

**IN THIS ISSUE:**

RECENT E/PO EVENTS	1
SGNC AUTUMN FESTIVAL	2
HOW TIME FLIES	2
AL OBSERVING CLUBS UPDATE	3
TCAA PUBLISHES 2012 POS SCHEDULE	3
CONSTELLATION OF THE MONTH: SCULPTOR—THE SCULPTOR	3
OBSERVERS' LOG FOR OCTOBER 2011	4
NOVEMBER SKY GUIDE	4
THE FLEDGLING ASTRONOMER— OCTOBER 2011	5
BECAUSE IT FLEW...	6
TREASURER'S REPORT	7

## RECENT E/PO EVENTS

### Contributions by Mark Honzell, Carl Wenning, and John Werner

The October POS slated for October 1<sup>st</sup>. The sky was clear, but it was a bit chilly which impacted the attendance a bit. Tom Weiland gave a very nice talk about Jupiter's Moons. About 10 members were present as were about 30 members of the general public.

On October 7<sup>th</sup>, the Lee Green held an observing session for the 2011 U of I Extension Master Naturalist class at Dixon Mounds. Lee took his telescope and conducted a survey of celestial objects in the sky using the telescope and laser pointer.

An unanticipated second October POS was held on October 8<sup>th</sup>. A miscommunication with the *Pantagraph* resulted in them publishing a statement that the event was on the second Saturday of October. Though many TCAA members were out of town, Carl Wenning was able to quickly cobble together a second Jupiter's Moons talk, and Tony Cellini and William Carney aided him. About 20 members of the general public were present for this event.

The same evening as the 2<sup>nd</sup> public observing session, John Werner and Duane Yockey hosted 50 scouts, parents, scout leaders, and other family members at the request of Tom Jones of Cub Scout Pack 3931 at Heyworth Centennial Park. Fortunately we had a clear sky this year. The event had been clouded out the year previous. Duane had his 11" Celestron SCT and John his 10" Meade Schmidt-Newtonian available for viewing. John and Duane gave a brief history of the TCAA and invited participants to Public Observing Sessions for the 2012 season. John then followed with a history of the constellations and a laser guided tour of the brightest constellations to include Pegasus, Ursa Major, Ursa Minor (Polaris), Cygnus (Deneb), Hercules, and Lyra (Vega). John challenged the group to answer basics questions about the night sky and awarded a photo of the Pleiades to those that answered the questions correctly (or nearly correctly). Sky Charts were handed out to the scout leaders for use at a future scout meeting. The objects observed were M13, the very bright Moon (at 90% illumination), Jupiter, and a wide field view of a dense star population in Cygnus. John noted, "Tom and the adults greatly appreciated our efforts and we can expect a repeat invite, hopefully under darker conditions."

On October 14<sup>th</sup>, the weather cleared enough for us to hold our second annual observing session for fifteen Ladies of Vale Community Church. Carl, Dan, John, William and Lee brought telescopes and got a chance to observe a nice variety of celestial objects. Carl also had three other guests join us for a tour of the observatory (with Lee and Bob assisting) and a tour the heavens. A thank you note was later received, "Thank you! Thank you! Thank you! It was a hit again this year. It is absolutely fascinating to be able to see so much in such a little bitty eyepiece. Everyone enjoyed the telescope show. Thanks for your time and willingness to teach us about our indescribable universe. God is Great. Penny and the Ladies of Vale Community Church."

On October 17<sup>th</sup>, TCAA member Marsha Forgyaty invited Lee Green and Dave Osenga to address the State Farm Facilities Management sectional meeting to talk about NASA scientific developments in the post-Shuttle era. Using the charter of Science Mission Directorate as the outline, we reviewed a variety of missions of discovery to highlight that NASA is alive and well. In addition, they had telescopes set up for demonstration and Dave showed sunspots for the 80 attendees.

Autumn Fest occurred once again at SGNC. The date was October 22<sup>nd</sup>. See the accompanying article by Tom Weiland that describes this event in detail.

Also on Sunday, October 23<sup>rd</sup> (Indonesia time), Carl Wenning gave a presentation providing a "NASA Update and More" to the Cakrawala Space Science Club at Universitas Pendidikan Indonesia (Indonesia University of Education) in Bandung from about 9-10 a.m. The "and more" aspect of the presentation dealt with the TCAA, its telescopes, and member activities. It featured recent photographic work carried out by Bob, Lee, and Tony. About 100 students and a half dozen faculty were in attendance. Carl wishes to express his thanks to Lee for providing the basic presentation – the same that he prepared for the State Farm group mentioned above – which he expanded by adding club information and pictures.

On October 25<sup>th</sup> there was an observing session for Civil Air Patrol from 7-9 pm. Dan and Lee gave presentation at hanger just east of the former CIRA terminal building. The group numbered about 20.

The *OBSERVER* is a monthly publication of the Twin City Amateur Astronomers, Inc., a registered 501 (c)(3) non-profit educational organization of amateur astronomers interested in studying astronomy and sharing their hobby with the public.

#### TCAA OFFICERS

President	Dave Osenga 309-287-0789 DaveOsenga@msn.com
Vice-President	Tom Weiland 309-830-0167 tomcea52@yahoo.com
Secretary	Lee Green 309-454-7349 lee@starlightsoftware.com
Treasurer/ ALCor/RA	Duane Yockey 309-452-3936 duane@lybinc.com
3rd Director	Paul Pouliot 815-844-7065 ppouliot2@mchsi.com
4th Director	Tony Cellini 309-829-9269 drksky1056@comcast.net
5th Director	Dan Miller 309-473-3465 damiller@mail.millikin.edu
Historian	Carl Wenning 309-830-4085 carlwenning@gmail.com
Webmaster	Lee Green 309-454-7349 lee@starlightsoftware.com
Property Manager	William Carney 309-829-7748 willcarney@aol.com

#### The Observer Editor

Erin Estabrook  
314 Covey Court  
Normal, IL 61761  
309-454-6894  
erin@lybinc.com

Submission deadline is the first of each month.

#### Membership Dues

Individual Adult/Family \$40  
Full-time Student/Senior \$25  
Electronic Newsletter \$25

To join the TCAA, send your name, contact info and dues payment to  
Duane Yockey  
508 Normal Avenue  
Normal, IL 61761

## SGNC AUTUMN FESTIVAL

By Tom Weiland

On Saturday, October 22, Autumn Fest was held at Sugar Grove Nature Center. Live music was provided by *Indras* and *The Emerald Underground*. A variety of activities were available for families to participate in for a nominal fee. Activities included pumpkin bowling, sack racing, bobbing for mini pumpkins, a scarecrow factory, pumpkin decorating, and horse drawn carriage rides. Vendors provided a variety of fall festival foods and drink. Great weather provided a wonderful opportunity for many people to enjoy a day in the country.

TCAA was also part of the event. We opened our observatory for tours and provided several scopes for viewing. Members present for all or part of the day included Lee Green, Bob Finnigan, Tony Cellini, Paul Pouliot with granddaughters Eve and Amber, Dave Osenga, Duane Yockey, Dan Miller, Larry Leetzow, Troy Berg and son Logan, and Tom Weiland. With so many members available, we were able to provide several opportunities for interacting with adults and kids alike. A 6-inch refractor was set up for landscape viewing showing how the image is flipped, an 11-inch reflector with a solar filter allowed viewing of sun spots, an additional 11-inch on the mount in the observatory tracked the moon until about 1:00 p.m. and then Venus for the remainder of the day. Two computers were showed many of the images taken by our members who have been working on astrophotography.

Tom and Carolyn Weiland - with the assistance of Bob Finnigan - spent several hours on Friday cleaning and preparing the observatory building for tours and moving some nonessential equipment to the newly created storage area in the adjacent machine shed.

Available for people to take away were copies of several *Astronomy* magazine articles, information about TCAA membership, and our brochure for 2012 that includes our future public observation dates and presentation topics. Many individuals expressed interest in attending future observation sessions. It was estimated that we had the opportunity to interact with as many as 300 people.

Member Josh Lindsay and his girlfriend Melissa were also working at the festival at other venues. A huge thanks goes out to all the members who worked the event and made it such a success.

## HOW TIME FLIES

TCAA Historian Carl Wenning provides monthly updates about the history of the club going back to intervals of 50, 25, and 10 years. Details about all mentioned events will be found in either the club history (<http://www.tcaa.us/History.aspx>) or in *The OBSERVER* archive found on the club's web site (<http://www.tcaa.us/Observer.aspx>).

### **50 Years Ago**

November 1961 – It is announced that the town of Normal will provide land for the erection of a suitable observatory in one of its parks. The club now plans to sell hot chocolate to ice skaters at Fairview Park to help pay for construction costs. Variable star observers are watching for the minima of Algol. Mirror making continues, and the RASC Handbook is sold to club members for the first time.

### **25 Years Ago**

November 1986 – The TCAA membership took a field trip to the University of Illinois campus observatory thanks to assistance of Mike Svec, the UIUC undergraduate who “landed” the observatory on the register of national historical places thereby protecting it for all time. The club's monthly meeting was held at the ISU Planetarium and included constellation study.

### **10 Years Ago**

November 2001 – The club's activities are dominated by amateur telescope making, a reading group, presentations at the Bloomington Public Library orchestrated by Mike Rogers, monthly meeting, members-only observing sessions, and work on SGO. New computer programs such as Deep Space Explorer are beginning to take center stage.

## AL OBSERVING CLUBS UPDATE

Brian Barling reported observation totals for the AL Observing Club records ending September 30<sup>th</sup>, but his information arrived one day after the article describing these accomplishments was sent to the editor for publication. In an attempt to be accurate and complete in our reporting, the following information is provided forthwith. These totals and any additional observations will be included in the January newsletter.

- Brian has now completed 288 Herschel 400 observations – all completed without the aid of a GoTo telescope – and 29 of the required 100 double star observations.

## TCAA PUBLISHES 2012 POS SCHEDULE

The TCAA Board of Directors has approved the following POS schedule and topics for 2012. The new 2012 brochure is now available on the TCAA website at <http://www.tcaa.us/>. All events are on Saturday evenings, and this coming year feature a moonless sky most evenings. Additional prominent sky objects such as planets, nebulae, star clusters, and galaxies will be viewed when visible. Thanks to Carl and Lee for arranging the new schedule.

Date (Sat.)	Time	Sunset	Topic
Mar 24	7:30 PM ~ 9:30 PM	7:12 PM CDT	Reasons for the Seasons
April 21	8:00 PM ~ 10:00 PM	7:41 PM CDT	Mars, the Red Planet
May 19	8:30 PM ~ 10:30 PM	8:09 PM CDT	Saturn, the Ring World
June 16	9:00 PM ~ 11:00 PM	8:29 PM CDT	Arc to Arcturus and Speed to Spica
July 21	8:30 PM ~ 10:30 PM	8:21 PM CDT	Asteroids, Meteors, and Meteorites
Aug 18	8:00 PM ~ 10:00 PM	7:50 PM CDT	Clusters and Nebulas of the Milky Way
Sep 15	7:30 PM ~ 9:30 PM	7:06 PM CDT	Stories of the Constellations
Oct 13	7:00 PM ~ 9:00 PM	6:20 PM CDT	Uranus and Neptune

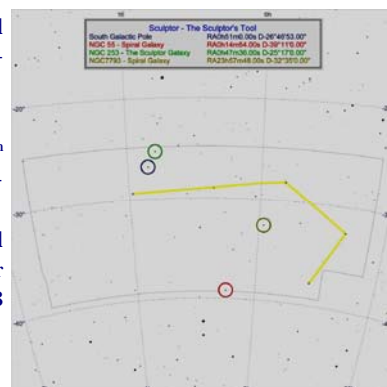
## CONSTELLATION OF THE MONTH: SCULPTOR—THE SCULPTOR

Sculptor is a moderate sized constellation that lies directly east of Pisces Austrinus and south of Aquarius and Cetus. Sculptor was created by Lacaille and as with his other constellations, Sculptor is comprised of dim stars between better known constellations.


Sculptor has no mythology associated with it and none of the main stars are named.


Sculptor is the 36<sup>th</sup> largest constellation covering 475 square degrees. It is the 78<sup>th</sup> brightest. Sculptor reaches opposition on September 27. The South Galactic Pole is located in Sculptor.

While Sculptor has few bright stars, several spectacularly bright galaxies are located there. NGC 7793, NGC55, NGC253, NGC300 and NGC613 are all 10<sup>th</sup> magnitude or brighter. Several other galaxies are brighter than 11<sup>th</sup> magnitude. Globular cluster NGC288 is another bright object that dazzles viewers, as is Blanco 1 a large naked-eye open cluster.




## NOVEMBER SKY GUIDE

**04** The Moon passes 6° north of Neptune,  
3 A.M. 


**06** The Moon passes 6° north of Uranus,  
8 P.M. 

**09** The Moon passes 5° north of Jupiter,  
1 P.M. 

Venus passes 4° north of Antares,  
3 P.M. 

Mars passes 1.4° north of Regulus,  
11 P.M. 

Mercury passes 1.9° north of Antares,  
11 P.M. 


**14** Mercury is at greatest eastern elongation (23°),  
3 A.M. 

**17** Leonid meteor shower peaks  


**19** The Moon passes 8° south of Mars,  
4 A.M. 

**22** The Moon passes 7° south of Saturn,  
4 P.M. 

**25** Partial solar eclipse,  
midnight 

**26** The Moon passes 1.7° north of Mercury,  
4 A.M. 

The Moon passes 3° north of Venus,  
10 P.M. 

## OBSERVERS' LOG FOR OCTOBER 2011

By Mark Honzell and Carl Wenning

Starting with the month of October, several observers imaged galaxies M31, M33, and NGC 981. A considerable amount of time was also spent imaging the heart (IC1805) nebula and the crescent nebula (NGC6888). The Bubble nebula and P/N Sharpless 2-188 were also subjects of observation. Clouds then moved in for more than a week and observations continued after mid month.

On October 20<sup>th</sup> first light was experienced with new "250" (10-inch) corrected Cassegrain telescope housed in the Sugar Grove Observatory. Bob, Lee and Tony had been working the past couple of days to get it operational. The next day Tony reported via listserv, "For those who might not know, we now have a CCA250 corrected Cassegrain telescope housed in Sugar Grove Observatory. Bob, Lee and myself have been working the past couple of days to get it operational. Attached is a quickie image of NGC6888, the Crescent Nebula, in H-alpha. It is a 70-minute composite of seven 10-minute exposures stacked with Deep Sky Stacker with minimal Levels and Curves applied in Photoshop."

First photo with the new scope:



Mark Honzell also noted on October 21<sup>st</sup>, "After almost two months without a night for personal observations, I went out last night. It was a bit cold, and I forgot my double-star matrix that would put me back on a designated path, so, I just casually observed things I had previously enjoyed. A pleasant surprise ensued when Roy Lowry showed up with a case of eyepieces he wanted to 'try out.' They ranged from Naglers to Televue Panoptics and really pulled my 16" dob up a step in contrast on the starry objects. I really appreciated the opportunity! Thanks! But, after a two month wait, I wanted to see something in particular, and it did not rise until after 11 pm – the Orion nebula. Unfortunately, the cold was turning ugly as dew settled on everything fogging lenses and wetting my paperwork, but the insulated body suit, gloves and pull down hat with ear coverings were holding up and I waited. Finally, Orion arose high enough to clear the buildings and I was rewarded with a crystal clear view. The details of this nebula are phenomenal. William offered his OIII and Hb filters that pulled out even more and so we spent some time observing this wonder. A nice gift to return to on my first night in a while of personal observations."

Subsequently, Roy Lowry replied, "Yup, I was getting pretty cold and I was only there a couple of hours. I wish my back ailment would allow me to observe more. Maybe next time I can bring my 10" Portaball which is a reflector but not actually a Dobsonian scope. It can move in all directions and even straight up. The Zambuto mirror makes it fantastic to see stuff at the high powers (4-600). Of course, the seeing has to be perfect and the collimation dead on. Most of my observing is down at 100-150, unless it is really good seeing. I keep a pretty low profile in the club. I donate new scopes and stuff for events at times (NCRAL) but anonymously. I talk with Carl occasionally (listen mostly). I remain a dedicated visual observer and a fan of the faint fuzzies. Orion Nebula, etc., are also favorites. Saturn and Jupiter are the only planets I look at regularly, with a couple of views of Mercury and Mars. I do like some oddities like the crimson star and transient phenomena like comets and meteor showers. I have a real nice couple of filters for bringing out some details in some objects. Knisely did a fine short article on filter selections for various objects. We saw the center star in the ring with the 10 inch. If you ever get the chance to go to the NSP,

*(Continued on page 5)*

## **THE FLEDGLING ASTRONOMER—NOVEMBER 2011**

### **By Mark Honzell**

I've finally decided to go with a simple truss-supported, 16" Dobsonian-mounted reflector based on my experiences with actually using the equipment at the local astronomy club and my personal budget.

I believe it is meaningless to squabble over actual aperture size, eyepieces and equipment that I finally purchased as each are dictated by personal budgets, experience at the local astronomy club, and the amount of observing time one will allocate to this hobby. Instead, I would simply warn you that a few visits to the local astronomy club will save you thousands of dollars by finding out what you can actually see with different combinations of equipment, limitations set by your normal atmospheric conditions, and then determining how much you are willing to spend on this wonderful hobby.

I rushed in and bought some things I did not need. I will tell you that after a phenomenal amount of research, I had allocated about one-tenth of my purchase money towards a set of four eye-pieces and the remainder towards the telescope. After actual use, I came to the decision that I should have put about one-third to one-half of my budget towards the eyepieces. That's a huge difference in allocation!

Why so much on the eyepieces?

- A good eyepiece will extract the absolute best image from a mediocre mirror.
  1. A good eyepiece will move to any future telescope you purchase. (And, you will eventually move to a better telescope.)
  2. A bad eyepiece will make an excellent mirror become mediocre.
  3. Wide angle field of view eyepieces will keep an object in the eyepiece longer as the object moves across the sky.
- This will be important since Dobsonian mounts are typically not motorized to track.
  1. Quality versions of these eyepieces can be heavy requiring counterweights on the telescope to maintain horizontal balance which requires more fiddling with the scope and less viewing.
- The number of lenses in an eyepiece can be responsible for reducing contrast due to some light scattering as it reaches each of the lens surfaces.
- This is minimized by construction of the lens, coatings on the lens surfaces, blackening of the inner eyepiece tube surface, etc. But, this is where the cost of an eyepiece comes into play.

Bottom line:

I should not have scrimped here on my initial purchase.

Two quality eyepieces have made my first four eyepieces obsolete and never used anymore. Instead, I use my longest focal length eyepiece to find objects and my shortest to view them in detail. But, do not assume that my shortest focal length is at the limit of the telescope's magnification. It is not. Instead, it routinely gives the best image for me to observe and this is what it is all about. I'm thinking about a new eyepiece with an even shorter focal length and wider field of view, but it is very expensive!

## **OBSERVERS' LOG FOR OCTOBER 2011 (CONT.)**

*(Continued from page 4)*

check it out. Good camping sites next to Merrit reservoir, lots of knowledgeable and friendly folks, and the darkest skies below 10,000 feet in the USA. And some of the biggest scopes you will ever look thru. I checked out a yard scope and the 30". Many 24" Starmasters and other excellent scopes, even AstroPhysic big boys [were present]. It was good to finally meet you, I wish I had brought warmer clothes and did not have a bad back (and weak mind)."

On October 22<sup>nd</sup> Bob used the new "250" reflector along with a 4-inch guider to photograph M33 and a passing asteroid (138524 2000 OJ8) using an ST 8300 (8 MP) camera. The NEO passed by Earth at 0.128 AU on October 13<sup>th</sup> and has a 1.2 to 2.7 KM diameter. Its period is about 12 years. Bob followed on by making an animated gif showing its rapid proper motion.

On October 24<sup>th</sup>, Bob and Tony collected 40 minutes of luminance of NGC7331 and its companion galaxies. The field of view was just a shade too small to include Stephan's Quintet according to Tony. This image can be seen at [http://www.dwfoto.com/images/astrophotos/ngc7331/NGC7331\\_CCA250\\_ST8300-4X600\\_L.jpg](http://www.dwfoto.com/images/astrophotos/ngc7331/NGC7331_CCA250_ST8300-4X600_L.jpg)

Also on the 24<sup>th</sup>, Dan Miller reported that "The northern light are very bright right now!" According to some reports, the sky was aglow with mostly red auroras that result from the excitation of oxygen molecules in the earth's upper atmosphere.

## BECAUSE IT FLEW...

By Lee Green

With the end of the Space Shuttle era, it may be helpful to review a few of the mission and milestones achieved by the Shuttle.

*From the NASA website:*

*NASA's space shuttle fleet began setting records with its first launch on April 12, 1981 and continued to set high marks of achievement and endurance through 30 years of missions. Starting with Columbia and continuing with Challenger, Discovery, Atlantis and Endeavour, the spacecraft has carried people into orbit repeatedly, launched, recovered and repaired satellites, conducted cutting-edge research and built the largest structure in space, the International Space Station. The final space shuttle mission, STS-135, ended July 21, 2011 when Atlantis rolled to a stop at its home port, NASA's Kennedy Space Center in Florida.*

*As humanity's first reusable spacecraft, the space shuttle pushed the bounds of discovery ever farther, requiring not only advanced technologies but the tremendous effort of a vast workforce. Thousands of civil servants and contractors throughout NASA's field centers and across the nation have demonstrated an unwavering commitment to mission success and the greater goal of space exploration.*

Over the 30 year program, the Shuttle was instrumental in a variety of programs that extended the boundaries in space exploration and scientific discoveries. The space stations Spacelab, MIR and the ISS were common destinations for the Shuttle as we learn to survive in space. The satellites launched, retrieved or repaired by the Shuttle crews include many of the most famous spacecraft in history. Hundreds of astronauts performed countless experiments in the weightless conditions found in orbit.

Fourteen brave astronauts died in the Challenger and the Columbia disasters. And while meeting the complex engineering problems of each flight caused frequent delays and the aging fleet posed additional challenges, it is a bright legacy left by the crews and the teams of dedicated individuals who made the Shuttle fly.

<b>MISSION REVIEW</b>	<b>SATELLITE REVIEW</b>
Spacelab (1983-1998) – 14 missions	Magellan – Venus Orbiter
Satellite Launches - 40+ satellites	Galileo – Jupiter Orbiter
Satellite Retrievals and Servicing – 10	Hubble Space Telescope
MIR (1995-1998) – 9 missions	Ulysses (Solar polar)
ISS Assembly (1998-2011) – 37 missions	Compton Gamma-Ray Observatory
DOD – 10 missions	Chandra X-Ray Observatory

With the end of the Space Shuttle era, it would be easy to think that we are no longer in the space business. Nothing could be further from the truth. In many ways we are in the 'golden age' of space exploration with so many robotic spacecraft performing an unprecedented number of missions of exploration and discovery. Consider the following points made by David Seidel from Jet Propulsion Laboratories:

- True, NASA is no longer flying the big truck. But,
- For every day over the last decade there has been one to three Americans living and working in space on the International Space Station, 4,000 straight days as of Sunday, October 16, 2011.
- For every day for the next decade there will be one to three Americans living and working in space on the International Space Station. (Today it is Mike Fossum, joined by Sergei Volkov and Satoshi Furukawa. Dan Burbank and two cosmonauts are set to join them mid-November.)
- There are four space vehicles capable of visiting ISS (Soyuz, Progress, ESA's Automated Transfer Vehicle and Japan's H-2 Transfer Vehicle).
- Several private companies are vying for work to deliver cargo and, eventually crew, to and from ISS. SpaceX may fly its Dragon spacecraft to rendezvous and dock with ISS before the end of this year. Orbital Science's Cygnus spacecraft may have a test flight before the end of the year as well.
- At this moment there are robotic spacecraft in orbit around eight different planetary bodies (Sun, Mercury, Venus, Earth,

*(Continued on page 7)*

## TCAA Treasurer's Report – October 2011

---

OPERATING FUND BALANCE – September 30, 2011 - \$ 1,676.04

Income

Troy Berg (Dues) - \$ 41.00

Tom Weiland (Dues) - \$ 40.00

Expenses

LYB Inc. (Observer copies & postage) - \$ 19.56

PayPal (Troy Berg) - \$ 1.20

OPERATING FUND BALANCE – October 31, 2011 - \$ 1,736.28

---

OBSERVATORY FUND BALANCE – September 30, 2011 - \$ 2,753.85

Income

Interest - \$ 0.53

Expenses

None! - \$ 0.00

OBSERVATORY FUND BALANCE – October 31, 2011 - \$ 2,754.38

---

TOTAL TCAA FUNDS – October 31, 2011 - \$ 4,490.66

---

Respectfully submitted,

L. Duane Yockey, Treasurer

## BECAUSE IT FLEW... (CONT.)

*(Continued from page 6)*

Moon, Mars, Saturn and Vesta). (Note that the ESA's Venus Express is not a NASA mission but there is some NASA support.) Three additional spacecraft (Voyagers and New Horizons) are on solar system escape trajectories.

- There is a mission on the way to orbit Jupiter (Juno) and the Grail twins are on the way to the Moon.
- There are three operational spacecraft in orbit around Mars and an operating rover on the surface (Opportunity).
- NASA's Science Mission Directorate lists 63 operational spacecraft and 36 space missions under development.
- JPL has 39 missions and instruments in some stage of the mission life-cycle. (These are either already in flight or being prepared; it does not include future competitions or hoped-for missions.)

## MISSING OUT ON TCAA ACTIVITIES & EVENTS?

If you are missing out on club activities or celestial events, be certain to join the TCAA listserv. Many activities are planned at the last minute, and announced only hours in advance through the club's listserv. Reminders about celestial events are also broadcast to the membership through the club's listserv. To join this free service by Yahoo, send a blank email to [TCAA-subscribe@yahogroups.com](mailto:TCAA-subscribe@yahogroups.com). Unsubscribing is just as easy. To unsubscribe, just send a blank email to [TCAA-unsubscribe@yahogroups.com](mailto:TCAA-unsubscribe@yahogroups.com).

To keep up to date on celestial events not described in *The OBSERVER* or addressed in the listserv, visit Carl Wenning's observing page at [www.phy.ilstu.edu/~wenning/observing\\_page.htm](http://www.phy.ilstu.edu/~wenning/observing_page.htm). It has been recently updated to include an extended sky calendar of events as well as additional space weather and satellite viewing links.

---

### **The OBSERVER**

Newsletter of the TCAA, Inc.

Erin Estabrook, Editor  
314 Covey Court  
Normal, IL 61761

Are your dues due?



### **The Dues Blues?**

**If you see a check in the box above, it means your dues are due. To retain membership, please send your dues renewal to our esteemed Treasurer:**

**Duane Yockey  
508 Normal Avenue  
Normal, IL 61761**