TWIN CITY AMATEUR ASTRONOMERS, INC.

The OBSERVER

VOLUME 35, NUMBER 1 JANUARY 2010

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PRESIDENT'S MESSAGE: 2009 IN REVIEW

Our accomplishments are many, our outlook is grand. By any measure, we had another busy and successful year in 2009.

By the numbers, we gained 15 new members this year! We held 50 public events and interacted with 1348 people. TCAA members attended those events 225 times, so we had an average of 4.5 members per event. Members brought telescopes to an event 56 times, including a club record of ten telescopes at our August Public Observing Session. Our activities included 12 events where we featured or utilized materials from the NASA Night Sky Network. In addition, individual members held private and impromptu observing sessions throughout the year. These numbers are outstanding when you consider that 5 of our 8 Public Observing Sessions had overcast or marginal weather conditions. Congratulations to each of you for helping to make 2009 another successful year.

This year also concludes the first decade of the century. As with all volunteer organizations, it is the people who have made the club a success. As a relative newcomer to the club, I read with interest of the dedicated support provided during the decade by people like William Carney, Sharon McDonald, Sandy McNamara, Jean Memken, Dan Miller, Dave Osenga, Lyle Rich, Mike Rogers, Allan Timke, Lenore Trainor, Avo Vill, Carl and Carolyn and Rebecca Wenning, John Werner, Duane Yockey and many, many others. Consider the progress we have made during the last ten years. When the decade started, the Sugar Grove Observatory was just a dream and a plan. Construction began early in 2000 and the SGO saw "first light" on February 20, 2001. Among the big highlights of the decade was the 2003 opposition with Mars and the establishment of the Sugar Grove Nature Center's "Chautauqua" that we now call the Autumn Celebration. Telescopes continued to improve throughout the decade as "go-to" scopes became more common, opening up vast new vistas to amateur astronomers.

Finally, let us consider that since its founding 50 year ago, the TCAA has continuously celebrated and promoted amateur astronomy. How amazing that our club has been so active for half a century! Let us rededicate ourselves to continuing the club's traditions of education and public outreach by recalling the proposition stated so clearly in our by-laws:

The purposes for which the TCAA is formed are: to promote in every way among its members and the general public an interest in, and knowledge of, astronomy and its allied sciences; to advance amateur astronomy and observational techniques; to render assistance to other individuals or organizations working in the same or related fields; and to do everything necessary and proper to further such on a formal or informal basis.

TCAA EVENTS FOR JANUARY

TCAA events for January are below. TCAAers are encouraged to attend and participate in all these events.

The last Board of Directors meeting before the club's Annual Meeting will take place on Tuesday, **January 12th**. The event will take place at the offices of Lewis, Yockey & Brown in downtown Bloomington. The meeting starts at 6:30 p.m. The NCRAL 2010 Planning Meeting will follow immediately after the Board meeting, and will likely commence at around 7:30 p.m. TCAA members are invited to attend these meetings if interested in assisting with TCAA activities.

The first members-only observing session of 2010 will take place at SGNC on Saturday, **January 16th**. Astronomical twilight ends at 6:31 p.m., so observing will begin around that time if the sky is clear and weather conditions aren't too severe. Caution, this session has no coordinator so if you plan to observe and don't have your own telescope, watch the TCAA listserv for details. See the article at the end of this newsletter for information about subscribing to the club's listserv if you have not already done so.

There is a **January 27th** deadline for making/changing/cancelling reservations for the TCAA's golden anniversary Banquet. Make your reservations now as you'll not want to miss this highly memorable event. In the event that you find out that you cannot attend after you have made reservations, you may cancel them by contacting either Lee Green or Carl Wenning. See the article below for details.

Lee Green will present the first of a 4-week adult education course starting on **January 28th**. The course will be taught at Heartland Community College. See the article later in this issue of *The OBSERVER* for details.

There are no public E/PO events scheduled for January due to the winter season. Public sky viewing sessions will commence again in March. See the article about POS later in this issue of the newsletter.

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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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

MAKE YOUR RESERVATIONS *NOW* FOR 50TH ANNIVERSARY ANNUAL MEETING

The TCAA will hold its golden anniversary Business Meeting and Banquet at Ewing Manor & Cultural Center in Bloomington on Saturday, February 6, 2010. This event is the club's 50th anniversary celebration, and you'll not want to miss it. Reservations are required for this gala event. Make your reservations now so you don't miss this historic and highly memorable extravaganza, and don't forget to dress up!

The event will kick off at 5:30 p.m. on the Manor's main floor with a social accompanied by the strains of piano music provided by Mr. Kerry Meyer, a friend of Dave Osenga. Those attending are asked to arrive at 5:30 p.m. and to bring an hor d'ourve such as on of the following: deviled eggs, jumbo chilled shrimp served with remoulade and/or cocktail sauces; ham & asparagus rolls, assorted finger sandwiches; assorted canapés; celery stuffed with cream cheese, and cheese and crackers. One member has already agreed to provide punch in a bunch bowl along with cups, and plates, utensils, and napkins will be provided.

At 6:30 p.m. we will reconvene in the banquet hall down the spiral staircase for dinner. At about 7:15 p.m. we will hold our annual business meeting consisting of introductions, a moment of silence, award presentations, election of the 2010 Board of Directors, bylaws amendment, reports, and other such manner of business as regularly comes before the membership. The business meeting will be followed by an "evening of reminiscences" led by William Carney, Carl Wenning, and others from the early days of the TCAA. Barry Beaman, a TCAAer from 1963-1973, will then address us starting around 8:30 p.m. Carl will then exhibit the 50th anniversary historical volume he will have completed. It's "lights out" at 10 p.m. when we are required to vacate the premises.

Redbird Catering will provide the banquet meal using a self-serve buffet format. Beef and chicken entrees will be provided, and a vegetarian option will be available. Side dishes include potatoes, a vegetable, roll, and a drink. A 50th anniversary cake bearing the new TCAA logo will be included. In addition to camaraderie and fine fare, we expect to see some very early members of the TCAA show up. Some were members of the club during its initial years in the 1960s. What a great way to brush elbows with the past!

The fee for attending this gala event will be a flat $25 per person – quite a deal in light of all that participants will be receiving. This fee will help cover the cost of Ewing Manor, the pianist, the banquet meal, gratuity, the 50th anniversary cake, plating and utensils, speaker honorarium, meals, and mileage. Payments should be made to Treasurer Duane Yockey in check form paid to the order of TCAA. Payment will be due at the banquet meal. Detailed information about the menu will be available on the reservation website (see next paragraph) shortly after the Board of Directors' meeting on January 12th.

Reservations are required to attend this event. Deadline for registration is Wednesday, January 27th. Reservations must be completed either online (preferred) by accessing http://www.tcaa.us/AnnualMeeting.aspx or via phone by calling Carl Wenning at (309) 830-4085. Make your reservations now being certain to state your preference for the meal entrée. Those who do not register for the banquet may attend the business meeting free of charge for the purpose of voting only.

Parking is available in the lot of St. John's Lutheran Church immediately south of Ewing Manor. For complete information about parking, location, and so on, visit the Ewing Manor and Cultural Center web site at the following URL: http://www.ewingmanor.ilstu.edu/about/

SATURNALIA PARTY PLEASURABLE

Sixteen member of the TCAA attending the annual holiday bash at the home of Dave and Donna Osenga on Saturday, December 19th. In attendance were Lee Green, Duane Yockey, Brian Barling, Carl Wenning, Daniel, Paulette, and Deanna Miller, John and Joyce Werner, along with three new members Dani Steinbeck, Bryan Roach, and Kyle Armstrong. The event began at 7:00 p.m. and ran until shortly after 10 p.m. There was much conviviality and plenty of treats and refreshments, etc. Thanks and a tip o the hat to Dave and Donna for hosting this festive event.

ORDER TCAA POLO SHIRTS NOW

Dave Osenga and the Board of Directors has worked long and hard to develop a new club logo. John Werner and the Board has worked diligently with *dk Designs* to have polo shorts with the TCAA logo embroidered into the fabric of the shirt. Now, these polo shirts are available for ordering. They are striking to say the least, and all club members are urged to "show their colors" at TCAA events by wearing one of these shirts to club functions in the future. See the order form enclosed in the December issue of *The OBSERVER* for ordering information.

AL OBSERVING PROGRAM STANDINGS

Below is a listing of the status of observers pursuing AL observing programs reported as of December 31st. If you would like to have your information included in next month's listing, be certain to forward your observing totals to Carl Wenning by the end of this month. Keep in mind that seven observing awards will be conferred at the Annual Meeting on February 6th. Be certain to get your completed observing records to our ALCor, Duane Yockey, as soon as possible so that you might be appropriately recognized.

AL Award	Bobby Arn	Brian Barling	William Carney	Lee Green	David Hahn	Chuck Mosier	Dave Osenga	Carl J. Wenning	Duane Yockey
S. Skies Binocular 50								(50)	(50)
S. Sky Telescope 50								(52)	(50)
Telescope Messier Prov70/		(110)	(110)	108*	110*		70*	(110)	31
Binocular Messier 50			(100)	60*	22	4		78*	22
Deep Sky Binocular 60			60*						
Herschel 400 Club		249	(400)	400*				(400)	
Urban Club 100			(100)	100*				(100)	
Comet Club Silver12/Gold30			31*					4	
Double Star Club 100		17		51				(100)	
Planetary Neb Club Basic60/			1					63*	
Globular Cluster Club 50				20				65*	
Lunar Club 100		(100)	(100)	100*			88	100*	
Lunar II Club 100			34						
Asteroid Club Reg25/Gold100			(52)						
Earth Orbiting Satellite 28			5		13			3	
Outreach Award Basic10/ Stellar60/Master160	*, **, ***			(*, **)				31h-06* 26h-07 44h-08** 43h-09	

* Program or first award level now complete. ** Second award level now complete. *** Third award level now complete. AL recognition (certificate and pin) will be given at the next general membership meeting if available. Numbers in parentheses (#) indicate that the associated pin and/or certificate has been received.

TCAA SEMI-CENTENNIAL HISTORY BOOK

Club Historian Carl J. Wenning will be preparing a limited printing edition of *History of the TCAA: 1960-2010* for distribution following the club's 50th Annual Meeting. The book will be a hard back with impressed foil lettering on the spine – much like a doctoral dissertation. It will be more than 80 pages in length and include a series of color plates containing important photographs, and a number of tables, vignettes, and tributes. This collector's edition will be put on file with the local historical society, and would be a great addition to the home libraries of club members. One copy will be deposited in the club library. It is estimated that the price of this volume will be on the order of $40 each at the time of printing.

To get an idea of the membership's interest in seeing such a book published, Carl is asking that members with an interest in acquiring this historical volume contact him either by phone at (309) 830-4085 or e-mail him at wenning@phy.ilstu.edu. A statement of interest does not constitute an agreement to buy this volume. Club members are reminded that this will be a one-time printing, and that once the copies of the first printing are gone, there won't likely be additional copies for sale. Thus far two individuals have indicated an interest in purchasing the historical volume.

On a side note, Lee Green is working diligently on seeing to it that all past copies of *The OBSERVER* appear online at www.tcaa.us. Working with Carl Wenning, every available copy of the newsletter from the early 1960s onward will appear in the Observer archive found there. This will serve to safeguard the history of the club and will prevent loss of important historical records such as occurred in the past with club minutes and two scrapbooks filled with pictures.

JANUARY SKY GUIDE

03 The Moon passes 7° south of Mars, 6 A.M.

Quadrantid meteor shower peaks

04 Mercury is in inferior conjunction, 1 P.M.

06 The Moon passes 8° south of Saturn, 1 P.M.

11 The Moon passes 1.1° north of Antares, 7 A.M.

Venus is in superior conjunction, 3 P.M.

13 The Moon passes 5° south, of Mercury, 10A.M.

15 Annular solar eclipse, 1 A.M.

17 The Moon passes 4° north of Neptune, 5 P.M.

18 The Moon passes 5° north of Jupiter, 4 A.M.

20 The Moon passes 6° north of Uranus, 5 A.M.

26 Mercury is at greatest western elongation (25°), 11 P.M.

29 Mars is at opposition, 2 P.M.

30 The Moon passes 7° south of Mars, 2 A.M.

DECEMBER EDUCATION/PUBLIC OUTREACH

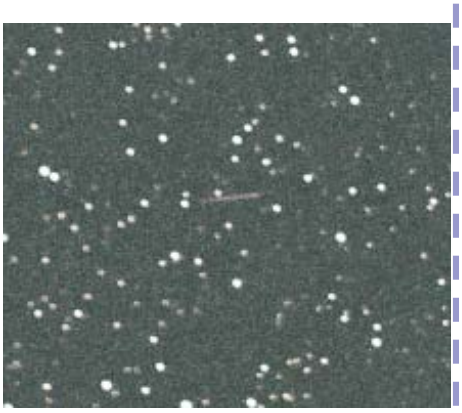
Carl Wenning and Lee Green presented the last of the TCAA's IYA 2009 events – *Classroom for Kids* – at Bloomington Public Library on Saturday, December 5th. Two elementary school girls were dropped off by their parents for the hour-long presentation at the start, and a high school boy joint the presentation about half way through.

Due to the young age of the girls, our speakers spent most of their time demonstrating how astronomers use light to learn about stars. They started with a brief PowerPoint presentation, and moved very quickly to demonstrations. They used the analogy of sound to explain many visual phenomena to deal with the nature of light, spectra, Doppler shifts, the effects of magnetic fields, and so on. They even addressed the Wien displacement law and the Stefan-Boltzmann law in such a way that the kids could understand how astronomers learn about stars by using their light and some interesting techniques. In nearly all cases the kids were involved with activities such as using diffraction gratings, playing with tuning forks, swishing a Slinky across the floor, and playing with polarizers.

Here's a round of applause to Lee and Carl who, in the main, managed the *Classroom for Kids* program during 2009. All tolled, they with the assistance of few other TCAAers, presented eleven 90-minute programs over the course of the year.

DECEMBER OBSERVERS' LOG

The traditional cold and cloudiness of late winter/early autumn plagued TCAAers during December. Nonetheless, a few brave souls did a bit of cold-weather observing. William Carney went out observing at SGO during the predawn hours of Saturday, December 12th. Due to the low temperature, he was out for only about an hour or so. He started observing about 1:30 AM despite the cold and wind. He managed to observe the last five objects he needed for to complete the AL's Deep Sky Binocular observing program. Congratulations William! Following that session he noted, "I only spotted about 3-4 Geminid [meteors], mainly because I was looking thru the binoculars. One I did spot had a nice long streak and gave the appearance of breaking up at the end. Not a small piece as usual."



William reported on December 21st that he had had some success with photographing a faint asteroid back in October. He stacked a number of images to obtain the view shown here. The asteroid is located just to the right of the center. According to William, the "slightly darker left side of streak indicates rotation and color variation in the asteroid. I think the asteroid was moving left to right in the picture." To get a better view of Williams image, visit

http://i658.photobucket.com/albums/uu304/WilliamCarney/Asteroids/Stacked9-10.jpg

Chuck Mosier started on his Binocular Messier observing program on December 28th. Chuck noted, "The sky was clear for the first time in weeks, so I started my list of Messier objects. I was able to get four before the wind and cold got to me: M41, M42, M44, and M35. The waxing moon didn't help, but [the sky] still was fair. M42 showed well with my 50*mm* binoculars; the clusters where a little more work. I went 5 miles north of Ottawa to get away from [extraneous] light." That makes 4 binocular Messier objects for Chuck.

Bobby Arn was able to get out six times for some imaging during December (the 1st, 15th, 16th, 27th (early morning), 27th (late evening), and the 29th). His notable achievements include capturing a (very pronounced) lunar halo and lunar corona. See http://barn.zenfolio.com/p700542958/h3e444e4f#h3e444e4f. Bobby has submitted this image to APOD (Astronomy Picture of the Day) and has been told they are going to publish it in a couple weeks.

Bobby also remarked, "I also got one of my cameras modified by Hap Griffin so I can capture H-Alpha detail. On the 15th and 16th, I used this new modification to capture the California Nebula - however, I am still in the process of processing that one (I am still trying to finish up the school semester, so I have not had a lot of free time). Finally on the 27th (early morning) I was able to reshoot an image I took a while back - only this time with a winter landscape. I have been working on a new way to process landscape astrophotography images so here is the result of that." You may see this photo as well as several others at the following URL: http://barn.zenfolio.com/p1068266116/haac18ff#haac18ff

2010 PUBLIC AND MEMBERS ONLY PROGRAMS

From March through October each year, the TCAA holds monthly observing sessions on the Saturday typically nearest the first quarter moon. All programs are free of charge and open to the public. The sessions are held at Sugar Grove Nature Center. In 2010, we will hold the observing sessions on the dates and time below. Each session will focus on a particular celestial phenomenon, though additional prominent sky objects such as planets, nebulae, star clusters, and galaxies are viewed when visible. A typical public observing session includes the following components:

- ☆ *Lecture about the featured object.* This 20-30 min. presentation, held in the SGNC picnic shelter, includes images of and details about the featured sky object as well as information on other interesting celestial objects that might be viewed that evening.
- ☆ *Sky tour using a laser pointer.* We step out under the stars to point out the major constellations and planets, and to designate the location of the featured celestial object for the evening.
- ☆ *Telescope observing session.* We use telescopes at ground level to observe the featured object and other wonders of the heavens.

Date	Featured Object	Time	Coordinator(s)
March 20	Crescent Moon and Mars	7:30pm - 9:30pm	
April 24	Gibbous Moon and Saturn	8:30pm - 10:30pm	
May 22	Variable Stars	9:00pm - 11:00pm	
June 19	Virgo Cluster of Galaxies	9:00pm - 11:00pm	
July 17	Globular Star Clusters	9:00pm - 11:00pm	
August 14	Planets and the Zodiac	8:30pm - 10:30pm	
September 11	Stars of Red, White and Blue	7:30pm - 9:30pm	
October 16	Perseus double star Cluster	7:00pm - 9:00pm	

A detailed brochure dealing with the 2010 Public Sky Viewing sessions can be downloaded from the TCAA website at www.tcaa.us. Please note that coordinators are needed for all POS programs.

Members-only observing sessions are held nearest the full moon and are typically held one week prior to POS events. The events for 2010 are listed below. Note that coordinators are needed for all events. MOOS programs are held throughout the year, but only during the winter if the temperature isn't too low or the wind too high.

Date	End of Astronomical Twilight	Coordinator(s)
January 16	6:31 p.m.	none
February 13	7:00 p.m.	
March 13	7:32 p.m.	
April 17	9:15 p.m.	
May 15	9:58 p.m.	
June 12	10:32 p.m.	
July 10	10:29 p.m.	
August 7	9:50 p.m.	
September 4	8:58 p.m.	
October 9	7:56 p.m.	
November 6	7:20 p.m.	
December 4	6:07 p.m.	

CALL FOR NOMINATIONS

Each year at the club's Annual Meeting, the membership elects a board of directors to serve for the next 12 months, and members are recognized for their service to the club. This year will be no different.

Nominations are needed for the Board. Five nominees are needed to "take the reins" of the club. As the TCAA is a legally incorporated body, its business is formally run by our Board of Directors under Illinois law. Its members elect the head of the Board; this person becomes president of the club. The Board then appoints members to the positions of vice president, secretary, treasurer, historian, property manager, and so on. These appointees need not be members of the Board, but are expected to attend Board meetings every other month.

Nominations are needed for the G. Weldon Schuette Society of Outstanding Amateur Astronomers. This award recognizes a TCAA member who has demonstrated great skill in observing, dedication to the club's education and public outreach efforts, and commitment to providing service to the membership. While holding the AL's Messier Award is recommended, it is not required by the Standing Rule that established this award in 1987. Michael Rogers was our winner last February.

Nominations are needed for the John and Bertha Kieviet Founders Award. This award is conferred upon a TCAA member to recognize demonstrated leadership to the club. Those so recognized need not have been a president of the club. If leadership is interpreted in terms of service to the membership, this is as close as the TCAA comes to having a distinguished service citation. Carl Wenning was our award winner at the last Annual Meeting.

Nominations are needed for the Eugene and Donna Miller Family Award. This award acknowledges the strong efforts by a family to participate in the club as a unit. One or more parents are recognized for their efforts to instill within their children interest in and dedication to amateur astronomy. Daniel and Paulette Miller were our winners last February.

Please e-mail your nomination(s) to either President Lee Green at lee@starlightsoftware.com or Secretary Carl Wenning at wenning@phy.ilstu.edu. If recommending candidates for the Schuette, Kieviet, or Miller awards, a short description explaining why you feel the nominee(s) deserve(s) the award(s) is required. The current Board of Directors and appointed officers will make decisions about the awards during the January 12th Board meeting, so be certain to get your nominations in by the 10th at the latest.

Historian's Note: While working on the TCAA historical record recently, I discovered that both Brian Barling and Sandy McNamara had been recognized with the inaugural Founders Award in 1996. Unfortunately, Brian's nameplate never appeared on the associated plaque that was created several years later. The updated plaque will be brought to the 2010 Annual Meeting.

TCAAers RECOGNIZED

Four TCAAers were recognized for completing Astronomical League observing programs in the December issue of *The Reflector*. Lee Green, Dave Osenga, William Carney, and Carl Wenning will receive a total of seven awards at the February Annual Meeting. Congratulations to these dedicated amateur astronomers. In order of appearance in *The Reflector*, we have the following recognitions:

Binocular Messier Observer Award, Certificate No. 853, **Carl**

Herschel 400 Club, Certificate No. 415, **William**

Herschel 400 Club, Certificate No. 421, **Lee**

Lunar Observing Club, Certificate No. 666, **Carl**

Lunar Observing Club, Certificate No. 667, **Lee**

Lunar Observing Club, Certificate No. 674, **Dave**

Urban Skies Award, Certificate No. 118, **Carl**

As Lee noted on the TCAA listserv recently, "You may have heard talk about various people working on observing clubs. The TCAA is a proud member of the Astronomical League and they sponsor about 30 observing 'clubs' that formally recognize achievements in amateur astronomy.

Each of the clubs includes a list of objects. After an individual has observed and documented the objects, application is made through Duane, our Astronomical League Coordinator, for inclusion on the national list of awards. Each club is well designed to highlight the most beautiful and significant objects in each class and the completion of a club's requirements results not only in a deeper appreciation of the objects, but also in improved observing techniques. There is a web site that discusses these clubs at http://www.astroleague.org/observing.html.

Over that last few years, we have had quite a few of these observing awards presented to our members. We have [7] awards that will be presented at our golden anniversary annual meeting."

THE LIFE AND TIMES OF GALILEO, PART 5

By Carl J. Wenning

In recognition of the 400th anniversary of the telescope's use to view the heavens, I re-present here in multiple parts a review of short biographical sketch of Galileo that I wrote in 1996.

The unrelenting advocacy of the new scientific ideas, the apparent lack of respect which he demonstrated for established and traditional authority, and the biting sarcasm he showed for those who would dare oppose him, no matter how justified, won for Galileo a large company of bitter enemies who opposed the Copernican viewpoint and embraced the Aristotelian standard.

Perhaps as a result of a growing awareness of the potential difficulties that might be raised by members of the academic and ecclesiastical circles, Galileo visited Rome in March of 1611 to secure the approval of the powerful and influential hierarchy of the Catholic Church. He did not seek to obtain support for his views, rather, it was his fervent desire to see to it that the Church not embroil itself in a controversy in which Galileo felt it had not part. At Rome he was warmly received and honored by Pope Paul V, numerous cardinals, and the Jesuit astronomers at the Roman college. Many persons in high places attended the frequent exhibitions of the telescope and viewed sunspots and all such manner of things that might present themselves. Though Galileo was well received, this was not indication that everyone was pleased with Galileo or what he was saying.

Galileo's detractors perceived a growing problem between the question of the validity of scientific observations and reasoning and the authority of both Church and Bible. The claims of imperfect heavens and invisible worlds, the earth displaced from its lowly position at the center of creation, were most unsettling to the theologians of his day. The future battle lines were drawn. Unfortunately, it was not long before Galileo was drawn into this controversy - a controversy which has erupted from time to time in different fields of science and which continues throughout today.

Later that same year Galileo was vehemently attacked in a small work that proclaimed the existence of Jupiter's moons to be in contradiction to the truths of the Bible. A small work by Galileo published in 1612 dealing with floating bodies proved to be immensely popular, but Galileo was once again met with a rousing cry of opposition by a select few who saw in the work the underpinnings of Aristotelianism attacked. And yet, in 1613, Cardinal Barberini (who would later become Pope Urban VIII) warmly thanked Galileo for the presentation of his new work dealing with sunspots in which Galileo, for the first time, publicly proclaimed his unequivocal support for Copernicanism. That same year his friend and follower, Father Castelli, was appointed professor of mathematics at Pisa and was charged not to lecture on the subject of the earth's motion.

A short time after his appointment, Castelli was invited to court breakfast with members of the Medici family present. He was drawn into private discussion of the relative merits of the new astronomical observations and related statement found in the Bible. Of particular note were the motion and moons of Jupiter (which Galileo had named the “Medicean stars” in honor of that house in return for his appointment) and the possible motion of the Earth. Was the Earth in motion or not? The Biblical citations suggesting the non-moving nature of the Earth were brought up. Clearly, during the battle of Joshua with the Gibeonites, God bade the sun to stand still. Clearly, this implied that it was the sun that moved and not the earth. When asked to respond to this question as a theologian, Castelli cited several of Galileo's statements in support of his views. Having heard of the interest of his mentors concerning this topic, Galileo expounded at some length on his personal views in a letter that was later widely circulated at court.

For more than a year there was no response from the opposition. And then in December of 1614, suddenly and without warning, a young a Dominican preacher in Florence by the name of Thomas Caccini vehemently denounced from the pulpit mathematicians in general and Galileists in particular. He decried Galileo's claim that the Bible spoke simply in a way that simple people could understand, that the authors of the Bible were not attempting to explain science, that theologians should attempt to understand seeming contradictions in the light of modern science, and that when it comes to the question of scientific inquiry, theologians should allow scientists to deal freely with all matters that could be decided by "sensate experiences and necessary demonstrations." It was Caccini's claim that no contradiction of Holy Scripture could be permitted in science any more than in other things. The text for Caccini's violent sermon was taken from the Acts, "Ye Galileans, why stand you gazing up into heaven?

Caccini was no stranger to the use of sensationalism. His superiors had previously reprimanded him for a similar indiscretion at Bologna. It appears that Caccini was most interested in an appointment at Rome and seems to have believed that this attack was one way to obtain it. A fellow Dominican at Rome even took the pains to write a formal apology to Galileo for the scurrilous attack by one of his order.

Caccini's attack had the effect of stirring up additional trouble for Galileo. A copy of Galileo's letter to Castelli was forwarded to Qualifiers of the Holy Office, the Inquisition, in Rome. After a reading of the letter to the wider Office, a qualified theologian proclaimed that the letter contained nothing of theological significance and that at worst, perhaps some better words might have been chosen here or there. Caccini traveled to Rome to testify against Galileo, and at Caccini's insistence two others were interviewed regarding Galileo's case. For a want of evidence that Galileo opposed the authoritative teachings of the Church, the case was closed. Even though Galileo was found innocent of the charges made against him, enough suspicion had been cast upon him so that he found it necessary to travel to Rome again in 1615 to clear his name and to set aright any wrong.

While in Rome he met and spoke with a number of different groups. Though Galileo won few converts for his own views, he thoroughly demolished the propositions of his opponents. Galileo was not surprised to find resistance to Copernicanism common, but was surprised to find it difficult to arrange appointments with a number of officials in order to discuss theological issues. The whole environment seemed now to be somewhat changed and with good reason.

Seated on the chair of Peter was one Pope Paul V. This pope was, as others before him, most concerned with the breakup of the Church precipitated by Luther a century before. The whole of northern Europe had broken away from the Church of Rome based on the claim of freedom of one to interpret the Bible for himself. If the Catholic Church was now to change its interpretation of the nature of the world system as implied by Holy Scripture, then what was to stop wholesale reinterpretation of any other part of scripture? Pope Paul worked vigorously to nip in the bud any discussion that might rise to the level of controversy which would in turn give the Protestants to the north new ammunition to use against Rome.

(Continued on page 8)

BYLAWS AMENDMENT TO BE VOTED ON AT ANNUAL MEETING

Among the business items to be transacted at the Annual meeting will be a vote on amendments to the corporation's bylaws. In an effort to clarify how the transition of power/duties occur between the election of new board members and the selection of officers at the first meeting of the Board of Directors to follow, the following amendments have been suggested and approved by the current Board members. The highlighted words constitute proposed new language in the Bylaws.

ARTICLE IV - ~~Officers and~~ Directors and Officers

Section ~~1~~ 3: Appointment and Installation of Officers

The Officers shall be President, Vice-President, Secretary, Treasurer, and Minor Officers. The minor Officers shall be Property Manager, Historian, Newsletter Editor, Astronomical League Correspondent, and Registered Agent. The Board of Directors may appoint additional Minor Officers as it deems necessary. The President and Vice-President must be members of the Board of Directors except during a transitory interim period as set forth in the next paragraph. All Officers shall be appointed by the Board of Directors and shall serve at the pleasure of the Board of Directors. In the event that an Officer is temporarily absent from an office, the President has the right to appoint a qualified member as an Acting Officer in the post until the absentee officer returns. The Board of Directors may remove and replace any Officer due to inability to serve or laxity in service. No member shall be eligible to serve as an Officer who is not a member in good standing.

All officers will be installed in office at the close of the Board meeting at which they are elected or appointed. The terms of previous officers will end only at the conclusion of this Board meeting.

Section ~~2~~ 1: Directors

The number of Directors shall be five.

Section ~~3~~ 2: Election and Installation of Directors

At the February Annual meeting, an election shall be held to select Directors for the TCAA. Directors shall serve for a term of one year or until successors have been duly elected. Installation of Board members occurs with the end of the Annual meeting. No member shall be eligible to serve as a Director who is not a member in good standing.

Section 4 of this article – dealing with removal of officers – remains unaffected.

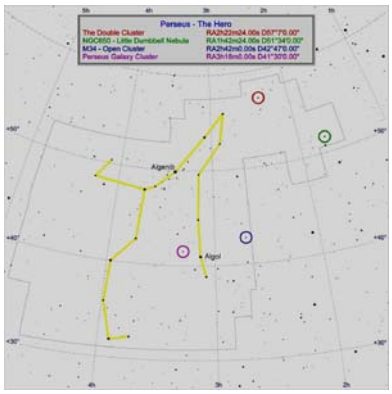
THE LIFE AND TIMES OF GALILEO, PART 5 (CONT.)

(Continued from page 7)

Prior to this time proponents of Copernicus' idea of a sun-centered world system such as Carmelite Father Foscarini felt free to publish and debate in Rome. Foscarini had prepared a book reconciling Biblical and Copernican viewpoints by reinterpreting the meaning of selected scriptural passages in light of Copernicanism and the observations of Galileo. Cardinal Bellarmine, a member of the Inquisition who had in fact condemned Giordano Bruno to death by burning in 1600 for his heretical views concerning the mortality of the soul and the eternal nature of the universe, received a copy of the book and warmly congratulated the author. Foscarini was warned in a letter, however, that the Copernican viewpoint was acceptable only so long as it was treated as hypothetical and not real. This was a symptom of the change that was sweeping Rome and would ultimately have disastrous consequences for Galileo.

At the prompting of the opponents of Copernicanism, the Pope was inclined to censure Galileo but, on the advice of Cardinal Bellarmine, submitted the two major theses of Copernicanism -- that the sun was the center of the world system and that the earth did move as a whole and daily upon its axis -- to the Qualifiers of the Holy Office. The Qualifiers found the basic tenets of heliocentric doctrine to be pernicious and further held that both propositions were foolish and absurd (but interestingly enough not false!) and formally heretical inasmuch as they contradicted expressed opinions of Holy Scripture.

CONSTELLATION OF THE MONTH: PERSEUS—THE HERO



Perseus is a prominent constellation that is visible in early winter. It is located east of Andromeda, south of Camelopardalis and west of Auriga.

Perseus was the son of Jupiter and Danaë. Perseus was sent to dispatch Medusa, one of the Gorgons. Medusa was once a maiden with beautiful hair but when Minerva became jealous, Medusa was transformed into an ugly, vicious creature with snakes for hair and whoever looked upon her face would be turn to stone. Perseus received the help from the gods Minerva, who gave him her shield, and Mercury who provided his winged shoes. Perseus tracked Medusa and used the shield to avoid looking at her face and was able to slay her. Later, Perseus used his sword and the winged shoes to help him defeat the sea-monster Cetus, thereby saving the life of Andromeda, daughter of Cassiopeia and Cepheus, and winning her for his wife.

Perseus is the 24th largest constellation covering 615 square degress. It is the 18th brightest constellation and reaches opposition on November 16.

The named stars in Perseus include Algenib and Algol, the Demon Star. Algol is a special class of variable star called the eclipsing binary. When two stars rotate, we will see both stars at all time unless the rotation is oriented such that the stars will pass in front of each other. With these eclipsing binaries, the brightness dips when the stars are aligned. Algol is a famous eclipsing binary system that changes from 2nd magnitude to 3rd magnitude during the 10 hour eclipse period every 2.86 days.

The Milky Way passes through Perseus so the constellation contains a large variety of objects including many attractive open clusters. The famous Double Cluster is two open clusters, NGC869 and NGC994, which have similar size and composition but are thought to be of greatly different ages. In NGC869, we see many blue stars that tend to be younger and in NGC884, we see older red giant stars. We also find a variety of emission, reflection and dark nebulae including the large but dim California Nebula. Towards the southern end of Perseus we find a number of galaxies including Abell 426 which is a cluster of 40 galaxies.

MILANKOVITCH CYCLES

By Lee Green

I have always been fascinated by the fact that the Earth is closer to the Sun during the winter months than it is during the summer months. This is due to the elliptical path the Earth follows in its orbit. With so many recent discussions about 'global warming' and its possible effects, I wondered about other long-term patterns in the Earth's movements. In searching the internet, I came across a discussion of the Milankovich cycles that reveals a wider variety of variations in the Earth's movements that I had previously considered. These theories were first postulated by Milutin Milanković, a Serbian mathematician.

I had heard about the precession of the Earth's axis. While the Earth's axis is currently aligned with Polaris, this has not always been the case. Like a spinning top, the axis slowly moves through a 24000 year cycle. Throughout this cycle, the amount of solar radiation incident on the surface changes intensity and affects the duration of the seasons.

Other cycle that were described include changes in axial tilt, apsidic precession and orbital inclination.

Currently the Earth's axis is tilted by about 23.44° from its orbital plane. There is evidence that the amount of tilt changes over time from 22.1 to 24.5° through a 41,000 year cycle. While this is a small variation, the resulting difference of incident solar radiation at the poles has been suggested to a one possible cause of ice ages.

Apsidic precession refers to the changes in the location of perihelion and aphelion over time. Think of this as the precession of the elliptical orbit of the Earth. While currently the Earth is at its closest point to the Sun (perihelion) during the winter months, this changes through a 26,000 year cycle. It is thought that gravitational interactions with Jupiter and Saturn also influence this pattern.

The Earth's orbit is slightly inclined from the plane of the Solar System. In January 9 and July 9, the Earth passes through the plane. It is thought that this inclination changes over a 100,000 year cycle. If additional material is concentrated in the plane, that could affect solar radiation and the number of meteors that strike the Earth.

While it appears the veracity of these theories is still in doubt, it makes sense that the Earth's orbital variation over time would be more dynamic than the simple model of rotation with axial precession. If you want to learn more about Milankovitch cycles, check out the Wikipedia site at http://en.wikipedia.org/wiki/Milankovitch_cycles .

NASA MISSION UPDATES FOR 2009

By Lee Green

Below is a quick review of NASA missions which had significant events during 2009.

Cassini continues to delight us with new discoveries. Saturn's recent equinox allowed Cellini to observe "spokes" of ice crystals that were highlighted while the rings were edge-on to the Sun. Previous fly-bys of Enceladus have revealed "tiger stripes" of ridges and fracture on the surface as well as plumes of water vapor jetting into space. In November 2009, Cassini flew through one of these plumes. More recently, it imaged an aurora effect near Saturn's pole.

The **Chandra X-ray Observatory** continues to provide high-energy observations. Launched in 1999 as the third of the NASA's Great Observatories program, Chandra has passed its 10-year milestone, more than doubling its 5-year mission goal.

Dawn was launched in September 2007 on a voyage to the asteroids Vesta and Ceres. It got a big gravity assist from Mars during 2009. The mission timeline calls for Dawn to fly by Vesta in 2011 and arrive at Ceres in 2015. Its instruments include a visible camera, infrared and visible spectrometer, and a neutron spectrometer. These instruments will measure the internal structures of these asteroids.

The **Fermi Gamma Ray Space Telescope** is the follow up version of the Compton GRST which was deorbited in 2001. Fermi, launched in June, 2008 as Gamma-ray Large Area Space Telescope (GLAST), contains a large-area telescope which looks at 1/5 of the entire sky. It must filter out the incident cosmic rays so it can detect only gamma rays. The complimentary instrument is called the Gamma-ray Burst Monitor (GRB), tries to detect radiation on timescales from microseconds to kiloseconds.

The **Herschel** Space Observatory, a space-based telescope that will study the universe by the light of the far-infrared and submillimeter portions of the spectrum, was successfully launched on May 14, 2009. This mission is primarily sponsored by the European Space Agency but NASA's JPL contributed two detectors for the mission. Herschel was launched along with the ESA's **Planck** mission which will examine the cosmic microwave radiation. Both spacecraft will orbit the Sun near the L2 LaGrange point, in the shadow of the Earth about 1 million miles further from the Sun.

The **Hubble Space Telescope** got it last update during the servicing mission in May 2009. This was the last shuttle mission that was not dedicated to the International Space Station.

Kepler was launched on March 6, 2009 and has been staring at thousands of stars looking for small changes in their luminosity due to planets passing across the stars' surface. The goal is to find Earth-sized planets orbiting nearby stars. Every 30 days, the data from the 42 2-megapixel detectors is downloaded for analysis.

Now that we have found that the Moon contains water, as revealed by the recent **LCROSS** impact and the Lunar Reconnaissance Orbiter (**LRO**), I am anxiously awaiting the next natural step, a beach resort.

MESSENGER is nearly ¾ through its journey to orbit insertion at Mercury. It is still amazing that there are still areas of Mercury that have never been imaged. Just 16 month before Messenger starts orbiting Mercury and making a new set of close up images that promise to enlighten and inspire us.

The **Mars Reconnaissance Orbiter** is being reprogrammed after a series of computer "reboots" due to unexplained causes. Rover Spirit is still stuck in the sand and NASA engineers are trying to free it. Companion rover Opportunity continues its spectacular operational record.

New Horizons is currently about half way between the orbits of Saturn and Uranus on its journey to Pluto. The spacecraft, moving at more than 16 km/s, is over 16 AU from the Sun and is scheduled to arrive at Pluto in 2015. http://pluto.jhuapl.edu/index.php

SWIFT launched in November 2004 to quickly locate for gamma-ray bursts. It includes x-ray and ultraviolet telescopes as well as a Burst Alert Telescope. Swift has successfully found several Gamma-ray bursts, including one on April 28, 2009, and has helped to coordinate the study of these mysterious and transient events.

Ulysses became the longest operational spacecraft ever since its launch in 1990. In its solar polar orbit, Ulysses has measured the heliosphere on each of three passes over the high latitudes of the Sun. Ulysses orbits the Sun at nearly 6 AU. The official mission ended in June 2009 when Ulysses transmitters were switch off.

WISE, the Wide-field Infrared Survey Explorer, was successfully launched on December 14, 2009 to begin its all-sky survey in 4 infrared channels. Its 40cm mirror promises 6 arc-second resolution over 99% of the sky during its expected 10 month mission.

TCAA Treasurer's Report – December 2009

OPERATING FUND BALANCE – November 30, 2009 -		$ 2,443.32
Income		
	Matthew Riddle (PayPal dues) -	$ 41.00
	Bryan Roach (PayPal dues) -	$ 41.00
	Danielle Steinbeck (PayPal dues) -	$ 41.00
	Kyle Armstrong (student PayPal dues) -	$ 26.00
	John Werner (dues) -	$ 40.00
	Duane Yockey (dues) -	$ 40.00
	Polo Shirt Order (Bobby Arn) -	$ 28.00
	Polo Shirt Order (Dan Miller) -	$ 72.00
	Polo Shirt Order (Lee Green) -	$ 64.00
	Polo Shirt Order (John Werner) -	$ 36.00
Expenses		
	LYB Inc. (Dec. Observer) -	$ 44.09
	PayPal Fee. (Matthew Riddle) -	$ 1.20
	PayPal Fee. (Bryan Roach) -	$ 1.20
	PayPal Fee. (Danielle Steinbeck) -	$ 1.20
	PayPal Fee. (Kyle Armstrong) -	$ 0.87
OPERATING FUND BALANCE – December 31, 2009 -		$ 2,823.76

OBSERVATORY FUND BALANCE – November 30, 2009 -		$ 2,194.98
Income		
	Donation (Carl Wenning) -	$ 100.00
	Donation (Duane Yockey) -	$ 100.00
	Donation (Wudtke family) -	$ 40.00
Expenses		
	None -	$ 0.00
OBSERVATORY FUND BALANCE – December 31, 2009 -		$ 2,434.98

TOTAL TCAA FUNDS – December 31, 2009 - $ 5,258.74

Respectfully submitted,
L. Duane Yockey, Treasurer

Sugar Grove Observatory

Listing of Official Keyholders (Paid $10 deposit/$5 renewal)

Duane Yockey (renewed through 2009)
William Carney (renewed through 2009)
Carl Wenning (renewed through 2009)
Brian Barling (renewed through 2009)
Christopher Franklin (renewed through 2009)
David Osenga (renewed through 2009)
Josh Lindsey (renewed through 2009)
Dan Miller (renewed through 2009)
Lee Green (renewed through 2009)

JANUARY 2010 TCAA EVENTS & RESERVATION DEADLINE

- ☆ January 12, (Tuesday), 6:30 p.m., TCAA Board Meeting, LYB, Inc., Bloomington
- ☆ January 12, (Tuesday), 7:30 p.m., NCRAL 2010 Planning Committee Meeting, LYB, Inc., Bloomington
- ☆ January 27, (Friday), Deadline for making/changing/cancelling Annual Meeting banquet reservations
- ☆ January 28, (Saturday), Members-only observing session, SGNC, 6:30 p.m. (no coordinator)

WINTER HCC ADULT EDUCATION COURSE

Lee Green will lead this coming year's adult education course at Heartland Community College. Lee has titled the course, "Astronomy in Action." Lee describes the course as follows: "In this course we will review the solar system, constellations and celestial objects we can see in the night sky and learn how and why they move over time. We will look at different types of telescopes that are used to detect visible and invisible light to see how they reveal the mysteries of the cosmos. Learn about past, current and future NASA missions and how they use scientific instruments to investigate the solar system, the galaxy and the universe. At our optional fourth session, we will visit the Sugar Grove Observatory and focus telescopes on a wide variety of representative deep space objects. Presented by the Twin City Amateur Astronomers."

Lee has set the meeting dates of the various classes as follows: January 28, February 4 and February 11 as the three classroom dates with two hour sessions on each night from 7 – 9 p.m. The fourth week's class will consist of an observing session at Sugar Grove Nature Center. The course fee is $60. More information about his course will be provided as details are worked out. Watch your mailbox during January (if you live in McLean County) for the HCC course offerings booklet.

The price for this adult education course (which includes materials) is $60 per person with the proceeds going to the TCAA. To register for this event online, please visit http://communityedregistration.heartland.edu/CommEdWebReg/. On that site, follow the Winter/Spring 2010 link and on the next page follow the Science & Nature Link. That page shows the courses offered. Prominently displayed at the top is our course, Astronomy in Action. Assisting Lee with this course will be Dave Osenga and John Littlefield.

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

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