May 2010

Volume 24 Issue 5

The Observer

East Valley Astronomy Club

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From the Desk of the President

by David Douglass

With the coming of summer, change is in the wind for EVAC. Nothing too major, but change nonetheless. EVAC has just completed the acquisition and construction of our own storage shed, now located next to the Gilbert Rotary Centennial Observatory (GRCO) facility, in the pump house fenced area. That completed project will make our storage facility much easier and more convenient to access, for both EVAC supplies and GRCO equipment. In addition, it will eliminate the annual rental charges that we have been paying in years past. Our thanks to the Riparian Institute for cooperating with EVAC and allowing the structure to be placed in the storage yard.

There are some changes happening at the GRCO as well. Gene Lucas has completed a new mount for the piggy-back telescope that sits on top of the 16" Meade LX200. This will permit much improved alignment and steady positioning of the upper telescope. The goal is to equip the upper telescope with a video camera that will display continuous imaging outside the observatory during public viewing on Friday and Saturday evenings.

A few months back, a Boy Scout Eagle project was completed at the GRCO. This project added the concrete pad located just east of the observatory. This pad has been useful on several occasions for telescope setup and viewing during both daytime and evening events. The pad is a welcome addition to the facility.

Another Eagle project is about to get underway. The Riparian Institute has authorized the creation of a "cut in" stairway to be constructed from the pump house area, up to the observatory. There is a lot of foot traffic

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The Backyard Astronomer

Amateur Telescopes - Than & Now

by Bill Dellinges

If you're shopping for a telescope these days, the first thing you'll notice is the plethora of instruments to choose from. It can be very confusing. Should you consider a Newtonian? Refractor? Schmidt-Cassegrain? Maksutov? Dobsonian? Computerized? What size? What brand? This wasn't always the case.

Imagine a time when the following companies didn't exist: Astro-Physics, Astro-Tech, Borg, Celestron, D&G Optical, Explore Scientific, JMI, Meade, Obsession, OGS, Orion, Pentax, Plane Wave Instruments, Sky Watcher, RCOS, Starmaster, Stellarvue, Takahashi, TEC, Televue, TMB, Versa, Vixen, and William Optics.

At an EVAC meeting in March of 2006, I gave a talk on the slim pickings amateur astronomers faced when looking for a telescope prior to 1970. Since many people have joined the club since 2006, I thought new members might be interested in the equipment situation that existed in the 50's and 60's before the above companies exploded upon the scene.

During the 1950's, stargazers who desired a first class instrument looked to two firms to provide them. Reflector buyers cast their eye to Cave Optical in Long Beach, California. Tom Cave (1923-2003) was a noted observer and telescope maker. His shop's first ad appeared in Sky and Telescope magazine in March 1953. He would eventually produce 16,000

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Upcoming Events:

Local Star Party - May 8

Public Star Party - May 14

Deep Sky Star Party - May 15

Monthly General Meeting - May 21

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

The Backyard Astronomer

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telescopes between 1950 and 1980. Cave Optical had a reputation for fine optics, massive German Equatorial mounts, moderate prices, and unique fiberglass tubes. Orders were brisk and his somewhat small production capacity resulted in wait times of several months. But if you wanted the best Newtonian made at the time, you looked to Cave Optical.

Refractor lovers who could afford the best achromatic refractor available at the time turned to Unitron of Boston, Massachusetts. The instruments were imported from Japan and available in apertures of 1.6 (!), 2.4, 3, 4, 5, and 6 inches. Their tall German Equatorial mounts were legendary and a work of art. Their prices were somewhat high, but still affordable to most Americans desiring a high quality refractor (note inch for inch of aperture, refractors were and still are pricier than reflectors).

There was a third option for those with deep pockets and who could live with modest apertures – Questar! This Maksutov (think Schmidt-Cassegrain, but with an extremely curved corrector plate) was the brainchild of Larry Brayer who began developing a small telescope based on the 1941 design of Russian Dmitiri Maksutov. Braymer introduced his little jewel in 1950. In June, 1954, the 3.5" Questar ad first appeared in S&T magazine, priced at $795 ($6,317 in 2010 dollars!). Many a budding stargazer, including this writer, lusted over this handsome marvel of optical mechanical excellence. But only the well-to-do could afford it! A 7" model was introduced in 1967 and a 12" ($20,000) appeared in 1979 (the 12" was later discontinued). You can still buy a Questar: the 3.5" price starts at $4,250 and the 7" runs about $10,000.

There were other telescope brands besides Cave, Unitron, and Questar in the period of 1950-60, but not nearly as many as now. A few reflector companies like the Optical Craftsman (1962-72), Coast Instruments (1956-61) and Starliner (1961-95) maintained a level of quality approaching Cave Optical. But many others were in the low-end category, like Criterion, Cleveland Astronomics, Garth, Skyscope, etc. Criterion was probably king of the low-end scopes. Many an aspiring astronomer cut his teeth on a 4" or 6" Criterion Dynascope, or RV 6" and 8" which featured an electrically driven German Equatorial mount. The 4" Dynascope was this writer's first telescope in 1955.

For refractors, there was Edmund, Jaegers, Lafayette, Harry Ross, and Swift, to name a few. The dark ages alluded to here began to see light (no pun intended) in 1960 when Tom Johnson, an engineer and amateur telescope maker living in southern California, began flirting with the idea – and challenge - of making a Schmidt-Cassegrain telescope (SCT). This would be a visual version of the Schmidt camera invented by Bernard Schmidt in 1930. Though a few opticians had experimented with a visual application of the Schmidt arrangement, Johnson's breakthrough lay in developing a method to mass produce the Schmidt corrector plate, a secret Schmidt had taken to the grave.

Johnson's Celestron Pacific ad first appeared in the May, 1964 issue of S&T. Sales of the heavy, expensive blue and white painted telescopes were modest until 1970 when Celestron introduced the orange tube C-8, a lighter and cheaper SCT model . Here was an affordable, compact and portable 8" telescope. It was an instant hit. The company couldn't make them fast enough (5, 11, and 14 inch models would follow). The popularity of SCT's and the development in the mid 70's of the Dobsonian reflector sounded the death knell of venerable Newtonian manufacturers like Cave, Optical Craftsman, etc.

When Meade Instruments, which heretofore had sold middle level refractors, reflectors, and accessories, introduced their own SCT to compete with Celestron in 1980, it was over for most of the pioneering post World War Two telescope companies. Left standing were Celestron, Meade, Questar, Unitron, and a few lesser players like Coulter, Edmund, and Jaegers.

The Newtonian reflector was saved in the mid-70's by the popularity of John Dobson's no frills Dobsonain mount, which made it possible for many amateur telescope makers with even modest skills to build large reflectors made of wood mounts and cardboard tubes. Commercial firms like Coulter Optical began offering somewhat primitive versions of them at low prices around 1980. The company fizzled out though when hi-end "Dobs" from Obsession (1988) and Starmaster (1997) appeared on the scene.

The 1980's were not kind to Unitron. The popularity of refractors had long been in decline. But the early 80's saw a resurgence of interest in refractors with the introduction of short focal length apochromatic refractors from Al Nagler's Televue Optics and Roland Christen's Astro-Physics. Obsolete was the classic F15 achromatic refractor. Unitron was doomed.

So the 70's, 80's, and 90's would see a second generation of new telescope companies, mentioned in paragraph two, emerge. It should also be noted that the recent availability of low cost Chinese imports has made this proliferation of new companies possible.

Computerized telescopes would be introduced by Celestron in 1988 and Meade in 1992. Though Celestron beat Meade to the punch with a GOTO telescope, Meade's LX-200 was far superior to the Celestron's clunky Compustar. Meade sold a huge number of their LX GOTO's before Celestron finally

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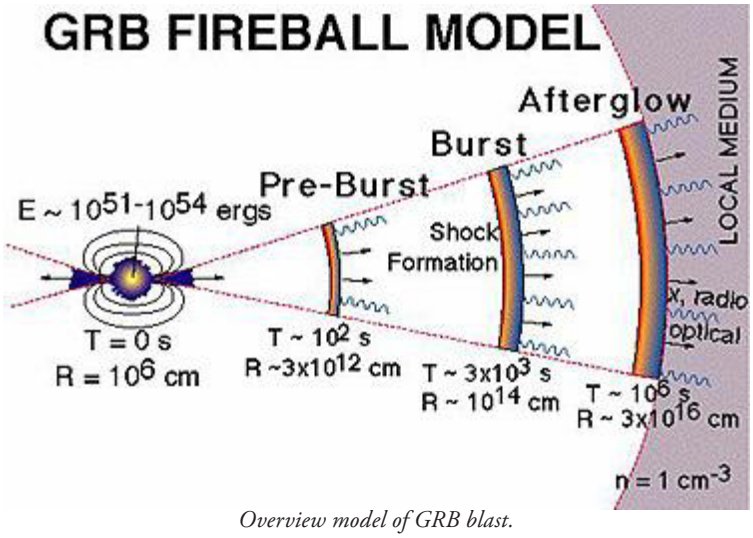
Gamma Ray Bursts (part two)

by Henry De Jonge IV

In this second article on GRBs we will summarize our knowledge of GRBs and their potential implications.

One point that should have been covered earlier is how GRBs are named. They are named after the date they are discovered, the first two numbers are the year, the second two are the month, and the final two are the day. If more than one is discovered in a day then letters beginning with an A are appended to the numbers. Thus one of the first GRBs to be detected visually was GRB970228, (February 28, 1997).

As is well known, GRBs were first detected in the late 1960s by cold war satellites that were looking for nuclear bomb gamma rays and as recently as the 1990s astronomers thought they may have all originated in our own galaxy and did not have a clear understanding of their cosmic origins. It was not until 1997 when GRB 970508 was detected and the distance to its host galaxy determined, (about 6 Bly) that they were first put on this cosmic scale in a proper manner after their afterglow was detected and analyzed spectrally. We detect on average about 1 GRB per day.



Overview model of GRB blast.

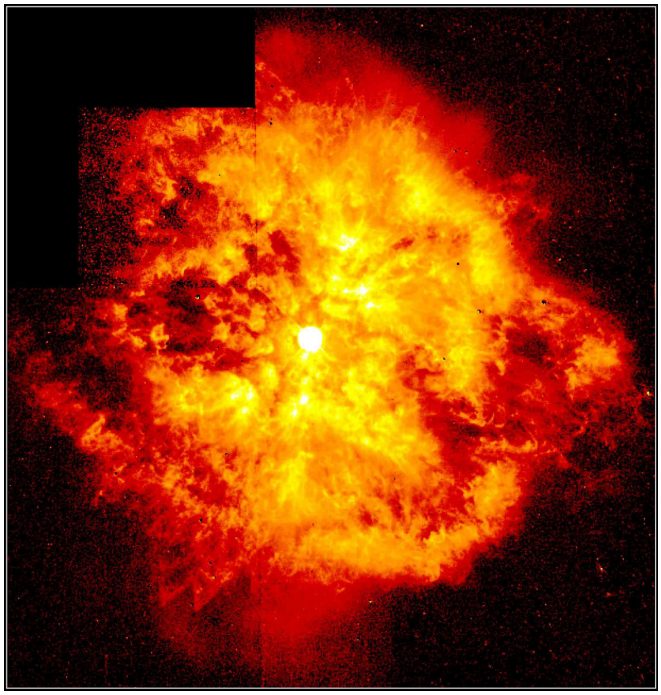
Short & Long GRBs

Overall, the less common short, (Type I) GRBs, (about 10-25% of GRBs) have gamma ray bursts that tend to be high energy and lasting on average about 300 milliseconds, while long GRBs tend to emit lower energy gamma rays and last an average of about 30 seconds. Long GRBs, (Type II) typically have the brightest afterglows and have been studied in much more detail than short GRBs. Long GRBs tend to be found in star forming regions while short GRBs are usually found in regions of low or no star formation.

In a new twist, besides the NS-NS or NS-BH merger models for Type I GRBs, in 2009 the discovery of a, (white dwarf) WD-NS/BH binary, (SDSS 1257+5428) with a merger scale of less than one half billion years, implied that such systems could be fairly common, (estimated to be about 1 million such pairs in our galaxy). It is thought that these types of mergers, (WD-NS/BH) could account for both some long and short type GRBs, (for example short GRBs with longer extended emissions, which comprise about 25% of short GRBs) further complicating the issue. Perhaps it may be possible to determine the exact merger scenario with neutrino analysis of the merger signature? These WD-NS/BH mergers are thought to be a major producer of heavy nuclei in the ISM. The final product of such a merger would usually be a BH and estimates are that millions of such BHs are floating about in our galaxy. In another scenario a Wolf-Rayet, (WR) star, (anywhere from 9-83 solar masses) "absorbs" a binary companion as a NS or BH orbits inside the WR star. Thus we see there may be many more ways to make a GRB than originally though and that the model distinction between short and long GRBs is still fuzzy.

As mentioned in the previous article, magnetic models have also been considered to explain the energy release of GRBs, in particular powering the relativistic jets thought to be part of all, (or most) GRBs. In all long GRB models, (both the collapsar models and the magnetic/magnetar models) accretion disks are present with the jets. However the exact ways that these disks and jets are maintained and even formed to begin with, are open to debate. Among the many questions are how does a jet make its way through many solar masses of material? How does an accretion disk begin to form in such a turbulent environment? To what degree do the magneto hydrodynamics of the accretion disk play a role? Rotational affects are also thought to be very critical in understanding these features of a long GRB. For example to what degree if any does the rotational energy of a BH supply the energy for the jets? The size and duration of these accretion disks and jets directly affects the light curves and widens the range of potential progenitors.

It will probably take the detection of gravitational waves to fully understand and classify short GRBs and tell the difference between a merger of two neutron stars or a neutron star with a BH or WD.



A Wolf-Rayet star in full bloom.

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Gamma Ray Bursts (part two)

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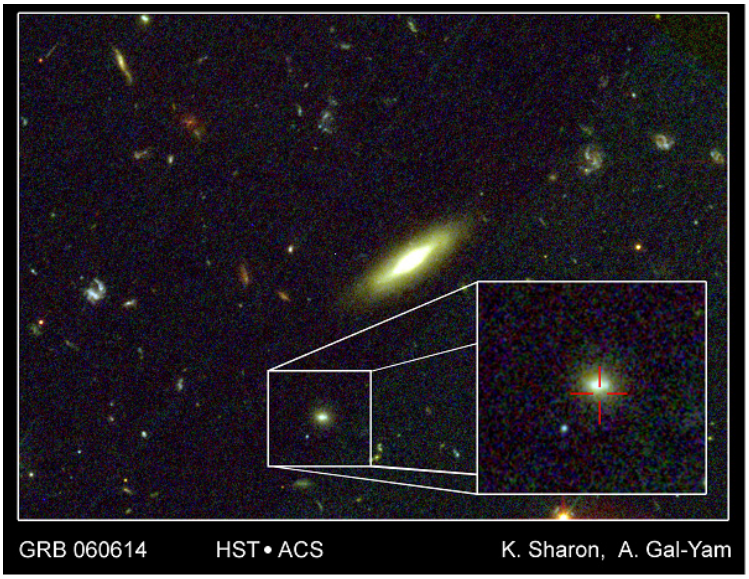
Some Interesting Observations

It was in 2005 that for the first time telescopes spotted a short GRB afterglow in both visible light and X-rays, (which are usually seen after a long GRB), and found no SNR. This gave firm evidence that something other than a massive SN type explosion was the cause of at least some of these short GRBs.

On the other hand GRB 060614 lasted over 100 seconds and was detected on June 14, 2006. It occurred in a galaxy only 2 BLY distant and was obviously in the class of long GRBs. Yet no SNR was ever detected. Is this a new class of GRB?



GRB 060614 as seen by HST.

On April 23, 2009, GRB 090423 was detected by the Swift satellite with duration of 10 seconds. There was no visible light detected, however there was IR light detected, (at about 1 micron wavelength) and the extreme redshift indicated that this GRB occurred about 13.035 Bly distant. This is about 640 million years after the formation of the universe! Prior to this the most distant GRB was seen at about 12.845 Bly distant. No doubt this distance record will be broken in the future.

Implications of GRBs

It is now thought that most cosmic rays originate from SN and SMBHs. GRBs and HN are thought to be a particularly significant source of ultra high energy cosmic rays in the Universe, especially via their relativistic jets. These HN and GRBs are TeV gamma ray sources and can also act as cosmic ray accelerators. They are thought to be the sources for most of the cosmic ray positrons and electron as detected by many experiments.

By looking at the gamma ray photons from GRBs astronomers may be able to test some alternate theories of space-time by examining the differences in these photons as they travel through vast distances. For example a theory of space time involving loop quantum gravity would imply that the foamy structure of space-time would cause photons of high energy gamma rays, (very small wavelength) to move more slowly than gamma rays of lower energy as these small wavelength gamma rays interact with the structure of space time. So far this difference has not been detected from GRBs but the search continues.

As we discussed in regards to HN there is also evidence that Type II GRBs can exert enough force to disrupt the orbit of a binary companion and sent it hurling off into space as a hyper velocity star, (HVS). It may even depart from the host galaxy as HVS HD271791 was observed doing in 2005. The boost came from a possible HN that was also a GRB.

It is now thought that how we detect GRBs, (especially for Type 2 GRBs) is a function of the angle at which we view them and their jets, much like the unified theory of AGN. That is, these explosions seem to be highly focused and have bipolar jets according to most models and observational characteristics. The amount of energy we receive is therefore a function of the angle of the jet we detect. If we happen to see one jet directly beamed at Earth we detect more energy than if we detect a glancing blow from one of these jets, and even less or none at all if we detect them at right angles to their line of beaming. These jets have solid angles that can range from a couple of degrees to a couple of tens of degrees. Their speed has been calculated at 99.99995 percent the speed of light. Thus the true rate of GRBs for both types in the Universe remains uncertain due to the beaming characteristics and unknown corrections. More observations of GRBs will need to happen to help clarify this theory.

A NASA illustration of GRB 080319b

Summary

We have seen how these powerful explosions, lasting from milliseconds to minutes, that can outshine a typical SN by an order of magnitude or more, (for example GRB 080916C produced as much energy as 9,000 typical SN) are quite common yet still not understood. They are also each quite unique

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May Guest Speaker: Allen Dart

Archaeologist Allen Dart, RPA, has worked and volunteered as a professional archaeologist in New Mexico and Arizona since 1975 for state and federal governments, private companies, and non-profit organizations.

He is employed full-time as a principal investigator in the Tucson office of EcoPlan Associates, Inc., an environmental and cultural resources consulting firm, and is the volunteer Executive Director of Tucson's nonprofit Old Pueblo Archaeology Center. He served as President of the Arizona Archaeological and Historical Society (AAHS) in 1991-1993, and founded Old Pueblo in 1994 to provide educational and scientific programs in archaeology and culture, and to create programs involving public outreach and participation in archaeology. He is a Registered Professional Archaeologist, and a member of several archaeology advocacy organizations.

Mr. Dart has been a recipient of the Arizona Governor's Award in Public Archaeology, and has received awards from the Arizona State Historic Preservation Office, the Arizona Archaeological Council, and the AAHS for his research and his efforts to bring archaeology and history to the public.

Mr Dart will give a talk entitled *Southwestern Rock Calendars and Ancient Time Pieces*. Southwestern Native Americans developed sophisticated skills in astronomy and predicting the seasons, centuries before Old World peoples first entered the region. In this presentation Mr. Dart discusses historically known sky-watching practices of various southwestern peoples, and how their ancestors' observations of the heavens may have been commemorated in ancient architecture and rock symbols. The program illustrates cardinal, solstice, and equinox alignments and possible calendrical reckoning features at such places as the Hovenweep area of Utah, the Mesa Verde and Chimney Rock regions of Colorado, New Mexico's Chaco Canyon archaeological district, and sites in Arizona including the Ancestral Pueblo ruins in northeastern Arizona and the Casa Grande Ruins and Picture Rocks Hohokam sites. Mr. Dart also offers suggestions for how these discoveries may relate to ancient Native American ritual.

This month's speaker is being sponsored by the Arizona Humanities Speakers Bureau.

Arizona Humanities Council
Sharing cultures. Enriching communities.

◑ Last Quarter Moon on May 5 at 21:15

○ New Moon on May 13 at 18:05

◐ First Quarter Moon on May 20 at 16:43

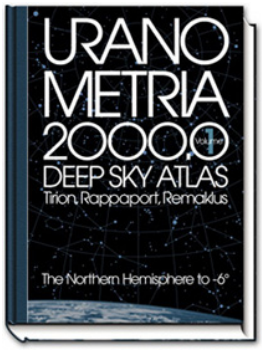
● Full Moon on May 27 at 16:08

Uranometria 2000.00 - Deep Sky Atlas

The most comprehensive stellar/deep sky atlas and data resource, the two volumes of Uranometria 2000.0 are so much more than a "Second Edition," they can only be considered the fulfillment of that process to which the first edition was but prologue. Years in development, this massive achievement affords astronomers, astrophotographers and CCD imagers the finest roadmap to the heavens yet produced at such a modest price. More than 280,000 stars and over 30,000 deep sky non-stellar objects are located with a degree of accuracy heretofore unavailable in one resource. Excellent condition.

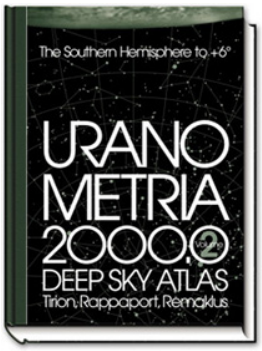
Volume 1: the Northern Hemisphere to -6°

Volume 2: the Southern Hemisphere to +6°



Retail price is $100... I'll let them go for $60.

Contact Peter Argenziano news@evaconline.org



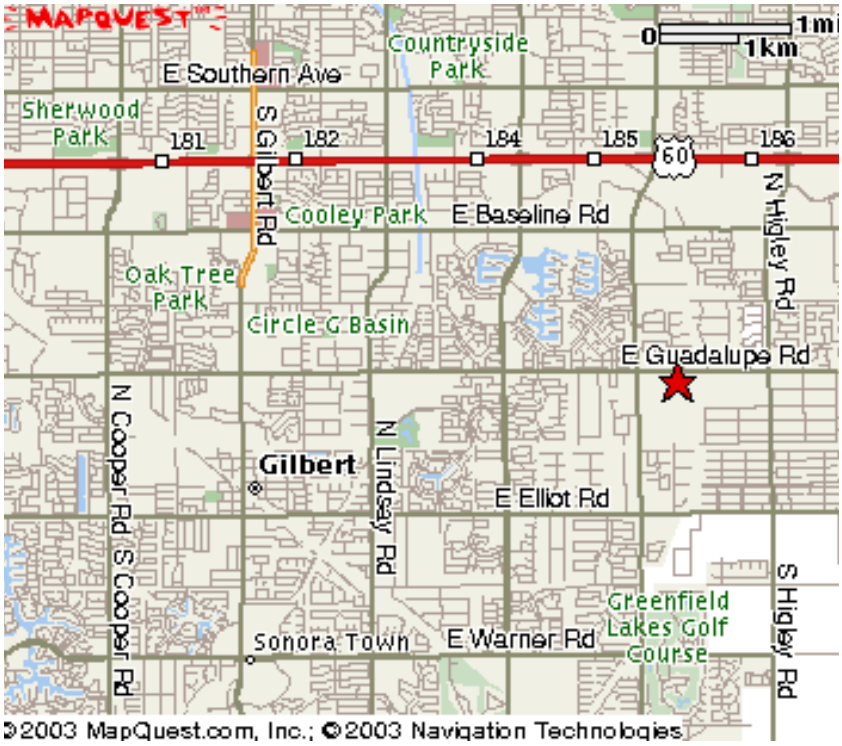
Celestron Ultima 8

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.

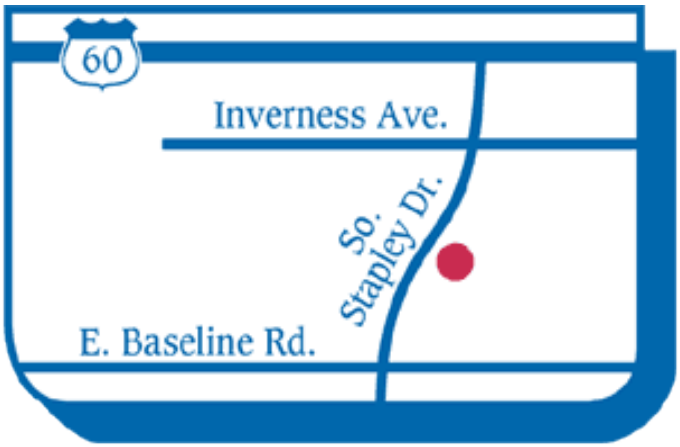
Mike Sargeant 480-839-3209

www.eastvalleyastronomy.org/grco/obs.asp



Upcoming Meetings

May 21
June 18
July 16
August 20
September 17
October 15

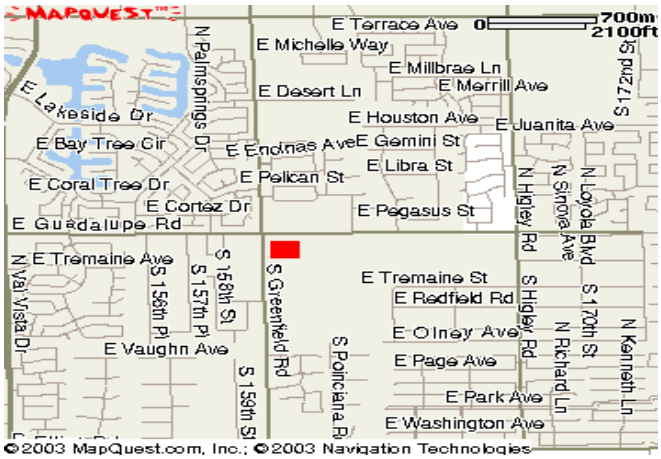


The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

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

May 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					

May 8 - Local Star Party at Boyce Thompson

May 13 - Camp Friendly Pines Star Party

May 14 - Public Star Party & SkyWatch at Riparian Preserve

May 15 - Deep Sky Star Party at Vekol

May 21 - General Meeting at SE Library

May 22 - Chandler Environmental Center Star Party

June 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			

June 5 - Local Star Party at Boyce Thompson Arboretum

June 5 - Grand Canyon Star Party (June 5th - 12th)

June 11 - Public Star Party & SkyWatch at Riparian Preserve

June 12 - Deep Sky Star Party at Vekol

June 18 - 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):

☐ **$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

NASA's Space Place

A Rock Hound is Born

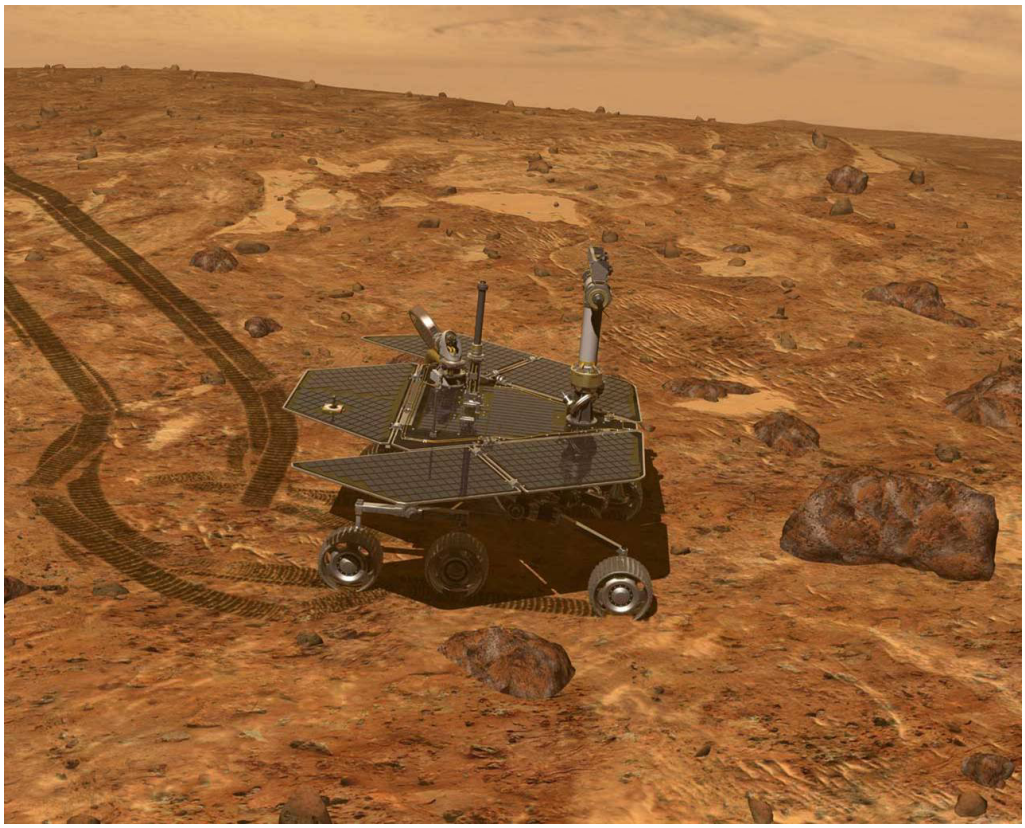
It's tough to be a geologist when you can't tell one rock from another. Is that a meteorite or a chunk of lava? A river rock or an impact fragment?

Houston, we have a problem!

It's a problem Spirit and Opportunity have been dealing with for the past six years. The two rovers are on a mission to explore the geology of the Red Planet, yet for the longest time they couldn't recognize interesting rocks without help from humans back on Earth.

Fortunately, it is possible to teach old rovers new tricks. All you have to do is change their programming—and that's just what NASA has done.

"During the winter, we uploaded new software to Opportunity," says Tara Estlin, a rover driver, senior member of JPL's Artificial Intelligence Group, and the lead developer of AEGIS, short for Autonomous Exploration for Gathering Increased Science. "AEGIS allows the rover to make some decisions on its own."



Opportunity spots a rock with its NavCam that its AEGIS software says meets all the criteria for further investigation.

Estlin and her team have been working for several years to develop and upload increasingly sophisticated software to the rovers. As a result, the twins have learned to avoid obstacles, identify dust devils, and calculate the distance to reach their arms to a rock.

With the latest upgrade, a rock hound is born.

Now, Opportunity's computer can examine images that the rover takes using its wide-angle navigation camera (NavCam) and pick out rocks with interesting colors or shapes. It can then center its narrower-angle panoramic camera (PanCam) on targets of interest for close-up shots through various color filters. All this happens without human intervention.

The system was recently put to the test; Opportunity performed splendidly.

At the end of a drive on March 4th, the rover settled in for a bit of rock hunting. Opportunity surveyed the landscape and decided that one particular rock, out of more than 50 in the NavCam photo, best met criteria that researchers had set for a target of interest: large and dark.

"It found exactly the target we would want it to find," Estlin says. "It appears to be one of the rocks tossed outward onto the surface when an impact dug a nearby crater."

The new software doesn't make humans obsolete. On the contrary, humans are very much "in the loop," setting criteria for what's interesting and evaluating Opportunity's discoveries. The main effect of the new software is to strengthen the rover-human partnership and boost their combined exploring prowess.

Mindful that Opportunity was only supposed to last about six months after it landed in 2004, Estlin says "it is amazing to see Opportunity performing a brand new autonomous activity six years later."

What will the rock hounds of Mars be up to six years from now? Stay tuned for future uploads!

Learn more about how the AEGIS software works at http://scienceandtechnology.jpl.nasa.gov/newsandevents/newsdetails/?NewsID=677. If you work with middle- or high-school kids, you'll find a fun way to explore another kind of robot software—the kind that enables "fuzzy thinking"—at http://spaceplace.nasa.gov/en/educators/teachers_page2.shtml#fuzzy.

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

May 2010

Celestial events (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) customized for Prescott, Arizona. Remember, the Moon is ½ degree or 30 arcminutes in diameter. All times are Mountain Standard Time.

On Wednesday, May 5, it is last quarter Moon. It rises at 1:27 AM (May 6) so you have most of the night to look for faint fuzzies.

On Thursday, May 13, it is new Moon, so you have all night to look for faint fuzzies.

On Sunday, May 16, at 11:40 PM, Titan (magnitude 8) moves in front of Saturn (magnitude 1). Starting when it is dark (about 9:00 PM) you can watch the satellite, which is below the rings on the left, approach the planet.

On Thursday, May 20, it is first quarter Moon. It doesn't set till 1:11 AM (May 21). Between now and full Moon on May 27, the north pole is tipped toward us by libration. It will be a good time to observe how the changing light affects the view of the craters Anaxagoras and Goldschmidt which are near the pole. Astronomy Magazine, May 2010, p. 53 has some information on this area.

On Thursday, May 27, at 7:47 PM (13 minutes after sunset) the full Moon rises spoiling the hunt for faint fuzzies all night.

On Saturday, May 29, at 9:20 PM, two moons of Saturn pass near each other. Dione and Tethys, both about 10th magnitude, are only 1 arcsecond apart to the celestial east of the planet.

On Monday, May 31, about 4:00 AM, you can find comet C/2009 R1 (McNaught) fairly easily. There are 2 stars in Andromeda, Beta (Mirach) and Mu, about 4 degrees apart, which act as pointer stars. If you follow them 4 more degrees northwest, you come to M31 (magnitude 3), the Andromeda Galaxy. If you follow them the other direction, 7 more degrees southeast, you come to M33 (magnitude 6), the Triangulum galaxy. Tonight if you follow them only 3 degrees southeast, you come to the comet (magnitude 8?). The comet is expected to grow in brightness during June. If you want to catch it earlier (and dimmer) see Astronomy Magazine, May 2010, p.54 for a finder chart.

As a preview of next month, on Tuesday, June 1, at 10:10 PM, Titan (magnitude 8) moves in front of Saturn. Actually, at 9:30 PM Dione (magnitude 10) also moves in front of the planet, but this may not be observable.

The Backyard Astronomer

Continued from page 2

offered a comparable GOTO in its 1997 Ultima 2000. Meade's latest telescope innovation is the Light Switch model that only needs to be turned on. It will then align itself and talk to you if you like.

Other recent advances are CCD photography and telescope robotics. The last 60 years have certainly seen some interesting developments in optical equipment for the amateur astronomer.

From the Desk of the President

Continued from page 1

there, and the resulting erosion of the dirt pathway is obvious. The goal of the stairway will be to eliminate that erosion, and provide a much safer walking path between the two locations. We will be hearing more on this project at the May EVAC meeting during announcements.

And lastly, new software for telescope control at GRCO is being purchased and installed. Up until now, GRCO has been using "The Sky 6" software by Software Bisque, the same people who produce the Paramount Pier that is used at GRCO. Software Bisque is releasing "The Sky X Professional" this month, which will include several improvements, including an upgrade path to control the movement of the dome in sync with the telescope.

GRCO has always been a big project for EVAC. From the looks of things, it is getting some much needed, and welcomed, improvements. The evenings are getting warmer, and the high country is calling to us to come visit and look at the clear dark skies. I hear discussions from many indicating that their travels will take them to the many high country dark sites soon. See you all at the May meeting. Until then, Keep Looking Up !

Gamma Ray Bursts (part two)

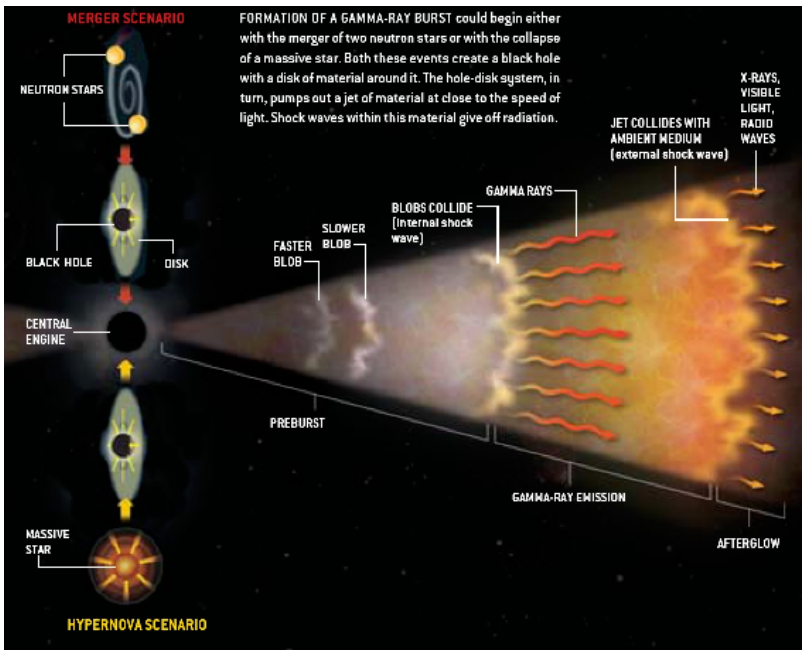
Continued from page 4

with no two exactly alike in their light curves. They may hold secrets regarding cosmic rays, free roaming BHs, lone hyper velocity stars, nuclear abundances, and help advances in gravitational theory, quantum mechanics, electromagnetic theory, and our understanding of space and time.

Many basic questions still remain, such as a complete and clear connection between GRBs and their host galaxies, and even their exact mechanisms, (models and interactions) for releasing this vast energy. The distinction between the observed bimodal distribution, (Type I & Type II bursts) is still not clear or understood. For example the evidence that GRBs occur in low metal galaxies could be biased due to the lack of an optical afterglow as seen from earth due to dust absorption, (a dark GRB).

Recent observations suggest that the active star forming galaxies, (starburst galaxies) that form most long GRBs also contain much stronger magnetic fields than galaxies like the Milky Way. Does this suggest that magnetic fields play a major role in such GRBs? Currently however it does appear that long GRBs are better understood and modeled than the short GRBs.

One thing we know is that thankfully none so far have been "detected" within our own galaxy. A direct blast from a GRB jet in our own galaxy beamed towards Earth within a kilo parsec or so would be potentially lethal to most life forms on Earth. As we have seen to date, the most powerful explosion in the known Universe besides the Big Bang is a Type 2 GRB. More surprises and questions surely await us.



Overview of NS-NS and HN models. Note the gamma rays are thought to be emitted from the interaction of the blast material with the ISM.

EVAC membership dues are now due
Single Membership is $30. Family Membership is $35.

If you have not already paid your 2010 dues, please consider visiting with the Treasurer before the meeting, or during the break. You can also make a check out to EVAC – Treasurer, and mail it to PO Box 2202, Mesa, Arizona 85214. Another option is to go online, and use the PayPal option. The link would be: http://evaconline.org/join_evac.htm

New EVAC Members in April

John McKinney - Mesa

Ann Sebren - Chandler

Richard Smith - Phoenix

The Deep Sky Object of the Month

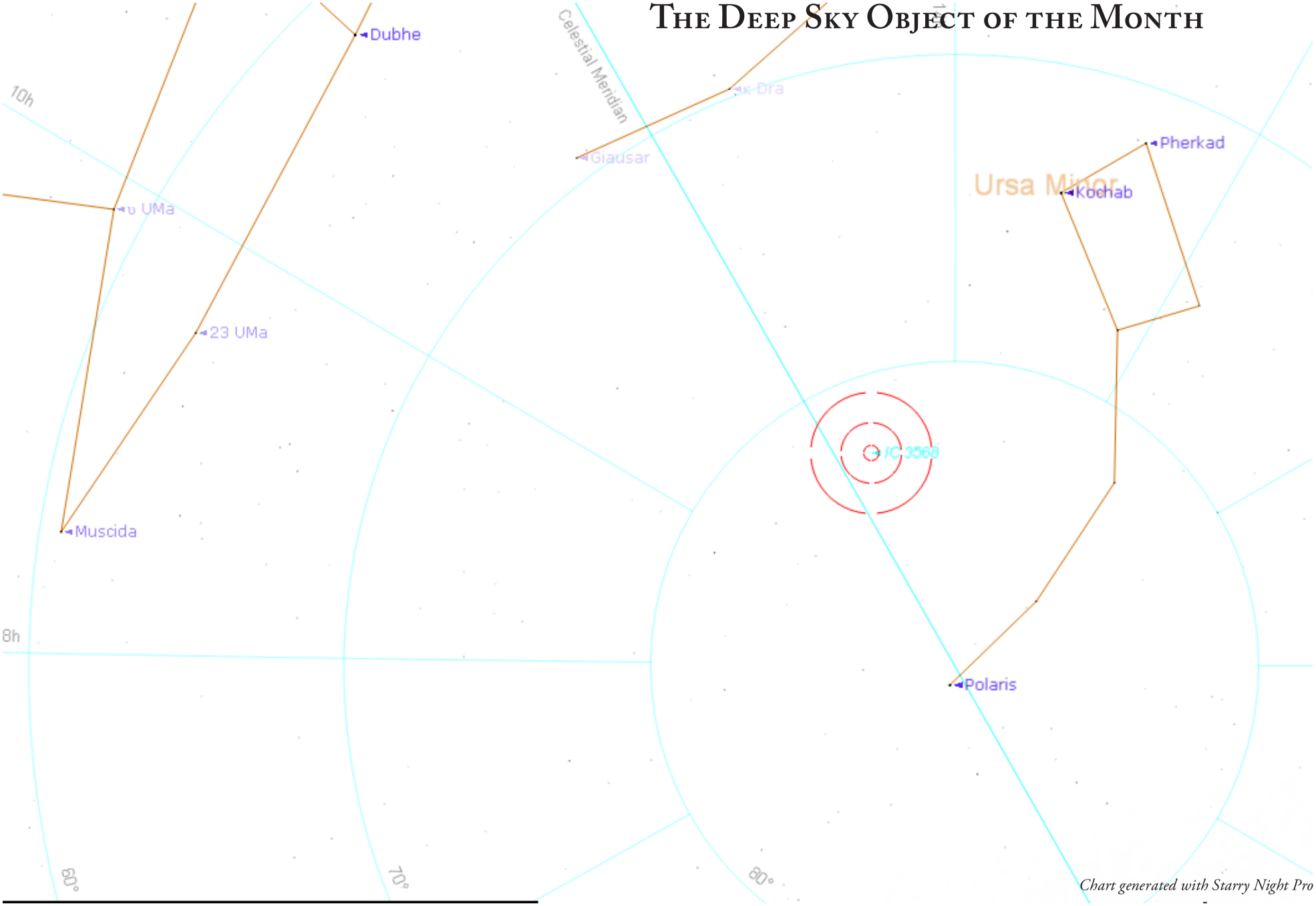


Chart generated with Starry Night Pro

IC 3568 (Baby Eskimo) Planetary Nebula in Camelopardalis

RA: 12h 33m 06.8s Dec: +82° 33' 50" Magnitude: 11.6 Size: 18.0"

New Item in the EVAC Library

At the April 16th General Membership meeting club member Bruce LaFrance, made a very generous donation to the library of EVAC. The donation was a complete 16 DVD set of lectures known as *Understand The Universe, An Introduction to Astronomy, 2nd Edition*. This lecture series is published by The Teaching Company. The presenter is Professor Alex Flippenko of the University of California, Berkeley.

There are a total of ninety-six 30-minute lectures, with 6 lectures on each of 16 DVDs. Club president David Douglass indicates he has looked at several of these lectures and gives them an enthusiastic thumbs-up!

The original cost of the series was over $800. Occasionally, the set goes on sale for about $250.

These DVD's are now available for loan (temporary check out) to paid up members of EVAC. If after looking at the links below, you have interest in viewing any of these DVD's, you can contact me or our Property Manager, David Hatch, Sr, and make arrangements to borrow (check out) the selected DVD.

Let's all extend a hearty thanks to Bruce LaFrance for his very generous donation to EVAC.

Course Description from the The Teaching Company
http://www.teach12.com/ttcx/coursedesclong2.aspx?cid=1810

Course Content (Lecture Titles)
http://www.teach12.com/common/courseLectureTitles.aspx?id=1810

Course Review (From Cloudy Nights)
http://www.cloudynights.com/item.php?item_id=1675

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.

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Keep Looking Up!

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