

IN THIS ISSUE:

PRESIDENT'S MESSAGE: AUTUMN IN THE TCAA	1
TCAA EVENTS FOR SEPTEMBER	1
TCAA PICNIC SMALL BUT ENJOYABLE	1
ONE-MAN PLAY GALILEO AT IWU	2
ASTRONOMICAL IMAGES BY TCAAERS	2
JUPITER—SAVIOR OR MENACE	2
TRAVELING ASTRONOMY EXHIBIT AT BPL	2
AL OBSERVING PROGRAM STANDINGS	3
AUTUMN CELEBRATION AT SGNC	3
AUGUST OBSERVERS' LOG	4
UPCOMING ASTRONOMICAL MEETINGS	4
SEPTEMBER SKY GUIDE	4
2009 IYA SESSIONS @ BPL	5
REMAINING 2009 MEMBERS-ONLY OBSERVING SESSIONS	5
FINAL 2009 PUBLIC OBSERVING SESSIONS	5
JULY EDUCATION/ PUBLIC OUTREACH	6
AUGUST EDUCATION/ PUBLIC OUTREACH	6
SEPTEMBER IN THE IYA: PLANETS AND MOONS	7
MARS PICTURES	7
CONSTELLATION OF THE MONTH: EQUULEUS—THE COLT	8
WEB CAM PHOTOGRAPHY	8
THE LIFE AND TIMES OF GALILEO, PART I	9
TREASURER'S REPORT	11
OCTOBER SKY MAP	

PRESIDENT'S MESSAGE: AUTUMN IN THE TCAA

Summer is rapidly coming to a close in our International Year of Astronomy. This month we pass through the Autumnal Equinox and usher in a new season of observing and public outreach.

Our luck has begun to change; after cancelling our spring Public Observing Sessions due to weather, we were able to hold all three summer sessions and we had a good turnout from the public. Keep your fingers crossed for good weather for this month's scheduled outings, our September 12 MOOS and our POS on September 19.

It's been great to have so many members participating at our events and fun to see the variety of activities that each are pursuing and the instruments they use. Welcome to all the new members who have joined us in recent months. Together, through the time and efforts of friends like you, we are making our club into a wonderful place to learn and to inspire us in our voyage of discovery of the cosmos. Thank you!

TCAA EVENTS FOR SEPTEMBER

The club's Members-only Observing Session will be held at SGNC on Saturday, September 12th. Carl Wenning and Duane Yockey will be coordinating this event. Sunset is at 7:10 p.m. and astronomical twilight comes to an end at 8:43 p.m. Observing will begin around 8:30 p.m.

The club's Public Sky Viewing Session will be held at SNGC on Saturday, September 19th. The program, *Exploring the Milky Way*, will begin at 7:30 p.m. Dave Osenga will be giving the talk followed by a sky lecture and telescopic observing. Sunset on this date is 6:58 p.m.

The September Board meeting will take place on Monday, the 21st, at 6:30 p.m. It will be held in the offices of Lewis, Yockey, and Brown in downtown Bloomington. A proposal for a roll-off roof observatory will be entertained as well as a proposal for an amendment to the club's Bylaws dealing with transfer of power following election of new Board members. The meeting is open to the club membership. Immediately following the Board meeting, a planning meeting for the NCRAL 2010 conference will be held.

The September *Classroom for Kids* program will be presented at the Bloomington Public Library on Saturday, September 26th from 1:30 to 3:00 p.m. Coordinating this event will be Lee Green. The theme for the month is "Planets and Moons."

TCAA PICNIC SMALL BUT ENJOYABLE

The club's annual summer potluck picnic with MOOS was greeted with a clear sky and fair weather on Saturday, August 15th. Sixteen members and guests were present at this function: William Carney, Randall Byland, Duane Yockey, Lee Green, John Scherr (with his Great Dane Scooby Doo), Brian Barling, Carl & Carolyn Wenning, Dan Miller along with Chris and Diana and friend Kory Whiteside as well as Josh Linsey and Melissa. Also in attendance were visitors Kris Cummings and Jetty Kircher.

Following a nice potluck picnic, Carl gave a talk about using the iPod/iPhone application Satellite Tracker and about a possible new Sugar Grove Observatory. Lee gave a brief talk about the Bahtinov focusing screen and the Galileoscope. Duane then presented the following ten Astronomical League observing club awards:

- William Carney, Asteroid I Club, certificate #30
- Lee Green and Bobby Arn, Outreach Awards (Basic and Stellar)
- Carl Wenning, Urban Club
- Duane Yockey and Carl Wenning, Southern Sky Binocular Club
- William Carney, Herschel 400 Club
- Carl Wenning, Double Star Club

Dan Miller accepted the award on behalf of Bobby Arn. Congratulations to all award and certificate winners. Altogether, ten awards with pins and/or certificates were presented. Several club members have also earned additional awards, but these have not yet arrived. They will be awarded at the 50th Anniversary Annual Meeting of the TCAA in February. The formal program concluded at approximately 9:05 p.m. and was followed by the monthly MOOS. Observing under clear skies continued until nearly 2 a.m.

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 Lee Green
309-454-7349
lee@starlightsoftware.com

Vice-president Dan Miller
309-473-3465
damiller@mail.millikin.edu

3rd Director Carl Wenning
309-454-4164
cjwennin@ilstu.edu

4th Director Dave Osenga
DaveOsenga@msn.com

5th Director Brian Barling
309-452-7507
res2213h@verizon.net

Secretary/Historian Carl Wenning
309-830-4085
cjwennin@ilstu.edu

Treasurer/ALCOR Duane Yockey
309-452-3936
duane@lybinc.com

Web Michael Rogers
309-825-6454
mprogers@mac.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

ONE-MAN PLAY *GALILEO* AT IWU

On Friday evening, October 9th, Illinois Wesleyan University's homecoming program will feature the one-man play *Galileo*. This program celebrates the 400th anniversary of Galileo's discoveries, explores the tensions between science and religion and one man's struggle for intellectual and spiritual salvation. Tim Hardy, a visiting professor at IWU in 1999, will perform the role of Galileo. He is currently a faculty member of the Royal Academy of Dramatic Art. He has enjoyed many roles on stage and on television.

The IWU School of Theater Arts will sponsor the reunion reception and one-man show according to the following schedule: 7 p.m. – wine and hors d'oeuvres reception on the McPherson Stage, 8:30 p.m. – stage will be cleared; 9:00 p.m. *Galileo* presentation.

The cost for the program is \$25 per person, and the fee includes both reception and play. The program is open to the public, with a registration deadline of Monday, September 28th.

Register online at www.titanpride.org/homecoming09.

ASTRONOMICAL IMAGES BY TCAAERS



As the accompanying images show, TCAAers John Scherr and Bobby Arn have been hard at work doing astronomy-related imaging (as has Tony Cellini). John recently captured the Big Dipper hanging over SGO. Bobby captured the Iridium 13 satellite as it flared to magnitude -6 over central Illinois on August 31st. Likewise, Tony Cellini recently made some rather amazing photographs with his new 6-inch refractor. Tony is not quite satisfied with his images (though the two he has shown were spectacular) due to what appears to be some form of "purple" chromatic aberration. We look forward to seeing Tony's handiwork in the not too distant future.

JUPITER—SAVIOR OR MENACE

By Lee Green

Last month, the New York Times ran an interesting article on July 25 about the recent impact of a comet into Jupiter and noted that the event was only the second time that mankind witnessed the collision of cosmic bodies in our solar system. It quoted the impact discoverer, Australian amateur astronomer Anthony Wesley, noting that "Jupiter is doing its vacuum-cleaner job and hovering up all these big pieces before they come for us." The article then cited Dr. Brian Marsden who recalled Comet Lexell which, in the 1770s, was diverted by Jupiter into a near Earth path, raising the question of whether Jupiter was savior or menace.

Jupiter's great gravity has caught 2 objects that we know about. Good job of protecting us so far. But of the hundreds and thousands of comets and asteroids out there and the many observed by long-time member William Carney, the percentage of objects captured by the king of planets is very low. I'd guess Jupiter diverts many more objects than it absorbs and deserves watching closely.

TRAVELING ASTRONOMY EXHIBIT AT BPL



The American Library Association's Traveling Astronomy Exhibit will be making its debut at Bloomington Public Library on in the next few weeks. Associated with this exhibit will be two hour-long public talks by TCAAers, and each will conclude with an hour-long observing program in the Library's parking lot of the sky is reasonably clear.

Lee Green will present a talk at 7 p.m. on Wednesday, October 14, about Dark Skies and Light Conservation; Carl Wenning will present at 7 p.m. on Wednesday, November 4, and talk about Galileo's Telescope. Programs are free of charge and open to the general public. TCAAers are both invited and encouraged to attend these events.

AL OBSERVING PROGRAM STANDINGS

Below is a listing of the status of observers pursuing AL observing programs reported as of August 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 the month.

AL Award	Brian Barling	William Carney	Lee Green	David Hahn	Dave Osenga	Carl J. Wenning	Duane Yockey
S. Skies Binocular 50						(50)	(50)
S. Sky Telescope 50						(52)	(50)
Telescope Messier Prov70/Hon110	(110)	(110)	108*	101*	70*	(110)	31
Binocular Messier 50		(100)	45			78*	22
Deep Sky Binocular 60		55					
Herschel 400 Club	249	(400)	400*			(400)	
Urban Club 100		(100)	99			(100)	
Comet Club Silver12/Gold30		31*				4	
Double Star Club 100	17		51			(100)	
Planetary Neb Club Bas60/Adv110		1				63*	
Globular Cluster Club 50			20			65*	
Lunar Club 100	(100)	(100)	93		88	100*	
Lunar II Club 100		11					
Asteroid Club Reg25/Gold100		(52)					
Earth Orbiting Satellite 24						3	
Outreach Basic10/ Stellar60/ Master160 (service program)			(*, **)			31 ^h -06* 26 ^h -07 44 ^h -08** 30.5 ^h -09	

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

AUTUMN CELEBRATION AT SGNC













The SGNC's 2009 Autumn Celebration is scheduled for Saturday, October 24th, from 10:00 a.m. to 5:00 p.m. Angela Smith is hoping that we are interested in once again hosting an observatory open house and some daytime astronomy. Carl Wenning has confirmed our participation in this event earlier so that Angela is able to include it in their promotional literature.

Each year the event seems to grow larger and larger. The first event about three years ago only drew about 300 people. Last year more than 1,000 were in attendance. This is a great way to showcase the TCAA and introduce the public to amateur astronomy. Typically we hold an open house in SGO, and provide views of the sun and bright daytime planets such as Venus. Mark your schedule now and plan to participate in this fun event.

On this date the moon will be a 40% waxing crescent moon, six days old. The moon, Jupiter, Uranus, and Neptune will all be readily visible that evening if the sky is clear. It might be a good idea to plan a public observing session from 7 to 9 p.m. on that date...

AUGUST OBSERVERS' LOG

SEPTEMBER SKY GUIDE

02	The Moon passes 3° north of Jupiter, 4 P.M.	
03	The Moon passes 3° north of Neptune, 2 A.M.	
05	The Moon passes 6° north of Uranus, 4 P.M.	
12	Asteroid Pallas is in conjunction with the Sun, 7 P.M.	
13	The Moon passes 1.1° north of Mars, 11 A.M.	
16	The Moon passes 3° south of Venus, 1 P.M.	
17	Uranus is at opposition, 5 A.M.	
	Saturn is in conjunction with the Sun, 1 P.M.	
20	Mercury is in inferior conjunction, 5 A.M.	
	Venus passes 0.5° north of Regulus, 5 A.M.	
21	Asteroid Juno is at opposition, 3 A.M.	
22	Equinox (northern autumn/southern spring begins), 4 P.M.	
24	The Moon passes 0.8° north of Antares, 1 A.M.	
29	The Moon passes 3° north of Jupiter, 7 P.M.	
30	The Moon passes 3° north of Neptune, 8 A.M.	

William Carney went out to SGNC on Saturday, August 8th, and reported observing a 14.2 magnitude asteroid (17274 2000 LC16 a AMOR-NEO) despite the presence of the waning gibbous Moon and the Stubblefield-Funk family reunion that was still going on. He also took some video and still photos.

Lee Green conducted some astronomical imaging of Jupiter from his home in Normal on the evenings of August 11th – 13th. He was able to capture good images using a new web cam (reported elsewhere in this issue of *The OBSERVER*).

Carl Wenning recently has been using his iPod Touch that came along with his new MacBook Pro computer to observe satellites. Carl uses a freeware program – Satellite Tracker – to download up-to-the-minute TLE files to make predictions (available for iPhone, too). The program can generate sky maps showing the passes of satellites for a given evening. Passes are organized chronologically conveniently allowing observations of as many as a dozen or more satellites each evening. Carl is using this nifty combination to work on his AL Earth Orbiting Satellite Observing Club certificate.

On Friday night, August 14th, Tony Cellini worked on getting some experimental prime focus shots using his Canon Rebel XSi camera and Orion Short Tube 80 telescope. He bought this scope to use with an autoguider, but he is having a fun time using it for astrophotography. At f/5, the telescope provides a wide field of view. He imaged both M31 and the M8/20 complex, and also worked on couple other targets, namely the Hercules globular cluster, and the Double Cluster in Perseus. Tony reports that he hasn't had the time yet to pull them off of his camera. The shots will probably show up on his observing blog that is available at the following URL: <http://www.dwfoto.com/blogs/blog6.php/2009/08/16/prime-time>

Following the club's annual picnic on August 15th, the monthly MOOS began under a sky partly filled with approaching cirrus clouds. Two 14-inch (Lee and Dan), two 11-inch (Duane and Randall), one 8-inch (William), and several smaller telescopes and cameras were present for this function. Observing continued for several hours, and observers saw a few Perseid meteors after 11 p.m. William was able to show a comet during the night – Comet W3 Christensen – using *Cartes du Ciel*, his Atlas mount, and his C-8 to find it. William also managed to spot an asteroid and confirmed its movement. According to William, "It was a good test of my mount with my C-8 OTA and my 4.7-inch refractor." William and Lee remained through 2 a.m.

William, Lee, and Tony returned to SGNC for some additional observing on the Sunday evening, August 23rd, following the public sky viewing session the night before. William viewed a 15th magnitude comet (and on the subsequent evening) using the club's 12" on his Atlas mount. Lee was working on Messier and Herschel viewing. Tony was doing some astronomical imaging using his new 6-inch refractor. William was out at SGNC observing again on the evenings of the 28th, 29th, and 30th despite the bright moon. He added one asteroid to his AL asteroid club bringing that total to 52. He also added five objects to his Lunar II observing program.

Carl remained home to do some satellite viewing during the last 10 days of August. On Sunday evening he observed the Lacrosse 3 spy satellite, the Cosmos 2322 rocket body, and the MetOp-A weather satellite; on Monday morning he observed the International Space Station and the Resurs O1 rocket. On the evening of the 29th he observed the Cosmos 2263 rocket and the Cosmos 1805 satellite. The evening he observed four satellites in just under an hour: Genesis I, Cosmos 1143 rocket, Cosmos 2360 rocket, and Resurs 1-4 rocket. Two were observed simultaneously, one going north and one going south. The next evening Carl and Carolyn, along with Dave Osenga, observed Iridium 13 flare to magnitude -6 as it passed nearly overhead at Normal at 8:27 p.m. Bobby Arn was able to photograph this event from SGNC. Paul Pouliot was able to observe it with his two granddaughters from Pontiac. The next morning, Carl observed the ISS mated with STS-128 pass nearly directly overhead at 5:43 a.m. As the satellite rose up from the northwestern horizon, it shone at a magnitude of approximately -3 rivaling Venus in the eastern sky.

UPCOMING ASTRONOMICAL MEETINGS

For the record, here are the dates of regional astronomical meetings for amateurs that TCAAers might wish to attend. TCAAers in charge of outreach for the 2010 NCRAL meeting might want to get on the agenda of some of the meetings.

- ☆ Prairie Skies Star Party: September 17-20, Bourbonnais, IL, see www.prairieskies.org
- ☆ CAS Astrofest: September 25-27, Kankakee, IL, see www.chicagoastro.org
- ☆ Illinois Dark Sky Star Party: October 15-18, Jim Edgar Panther Creek State Park, see www.sas-sky.org
- ☆ NCRAL 2010: April 16-17, 2010, Bloomington, IL, see www.tcaa.us

2009 IYA SESSIONS @ BPL

The TCAA's saga into astronomy in recognition of the International Year of Astronomy continues with the *Classroom for Kids* program. Family astronomy workshops for those aged 10 years and above will take place from 1:30 to 3:00 p.m. on the 4th Saturday of each month at Bloomington Public Library throughout 2009. The November and December events have been integrated into a single December 5th event due to conflicts with the holidays. The tentative dates and topics for the remainder of the year are as follows:

Date	Topic	Possible Activity	Coordinator(s)
October 24	What is the Fate of the Universe?		TBD
December 5	The Lives of Stars	Light and spectra	Lee Green

These events are all intended to include hands-on, minds-on activities. Coordinators are needed for the majority of these events. Please inform Lee Green if you are willing to coordinate one or more of these events.

REMAINING 2009 MEMBERS-ONLY OBSERVING SESSIONS

The club's members-only observing sessions are slated one week earlier than the club's public sky viewing sessions. This ensures club members with a dark night, and a public sky viewing session with typically a crescent moon. Member-only observing sessions begin as soon as the sky grows dark enough for viewing, usually one hour after sunset. Coordinators are needed for each session to ensure that at least one telescope is available for viewing with TCAAers not in possession of their own telescopes.

Date	Coordinator(s)
October 10	John Werner
November 14	Lee Green
December 19 (Saturnalia)	Carl Wenning

FINAL 2009 PUBLIC OBSERVING SESSIONS

While only two of the TCAA's public observing sessions have not been clouded out this year, the club continues to offer when possible public sky viewing sessions at SGNC. Additional prominent sky objects such as planets, nebulae, star clusters, and galaxies will be viewed when visible. *When uncertain if an observing session will be held, call one of the following cell phone numbers after 6:00 pm: 309-830-4085 (Carl) or 309-824-2804 (Lee).* The 2009 public brochure for these sessions can be downloaded from the club's web site: www.tcaa.us. The sole remaining scheduled POS for 2009 is the following:

Date	Times	Sunset	Topic	Coordinator(s)
October 17	7:00 PM ~ 9:00 PM	6:13 PM CDT	The Pleiades Star Cluster	John Werner Dave Osenga

JULY EDUCATION/PUBLIC OUTREACH

(Note: the following article inadvertently was left out of the August issue of *The OBSERVER* when it was being assembled. It is published now for completeness of the historical record.)

On July 15th, Duane Yockey presented an astronomy talk to the Normal Rotary Club. The subject of his talk was a tour of the sky using Hubble images. Approximately 75 members were in attendance.

On Thursday, July 23rd, Carl Wenning was interviewed live for about 20-minutes by WJBC's Scott Lauchlin. The interview took place at the studios of WJBC during his morning show. The interview lasted from 9:40 to 10:00 a.m. They talked about the recent Jupiter impact, the upcoming public observing session about Galileo's telescope at SGNC, and the *Classroom for Kids* program at Bloomington Public Library.

The club's *Classroom for Kids* activity took place at BPL on the 25th. Despite the fact that there were two *Pantagraph* notices, a WJBC radio announcement, a tray liner announcement through McDonalds, information on the web pages of the TCAA and BPL, and an article in *The OBSERVER*, only six attendees were at the program. Thankfully in attendance was the Fogarty family, TCAA members. Carl spoke about black holes and Lee spoke about the Perseid meteor shower. Lee remained behind after the program to assemble his lately received *Galileoscope*; he was assisted by a middle school boy who has been present at the last three *Classroom for Kids* programs.

The club's public observing session for July also took place on the 25th. Carl started off the program at 9 p.m. with his talk *Galileo's Telescope*. Toward the end of the talk, a short break was taken to observe the passage of the ISS linked with STS-127 along with the Progress transfer vehicle on its way to join up. Lee Green concluded the talk section by demonstrating his newly-arrived *Galileoscope*. Following this event, Dave Osenga gave a sky lecture, pointing out the most prominent constellations. Afterward, we observed with four telescopes.

Approximately 55 were in attendance, including TCAAers. Our telescopists for the evening were Lee, Carl, Dave, and William. Also in attendance was TCAA past-president Tony Cellini; in the distance Mark Cabaj was working at his observatory. Observations continue until after midnight when a cloudbank began moving in from the north.

On the evening of July 29th, Carl and Lee presented a talk and viewing session respectively for the Ecology Action Center at SGNC. Also in attendance was a potential new TCAAer, John Scheer. Carl spoke about earth-sky relationships involving the sun and moon, and Lee showed the moon through his 14-inch telescope. Approximately 22 children and their parents were present for this hour-long combined program.

AUGUST EDUCATION/PUBLIC OUTREACH

Lee Green, William Carney, and Carl Wenning represented the TCAA at the 125th annual Stubblefield-Funk family reunion on Friday, August 7th. While more than 200 family members were present from across the USA for the events of that evening, a smaller number participated in the club's offerings – perhaps 60. Carl gave the 30-minute presentation *Our Amazing Moon* in the SGNC's corncrib with about 45 in attendance. William set up the club's 12-inch and Lee his 14-inch telescopes. Attention was focused primarily on the near-full moon and Jupiter. The evening sky was hazy and very few stars visible. Observing lasted from roughly 9 to 10 p.m.

The waning gibbous moon interfered with the Perseid meteor shower this year, rising as it did on the night of the 11th at 11:20 p.m. Nonetheless, Carl Wenning headed down to Weldon Springs to provide a 2-hour observing session for the general public who out that night to watch for meteors. Carl reported, "Jupiter last night was spectacular!!! The equatorial belts revealed a number of clear scallops. We even observed a moon (Io) come out of eclipse from behind the planet while two other moons were nearly eclipsing one another. The view was the best I have seen since about 1980 when I was viewing with former TCAAer Stuart Riley from the Finnegan residence in Downs. We had about 100 people show at Weldon Springs last night, and a couple of dozen spent two hours with me observing through my telescope. It's amazing how much the moon washed out the sky and made objects difficult to see once it rose into view. We did see a number of very bright meteors that left enduring trains visible to the unaided eye." Jupiter was at opposition on August 14th.

On Thursday, August 13th, Carl had a "ghostly" observing session. He viewed from Funk's Grove Cemetery where he provided telescopic views of celestial objects for about 30 individuals attending the SGNC's bat talk. Accompanying him was his brother Tim, a truck driver who was staying over night in Bloomington. Just after sunset he was able to view Saturn about 5 degrees above the western horizon. While the planet's ring system was only 1.4 degrees from edge-on, he was able to view the planet "without rings." While observing telescopic objects (and watching flying bats), he was also able to point out to attendees the passes of two satellites – Cosmos 1220 and METOP-A. The viewing session lasted about one hour, from 9:30 to 10:30 p.m. On the way back into Normal, Carl observed the most impressive moon illusion of the third quarter moon that he had ever seen.

(Continued on page 10)

SEPTEMBER IN THE IYA: PLANETS AND MOONS

Credit NASA

Galileo's telescopic discoveries shook the foundations of the cosmology handed down from the ancients. He observed sunspots, the rugged surface of the Moon, and perhaps most profoundly, bright Jupiter and what appeared to be four small companion bodies (right). He noticed that these four objects were lined up and that they changed positions over time. Galileo realized that the four satellites were orbiting Jupiter, directly contradicting the older idea that Earth is the center of motion for all heavenly bodies. You can see this bright planet in the night sky this month.

Of course, we now know that the planets of the Solar System orbit the Sun, not Earth, and all the planets except for the two closest to the Sun have at least one moon to keep them company. In fact, there are 144 known planetary moons, with at least 21 more awaiting official recognition. Telescopes have improved considerably since Galileo's time, growing larger and more sophisticated. Because Earth's atmosphere interferes with observations, NASA sent telescopes into orbit around the Earth, including the Hubble Space Telescope and later the infrared Spitzer Space Telescope. NASA increased our observational powers with spacecraft sent to all eight planets as well as to many moons, asteroids, and comets. Galileo would be quite surprised to learn that humans have explored and walked upon Earth's Moon, even bringing back moon rocks for study.

What we know about the Solar System has increased dramatically in just the last few decades.

One of the spacecraft that changed the way we look at the planets and moons was named after Galileo. The Galileo spacecraft was the first to fly past an asteroid and the first to discover a moon of an asteroid. It provided direct observations of a comet colliding with a planet. It was the first to measure Jupiter's atmosphere with a descent probe and the first to conduct long-term observations of the Jovian system from orbit. The moons of Jupiter reflect the great diversity of moons throughout the solar system - Io is the most volcanically active body in the entire solar system, and evidence supports the presence of a hidden subsurface ocean of water on Europa.

Our journey of discovery has just begun. Cassini-Huygens, in orbit at Saturn, is imaging the rings and moons and unveiling methane lakes below the clouds of the moon Titan. The Mars Exploration Rovers and the Phoenix Lander have researched the terrain and soil of Mars. And there will likely be more surprises waiting. The Messenger spacecraft passes by Mercury this month and will settle into orbit in 2011 to conduct extensive studies of this innermost planet. The LRO and LCROSS missions will map the surface and look for water ice on our own Moon. NASA spacecraft travel even to the most distant places and it will take the New Horizons mission a decade to reach the outer edge of our Solar System.

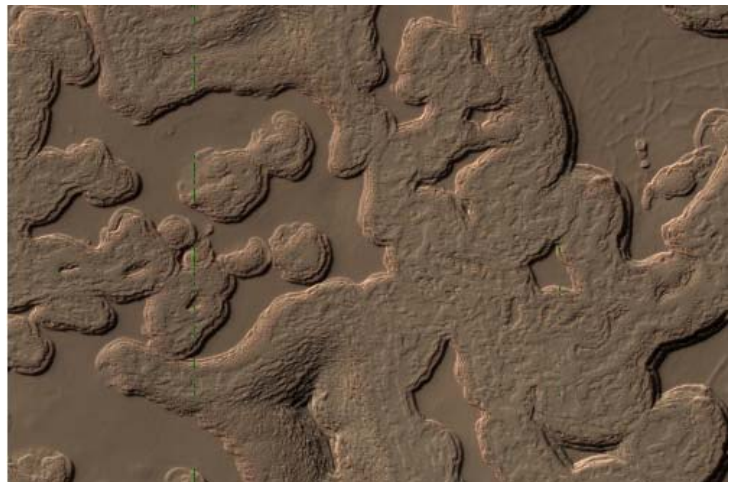
MARS PICTURES

Credit: Nasa

For more photos: http://hirise.lpl.arizona.edu/releases/sept_09.php



Gullied Crater Walls



South Pole Residual Cap Monitoring and Change Detection

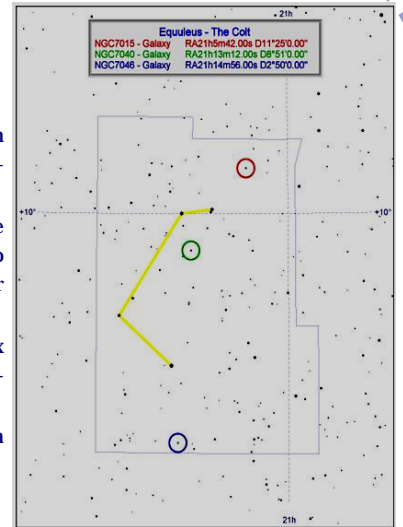
CONSTELLATION OF THE MONTH: EQUULEUS—THE COLT

Equuleus is a small constellation that lies between Pegasus and Delphinus and north of Aquarius. It is seen as the head of a small horse. Equuleus is a relative dim constellation whose main stars are 4th magnitude.

There are no mythological stories explicitly associated with Equuleus, but some believe that Equuleus was the brother of Pegasus given to Castor by Mercury. Also called the small horse, the first horse or the filly, Equuleus rises just before the larger and more famous equine Pegasus.

Equuleus is the 87th largest constellation, or the second smallest, with only Crux being smaller. Equuleus cover just 72 square degrees. It is the 85th brightest constellation or the 4th dimmest. Equuleus reaches opposition on August 8.

Because it is located away from the Milky Way, the deep space objects found within Equuleus primarily include galaxies, and most of these are rather dim.



WEB CAM PHOTOGRAPHY

By Lee Green

I recently purchased a webcam, the Celestron NexImage system for under \$100. It is billed as a Solar System imager and it is effective and easy to use. The camera is packaged in a small, lightweight plastic housing and has a 1-1/4" T-adaptor that fits in the place of your eyepiece. It contains a small 640x480 pixel color imaging CCD. The camera hooks to your computer via a USB port.

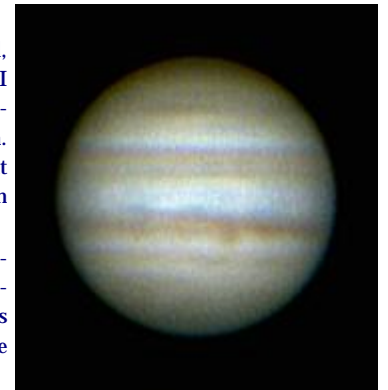
The software that comes with the package is a simple control program that lets you set the brightness, saturation and gamma (color balance) for the image. You can also control the number of frames per second, the shutter speed and the gain for recording images and the result is written to an AVI movie file.

Processing the movie is accomplished using the included freeware program Registax which reads the individual frames, helps you align them, select the frames to be processed and combine them into a final image.

I recently tried out the NexImage on Jupiter by connecting it to my f/10 telescope. Hooking the unit up was a breeze because the camera is small and has a single USB cable that connects to the computer. Pointing the camera at a target was a bit tricky at first due to the small size of the imaging chip. The gain must be set high enough to show any out-of-focus star image, but using a quick search pattern the target is quickly found. After the initial target star was acquired, focusing was easy, with the Bahtinov mask providing its characteristic focus pattern. After acquiring Jupiter, it was interesting just to watch in real-time the effects of atmospheric disturbances.

I made a series of test movies and tried a variety of settings for the gain, shutter speed, frame rate, brightness and saturation. Recording the movies was a simple process and I completed my session, taking 15 movies, in under 1 hour. Processing the movies using Registax was less straight-forward since this was my first real attempt at using the program. There seems to be a lot of magic going on under the hood of this program, but I'm sure that is mostly due to my inexperience with the program. But I was able to get my first webcam image of Jupiter.

The next evening, I tried another imaging session with the same setup but this time using my Barlow to image at f/20. I was so pleased with the f/10 image, I hoped that the expanded scale would provide some improved resolution. However, the seeing conditions were much worse and resulting image was considerably poorer. I'll be trying that technique again on another night.



THE LIFE AND TIMES OF GALILEO, PART 1

By Carl J. Wenning

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

"In this present small treatise I set forth some matters of great interest for all observers of natural phenomena to look at and consider."

So began Galileo in his introduction to the *Sidereus Nuncius* (*Starry Messenger*) which he published in the year 1610 to describe some of the observations that he had made with his crude telescope – observations which were literally earth shaking. These observations were the first real evidence that showed that the Earth was not necessarily the center of the universe as many philosophers and scientists had supposed up to that time.

Using a telescope generally much poorer than a toy one might purchase in any retail store today, Galileo observed, recorded, and reported observations of the moon, sun, Venus, Saturn, Jupiter, the Milky Way, star clusters, and many other things. His crude telescope kept him busy for years, providing him with evidence that the prevailing view of the time – that the Earth was the center of the cosmos – was clearly and demonstrably wrong.

Though Galileo is almost universally known by his first name, he was born Galileo Galilei on February 15, 1564 in Pisa, a town of northern Italy. His father, a poor member of a good family from Florence, was Vincenzo Galilei. Vincenzo was distinguished by his abilities as a musician and a mathematician. His son Galileo was a bright child, and at first his father steered him away from a career in mathematics. He had hoped that Galileo would eventually make his fortune in business. But Vincenzo was wise enough to see that his son had other abilities and interests that would better suit him in some sort of a professional career. In 1581, at the age of 17, Galileo's father sent him to study medicine – a profession that paid much more than one in the academic world – at the University of Pisa.

While at the University Galileo's academic abilities and sharp wit set him apart from his peers. As a student he was noted for his seeming inability to accept statements from his teachers that were based upon the authority of ancient writers who offered no evidence for their conclusions. From a note written in his later years, Galileo indicated that he was particularly incensed by a claim of the ancient natural philosopher Aristotle that heavier objects would fall faster than lighter objects. This offended Galileo's sensibilities because as a youth he had observed a shower of hail stones all of which, large and small, reached the ground at the same time. If the larger, heavier stones fell faster, he argued, then they should have reached the Earth sooner than the smaller, lighter stones. They did not. Bringing contradictions such as these to the fore, Galileo earned nothing but the ire of many of his instructors and respect from fellow students who gave him the nickname of "The Wrangler." This skeptical attitude, along with his skill in argument, marked Galileo for a noteworthy, albeit controversial, future.

In 1582, while attending church services at the cathedral of Pisa, Galileo's attention was attracted to a chandelier set into motion by air currents. He noticed that as the air currents came and went the arc of the chandelier's swing increased and decreased with one unusual tendency – the period of the swing appeared to remain unchanged. Using his pulse as a crude clock, Galileo confirmed this observation. Upon arriving home he performed an experiment that showed to his satisfaction that this was true for any weight suspended by a string. To test this conclusion with a greater accuracy, Galileo set up two identical pendulums and set them into swinging motion. One he swung with a large arc, the other with a small arc. Nevertheless, both swung back and forth at the same rate. Galileo was amazed.

Before long it became clear to Galileo that his life calling was not medicine, a career chosen for him by his father, but rather mathematics and its applications to the physical world. Up to the point of his entry into the University Galileo had not received any formal instruction in the area of mathematics. During his second year at the University, however, he happened to overhear a lesson dealing with geometry. He was so fascinated by what he heard, that he continued auditing the course. Galileo's aptitude for mathematics was immediately apparent. Within a short time he obtained his father's consent to study mathematics in lieu of medicine.

Interest and ability notwithstanding, Galileo was compelled to quit the University in 1585 without completing his course of studies and without obtaining his degree. Galileo was financially strapped and his father, equally strained, could not help. Galileo remained at home over the next four years where he continued to read and to think about matters of math and science. Fluids and the laws that surrounded them were his primary interest. Within a year of departing the University he wrote and published his first scientific article. In this manuscript he described an instrument that he had invented. The instrument is today called the hydrostatic balance. This article first brought Galileo to the attention of the scientific world.

In 1589 Galileo was appointed to a temporary position as an instructor of mathematics and astronomy at Pisa. The pay was inadequate and Galileo added to his income by tutoring students and taking private pupils. In this new position Galileo demonstrated his tremendous abilities as teacher and researcher. His many students as evidenced his popularity as a teacher. As a researcher he introduced new methods of scientific investigation that earned him the ire of his fellow professors.

At this time scientific investigation as we know it today was not in the vogue. Scientific investigation consisted largely of interpretation of
(Continued on page 10)

AUGUST EDUCATION/PUBLIC OUTREACH (CONT.)

(Continued from page 6)

On August 19th Carl gave an hour-long presentation to the Yokefellows group at First United Methodist Church in Normal. The title of his program was *Galileo and the Church*. The talk was well received by a group of about 24 senior citizens.

The August 22nd session of *Classroom for Kids* series featured the *How to Survive a Black Hole* presentation and followed up with extensive discussions about stellar life cycles, exotic objects, asteroids and many other topics. Lee Green had 11 people join in, including four kids who had a variety of questions that contributed to this fun event.

Our August 22nd public observing session was held at Sugar Grove Nature Center. Forty-seven individuals were in attendance. The theme of the session was Jupiter and Neptune. Lee Green gave a presentation about the planets and their recent conjunction and oppositions. Dave Osenga gave a partial sky tour that was limited by clouds that came in and obscured observing for a while. We had a record of 10 telescopes set up for the evening including Tony Cellini's 6-inch refractor. Clouds returned occasionally throughout the evening and most observers departed by midnight. It was great to see returning members David Hahn, John Littlefield and Linda, John Werner, Dave Osenga, Duane Yockey, and William Carney. Welcome to all the new TCAA members including John Scherr, Chris and Jetty, Randy, Sean and Tony. Thanks to each of you for helping to make this outing such a great success.

THE LIFE AND TIMES OF GALILEO, PART 1 (CONT.)

(Continued from page 9)

the writings of Aristotle, Galen, Ptolemy, or other great natural philosophers of the past. Results were reasoned out from general principles that were found in these writings without any appeal to observation. Galileo, who was prone to sharply criticize unsubstantiated statements and theories unsupported by observation, began a new study of the physical world.

He studied falling bodies and "diluted" gravity by rolling balls down inclined planes. According to Aristotle, an object that weighs ten times as much as another should fall ten times faster or go ten times as far in the same interval of time as the lighter object. The typical example was that a ball of lead should fall faster than a ball of wood. Galileo showed by simple demonstration that this wasn't the case and that the two fall at nearly the same rate – the difference being attributed to air resistance.

Rolling balls down an incline, Galileo correctly demonstrated that the ball would continue to speed up so long as air resistance wasn't a factor. If the ball reached the bottom of an incline and then began to climb another ramp upwards, the ball would slow down. If moving downwards meant that an object would speed up and if moving upwards meant that an object would slow down, then, as an object moved along a flat course getting neither nearer nor farther from the center of the Earth it would neither speed up nor slow down – that it would maintain its speed were it not for friction. Today we call this concept inertia.

The results of experiments such as these shocked the sensibilities of contemporary scholars. Galileo's experimental methods were entirely foreign to scientists of his day and were regarded by most of his colleagues as undesirable if not dangerous innovations. Accordingly, the results derived in this fashion were also suspect.

These studies – which upset Aristotelian physicists – as well as Galileo's habit of getting into trouble with persons with whom he did not agree, made Galileo far from popular with the faculty at Pisa. Either on this account or on account of his father's death in 1591, Galileo resigned his teaching post at the University several months before it was due to expire and returned to his mother's home in Florence.

After a stay of some few months at Florence, Galileo was appointed to a professorship of mathematics at Padua with the assistance of a friend. The year was 1592. The appointment was for six years and the pay three times that which he had received at Pisa. This situation was much more suited to Galileo's temperament and attitudes as an atmosphere of intellectual freedom prevailed there. At this new place Galileo flourished. In addition to enormously popular lectures, he wrote short articles on the subjects of astronomy, physics, and war, and invented a variety of scientific instruments. Following his first year at the University of Padua, Galileo's teaching contract was extended and his salary was increased. This was repeatedly done so and eventually his appointment was for life.

TCAA Treasurer's Report – August 2009

OPERATING FUND BALANCE – July 31, 2009 - \$ 2,616.74

Income

Bob Illert (family dues) - \$ 40.00
Jetty Kircher (family dues) - \$ 40.00
John Scherr (family dues via PayPal) - \$ 41.00

Expenses

LYB Inc. (August Observer) - \$ 34.74
William Carney (SGO Repairs) - \$ 94.73
PayPal Fee (John Scherr) - \$ 1.20

OPERATING FUND BALANCE – August 31, 2009 - \$ 2,607.07

OBSERVATORY FUND BALANCE – July 31, 2009 - \$ 2,194.29

Income

None - \$ 0.00

Expenses

None - \$ 0.00

OBSERVATORY FUND BALANCE – August 31, 2009 - \$ 2,194.29

TOTAL TCAA FUNDS – August 31, 2009 - \$ 4,801.36

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)

UPCOMING EVENTS

- ☆ September 12, Members-only Observing Session, SGNC, dusk
- ☆ September 19, Public Sky Viewing Session, *Exploring the Milky Way*, SGNC, 8:30-10:30 p.m.
- ☆ September 21, TCAA Board Meeting, LYB, Inc. Bloomington, 6:30 p.m.
- ☆ September 21, NCRA 2010 planning meeting, LYB, Inc., Bloomington, 7:45 p.m.
- ☆ September 26, *Classroom for Kids*, "Exploring the Milky Way," BPL, 1:30-3:00 p.m.

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. Unsubscribing is just as easy. To unsubscribe, just send a blank email to 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. 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

Newletter 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

Visit the Twin City Amateur Astronomers
on the web at
www.twincityamateurastronomers.org/