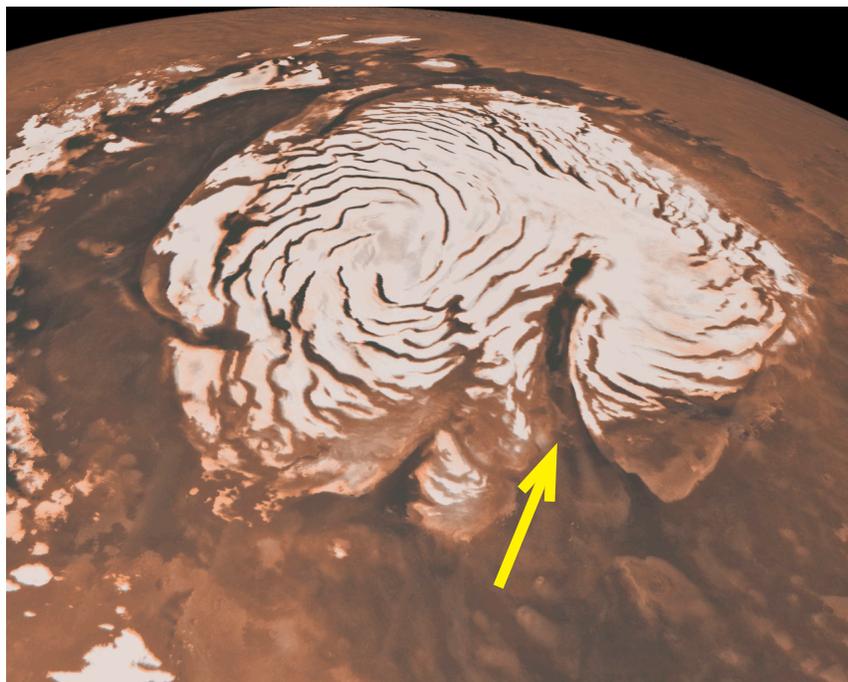
"For a long stretch of Martian history the ice layers were regular and uniform, then there was a distinct period when the spiral ice troughs got started," says Smith. "Something changed. There must have been a very fast (relatively speaking) and powerful change in climate. We still don't know what that change was."

"To figure that out, we need to look at the rest of Mars for evidence of other changes at that same time," says Holt.

"This is just the tip of the iceberg."



Alan Howard of the University of Virginia first suggested the ice trough migration model based on Viking spacecraft data back in 1982. His theory, that wind erosion and sunlight shape and move the troughs, was never widely accepted, but the new data supports it.



Chasma Boreale is indicated by an arrow in this modern image of the Martian north pole.

Article courtesy of Science@NASA

The Observer is the official publication of the East Valley Astronomy Club. It is published monthly and made available electronically as an Adobe PDF document the first week of the month. Printed copies are available at the monthly meeting. Mailed copies are available to members for a slight surcharge to offset printing and mailing expenses.

Please send your contributions, tips, suggestions and comments to the Editor at: [news@evaonline.org](mailto:news@evaonline.org)  
Contributions may be edited. The views and opinions expressed in this newsletter do not necessarily represent those of the East Valley Astronomy Club, the publisher or editor.

Material in this publication may not be reproduced in any manner without written permission from the editor. ©2005-2010

The East Valley Astronomy Club is a 501(c)(3) nonprofit charitable organization.

*President: David Douglass*

*Vice President: Bill Houston*

*Secretary: Dave Coshow*

*Treasurer: Silvio Jaconelli*

*Events Coordinator: Lynn Young*

*Property Director: David Hatch*

*Membership: Les Wagner*

*Newsletter Editor: Peter Argenziano*

*Webmaster: Marty Pieczonka*

*Board of Directors: Tom Polakis, Howard Israel, Ray Heinle, Ed Thomas & Claude Haynes*

*Observatory Manager: Martin Thompson*

[www.evaonline.org](http://www.evaonline.org)

[www.eastvalleyastronomy.org](http://www.eastvalleyastronomy.org)

[www.grcoonline.org](http://www.grcoonline.org)

East Valley Astronomy Club  
PO Box 2202  
Mesa, Az. 85214-2202