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TCAA'S 52nd ANNUAL MEETING FEBRUARY 18

The 52nd annual business meeting and banquet of the Twin City Amateur Astronomers will take place on Saturday, February 18th, at the Normal Township Hall, 304 E. Mulberry Street in Normal. Participants should arrive at 6:00 p.m., and the banquet begins at 6:15 p.m. Free parking is available in back of the building and on the adjacent street. There is also a small parking lot across the street. You need to be traveling westward on Mulberry St. (a one-way street) in order to gain access to the location. The purpose of the Annual Meeting is to elect this year's Board of Directors, listen to officer reports, watch award presentations, and hear a guest speaker.

Our guest speaker this year will be Dr. Daniel Miller who will speak about his recent trip to Machu Picchu in Peru. The talk, titled *The Ancient Cultures and Natural Wonders of Peru*, will commence after the business meeting that itself follows the banquet meal. Dan's talk will quickly summarize astronomy trips that he has taken with TCAA members in the past with the hope of energizing yet other members to join the next adventure. Following these introductory comments, the talk will focus on Dan's most recent trip to Peru – highlighting the natural, cultural, and scientific wonders the team encountered along the way.

This year, like last year, we will have a buffet-style banquet meal provided by Rick McCormick of Redbird Catering. The menu consists of the following: fried chicken, baked potato with butter and sour cream, rolls and butter, sliced carrots, fruit salad, and iced tea and coffee. Cake will be served for dessert. Plates, plastic utensils, cups, and napkins will be provided.

Reservations for the banquet are due online at <http://tcaa.us/AnnualMeeting52.aspx> by Tuesday evening, February 14th. The cost of the banquet is \$15 per person; payment must be made at the door to Treasurer Duane Yockey. If for any reason you make reservations and are not able to attend, please cancel your reservations with Lee Green <lee@starlightsoftware.com> not less than three days in advance of the event. Failure to cancel reservations in a timely fashion might result in billing for the cost of the banquet.

TCAA members are invited to attend both the business meeting and the follow-up talk starting around 7 p.m. at no charge. No reservations are required for either, only the banquet.

Many thanks to President Dave Osenga for making arrangements for the Hall and the catering.

TCAA BOARD MEETING—JANUARY 10, 2012

The TCAA Board meeting was held at the Sugar Grove Nature Center on November 8, 2011. President Dave Osenga called the meeting to order at 6:38pm. In attendance were Dave Osenga, Tom Weiland, Paul Pouliot, Tony Cellini, Dan Miller, Bob Finnigan, Lee Green, Carl Wenning and John Werner. The minutes of the previous meeting were unanimously approved as was the Treasurer's report. There were no items reported by the various officers.

Lee reported modest progress on the electrical work at the Sugar Grove Nature Center Shed project with three lighting circuits completed. Most of the materials have been purchased and Lee received a reimbursement check in the amount of \$761.66 from the club treasury.

Our Education and Public Outreach results for 2011 were distributed to the Board before the meeting. We had an outstanding year, interacting with over 1900 people. Carl noted that the results had not been printed in the Observer and agreed to include these in an article for next month. A signup sheet for hosting the 2012 Public Observing Sessions was passed around.

Dave reported that planning for the Annual Meeting is nearly complete. It will be held on Feb. 18, 2012 at the Normal Township Hall starting at 6:30pm and will feature Dan Miller and John Werner talking about Peruvian Mythology and their recent observing trip to Peru. Lee volunteered to add a reservation page on the website to facilitate getting a count of attendees.

Nominations for the next Board were discussed. Most current Board members expressed their willingness to continue serving. We also reviewed the service awards to be presented at the meeting and a call was made for nominations for these awards.

We next considered the ISU Family Science Day on Apr 22, 2012 and the activities that TCAA would present. Carl previously suggested having solar observing and of using GPS to help kids to measure the Earth's diameter. Dan suggested using the new Night Sky Network Meteor Toolkit to demonstrate how to identify meteorites. Lee will coordinate and register so the club can participate in this event.

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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.

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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
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Normal, IL 61761

TCAA BOARD MEETING—JANUARY 10, 2012 (CONT.)

(Continued from page 1)

Carl agreed to look into the possibility of a field trip to the observatory near Charleston, IL. His suggestion of creating an email signup list was warmly received and Lee will add support for this into the club website. It was agreed that adding QR Response codes to our club presence was needed.

The June 5 Venus transit promises to be a major astronomical event and we discussed several options for holding a public event. Tom volunteered to spearhead the effort for organizing such an event and John agreed to help.

The Board addressed Carl's rough draft Memorandum of Understanding relating to the refurbishment of Illinois Wesleyan University's Mark Evans Observatory and the construction of a new roll-off-roof observatory (RORO) for the TCAA. Dan moved that Bob and Carl be directed to move forward with discussions with IWU to assist in their efforts to upgrade their observatory. Among the issues discussed on this motion were the possible sale of the club's CGE-Pro mount to IWU, obtaining a replacement mount, the role of the observatory in meeting the needs of the members, the scheduling of the facilities by the members, and the accounting concerns associated with such a series of transactions. A specific scenario was discussed wherein IWU would purchase the CGE-Pro mount for \$4000 and that money would be applied toward the purchase of a replacement mount, but this scenario depended on IWU's ability to obtain funding for the transaction. The Board approved the motion and Bob and Carl agreed to continue the discussions with IWU and submit a proposal to the next Board for approval.

Dan then moved that planning for the construction of a roll-off roof observatory as described by Carl in his MOU should proceed. We talked about coordinating with the Sugar Grove Nature Center to obtain their approval and selecting a site for the structure, the types of capabilities envisioned for such a facility, the envisioned impact of the addition on our outreach-related and member activities, and the equipment to be housed there. The Board approved the motion to continue planning for this welcome addition to our facilities. Two sites for the RORO were reviewed after the meeting – one near the existing gazebo northwest of SGO and another far to the north of SGO near the tree line.

Our next Board meeting will be held on March 6 when the new Board will be installed.

The meeting adjourned at 8:25pm.

Respectfully submitted,

Lee Green

Secretary

UPDATES AT SGO

Work started on Tuesday, January 24th, to install the new Paramount ME under the dome of Sugar Grove Observatory. Earlier in the day, the mated base plate and mount interface were picked up from JD, our machinist who did an "excellent job" of connecting the two following a bit of machining and drilling. The work continued in the week to follow, routing control cables and power cords through the base of the mount and the support assembly. The 11-inch Celestron Edge HD was mounted shortly thereafter. (See the accompanying picture.)

On Saturday, January 28th, the sky cleared long enough for Bob and Lee to begin initial alignment procedures for the new mount. Also in attendance for the firing up of the mount were Tony Cellini, Larry Leetzow, and Carl Wenning. The sky cleared long enough for 25 stars to be imaged and for the mount to be adjusted for the first time. Bob and Lee returned the next evening to continue work on the mount. Lee, Bob, and Carl returned again on January 30th to continue alignment procedures imaging this time 38 stars. The telescope is now within 5-6 minutes of arc in both azimuth and elevation. With one-star synchronization, the telescope can now find objects with precision on either side of the meridian. It shouldn't be long at this rate for the telescope to be 100% operational.



2012 POS COORDINATORS

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. Note that a coordinator is still needed for the October 13th talk dealing with Uranus and Neptune.

Date (Sat.)	Time	Topic	Coordinator
Mar 24	7:30 PM ~ 9:30 PM	Reasons for the Seasons	Dave Osenga
April 21	8:00 PM ~ 10:00 PM	Mars, the Red Planet	Lee Green
May 19	8:30 PM ~ 10:30 PM	Saturn, the Ring World	Tom Weiland
June 16	9:00 PM ~ 11:00 PM	Arc to Arcturus and Speed to Spica	Carl Wenning
July 21	8:30 PM ~ 10:30 PM	Asteroids, Meteors, and Meteorites	William Carney
Aug 18	8:00 PM ~ 10:00 PM	Clusters and Nebulas of the Milky Way	John Werner
Sep 15	7:30 PM ~ 9:30 PM	Stories of the Constellations	Eve Pouliot
Oct 13	7:00 PM ~ 9:00 PM	Uranus and Neptune	(coord. needed)

MOVING AHEAD WITH THE RORO (ROLL-OFF-ROOF OBSERVATORY)

On January 17th, Bob and Carl met with Angela Smith-Funk and Eric Funk at SGNC to discuss the possibility of a RORO being built there. An observatory building as large as 16'x32' was proposed (not including tracks that will extend beyond the length of the building). Angela and Eric were quite receptive of the idea being as it would be focused on use by the general public and would include larger instruments such as Carl's 18-in telescope and some new "research grade" equipment. It was agreed that the area to the southeast of SGO would be suitable so long as it did not encroach on the buffer zone area of the prairie grass reserve to the east.

Eric noted during the discussion that one problem with a similar proposal more than a decade earlier was that the club was unable to fund the approved project. Carl and Bob both assured Eric that this would not be a problem this time, and that plenty of private resources were available for funding the proposal. It was generally agreed by everyone that if the SGNC Board approves of the proposal, Carl will work out a Memorandum of Agreement governing the construction, use, and disposition of the facility. Carl will then purchase appropriate construction plans for the RORO and that the work crew at SGCN headed by George Farnsworth might well build the facility pending all around approval. Everyone saw this as a more economically viable way of building the observatory than having the materials shipped from Ohio and having a work crew from Ohio on site for several days. Hardware will still be purchased from the construction group in Ohio (Backyard Observatories, <http://www.backyardobservatories.com/>).

Angela and Erik had planned to take the query to the SGNC Board the following Monday to see if they are willing to provide approval or have any questions. They did so but, unfortunately, a quorum was not present allowing for a decision to be made.

Bob and Carl met over breakfast on January 28th to talk about moving ahead with the RORO project. It was agreed that Carl will purchase the blue prints for the observatory so that he had something to share with George Farnsworth when next they meet. Later that evening, Carl used orange flags to mark out on the ground a full-scale 16' x 32' footprint for the new observatory adjacent to SGO. Bob, Lee, Larry, Tony, and Carl had a chance to discuss the size of the observatory, the 8' x 16' warming room, the 16' x 24' observing area, the number and type of instruments it might hold, and limits imposed by the walls of the observatory for various telescopes. A telescope mounted close to the roof line should be able to "see" to within 10 degrees of the horizon east and west and perhaps a bit lower to the south with a drop-down wall. Carl's 18" Obsession telescope, because it sits much closer to the floor, probably will be able to "see" down to only within 35-40 degrees of the horizon east and west. A CPC1100, should be able to down to within 20 degrees of the horizon due to its higher positioning.

FAMILY SCIENCE DAY 2012

Family Science Day 2012 will be held this year on Earth Day, Sunday, April 22, 2012. The event will take place at Horton Field House at Illinois State University in Normal, Illinois from 1 p.m. to 5 p.m. We had a tremendous turnout last year, and are looking for a bigger and better event this year so far as the TCAA is concerned. Here are the proposed offerings by the TCAA this year:

- *Meteorite or Meteor-Wrong?* - Can you identify the meteorite from a sample of Earth rocks? Become a Meteor Detective and learn about what make meteorites different from rocks. Hold an actual meteorite to see how heavy it is.
- *Eclipses and Transits* - When planets line up, amazing things happen. Learn how eclipses and transits happen and why they happen so rarely. Find out about the Transit of Venus on June 5, 2012 and how to safely observe the event.
- *Measure the Size of the Earth* - Join us as we use a handheld GPS unit to measure the size of the Earth (a short hike of a few hundred feet is required). Learn about how we map the Earth and how that helps us navigate.
- *Observe the Sun* - Did you know that the Sun has spots? View the sun safely through a telescope outfitted with solar filters. How many sunspots can you see?

Make plans now to attend and participate in this annual event. With four stations this year, the TCAA will have to turn out in force to cover each of these. Lee Green is coordinator of this year's event.

DARK SKY EVENTS COMING

Fellow amateur astronomer Ray Watt from Sangamon Astronomical Society (Springfield) has sent us information about both a March Messier Marathon as well as the annual Illinois Dark Skies Star Party. Both will take place at the Jim Edgar – Panther Creek State Fish and Wildlife Area about 30 miles northwest of Springfield. The Messier marathon will take place on the nights of March 23 and 24. Ray indicates that there is “plenty of room for tents, campers and equipment.” He indicated the availability of a warming area, with coffee, tea and hot chocolate provided. The fee is \$15.00 for two nights to help defer camping fees. Contact Ray at (raywatt@hotmail.com) with any questions that you might have. He also said, “Let us know you’re coming; walk-ins are welcome too.” To mail a pre-registration, send it to Sangamon Astronomical Society, Post Office Box 9461, Springfield, IL 62791-9461.

Ray also wants us to know about the Illinois Dark Skies Star Party that will take place from October 11 -14, 2012. He was quick to mention that this event is observer oriented with dark skies, great facilities, and fantastic food. Mark your calendar – Save the dates! Registration opens in April and details will be coming soon. To learn more about this event, visit the SAS web site at <http://www.sas-sky.org/>. You might also want to talk with TCAA's Duane Yockey who tends to go to the IDSSP event each autumn.

UPDATES AT MEO

Bob Finnigan and Carl Wenning are working with IWU's Dr. Linda French to update the Mark Evans Observatory (MEO) located on campus. It is hoped that the old 16-inch Ealing telescope can be removed and replaced with a much more functional telescope and mount. The 16-inch has underperformed ever since it was installed, and Carl noted that he used it several times side-by-side with an 8" Celestron, with the smaller instrument providing superior views. It is very probable, according to Carl, that the Ealing has a sub-diameter secondary mirror that results in a very significant vignetting of the light producing an effective aperture even less than 8 inches.

Hopes are to replace the faulty telescopic assembly and very crude mount with a modern Celestron German Equatorial CGE Pro which will be of infinitely greater precision. The telescope might well be replaced with a Celestron 11-inch telescope. It is possible that IWU will also acquire a 8300-based astronomical digital camera.

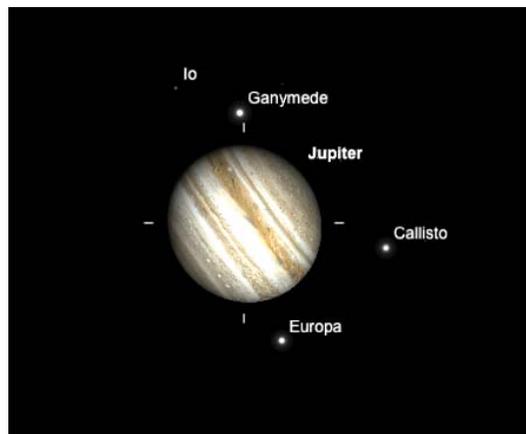
Bob and Carl visited MEO on the morning of January 30th to make final recommendations about work and materials required to bring the observatory up to modern standards. They provided their written recommendations to Dr. French later in the day. Everyone involved in the project is anxious to see the work begin putting MEO into modern working order. Once the old Ealing telescope is removed, it should only take about a week for MEO to see “first light.”

MONTHLY REFLECTIONS

By Carl J. Wenning

This month I begin a series of monthly reflections on my own visual observations and those who observe in conjunction with me. My goal is to let non-participating “arm chair” amateur astronomers get an idea of what one amateur astronomer can do who is dedicated to visual observing. This column won’t be unlike that recently started by Mark Honzell – *The Fledgling Astronomer* – but will provide a somewhat different perspective.

William Carney and I spent about 2 hours observing on Saturday, January 21st, and Tony Cellini stopped out for a few minutes to see if any auroras were visible following recent coronal mass ejections. None were. I started my evening pursuing Herschel II objects – mostly faint galaxies – near the end of evening twilight. Around 7:30 p.m., long after Tony had come and gone, William and I made a very interesting observation. I had turned my CPC 11-inch telescope to Jupiter to make certain it was still properly aligned for finding faint NGC objects in that vicinity of the sky and we were greatly surprised to see an extremely unusual configuration of Jupiter and its moons Europa, Ganymede, and Callisto. Io was just exiting the Jovian shadow and was barely visible. The three outer moons formed a triangle encapsulating the planet as shown in the picture below. The moon Io was brightly visible shortly thereafter. Despite the 12°F temperature and bone-chilling breeze, I was able to observe an additional 16 NCG objects for the Herschel II program before call its quite for the night around 8:30 p.m.



Leap Years and Calendars

How the current calendar came to be.

Most of the western world is currently using a version of the Gregorian Calendar, a modification of the civil calendar first established by Julius Caesar and based on the cycle of the seasons. Civil calendars are considerably different from religious calendars based upon the phases of the moon – a period of approximately 29.5 days.

Early lunar calendars had months consisting of 29 and 30 days – alternating to keep the calendar aligned within a half day of the moon’s actual phase. Unfortunately, the 12 lunar months in a calendar year amount to only 354 days – some 11 and ¼ days shorter than the cycle of the seasons. Every third year or so, a 13th month had to be added the end of each lunar year – the extra month following February – to bring the calendar back into alignment with the seasonal year. This caused all sorts of civil unrest due to the payment of additional salaries and rents (as you might imagine).

In order to overcome the problems association with the contentious extra month every third year or so, Julius Caesar decided that the year would consist alternatively of 12 months of 30 and 31 days, with February – the last month of the year – having only 29 days. This produced a calendar of a total of 365 days per year – ¼ day short of the seasonal year that was known to be about 365 and ¼ days long. Caesar added one additional day each four years to bring this new civil calendar back into alignment with the seasons. Hence, the origin of leap years.

Later, Augustus Caesar – the adopted son of Julius Caesar – named the month following July (that had been named in honor of Julius Caesar) August (in honor of himself) and removed the extra day added to August from February giving it only 28 days. The lengths of the other months following August were flipped giving us the month lengths we still have today. Perhaps you know the traditional English mnemonic rhyme used to remember the lengths of the months in the Gregorian calendar.

*Thirty days hath September,
April, June, and November;
All the rest have thirty-one,
Save February, with 28 days clear,
And twenty-nine each leap year.*

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MONTHLY REFLECTIONS (CONT.)

(Continued from page 5)

While Julius Caesar's concept for dealing with leap years worked well for a long time, it was not quite properly aligned with the length of the seasons that is 365.242199 days long. The difference between the Julian calendar and the length of the seasons amounted to only 78 ten thousandths of a day (11.233 minutes), but this difference accumulated at a rate of about 3 days every four centuries.

After many centuries, Easter was becoming a late winter season event – not the start-of-spring event that it was supposed to be. By the 16th century, the spring equinox was falling on March 11th under the Julian calendar. In 1582 Pope Gregory XIII modified that calendar, changing the number of leap years in four centuries from 100 to 97, by making 3 out of 4 centurial years common years instead of leap years. He initiated his calendar reform by dropping 10 calendar days, to restore March 21st as the date of the March equinox that was set in AD 325 by the First Council of Nicaea. March 15th followed March 4th in 1582 in the Catholic world. The rest of the world would follow years later. An additional rule – millennial years evenly divisible by 4000 will not be leap years – was more recently added giving us the modified Gregorian calendar that we use today. Our current civil calendar is known to be accurate to one day in 68,000 years in comparison with the cycle of the seasons.

It is Time to Overhaul the Calendar?

Calendar reform isn't a done deal. More than two dozen calendar systems are in use around the world today thanks to diverse religious and cultural groups. Major calendar reform in the Western world has taken place twice over the past two millennia when leap year corrections were made. As we heard earlier, Julius Caesar added an extra day to the end of the calendar every fourth year, and Pope Gregory XIII subtracted certain ones of these in 1582. We now turn our attention to proposed reforms of our current civil calendar. After all, it has been 430 years since we last made significant changes in western world's calendar system.

Two faculty members at Johns Hopkins University in Maryland – one an astronomer and the other an economist – want us to forget about leap years, and months with 28 or 29 days. Anathema under this new system is calendar dates falling on different days of the week. Their newly proposed calendar would arrange months and weeks so that every calendar date would always fall on the same day of the week. The year and each of its months would always begin on a Sunday. Such a new calendar would not be more accurate, but it would be more convenient according to Richard Henry, an astronomer at Johns Hopkins.

Under the Hanke-Henry Permanent Calendar (named after Henry and Steve Hanke, a Johns Hopkins economist who also advocates calendar overhaul), the calendar follows a pattern of two 30-day months followed by one 31-day month. The months of the equinoxes and solstices – March, June, September, and December – would have 31 days. Such a calendar would have only 364 days. To account for difference between the seasonal year of 365.242199 days, Hanke and Henry propose dropping leap days and creating an intercalary week at the end of December every five or six years. This extra week would adjust for seasonal drift while keeping the 7-day cycle on track. While the new calendar could be off as much as three days in relation to the seasons, the difference would hardly be noticeable.

The new calendar system, if adopted, would fix problems with day and dates being out of sync on a yearly basis. For instance, work and vacation schedules could be worked out once and for all. Teachers wouldn't have to adjust their syllabi from semester to semester, and neither would sports teams have to redo their schedules. This would be quite a boon, but the system would introduce a new set of social problems different from those that Julius Caesar attempted to remedy with his calendar reform before which an extra month was added to the old lunar calendar about every three years.

The new calendar system – suggested for implementation on January 1, 2017, when New Year's Day next falls on a Sunday – would provide for a certain desirable regularity, but it might produce a considerable tide a resistance from the social, business, and religious communities. Besides, who would always want to celebrate their birthday on the same day of the week – always a week-day and never a weekend? Despite the advantages of the proposed calendar reform, it is not likely to be implemented due to the very serious problems that it introduces.

CJW

REVIEW OF E/PO FOR 2011

Lee Green has provided a summary of the club's Education and Public Outreach efforts for 2011. According to Lee, we participated in 43 events. We had members help out with events 213 times, for an average of 5 members per event. We brought telescopes to our events 103 times.

We interacted with 1934 people throughout the year. This is a new record in recent history. This number was helped by two major events where we participated – the *SGNC Autumn Celebration* and, new for this year, the *ISU Family Science Day*. At both of these, we recorded our interaction with several hundred people.

Year	2011	2010	2009	2008
Events	43	37	50	44
Members	213	194	225	214
Scopes	103	87	56	85
Public	1934	1177	1348	1469

This listing, which TCAA board members saw before, has been updated to include a talk to the Civil Air Patrol (CAP) on October 18, 2011. There were 20 students and 10 adults. Dan Miller and Lee Green co-represented. The talk was on general astronomy as it relates to the 6-12 state science standards. Dan and Lee had students sort plain rocks from meteorites using a kit from Night Sky Network.

CONSTELLATION OF THE MONTH: TAURUS—THE BULL

Taurus is a zodiac constellation that is best visible during the winter months. Taurus lies between Aries and Gemini, south of Auriga and Perseus and northwest of Orion. The constellation is pictured as the head and front legs of a bull.

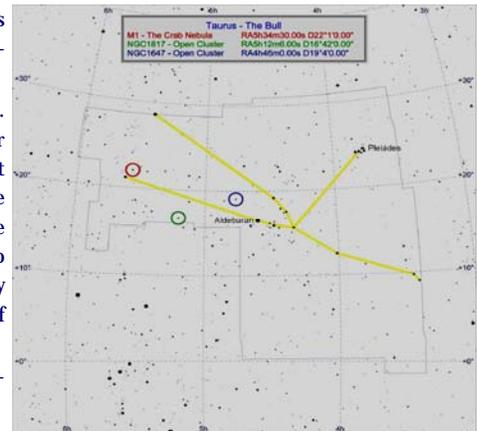
There are two stories that relate to the bull and both involve Jupiter and his love affairs. Europa was the beautiful daughter of King Agenor of Sidon who saw a white bull in her father's herd. The bull was gentle and Europa climbed on the bull's back, not realizing the it was Jupiter in disguise. The bull swam all the way to Crete where Europa became the mother of Minos, the future king of Crete. In another story, Jupiter fell in love with Io, the daughter of the River God Inachos. When Juno learned of Jupiter's affair, she turned Io into a heifer and imprisoned her with the 100-eyed Argus as her jailer. Jupiter sent Mercury to slay Argus and free Io, who was taken to Egypt and returned to human form. The eyes of Argus were memorialized in the constellation Pavo, the Peacock.

These stories of Jupiter's love affairs, along with the story of Callisto, were also the reason that three of the moons of the planet Jupiter are Callisto, Europa and Io.

Taurus contains two famous star clusters, the Pleiades and the Hyades. The Pleiades were the seven daughters of Atlas and Pleione who were changed by Jupiter into doves to escape Orion. The Hyades were the daughters of Atlas and Aethra who brought rain and storms over the drowning death of their brother. The Hyades form the face of Taurus.

Taurus is the 17th largest constellation covering 797 square degrees. It is the 10th brightest constellation and reaches opposition on December 1. The Sun passes through Taurus from May 14 through June 21.

Taurus contains two Messier objects, M45, the Pleiades and M1, the Crab Nebula. The Crab Nebula is the remnant of a star that exploded in a supernova in 1054AD. Taurus is also rich in open clusters.



NASA 2011 IN REVIEW

By Lee Green

2011 was a banner year for space exploration. Each month, new findings were released and new milestones were reached. Here are a few of this year's highlights.

In January, the initial Planck results were released, Fermi caught thunderstorms hurling antimatter into space and Kepler announced the finding of the first rocky world around another star.

February was the month the WISE mission released its Near Earth Object survey and on Valentine's Day, Stardust-Next made a sweet fly-by past comet Temple 1.

March saw the failure of the Glory mission on launch and the loss of the program. The Lunar Reconnaissance Orbiter team released the final set of exploration data, and the Stardust mission formally ended. After a six year flight, MESSENGER arrived at Mercury in March and became the first spacecraft to orbit the innermost planet. It is well into its 2-year primary mission to image the surface and probe the planet's structure, environment and magnetosphere.

In April, Cassini discovered an electrical linkage between Saturn and its moon Enceladus. The Mars Reconnaissance Orbiter discovered significant changes in atmospheric volume through the Martian year.

During May, Fermi found gamma-ray flares coming from the Crab Nebula. The penultimate Shuttle mission to the ISS launched May 16. Cassini images a violent springtime storm in Saturn's northern hemisphere.

June saw the launch of the Aquarius into polar orbit from Vandenberg Air Force Base atop a Delta II rocket. Its mission is to study the ocean surface salinity, producing a detailed global map every 7 days. Monitoring changes in salinity over time will aid our understanding of the global water cycles.

In July, the ultimate Space Shuttle mission, STS-135, concluded that famous program. For over 30 years, the reusable spacecraft was instrumental in a variety of programs that extended the boundaries in space exploration and scientific discoveries.

The Juno mission launched on August 5, starting a five year trip to Jupiter. It is expected to arrive in 2016 for a 1 year mission to study the structure and composition of the giant planet and help us understand planetary formation and evolution.

Also in August, the Dawn spacecraft rendezvoused with the 2nd-largest asteroid Vesta. Dawn is currently in a close orbit and taking detailed data before its planned departure later in 2012 on its way to Ceres. We held a Vesta Fiesta at our August Public Observing Session and had good turnout.

In September, the Terra spacecraft marked its 10 year anniversary monitoring the Earth's environment. As the flagship mission of the Earth Observing System, Terra continues to provide unprecedented global observations of the Earth's radiation budget, atmospheric, and surface properties that cut across a broad suite of science and applications. Using multichannel spectral radiometers, Terra is quantifying many elements of Earth's Energy Budget including ocean temperatures, cloud height and density, atmospheric particulates and composition, and surface vegetation.

October saw NASA's National Polar-orbiting Operational Environmental Satellite System Preparatory Project, or NPP, launched. It will provide critical data to help scientists understand the dynamics of long-term climate patterns and help meteorologists improve short-term weather forecasts.

The Mars Science Laboratory launched on Nov. 26 carrying the next generation Curiosity rover towards a August 2012 arrival at Mars. The mission will be the first use of a "sky-crane" to deposit the car-sized, 2-ton rover onto the surface. The rover will explore parts of 96-mile wide Gale Crater which has many exposed rock layers. By investigating the chemistry and minerals there, we can learn if the environment can support the formation of the chemical building blocks for life.

The Kepler mission to search for stars with Earth-like planets made several significant announcements. Among the 1500 stars where planets have been detected since the mission launched in 2009, the first Earth sized planet was announced in December orbiting a Sun-like star called Kepler-22. The planet is thought to orbit in the star's "habitable zone" with temperatures allowing liquid water to exist.

The Gravity Recovery And Interior Laboratory (GRAIL) mission provided a fitting end of this banner year for NASA. On Dec 31 and Jan 1, 2012, the twin GRAIL orbiters reached the Moon. They will be orbiting in tandem to detect and analyze the tiny tugs from the Moon's gravitational field. These tiny variations will help us understand the internal structure and thermal evolution of the Moon.

What a year 2011 has been for space exploration! Here's wishing you all the best for 2012 and beyond.

TCAA Treasurer's Report – January 2012

OPERATING FUND BALANCE – December 31, 2011 - \$ 1,770.87

Income

Allan Timke (Dues) - \$ 40.00

Expenses

LYB Inc. (Observer copies & postage) - \$ 33.32

Lee Green (Storage Bldg. Electrical) - \$ 761.66

OPERATING FUND BALANCE – January 31, 2012 - \$ 1,015.89

OBSERVATORY FUND BALANCE – December 31, 2011 - \$ 2,954.38

Income

Interest (Oct. – Dec.) - \$ 0.53

Expenses

None! - \$ 0.00

OBSERVATORY FUND BALANCE – January 31, 2012 - \$ 2,954.91

TOTAL TCAA FUNDS – January 31, 2012 - \$ 3,970.80

Respectfully submitted,

L. Duane Yockey, Treasurer

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

February 1962 –Visitor Roland P. VanZandt from the Peoria Astronomical Society addressed the membership at the 2nd annual meeting telling of the new Lakeview Museum planetarium with a Goto-1 star projector in Peoria. It was reported that the astronomy club netted \$55 from the sale of hot chocolate to ice skaters in Normal's Fairview Park during December and January. Tennis courts were flooded with water that then freezes allowing for this winter outlet.

25 Years Ago

February 1987 – The club continues to vigorously debate whether or not to purchase a used 16-inch reflecting telescope from the president of the Decatur Area Astronomy Club. Ultimately, the club would do so. Emphasis was placed on members making observations of Uranus now that it is in a prime viewing location.

10 Years Ago

February 2002 – The club celebrates the 500th anniversary of Christopher Columbus' "discovery" of the New World. At the club's 42nd annual meeting held at SGNC, Carl Wenning tells the assembled membership how Columbus navigated the ocean during his 1492 voyage. This event leads to the return of Carl to the club after a period of inactivity that lasted several years due to an increasing workload at his place of employment.

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@yahoogleroups.com. Unsubscribing is just as easy. To unsubscribe, just send a blank email to TCAA-unsubscribe@yahoogleroups.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. 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**