December 2009

The Observer

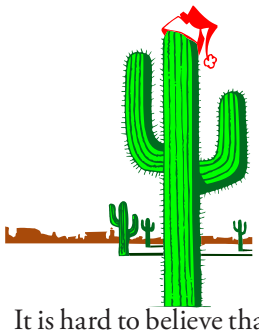
East Valley Astronomy Club

Volume 23 Issue 12

Inside this Issue:

From the Desk of the President

by David Douglass



It is hard to believe that it is truly December, and that I am completing a full year as your President. It has been a very exciting year, and a most rewarding experience. Congratulations to the new officers that were elected at the November meeting for the 2010 calendar year. I feel very privileged to continue serving as the President of EVAC for a second year. There is a listing of the officers that were elected on page 13 in this Observer.

As is our custom, there will not be a regular membership meeting in December. Instead, we have a Holiday Season Potluck Social, with EVAC supplying much of the food, and our membership supplying some side dishes and desserts. This year's Holiday Social will be on Friday, December 18th, and once again held at the home of Tom and Jennifer Polakis. Many ***Thank Yous*** to them for hosting this special event for us. There is a map on page 15 in this edition of the Observer to help you find the location. Hope you can join us.

The November meeting introduced a new format for our meetings. At the request of several of our members, we have shortened the *business* items, and expanded the (now renamed) *Show, Tell, and Ask* section. If you have something that you would like to share with the membership, let me know, and I will schedule you in. Likewise, if you have questions that you would like to *Ask the Membership*, feel free to bring them to the

Continued on page 12

The Backyard Astronomer

Autumn Goodies for Binoculars *by Bill Dellinges*

Anytime of the year there will be objects in the night sky best seen with binoculars - autumn is no exception. In theory, every stargazer knows the value of these wonderful instruments for their ability to scoop up large chunks of sky, assist in tracking down elusive targets or comet viewing. But what do you see at star parties? Observers peering into telescopes with one eye. Not a binocular in sight. For shame. These poor souls are doomed to view astronomical objects in a relatively restricted field of view of perhaps only a degree or two at best. And with only one eye! Millions of years of evolution have provided us with two eyes and it's with two eyes that the brain wants to receive information to best produce images. A two eyed view of anything is far superior to that of one eye. When Hans Lippershey invented the telescope in 1608 and tried selling it to his government, the first thing they said after noting it was a pretty cool device, was, "Any chance you can make one of these with two eyepieces?" [Stargazer, the Life and Times of the Telescope, P.61. Fred Watson, 2004]

You can try using a binoviewer but they produce even smaller fields. So dust off those binoculars and let's put them to work. They're probably photon starved. One more thing, while you can hand hold binoculars up to powers of about 10x, you'll get much more enjoyment out of them if they're tripod mounted (even at their lower powers). I will use 8x50 and 10x70's to peruse the larger autumn splendors on display these evenings. These mid-

Continued on page 2

Upcoming Events:

Public Star Party - December 11

Deep Sky Star Party - December 12

Holiday Party - December 18

Local Star Party - December 19

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

The Backyard Astronomer

Continued from page 1 sized binoculars are popular and likely to be owned by many amateur astronomers. Let us begin our journey.

M31, the Andromeda Galaxy: M31 is our nearest major galactic neighbor about 2.5 million light years away. It can be seen with the naked eye in a dark sky as a small hazy blob in the constellation of Andromeda. Its elongated form covers about 3° of sky. Some wide field scopes can accommodate this monster but most telescopes can't. So the 7° field of the Swarovski 8x50 renders a nice overall view. They do not pick out M32 and NGC 205, M31's two satellite galaxies. But the Fujinon 10x70's did, and the galaxy appeared a bit brighter (as you'd expect). This time of year M31 is overhead so you'll need to view it either lying on a lawn chair or by tilting your tripod mounted binoculars way back on two legs as you view straight up – an old trick of the trade.

Perseus OB Assocation (Mel 20): Looking towards the northeast midway between the horizon and zenith is Perseus, the Hero. For reference, it's a wishbone shaped string of stars between Cassiopeia and the Pleiades. Just under its brightest star, Mirphak, the naked eye perceives a slightly illuminated area. Closer examination with any sized binocular will reveal a lovely large open star cluster with about fifty members. Some of its brightest stars form a serpentine shape or gooseneck like affair. While the wider field of the 8x50's took them all in and then some, I found the 5.18° field of the 10x70's did a better job – they still got all the stars in and the image was brighter. Thus I recommend 10x70's on this splash of diamonds. Amazingly, many amateurs are unaware of this beauty that rivals the Pleiades. Speaking of which…

M45, The Pleiades imaged on November 25, 2006 with a Takahashi Epsilon astrograph and an SBIG STL 1100M camera (160L, 60R, 40G, 60B). Photo courtesy of Jon Christensen

M45, the Pleiades: With the possible exception of a total solar eclipse or possibly the half moon at 50x in a quality refractor, I believe the Pleiades in 10x70 binoculars is the most spectacular sight to behold in the night sky. It never fails to leave even non-astronomically inclined folks flabbergasted with its stunning beauty. This open star cluster in Taurus is comprised of about a hundred stars 380 light years away. These young stars, about 70 million years old, represent the shoulder of the Bull and occupy about 1.5° of sky. Most telescopes have difficulty fitting the cluster into their limited field. While some scopes might be able to squeeze most of M45 in their field at low power, you want more than that to fully appreciate the cluster. For any open star cluster, it's desirable to have a little extra space around the cluster to frame or define it for esthetic purposes. A general rule of thumb is to observe deep sky objects at the highest power that still allows the object to be framed reasonably in your field. Thus I found M45 most appealing with the 10x70's. They gave more magnification and light gathering power than the 8x50's, yet still left plenty of room around this stellar grouping and the binoculars field stop. Both binoculars split the dainty 8th magnitude double star, S 437 Taurii (39.4"), in the middle of the "bowl" of M45 (if you think of the Pleiades as a miniature "Little Dipper").

The Hyades in Taurus: The "V" shaped pattern of stars representing Taurus' face is actually an open star cluster about 120 light years away, making it the closest star cluster to us (excepting the Ursa Major Moving Cluster – mainly the five central stars of the Big Dipper – not much of a cluster!). The Hyades is huge, requiring the 8x50's 7° field to contain all of its stars. As mentioned above, a little extra framing space is nice, so I broke out my 7x42, eight degree binoculars to give the grouping some breathing space. That did the trick. So for this object, you'll want to use a binocular with an eight to ten degree field. The Hyades' lucida is Aldebaran, a magnitude 0.86 orange giant forty times the Sun's diameter and not a member of the cluster but a foreground star 67 light years distant. Check out the neat little arrangement of stars just west of Aldebaran, a unique looking triangle of three wide double stars. Adding 75 Taurii north of them, I create an asterism I call "Little Cepheus", a likeness to that constellation.

The Double Cluster, NGC 869 and 884, in Perseus: The Double Cluster is a glorious deep sky object for stargazers. It doesn't hurt that the clusters are also imbedded in the Milky Way, adding myriad other stars to the stellar panoply. No doubt the best view is in a telescope where its large aperture can pull in light from thousands of stars. But you'll need at least one degree of field to see both clusters - two degrees is better. If you can't swing that, revert to your binoculars. As the clusters are some 7000 light years away and a tad dim for smaller binoculars, I prefer my 20x100's on this object with their 2.5° field and light gathering power. The 8x50's render a beautiful view of this region, but the superior aperture of the 10x70's produces brighter star images while their 5.18° field is more than enough to encompass the clusters. Follow a string of 5th magnitude stars running about two degrees north from the Double Cluster to Stock 2, a large sparse open star cluster. The 8x50's can get all three in its 7° field. This area is a stellar wonderland where one can get joyfully lost.

32 Camelopardalis: Our last object is a double star directly south of Polaris this time of the year. At other times you can find it by drawing a line between Polaris and Beta Ursa Majoris, the brightest star in the Bowl of the Little Dipper. A little less than halfway along this line from Polaris (7°) and away from the Dipper, look for 6th magnitude star. It's the brightest star along this path. The double is comprised of white 5.3 and 5.8 magnitude stars 21.5" apart. The 8x50's barely resolved the pair. 10x70's made the chore easier. I called for backup. My 15x70's left no doubt about its duality. This equal magnitude binary gives the impression of cat's eyes looking back at you from a dark alley. The feline's eyes are 290 light years down that alley.

Hypernova

by Henry De Jonge IV

In previous articles we have explored SMBHs, alternatives to BHs, and the various types of SN. In forthcoming articles we will look at GRBs, (gamma ray bursts). However there is a certain class of SN that are called hypernova that I would like to briefly examine that are a sort of bridge from regular SN to GRBs. A hypernova, (HN) is basically a hyper energetic SN of a very, very, massive star that is usually tens or even a 100-150 solar masses. They are characterized by hyper-energetic and hyper-aspherical explosions that are usually at least an order of magnitude, and can be up to several orders of magnitude, more energetic than a regular or even large SN. In fact many believe that HN are the basis for long term GRBs, although some HN are more energetic than some GRBs.

The exact mechanism for HN is still under study and debate. They are sometimes modeled by a very massive stellar collapse called a collapsar. The collapsar model refers to a modified SN of a very massive star that produces an explosion after is has collapsed into a BH, (if the star was rotating rapidly enough). This model has also become widely accepted as the model for long duration GRBs. It involves a magnetic dynamo in an accretion disk to give near light speed jets and the powerful explosion that may result in a HN. The collapsar model usually refers to stars of tens of solar masses, however if the progenitor is massive enough, (>60 solar masses) and incurs no mass loss in the collapse process, then it may directly collapse into a BH. Often such massive stars lose much of their mass by strong stellar winds. Mass losses from around 40 solar masses down to less than 10 solar masses are not uncommon in such stars, (normally called Wolf-Rayet type stars). This mass loss contributes greatly to the dust in the ISM. Remember that the more massive a star the shorter its lifetime and stars with masses > 40 solar masses usually die in less than 6 million years.

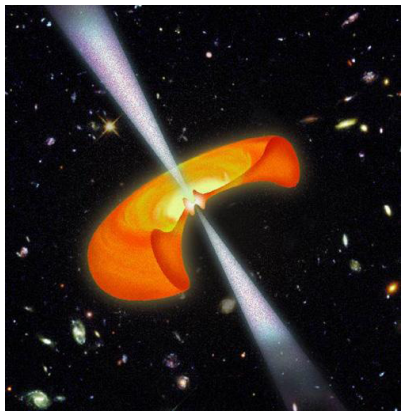
The chemical make up and exact mechanism for the jets in a HN are still unknown. It is thought that these jets besides shooting out mass and energy, actively produce radioactive isotopes, (for example Ni and Co) in the jets themselves. The SN Ib 2008D is an example of a HN, as the explosion was far more energetic than a conventional SN Ib explosion. The progenitor star had a calculated mass of 20-25 solar masses. SN Ib 2006jc and SN Ib/c 1999ex are also thought to be examples of a HN. These HN could also have been brought on by the merging or spiral in of a low massive binary companion star into a more massive star, (a different model than the collapsar model).

An artist's version of a HN explosion.

HN are often observed as very large type Ic SN and are also thought to be very occasionally massive type Ib SN as well. These massive stars are concentrated in the very brightest regions of host galaxies, much more so than other SN. HN are also often associated with GRBs due to their great energy and their jets. Some examples are SN 1998bw with GRB 980425, SN 2003dh with GRB 030329, and SN 2003lw with GRB 031203. It has been suggested that HN and GRBs are associated with high density, star forming regions. We do know that SN Ic are seen in metal rich galaxies but that GRBs are usually seen in low metal regions. However it is possible for "dark GRBs" to be in more metal rich regions since their afterglows would be effectively blocked from our view by the dust absorption. There is also evidence that HN are seen in galaxies with much less metal than our own, however this correlation is not fully confirmed.

HN are also thought to be extremely abundant in the very early universe due to the vast number of primordial and hugely massive stars that were born, some up to about 150 solar masses. These stars are very low metallicity, (with metallicities less than 1/100 solar) and produce certain elemental abundances that differ from a usual SN such as more Ti. Since they were common in the early universe we do not see very many below a redshift of about 2.8.

HN like regular SN make important contributions to the ISM by enriching the universe with many chemicals and higher atomic numbered elements. It is not uncommon for 5-10 solar masses of nucleated material to be blasted away during the explosion of a HN.



A model of a HN explosion.

In addition there are metal abundances observed in early stars and SN remnants that cannot be explained in terms of regular SN energies but need the nucleosynthesis only available in HN energies, (due to more complete Si burning) such as high concentrations of certain isotopes of Co, Fe, Sc, Ti and Ni.

SN 2002ap in M74 was spotted in January 2002 and lies about 30 Mly distant. It is classified as a HN with a suspected progenitor mass of over 40 solar masses.

In another example of the power of HN, hyper velocity stars are stars that are accelerated beyond the escape velocity of the Galaxy usually by tidal disruptions in a binary system by a SMBH. This is called the Hills mechanism. The SMBH in the center of our Galaxy is thought to have ejected about

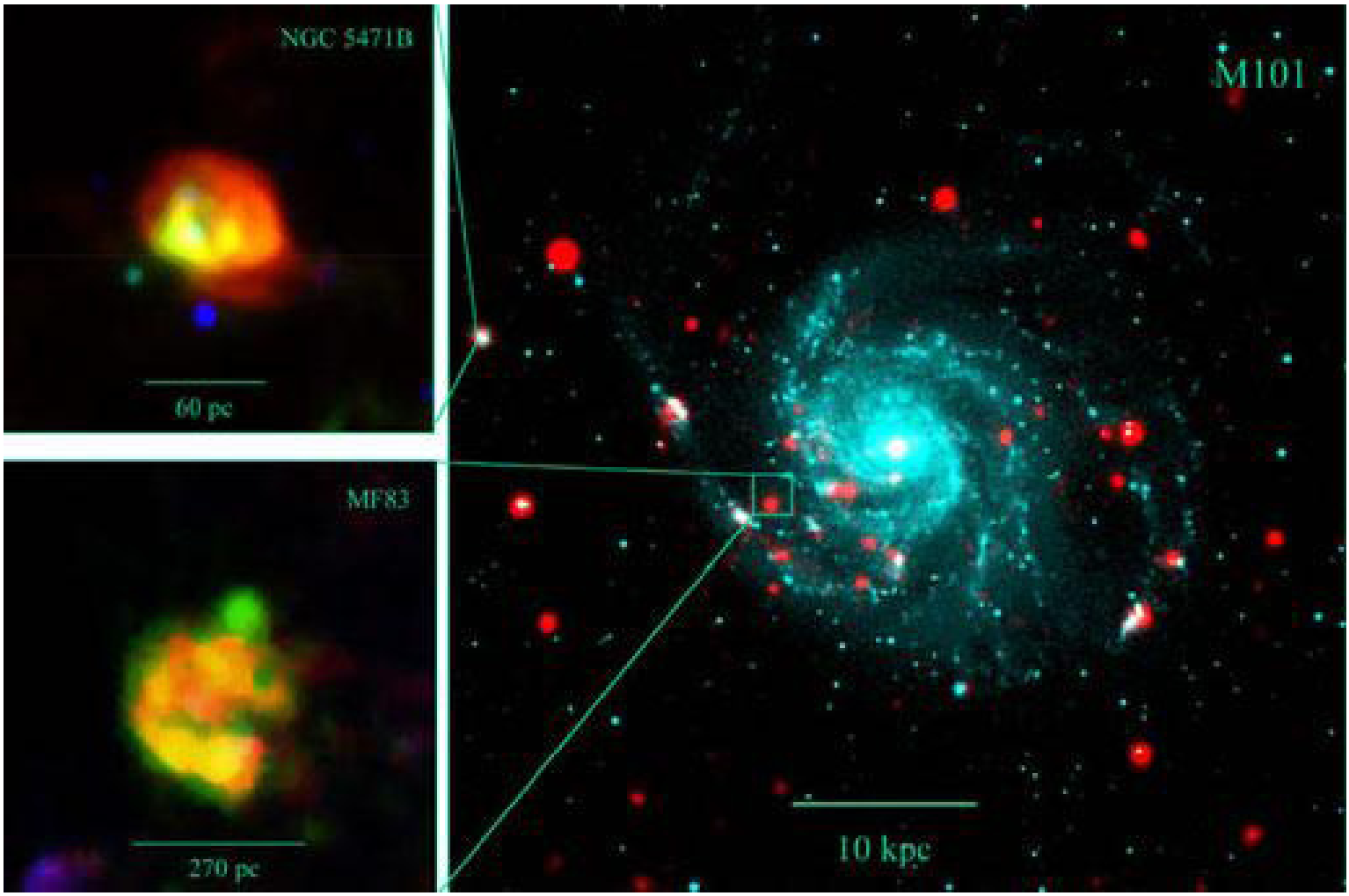
Continued on page 4

Hypernova

Continued from page 3

a dozen such observed stars to date. However there is one star, HVS HD 271791 first observed in 2005, that has its back projected birthplace in a metal poor rim of our Galactic disk, far away from the SMBH in the center of our Galaxy. By observing its atmosphere and the unique elemental signature it possesses, (with certain metals only producible in a HN nucleosynthesis) it has been determined that this star is most likely the survivor of a HN explosion and is the first Galactic runaway star found to be produced by this mechanism. Its chemical signature also does not reflect the chemical signatures of other stars near the center of our Galaxy. The HN progenitor is thought to have had a mass of >55 solar masses and may have also been a long duration GRB. This star is escaping our Galaxy with a speed between 530-920 km/sec. So by analyzing both its chemical signature and its kinematics, astronomers have determined that it was most likely ejected by a very strong SN explosion or a HN.

In summary we see that HN are not your usual SN but are rare and incredibly powerful yet important explosions, that enrich the universe with specific critical elements, provide an excellent source and accelerator of cosmic rays, (as cosmic rays are now thought to come from SN explosions and SMBHs), and can show up as high energy radiation sources, (gamma and x-rays). They are thought to be a model for long term GRBs, (although not all HN are GRBs and not all GRBs associated with SN are HN). HN are also thought to have enough power to eject binary companions completely out of the Galaxy. These fantastically powerful explosions are just beginning to be studied and understood. There are undoubtedly many more surprises to be discovered.



M101 on the right has 2 SNR shown on the left, (NGC 5471B on top and MF83 on the bottom), that could be HN remnants due to the high amount of x-ray radiation they emit. MF83 is also one of the largest SNR ever found. (APOD April 20, 1999).

December Holiday Party

Please join us for the annual Holiday Season Potluck Social, this year to be held at the home of Jennifer and Tom Polakis.

EVAC will supply a cold-cut plate and rolls for sandwiches along with sodas, coffee and hot tea. The club will also furnish plates and utensils. You should bring something to share, as well as any other beverage you may prefer.

Casa Polakis is located at 121 W. Alameda Drive in Tempe - midway between Broadway and Southern, west of Mill. The phone number is 480-967-1658. The party starts at 7:30 pm. A map can be found on page 15.

Hope to see you there!

Basic Astronomy Four Part Lecture Series Began in October

Howard Israel will be presenting a four part lecture series that began at the October 2009 EVAC meeting. The Lecture Series will be presented in four separate (monthly) sessions, each beginning at 6:10 PM, lasting for one hour, followed by a break, and then the regular EVAC meeting will begin at 7:30 PM.

Following is a brief outline of the topics that will be covered during the lecture series:

- The terms of astronomy – words you need to know
- Star gazing basics
- Learning the sky – planets, constellations, stars, deep sky objects
- Visual observing – How to see the wonders of the heavens with your own eyes
- How to use a Planisphere
- How to read a star map
- Secrets of deep sky observing
- Where to get free astronomy software
- Choosing a pair of binoculars
- Choosing your first telescope
- Light pollution – what you can do about it

Session 3 (**Jan. 15th**) covers deep sky observing
Session 4 (**Feb. 19th**) covers binoculars, telescopes, eyepieces, etc.

● Full Moon on December 2 at 00:31

◑ Last Quarter Moon on December 8 at 17:14

○ New Moon on December 16 at 05:03

◐ First Quarter Moon on December 24 at 10:36

TeleVue TEMTS4 Mount Ring Set for 4" Diameter Tube

This 4" inside diameter ring set is brand new, never used.

$175 or trade for a TeleVue Radian 10mm eyepiece in excellent condition.

Alex Vrenios **axv@att.net**

Celestron Ultima 8

Celestron 8" SCT. Heavy Duty photographer's scope with Periodic Error Correction that computer duplicates the first two minutes of hand guiding. Includes Sky Wizard computerized setting circles, tripod with bag, foam lined scope and accessories case, Celestron Ultima series eyepieces, in 4mm, 5mm, 7.5mm, 10mm, 18 mm, and 30 mm, motorized RA, Dec and Focus, manuals, star maps, books, planisphere.

$1300.

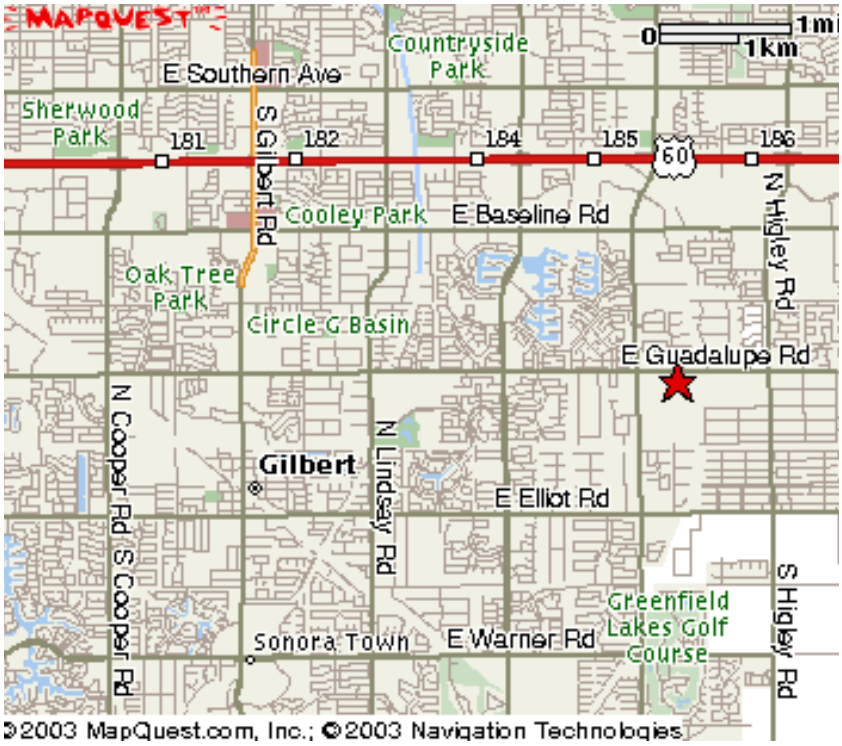
Mike Sargeant **480-839-3209**

Accessories for Sale

TeleVue Visual Paracorr: $295
22 mm TeleVue Nagler T4 : $390
17 mm TeleVue Nagler T4: $330
12 mm TeleVue Nagler T4: $300
2 inch Lumicon OIII Filter: $200
2 inch Lumicon UHC Filter: $200
2 inch Lumicon H-beta Filter: $200
Catsperch Adjustable Height Observing Chair: $200

Bill Ferris
928-606-2447 **BillFerris@aol.com**

www.eastvalleyastronomy.org/grco/obs.asp



Upcoming Meetings

December 18

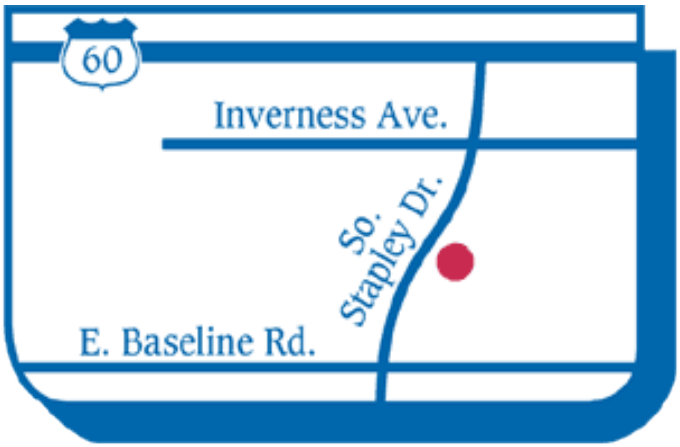
January 15

February 19

March 19

April 16

May 21

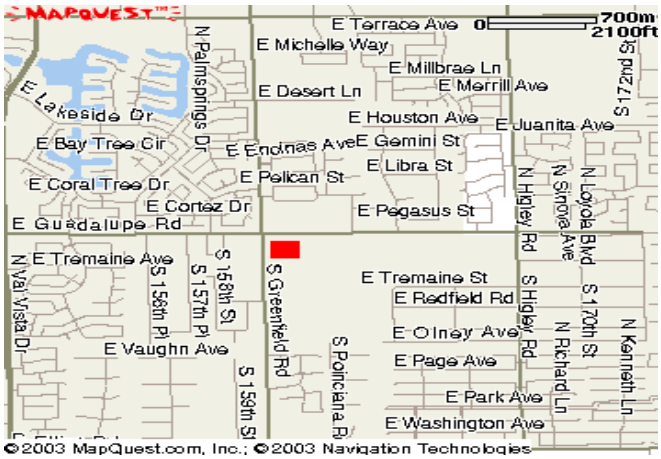


The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

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.

Visitors are always welcome!



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, just south of US60.

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

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.

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

December 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		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		

December 3 - Webster Elementary Star Party

December 5 - IYA at Az Science Center

December 11 - Public Star Party at Riparian Preserve

December 11 - SkyWatch at Southeast Regional Library

December 12 - Deep Sky Star Party at Vekol Road

December 14 - Geminids Meteor Shower

December 18 - Holiday Party at Casa Polakis

December 19 - Local Star Party at Boyce Thompson Arboretum

January 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					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						

January 8 - SkyWatch at Southeast Regional Library

January 8 - Public Star Party at Riparian Preserve

January 9 - Local Star Party at Boyce Thompson Arboretum

January 15 - General Meeting at Southeast Regional Library

January 16 - Deep Sky Star Party at Vekol

January 19 - Las Sendas Star Party

January 22 - Chandler Environmental Center Star Party

January 28 - Jacobson Elementary Star Party

January 29 - Red Mountain Ranch Elementary Star Party

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):

☐ **$30.00 Individual** January through March

☐ **$35.00 Family** January through March

☐ **$15.00 Individual** July through September

☐ **$17.50 Family** July through September

☐ **$22.50 Individual** April through June

☐ **$26.25 Family** April through June

☐ **$37.50 Individual** October through December

☐ **$43.75 Family** October through December

Includes dues for the following year

Renewal (current members only):

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

Magazine Subscriptions (include renewal notices):

☐ **$34.00** Astronomy ☐ **$33.00** Sky & Telescope

Name Badges:

☐ **$10.00** Each (including postage) Quantity: _____

Name to imprint: _____

Total amount enclosed: _____

Please make check or money order payable to EVAC

☐ Payment was remitted separately using PayPal ☐ Payment was remitted separately using my financial institution's online bill payment feature

Name: _____ Phone: _____

Address: _____ Email: _____

☐ Publish email address on website

City, State, Zip: _____ URL: _____

How would you like to receive your monthly newsletter? (choose one option):

☐ Electronic delivery (PDF) *Included with membership* ☐ US Mail **Please add $10 to the total payment**

Areas of Interest (check all that apply):

☐ General Observing ☐ Cosmology

☐ Lunar Observing ☐ Telescope Making

☐ Planetary Observing ☐ Astrophotography

☐ Deep Sky Observing ☐ Other

Please describe your astronomy equipment:

Would you be interested in attending a beginner's workshop? ☐ Yes ☐ No

How did you discover East Valley Astronomy Club? _____

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

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

Liability Release Form

In consideration of attending any publicized Star Party hosted by the East Valley Astronomy Club (hereinafter referred to as "EVAC") I hereby affirm that 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

A Cosmic Crash

by Patrick Barry and Dr. Tony Phillips

Two small planets hurtle toward each other at 22,000 miles per hour. They're on a collision course. With unimaginable force, they smash into each other in a flash of light, blasting streams of molten rock far out into space.

This cataclysmic scene has happened countless times in countless solar systems. In fact, scientists think that such collisions could have created Earth's moon, tilted Uranus on its side, set Venus spinning backward, and sheared the crust off Mercury.

But witnessing such a short-lived collision while pointing your telescope in just the right direction would be a tremendous stroke of luck. Well, astronomers using NASA's Spitzer space telescope recently got lucky.

Artist's rendering of cosmic collision involving two objects whose combined mass was at least twice that of our Moon. Discovered using the Spitzer Space Telescope in the planetary system of a star called HD 172555 100 light-years away.

"It's unusual to catch such a collision in the act, that's for sure," said Geoffrey Bryden, A cosmic Crashspitzer_an astronomer specializing in extrasolar planet formation at NASA's Jet Propulsion Laboratory and a member of the science team that made the discovery.

When Bryden and his colleagues pointed Spitzer at a star 100 light-years away called HD 172555, they noticed something strange. Patterns in the spectrum of light coming from nearby the star showed distinctive signs of silicon monoxide gas — huge amounts of it — as well as a kind of volcanic rock called tektite.

It was like discovering the wreckage from a cosmic car crash. The silicon monoxide was produced as the high-speed collision literally vaporized huge volumes of rock, which is made largely of silicon and oxygen. The impact also blasted molten lava far out into space, where it later cooled to form chunks of tektite.

Based on the amount of silicon monoxide and tektites, Bryden's team calculated that the colliding planetary bodies must have had a combined mass more than twice that of Earth's moon. The collision probably happened between 1,000 and 100,000 years ago - a blink of an eye in cosmic terms.

The scientists used the Spitzer space telescope because, unlike normal telescopes, Spitzer detects light at invisible, infrared wavelengths.

"Spitzer wavelengths are the best wavelengths to identify types of rock," Bryden says. "You can pin down which type of rock, dust, or gas you're looking at."

Bryden says the discovery provides further evidence that planet-altering collisions are more common in other star systems than people once thought. The "crash-bang" processes at work in our own solar system may indeed be universal. If so, Spitzer has a front row seat on a truly smashing show.

See Spitzer Space Telescope's brand new Web site at http://spitzer.caltech.edu/. Kids can learn about infrared light and see beautiful Spitzer images by playing the new Spitzer Concentration game at http://spaceplace.jpl.nasa.gov/en/kids/spitzer/concentration.

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

If It's Clear...

by Fulton Wright, Jr.
Prescott Astronomy Club

December 2009

Celestial events customized (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) for Prescott, Arizona. All times are Mountain Standard Time.

On Tuesday, December 1, at 4:44 PM (35 minutes before sunset), the full Moon rises spoiling any chance of seeing faint fuzzies tonight.

On Wednesday, December 2, at 7:10 PM, one of Jupiter's moons, Io, almost completely occults another one, Europa.

On Friday, December 4, in the early evening, you can observe a complete transit of Io in front of Jupiter. At 6:18 PM Io moves in front of the planet. At 7:31 PM Io's shadow falls on the planet. At 8:34 PM Io moves from in front of the planet. At 9:45 PM Io's shadow leaves the planet. At 10:29 PM Jupiter sets. While the shadow is on the planet, it is just north of the red spot.

On Monday, December 7, in the early evening, you can observe much of a transit of Europa in front of Jupiter. At 6:38 PM Europa moves in front of the planet. At 9:03 Europa's shadow falls on the planet. At 9:29 PM Europa moves from in front of the planet. At 10:20 PM Jupiter sets with the Europa's shadow still on it.

On Tuesday, December 8, it is third quarter moon. It doesn't rise till 12:41 AM (December 9).

On Sunday, December 13, after around 10:00 PM, you might see some Geminid meteors. This is one of the better "showers" of the year. No Moon and before-midnight-viewing add to the attraction. December temperatures subtract. Dress warmly, face toward the east, lie back, and look up.

On Tuesday, December 15, it is new moon, so you have all night to hunt for faint fuzzies.

On Sunday, December 20, in the early evening you can see 2 moon shadows on Jupiter. The Sun sets at 5:22 PM with Io in front of the planet and Callisto having moved past the planet. At 5:51 PM Io's shadow falls on the planet. At 6:31 PM Callisto's shadow also falls on the planet. At 7:03 PM Io moves from in front of the planet. At 8:05 PM Io's shadow leaves the planet. At 9:40 PM Jupiter sets with Callisto's shadow still on it. While you are waiting for one of these events, look about 1/2 degree north of Jupiter for the planet Neptune (magnitude 8).

On Monday, December 21, about 6:00 PM, you can see Mercury at its best. Look low in the southwest for the magnitude -0.3 planet. It should be visible for a few days around this date.

Also on December 21, in the early evening, you can see 2 pairings of Jupiter's moons. At 7:09 PM, on the celestial western (lower) side of the planet, Callisto and Ganymede pass about 3 arc-seconds from each other. At 7:50 PM, on the other side of the planet, Europa halfway covers Io.

The third thing you can look for on December 21 is the asteroid (18) Melpomene passing near a star. At 7:40 PM the asteroid (magnitude 9.5) will be between two stars, closer to one (magnitude 9.8) than the other (magnitude 11.0). An hour later it will be obvious that they are no longer aligned. The asteroid starts off at RA 1hr 33m 6.0s, dec -5d 48' 21".

On Thursday, December 24, it is first quarter moon, which sets at 1:09 AM (December 25, merry Christmas).

On Thursday, December 31, at 5:38 PM (9 minutes after sunset), the full moon rises, spoiling the whole night for deep sky work. This is the second full moon of the month.

From the Desk of the President

Continued from page 1

meeting.

We are working on a method to publish our financial reports, and board meeting minutes. We are considering the Observer, our website, and the EVAC Forum pages (also on the web). A final decision has not been made yet, but will be announced later, probably next month.

I wish everyone a wonderfully holiday season. We look forward to resuming normal meetings, and classes in January. Till then… Keep Looking Up !

2010 EVAC Officers, Board Members and Chairpersons

Officers

President - David Douglass
Vice President - Bill Houston
Secretary - Dave Coshow
Treasurer - Silvio Jaconelli

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Howard Israel
Claude Haynes
Tom Polakis
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Events Coordinator - Randy Peterson
Newsletter Editor - Peter Argenziano
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Observatory Manager - Martin Thompson
Membership - Les Wagner
Refreshments - Mort Hanlon

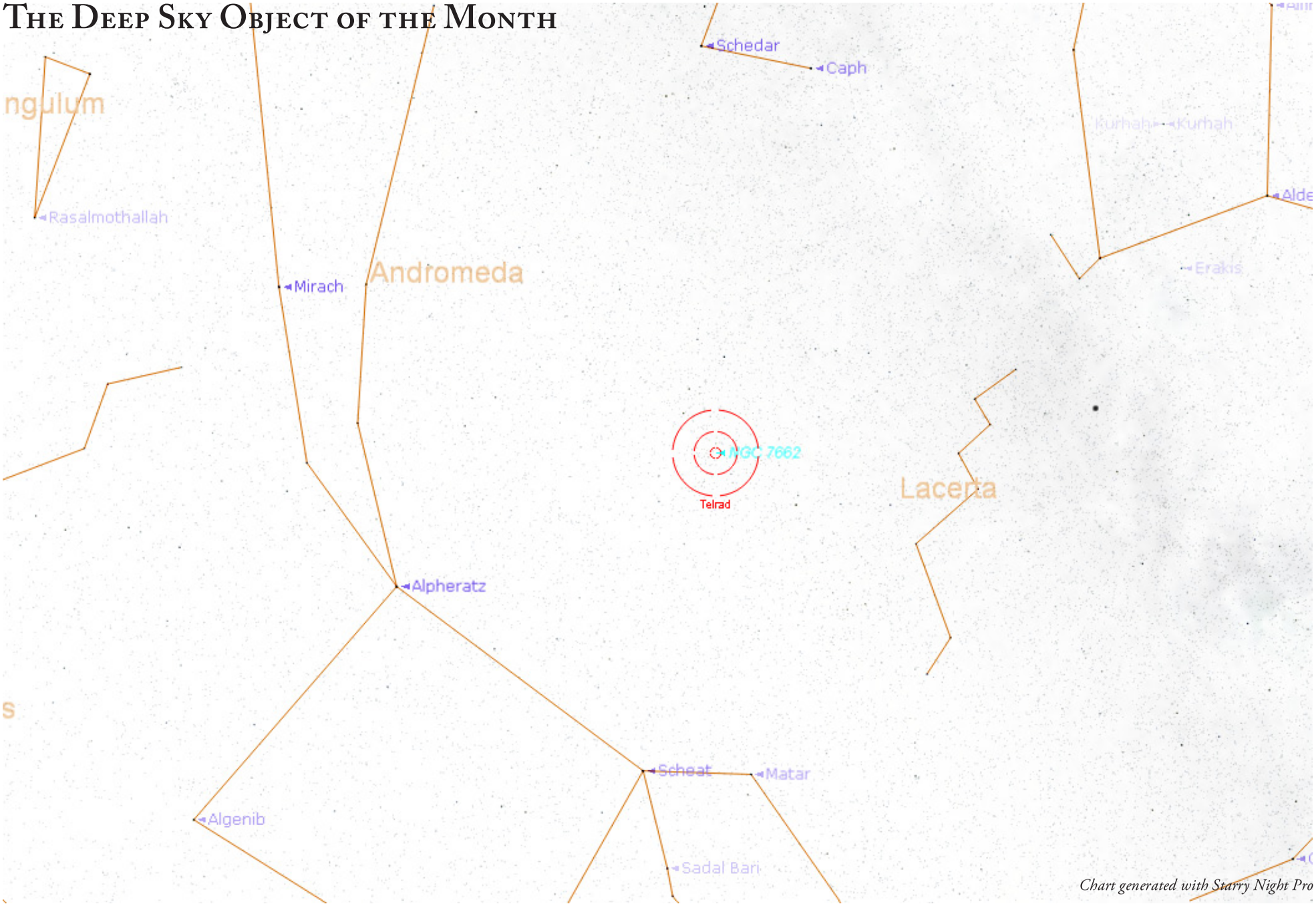
Black are incumbents serving second term - Blue are new in position - Green are appointed positions

A big Thank You to those who have served and a hearty Congratulations to those about to!

New EVAC Members in November

Howard H. Bower - Chandler
Harvey Hitchcock - Chandler
John W. Hesterman II - Mesa
Steve Hollenbach - Apache Junction
Aaron Lenz - Chandler
Drew Lyman - Chandler
Renu Kaur Sidhu - Chandler

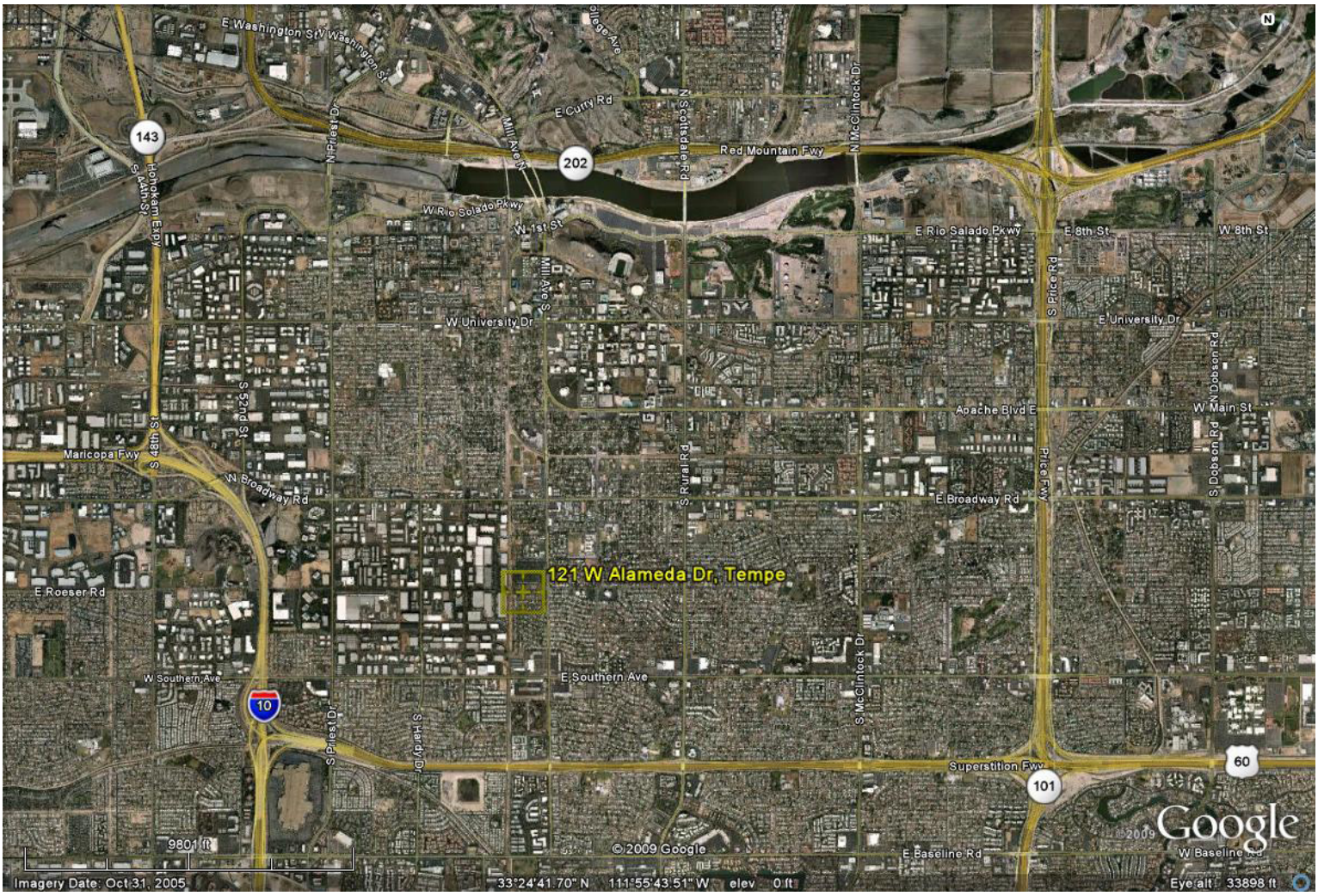
The Deep Sky Object of the Month



NGC 7662 (Blue Snowball) Planetary Nebula in Andromeda

RA 23h 25m 54.0s DEC +42° 32' 05" Magnitude: 8.6 Size: 17.0"

Oh, the weather outside may be frightful
but inside friends are so delightful…
Please join us for the annual EVAC Holiday Party
Friday, December 18th
7:30 PM



Hosted by

Jennifer & Tom Polakis

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Keep Looking Up!

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