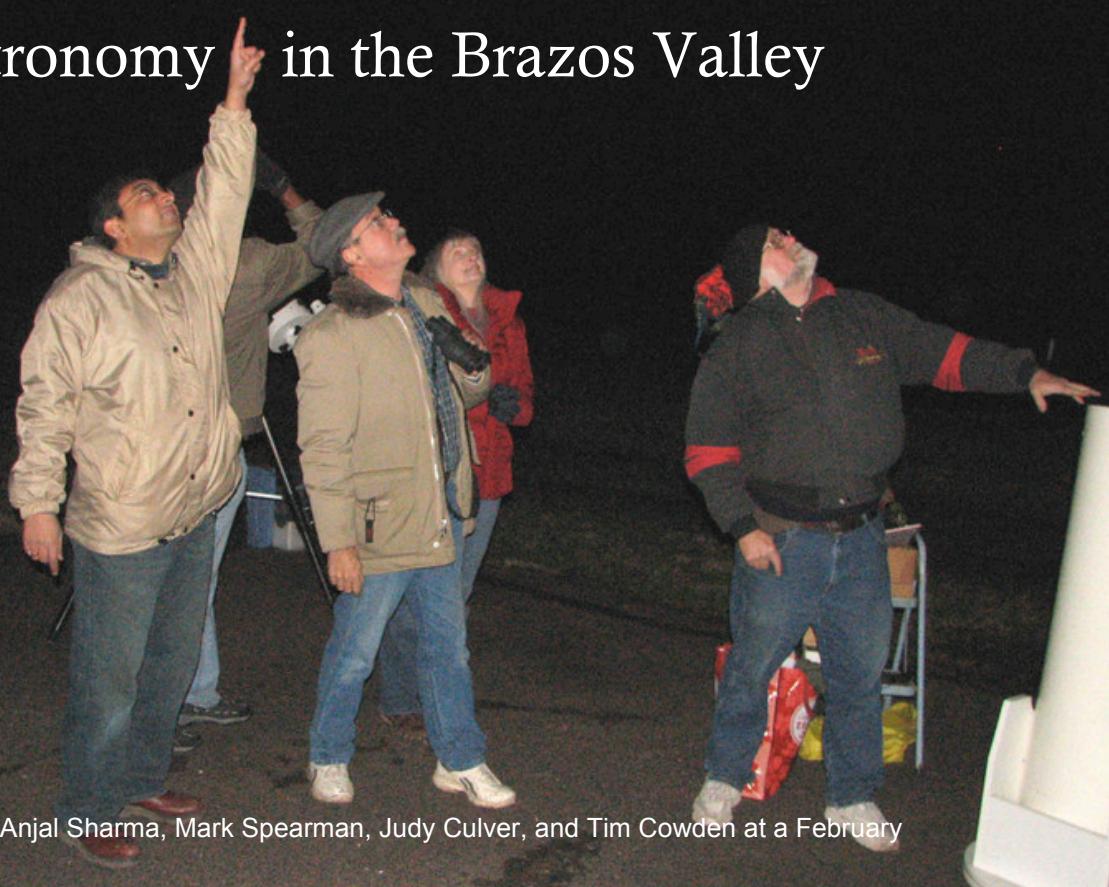


# The Observer

Newsletter of the Brazos Valley Astronomy Club

## Astronomy in the Brazos Valley



Club members Anjal Sharma, Mark Spearman, Judy Culver, and Tim Cowden at a February 2010 star party

Astronomy is looking up in the Brazos Valley. For many years there were few area outlets for those interested in the space sciences, but now there are several options. In 2006 the Brazos Valley Astronomy Club (BVAC) was formed, bringing together many amateur

astronomers who once had to practice their hobby solo. BVAC joined BRASS (Brazos Region Astronomy Service Society) an existing astronomy outreach program organized at Blinn College by Dr. Dennis Utley. The other big change in local astronomy (continued next page)

### Visit to NSO

Joe Powell shares a trip to National Solar Observatory in Sunspot, NM

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### An App for That

Derek Kuhl writes about his favorite star map app for the iPhone

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### Aggie Astronomy

The Big School is an emerging powerhouse in Astronomy. Who knew?

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is the big effort by Texas A&M University to build an astronomy program. A decade ago astronomy at the University was limited to an undergraduate survey course and a small amount of research. But now the University boasts the Mitchell Institute for Fundamental Physics and Astronomy

and has attracted a critical mass of top astronomy faculty. Information about the BVAC, including meeting times and contacts, can be found later in this newsletter. A story about the Mitchell Institute found on page 7.

## A Trip To National Solar Observatory

By Joe Powell

Last year I traveled to Sunspot, New Mexico, atop Sacramento Peak at 9250 feet (650 miles WNW and 12 hour drive from BCS) to tour the National Solar Observatory (NSO). It is an "Observatory of the Southwest Consortium". The consortium consists of Apache Point Observatory, NM, Fred Lawrence Whipple Observatory, AZ, National Solar Observatory, NM, National Radio Astronomy Observatory, NM, McDonald Observatory, TX, and Kitt Peak National Observatory, AZ.

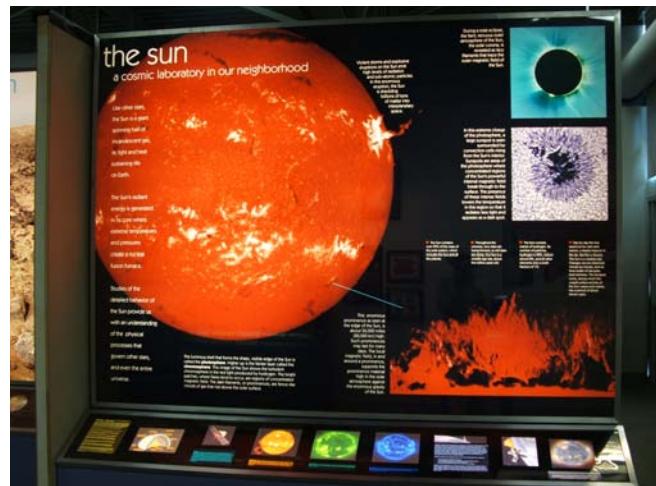


The sprawling complex ([www.nso.edu](http://www.nso.edu)) was mainly built between 1947-1969 by the USAF not far from White Sands Missile Range and overlooking the Tularosa Basin of Southeastern New Mexico. USAF funding stopped in 1974. The NSO is now operated by the "Association of Universities for Research in Astronomy". Its mission: "To advance knowledge of the Sun, both as an astronomical object and as the dominant external influence on Earth, by



providing forefront observational opportunities to the research community. The mission includes the operation of cutting edge facilities, the continued development of advanced instrumentation both in-house and through partnerships, conducting solar research, and educational and public outreach."

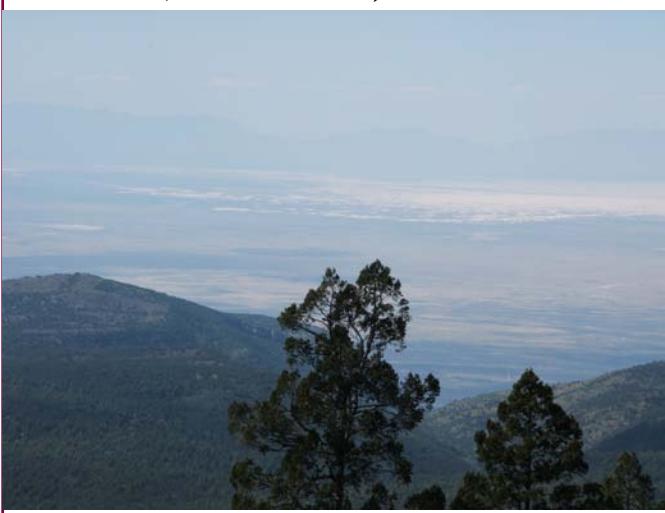
About a mile from the entrance to Sunspot, NM, (they have their own post office) is the Visitors Center (1997) that contains



lecture rooms, a gift shop, snacks, public facilities and free outdoor exhibits. The visitors center also has several walk thru indoor exhibits (modest fee). Outside the center is the entrance to a free 1



mile, self guided tour of the Sunspot complex (a guided tour is possible if you can "time" your visit better than mine). The path takes you to all the NSO observatories and to a scenic mountain crest overlook of New Mexico, Texas, and Old Mexico. (Note: those are not low level clouds you see in this "west" vista photo below, but the famous dunes of the White Sands National Monument, 35 miles distant).



The 1<sup>st</sup> tour stop is the Evans Solar Facility (1952) which consists of 2 telescopes: a 16" coronagraph and a 12" coelostat. Each of these

telescopes can be used to feed other instruments. Thus, two observing programs can be run simultaneously. Observations are made of solar corona and transient phenomena (solar flares, prominences, etc).



Evans Solar Facility

The 2<sup>nd</sup> tour stop, and most stunning, is the Richard B. Dunn Solar Telescope (1969) structure (photo on next page). It rises 136 feet above the ground and extends 228 feet into the mountain top. It has a window and 2 mirrors that guide the Sunlight down the telescope's 329 foot vacuum tube to a 64 inch primary mirror. The telescope tube is suspended on a ring, containing 10 tons of mercury, that allows for easily rotation of the 200 ton telescope structure. Scientists use this solar telescope to study granulation, sunspots, filaments, solar fares, etc. Most of the work done is based on spectroscopy. By examining the solar spectrum, it's possible to determine the sun's chemical makeup, temperature, motion of surface gases and magnetic field strength.

The 3<sup>rd</sup> tour stop is the Hilltop Dome (1963) (photo on next page). This telescope is used for taking patrol images of the whole sun every minute and provides a complete historical record of solar flares for research purposes. The last tour stop, is the historic Grain Bin Dome, which is the first telescope dome built at Sunspot (1950) (photo on next page). This 60 year old observatory is a modified "grain bin," ordered from a *Sears & Roebuck* catalog, that housed a 6-inch prominence scope until 1963.



Grain Bin Dome



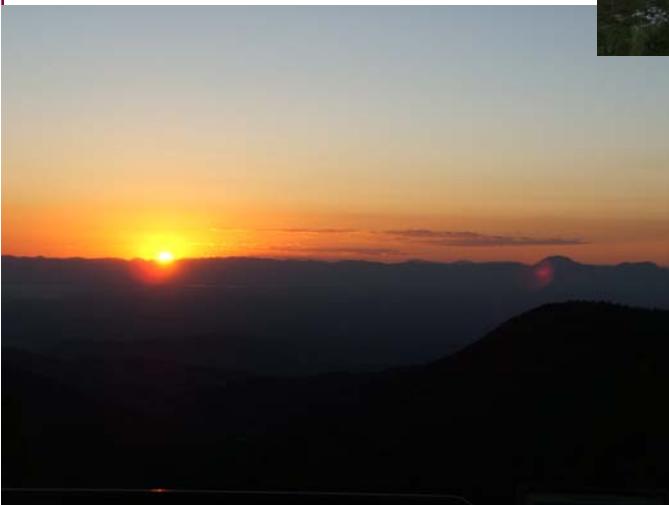
Dunn Solar Telescope

To explore the NSO requires a morning or afternoon. Weather conditions can be a factor in which exhibits you can visit. In the summer the Tularosa Basin temperature can easily be 100F+, with Sunspot at a comfortable 72F. However, thunderstorms are a normal (and exciting) summer afternoon occurrence. I can tell you from experience that the flash and crack of a "bolt" above you (at 9000+ feet) is awe inspiring (putting it mildly!). These afternoon storms can cool the NSO temperature quickly into the 50's. By nightfall, the air clears and temperatures typically dip into the 30-40's.

Sunspot is located within the Lincoln



Hilltop Dome



National Forest. The drive from the nearest town (Cloudcroft NM) to NSO is a beautiful 25 mile aspen, pine and spruce lined "Scenic Byway". It's not unusual to see elk, deer and wild turkeys along this mountain ridge highway. Bear, mountain lions and bobcats are more elusive. These roaming large animals, make dusk and night drives challenging. You never know what's around the next curve....maybe a 900 pound bull elk...or a "free range" steer.



## Join the Club and Support Astronomy in the Brazos Valley

Your club dues give you benefits: you receive club discounts for Astronomy and Sky and Telescope magazines; you also become a member in the Astronomical League (a national organization of amateur astronomers), and you gain access to members-only star parties and can borrow club equipment. Your dues also support the club and its activities.

### BVAC dues (per year):

*Regular Member:* \$25

*Student Member:* \$10

*Senior Member:* \$15

*Family Membership:* \$35

### Sustaining memberships:

*Silver:* \$50

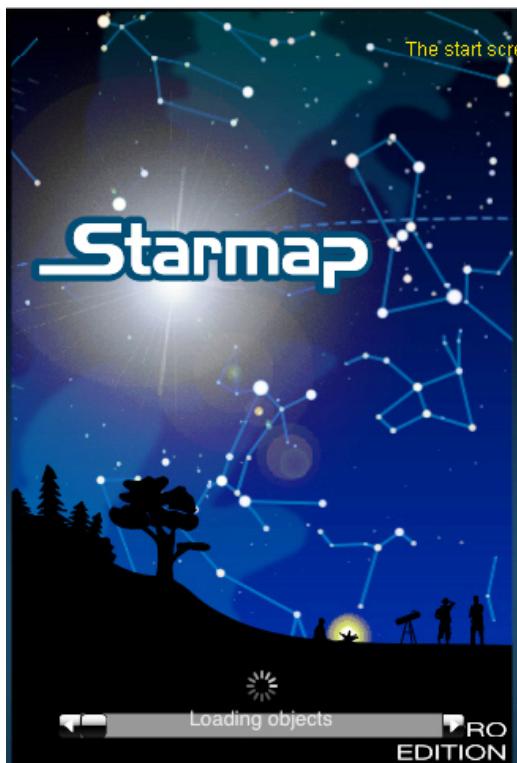
*Gold:* \$75

*Platinum:* \$125

## An iPhone App for Star Maps

### By Derek Kuhl

Smartphones are changing our lives in ways we never before imagined. The ability to access incredible amounts of information on devices we carry in our pockets allows us to expand our knowledge base at amazing rates. A major leap forward in the information acquisition revolution has been the smartphone application or “app,” most prominent on the iPhone. Apps have now touched astronomy.



Planetarium programs have held a valuable place in the astronomer's armamentarium for quite some time now. Programs like *Starry Night* and *The Sky* are very popular with both the beginner and the very advanced. However, if we have wanted to use them in the field, we needed to bring our computers or laptops with us. No longer. Planetarium programs have come to the iPhone, and boy are they neat!

These programs feature incredibly complete object sets and detailed information about thousands of deep space objects. In many instances, they can replace the computer based programs. I have identified more than ten such programs available for the iPhone. I have three of them, testing different features, but I will confine this introductory article to just one, *Starmap Pro*.

*Starmap Pro* is a very full featured program which I have used extensively for the past three months but am still just scratching the surface of its capabilities. *Starmap Pro* maps 2.5 million stars, the full SAO and Tycho catalogs down to magnitude 16. It locates and contains information of all 110 Messier objects, the full NGC (7840 objects), and the full IC (5386 objects) catalogs. Quite a comprehensive listing! You can identify objects represented on a starmap or you can search for an object in the database and then have the app locate it in the sky.

*Starmap* will also identify your location and

show you the sky as it is at your time and place. It also maps planets, comets and satellites. Even better than that is the compass and accelerometer features. These allow the *Starmap* to show you the section of the sky you are looking at if you hold your phone in front of you. Never again will you be lost in the night sky! I have found this to be the greatest tool ever for learning the location of stars and constellations.

*Starmap* also has the ability to project Telrad finders onto the nights sky instantly making finder charts for you. It will also show you the views you would expect through your eyepiece or finder.

If that were not enough, the *Starmap* app can control your telescope with an interface through the

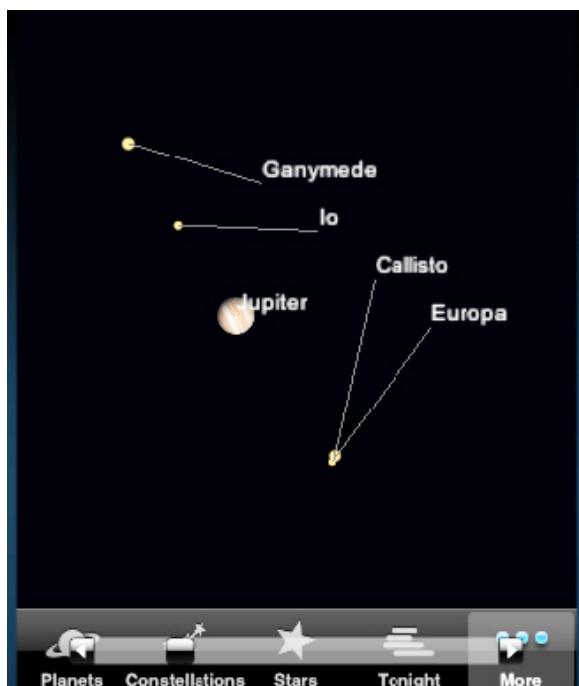


*Equinox* planetarium program. I have not utilized this feature yet but it looks interesting.

The program also contains the ability to maintain a logbook, search for currently visible objects, track the planets and their moons, time astrophotos and it will even switch the display of your iPhone to red to preserve your night vision.

I cannot tell you if *Starmap Pro* is the best or most capable of all of the planetarium apps out there, it is just the one I am using the most now. If you own an iPhone, I think you owe it to yourself to check out these apps. It is another way we can bring the wonders of the sky a little closer.

[I guess this means I need to get an iPhone. Ed.]



## Summer Meteor Showers 2010

Several major meteor showers occur in late spring and summer, but most have poor prospects because of the Moon's light. The **Eta Aquarid** (May 4-6) shower will be washed out by a waning third quarter moon. Likewise, the **Northern and Southern Delta Aquarids** in late July will be masked by a nearly full moon.

Prospects are best for the strong **Perseid** shower, which comes to maximum on the night of August 12-13, only two days after the new moon. Meteor observers should find an open area with few obstructions and sit looking upward on a comfortable reclining lounge chair. The best times are the hours after midnight and before dawn.

# Aggie Astronomy

**By Will Sager**

The astronomy scene at Texas A&M University has changed dramatically during the last decade. Not long ago, Astronomy 101 was the main course offering in astronomy and only a little astronomy research was done in the Department of Physics. The cosmic shift began with the establishment of the George P. and Cynthia Woods Mitchell Institute for Fundamental Physics & Astronomy in 2002. Today the Mitchell Institute boasts seven top astronomy researchers, a new building on campus, a Ph. D. studies program, and a director, Dr. Nicholas Suntzeff, who was recently appointed vice-president of the American Astronomical Society. The institute is also a founding partner of the Giant Magellan Telescope Consortium. The Institute research focus is observational extragalactic astronomy and cosmology, specifically high redshift galaxies, resolved stellar populations, supernovae, and Antarctic telescopes. Institute faculty and their research areas are as follows.

**Dr. Nicholas Suntzeff** is professor and director of the astronomy program. His research is in cosmology, supernovae, galactic evolution and large-scale structure, stellar populations, astronomical site surveys, and instrumentation.

**Dr. Darren DePoy** is also a Professor and Head of the Instrumentation Lab. He builds instrumentation for ground-based telescopes, including the Dark Energy Camera, a 500 Mpixel camera to image the colors of galaxies out to a

redshift of 1 [Ed. Note: Eat your heart out, Anjal!].

**Dr. Kevin Krisciunas** is a lecturer who works on observational astronomy projects, including the ESSENCE project, a supernova search being carried out on the 4-m telescope at Cerro Tololo observatory in Chili. He also works on analysis of supernova light curves. Dr. Krisciunas is also an occasional contributor to *Astronomy Magazine*.

**Dr. Lucas Macri** is an Assistant Professor who works on the extragalactic distance scale, stellar populations, and large-scale galaxy flows. One of his current research foci is the study of Cepheid variables, which he studies using the Hubble telescope, among others.



Giant Magellan Telescope

**Dr. Casey Popovich** is an Assistant Professor whose research includes the formation and evolution of distant galaxies and the growth of large-scale galaxy structures using space telescopes including Hubble, Spitzer, and Chandra.

**Dr. Kim-Vy Tran** is an

Assistant Professor with interests in understanding galactic evolution combining space telescope data with that from large ground observatories.

**Dr. Lifang Wang** is an Associate Professor who has worked to establish observatories in the extreme but pristine environment of Antarctica.

Readers interested in more information about the Texas A&M astronomy programs can find it online at <http://physics.tamu.edu> and <http://mitchell.physics.tamu.edu>.

## Messier Marathon 2010

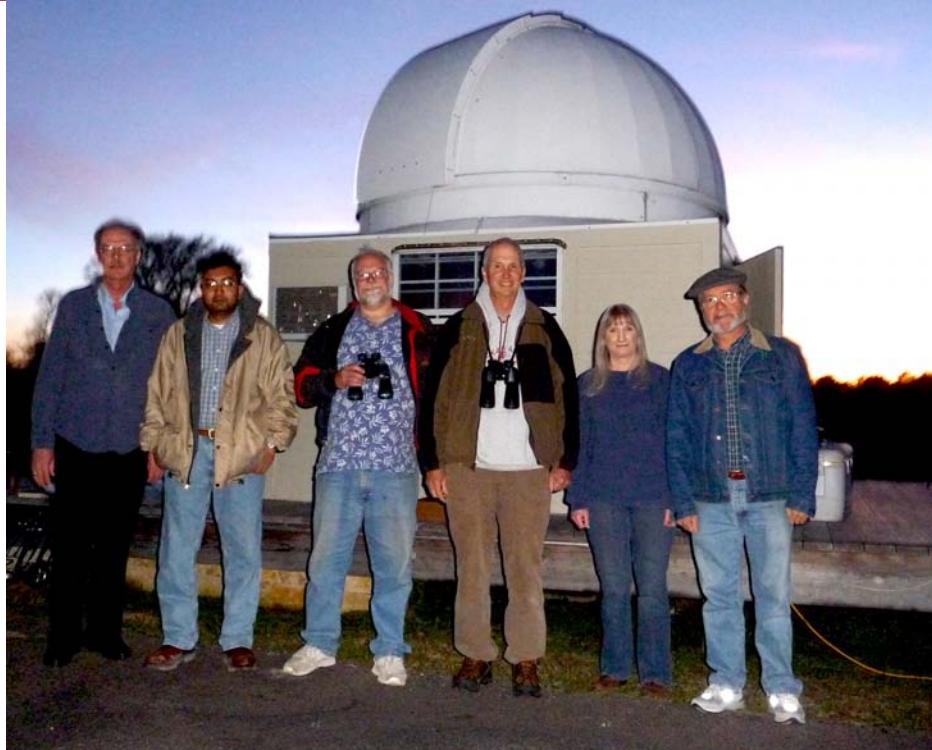
BVAC members met on the night of March 13-14, 2010 for the second annual Messier Marathon at Mark Spearman's *Regina Caelorum* observatory. The marathon is an all night observing session, usually on a March night when it is possible to see all 110 objects (star clusters, nebulae, and galaxies) on the Messier list. The turnout was good, with more than a dozen attendees, and as usual Mark was able to conjure up clear skies.

Or partly clear skies as the case may be. A thin layer of high clouds drifted overhead as it began to get dark and this kept the group from catching the first, difficult Messiers of the night, M77 and M74.

Before too long, however, the clouds drifted away and the sky remained clear for the rest of the night.

Observers broke up into several groups with some working alone and others in teams. Mark used the 5.1-inch Takahashi refractor in his observatory dome along with Don Corona. Mark says they tracked down about 40 objects. Kevin Gassen and his daughter worked with a 10-in Meade SCT. Judy Culver, Anjal Sharma, and Joe Powell teamed to observe through Judy's 8-inch Vixen Cassegrain scope. One of the team would look up the next object on the charts, one would find it with binoculars, and the other would translate to the scope finder. As a team, they bagged 48 Messiers.

Derek Kuhl worked alone with his 11-inch Celestron CPC-1100 with a Takahashi Sky90



Club members pose in front of the *Regina Caelorum* observatory dome at dusk. From left: Karl Aufderheide, Anjal Sharma, Tim Cowden, Joe Powell, Judy Culver, and host Mark Spearman. (photo by Derek Kuhl)

piggyback on top. He said that a new Telrad was the most useful finder but he ran into trouble after midnight when heavy dew fogged it and his binoculars. Tim Cowden tracked down fuzzies with his 10-inch Dobsonian scope. He used the book "Year Round Messier Marathon" by Pennington as his guide. He scoped 41 Messiers before quitting. New observer Soma Essakiappan explored the sky with one of the loaner scopes, a 5-inch Newtonian. Veteran Karl Aufderheide tracked down objects with his 6-inch Celestron refractor.

Mark and Tim were the last observers around 1:30 a.m., finishing the night with Mark's Tak viewing Saturn. They both said that by then the seeing was good and the Tak gave excellent detail on the ringed planet. Cold and heavy dew discouraged everyone and led to a short night, although many stayed until after midnight.

## Club Activities



Tim Cowden eyes a hole in the clouds seeking a target for his 10-inch Dobsonian as a troupe of Girl Scouts and their parents wait patiently at the Brazos Valley Museum of Natural History star party on 22 January.

**November 20, 2009.** Club meeting at Texas A&M Observatory. Speaker Will Sager gave a presentation entitled: "Lifesyle of an Oceanic Super-volcano".

**November 21, 2009.** Star party cancelled because of inclement weather.

**December 2009.** No meeting was held owing to proximity of the holidays.

**January 15, 2010.** Meeting at Gander Mountain Lodge. Discussed plans for a star party in conjunction with the Brazos Valley Museum of Natural History as well as web-site creation.

**January 22, 2010.** Held a star party with BRASS and Brazos Valley Museum of Natural History at the Brazos Center.

**February 19, 2010.** Meeting at the Texas A&M

Observatory, discussing plans for the Messier Marathon.

**March 13, 2010.** Messier Marathon Star Party at *Regina Caelorum* in Wheelock.

**March 19, 2010.** Meeting at Gander Mountain Lodge discussing astronomy topics of interest.

**April 9, 2010.** Star party in conjunction with BRASS for Bioblitz at Lick Creek Park.

**April 10, 2010.** Star party in conjunction with BRASS at Austin's Colony park.

**April 13, 2010.** Impromptu star party at Lick Creek park.

**April 16, 2010.** Meeting at Texas A&M Observatory discussing potential observing sites around the Brazos Valley.



Club members chatting at the April club meeting.

Left (l to r): Kevin Gassen, Anjal Sharma, and Joe Powell.

Below (l to r): Tim Cowden, Karl Aufderheide, and Don Bray.



See the New BVAC Web Site!

<http://www.brazosvalleyastronomyclub.org>

Also look for BVAC on Facebook

*Anjal's Members' Photo Gallery*

Photos by  
Anjal  
Sharma

Tricolor narrow-band images with an f/4.8 130-mm APO refractor using a FLI-8300 camera.

Top: Orion nebula

Bottom: Rosette Nebula using OIII, H-alpha, and SII wavelengths





Tim Cowden and Anjal Sharma check the level of Anjal's backyard, concrete astro-imaging pier during construction.

## Brazos Valley Astronomy Club

### Contacts

President: Anjal Sharma  
[anjal\\_sharma@yahoo.com](mailto:anjal_sharma@yahoo.com)

Vice-President: Mark Spearman  
[spearman@factoryphysics.com](mailto:spearman@factoryphysics.com)

Secretary: Tim Cowden  
[t-cowden@tamu.edu](mailto:t-cowden@tamu.edu)

Treasurer: Don Bray  
[debray1@mac.com](mailto:debray1@mac.com)

Newsletter Editor: Will Sager  
[wsager@tamu.edu](mailto:wsager@tamu.edu)



John Croom's SkyShed roll-off roof backyard observatory