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PRESIDENT'S MESSAGE: NIGHT SKY UPDATE

Can you believe the luck we've been having this year? It seems like every time we want to go out to observe, the weather turn cloudy and cold. Of the eight Public Observing Sessions this year, three were cancelled outright and two others had very marginal turnout due to the weather. So let find something that we can blame for the bad conditions. I nominate the sunspots.

2008 had the lowest number of sunspots since 1913 and 2009 is on track to be lower still. This is coupled with and perhaps related to a 50-year low in the pressure of the solar winds and a 12-year low in the solar irradiance and similar drop in solar radio emissions. It is much too soon to think that this could be the beginning of another Maunder Minimum when, back in the 1600s, sunspots became almost nonexistent for 75 years, but it is an interesting coincidence that the small number of sunspots was coupled with a particularly cool year. Another 'Little Ice Age' would certainly give fits to the global warming theorists. While I personally believe that we cannot continue to pour carbon dioxide into the environment on an industrial scale with some consequence, it's good to remember that the Earth and Sun are connected in ways that we are only now beginning to investigate and understand.

All we can do is to keep watching for those times when weather and fortune favor us with clear, dark skies so we can go out to enjoy the wonders of the night sky.

TCAA EVENTS FOR NOVEMBER

The TCAA events for November are wide-ranging to say the least. TCAAers are encouraged to attend and participate in these events.

- ☆ Carl Wenning will present *Galileo's Telescopes* on Wednesday, November 4th. The program begins at 7 p.m. in the Community Room of the Bloomington Public Library. Attendees will learn about Galileo's life and times, his telescope and discoveries. A telescope viewing session will follow in the parking lot of BPL at about 8:15 p.m. if the sky is tolerably clear.
- ☆ On November 5th Lee Green will speak to Rock Island's Popular Astronomy Club about NCRAL 2010. Lee first made contact with this group when attending the NCRAL 2009 meeting in Iowa.
- ☆ The November Board and NCRAL 2010 Planning Team meetings will be held at the offices of LYB, Inc., in downtown Bloomington on Tuesday, November 10th. Start time is around 6:30 and 8:00 p.m. respectively.
- ☆ Carl Wenning will deliver the talk *Galileo's Telescopes* and spend additional time promoting NCRAL 2010 talking to the Champaign Urbana Astronomy Club on November 12th. This event was arranged through contacts made first by Lee at the DAAC Astrojam event. The event will be held at Parkland Community College's Staerkel Planetarium.
- ☆ The November MOOS will occur on Saturday, November 14th. Lee Green will serve as coordinator. The event will begin at around 7 p.m. at Sugar Grove Nature Center if the sky is clear. Sunset on this date occurs at 4:49 p.m. and the sky will be as dark as it gets by 6 p.m.
- ☆ Due to the fact that *Classroom for Kids* programs at BPL are normally held on the 4th weekend of each month, the events of November and December have been joined into a single event due to Thanksgiving and Christmas. The joint event will occur on Saturday, December 5th. The program will run from 1:30 to 3:00 p.m. and will focus on Lives of Stars/Discovering New Worlds. The Lives of Stars component will feature an interesting light show demonstrating spectral of different types, Wien's Law, Stefan-Boltzman Law, and wave phenomena. These events are all intended to include hands-on, minds-on activities. Lee and Carl will provide the program. This information is provided here and now in the event that the December issue of The OBSERVER comes out after December 5th.

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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

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To join the TCAA, send your name, contact info and dues payment to

Duane Yockey
508 Normal Avenue
Normal, IL 61761

TCAAers ATTEND EVENTS

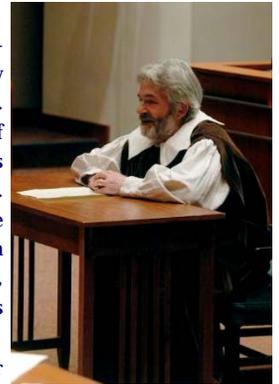
John Werner attended Astrofest September 25-26 at Vana's Pumpkin Land just west of Kankakee, IL. There John was able to make an announcement about our NCRAL 2010 meeting, and distribute updated flyers to all attendees (about 60 were present).

Three TCAA members represent the club at the AstroJam on October 3rd. Dan Miller, Bobby Arn, and Lee Green attended this event despite the fact that it was cloudy and raining all day, including a heavy downpour on the way there. As Lee reported, "[The DAAC] had a nice setup at Friend's Creek with several booths, many handouts and Bryan Maple, the DAAC president, gave a presentation about current events in astronomy and introduced us too. David Leake then gave an enthusiastic and interesting presentation about Galileo and how his discoveries changed the way we see the universe. After that, several door prizes were given away including a telescope. About 35 people came out in spite of the weather, which started to clear as the evening ran down. I chided Bryan, the DAAC president, about how he couldn't pick dates any better than we did this year. Bryan, and a couple other DAAC members indicated their intent to join us for NCRAL, as did David Leake. The Challenger Center was the big event that I talked up, and they seemed to be very interested in attending that." Thanks, Lee, for this report.

On Friday evening, October 9th, Lee Green, Carl Wenning, and Duane Yockey attended Illinois Wesleyan University's homecoming program featuring the one-man play *Galileo*. Tim Hardy, a visiting professor at IWU in 1999, performed the role of Galileo. The play consisted of a number of "dialogues" between Galileo, the pope, members of the Roman Inquisition, and a frightened lawyer who refused to take his case. Hardy's performance was mesmerizing. The actor channeled the persecuted scientist perfectly. The play chronicled the trial in front of the Papal inquisitors and a confrontation in the Vatican Gardens with Pope Urban VIII. As a reasonable man, Galileo was faced with being punished for revealing the truth. This is truly a one-man tour-de-force by Hardy, who played all parts to perfection, and in particular, a resigned yet inwardly rebellious and defiant Galileo.

Duane Yockey was fortunate enough (or was that unfortunate?) to attend all four days of this year's Illinois Dark Skies Star Party at Jim Edgar – Panther Creek State Park about 30 miles west-northwest of Springfield. Despite the name of the event, the sky was overcast the entire time except for Saturday afternoon when the sky became partly cloudy. By sunset the sky was mostly cloudy once again precluding any observing at this year's event. Due to the extended period of overcast skies, about 80 amateur astronomers had pre-registered for the event, but only about 40 actually attended. Also attending and staying one or more nights was Bobby Arn who gave a talk on Friday afternoon about astrophotography; assisting was Dan Miller. Carl Wenning made cameo appearance on Saturday afternoon to give a talk along with Duane called "Stalking the Southern Tier: Observing from Bolivia and Chile." Both sets of speakers included information about NCRAL 2010 in their presentations.

In another sort of "star" watching, Lee Green and Carl Wenning were able to meet and speak briefly with Shuttle Astronaut Scott Altman in Pekin on Friday, October 23rd, thanks to a tip from TCAAer Hilary Goff Shirven. (Thanks, Hilary!) Our dynamic duo attended an open house at the Tazewell County Museum for the dedication of a display room commemorating Altman's exploits. About 50 people were present for the event allowing time for everyone to press the flesh. Carl mentioned the NCRAL 2010 meeting to Scott, and he indicated an interest in attending. His presence at our NCRAL 2010 event on April 17 will depend on approval by NASA.



AL OBSERVING PROGRAM STANDINGS

Below is a listing of the status of observers pursuing AL observing programs reported as of October 31st. Lee Green has recently completed three observing projects despite the frequently overcast skies – Lunar Club, Urban Club, and Binocular Messier Club. Congratulations Lee! 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.

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*	110*	70*	(110)	31
Binocular Messier 50		(100)	60*			78*	22
Deep Sky Binocular 60		55					
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 Bas60/Adv110		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				3	
Outreach Basic10/ Stellar60/ Master160			(*, **)			31 ^h -06* 26 ^h -07 44 ^h -08**	

* 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.

NOVEMBER SKY GUIDE

- | | | |
|----|--|--|
| 01 | Venus passes 4° north of Spica, 8 P.M. |  |
| 05 | Mercury is in superior conjunction, 2 A.M. | |
| 09 | The Moon passes 3° south of Mars, 12 A.M. |  |
| 12 | The Moon passes 8° south of Saturn, 7 P.M. |  |
| 17 | Leonid meteor shower peaks |  |
| 23 | The Moon passes 4° north of Jupiter, 4 P.M. |  |
| 24 | The Moon passes 3° north of Neptune, 12 A.M. |  |
| 26 | The Moon passes 6° north of Uranus, 12 P.M. |  |

OCTOBER OBSERVERS' LOG

October was cloudier, wetter, and colder than usual. The amount of rain we received during October was the second highest on record, with more than 8 inches. This is nearly half a foot more than we usually receive during a typical October. October is normally one of the clearest months of the year in central Illinois according to data provided in Clear Sky Clock. With the lower temperatures and clouds, it was almost as though November filled in for October this year. (So much for global warming – at least locally.) As a result, TCAAers had fewer opportunities than usual to get in any observing. Still, a few clear nights were scattered throughout the month.

Carl and Carolyn Wenning viewed the beautiful gathering of Venus-Saturn-Mercury with unaided eye and binoculars at 6:30 a.m. on Saturday, October 10th. They just happened to be outside on this beautifully cool, crisp, and clear morning setting up for a garage sale. Around 4 a.m. Carl spent a few minutes viewing the moon and Mars as well.

The October MOOS was scheduled for the evening of Saturday, October 10th. A cold front brought crystal clear skies late Friday night, and colder than usual temperatures were experienced. Unfortunately, this clear spell didn't last long enough. The next night views of Jupiter were had through openings in the clouds. Nothing else was observed despite the fact that William Carney remained until about 10:30 p.m. in hopes of clearing. On the next evening, Sunday William Carney and Tony Cellini took advantage of an amazingly transparent sky to conduct some additional observations. Tony was imaging M31 and William was looking for a 12th magnitude asteroid among the Cygnus Milky Way – an almost impossible task. After a while, Tony turned his attention to photographing η & ζ Persei, the double cluster with amazing results. The accompanying image shows what he achieved with his new photographic rig. "The sky was amazingly clear – the Sagittarius Milky Way was visible nearly to the southern horizon." according to Carl Wenning who just happened to stop in to visit with these dedicated observers around 7:15 p.m.



William Carney was able to get out on Halloween to do some observing. He noted the next day, "I was out last night for a little while using the 12" on my mount and managed to observe the asteroid 159402 despite the full Moon. This asteroid's close approach was actually 10/20 but because of its orbit was still visible. I was going to try for another one but it was way too cold." Of course, wouldn't you know it, *Timke's Rule* applies once again. If the moon is full, the sky will be clear. At least the trick or treaters probably liked the presence of the full moon.

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.

OCTOBER EDUCATION/PUBLIC OUTREACH

With regard to the October 17th POS, Lee Green wrote, "Attendance at our last Public Observing Session of the year was notably sparse due to the mostly cloudy conditions, but also to the fact that we were not listed in the Pantagraph's current events section this week. John Werner gave an excellent program featuring the Pleiades open cluster. His presentation was highlighted with many beautiful images he has taken. John also brought a sample of a tee-shirt with our new logo embroidered. It looks great! I know many members will want to have one for their very own. Visiting us...for the first time was Matt Riddle. Bob and Lynn, from Lincoln, joined us again and brought their new Galileoscope. It was great to have them all with us. Also present were members Joyce Werner, William Carney and me."

The TCAA assisted with the SGNC Autumn Celebration and presented *Classroom for Kids* at the BPL on the 24th. Lee Green reported, "Autumn Celebration at the Sugar Grove Nature Center started under cloudy skies with cold temperatures. Dave Osenga arrived early and opened the Sugar Grove Observatory and set up one of the telescopes on the sidewalk to draw people in. Lee arrived soon after and he and Dave greeted people and showed them the telescope and explained how it worked. Dave continued to man the observatory after Lee left to conduct the session at the library. The weather continued to warm and clear. By afternoon it was nearly cloud free with temperatures in the mid-60s. John Werner arrived to assist and showed people our telescope and gave them a look at the Moon. John reported a steady stream of people. Lee returned and relieved Dave and John wrapping up the day by showing the observatory to an additional 40-50 people. Also volunteering for the Nature Center at the Autumn Celebration were members Kris Cummings and Jetty Kircher and Josh Lindsey and Melissa. New member Chuck Mosier came down from Ottawa to help out and John Littlefield stopped by too. I broke away from the Autumn Celebration to lead the *Classroom for Kids* session at the Bloomington Public Library. We had only two people attend the session, although they were very engaged in the content. They made the appropriate point that the content, What is the Fate of the Universe?, seemed to be an advanced topic for a program called *Classroom for Kids*. Afterwards I returned to the Autumn Celebration."

On Monday, October 26th, despite an overcast sky and persistent drizzle, Carl and Lee gave a constellation and sky lore talk to Marty Morris' 4th graders from one of the Clinton elementary schools. The program was presented in the Meadowview area of Weldon Springs SRA just southeast of Clinton. About 15 kids and parents showed up for the event. Despite the weather, everyone appeared to have a good time.

THE LIVES OF STARS From the IYA Discovery Guide

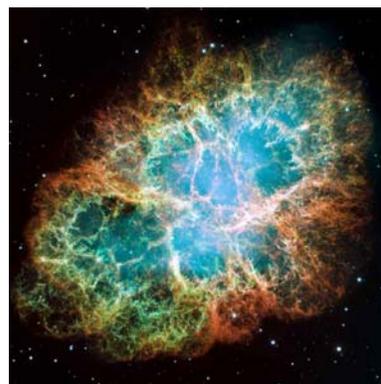
Back in 1054 AD, Chinese and Arab astronomers recorded seeing a "new star" that was bright enough to be visible even during the day. 450 years later, Galileo also saw a bright "star" appear, just a few years before he made his telescope. But for both of those events, no one knew what they were seeing. We have learned now that ancient astronomers saw a special event called a supernova – the flashy end to a giant star's life. Stars spend most of their lives shining brightly without much change. But the sight of their birth and death can be spectacular.

Every star begins its life in a stellar nursery of gas and dust. As enough of this starbuilding material falls together it becomes hot and dense enough to form a star. Because the dense clouds where stars form block visible light, it is often easier to study them using infrared light which can pass right through the clouds. NASA's Spitzer Space Telescope and Hubble Space Telescope have both used infrared light to study star formation in our own galaxy and in distant ones. You can see a stellar nursery where stars are being born if you look at the December IYA Discovery Guide, which features the Orion Nebula.

At the end of their lives, very large stars will go supernova. This huge explosion blows off the outer layers of the star in a bright display. It releases oxygen, iron, and other heavier elements into the surrounding space. These contribute to making a new stellar nursery and eventually get recycled into new stars. Many of the elements that make up the Earth and even us came from many supernovae that occurred billions of years ago.

The supernova that was observed in 1054 faded after about a year. Now, when we look at the same place in the sky we see a supernova remnant called the Crab Nebula (right). You can locate this blast of material with the Finder Chart in this guide. Giant stars also leave something else behind. In the Crab nebula, there is a neutron star that is so dense that a teaspoon would weigh as much as a train of boxcars loaded to maximum capacity that stretched all the way from Canada to Mexico! And the very biggest stars leave behind a black hole, which is even denser and more mysterious, and also invisible.

NASA is studying black holes and other high-energy x-ray and gamma-ray sources with the Suzaku and XMM-Newton Missions. The Swift and Fermi missions are orbiting Earth to study the dramatic deaths of very large stars. To learn more about the lives of these giant stars and to see what happens to stars like our Sun at the end of their lives, see the activity included in this packet.



Crab Nebula: Credit Hubble Space Telescope

CONSTELLATION OF THE MONTH: PISCES—THE FISHES

Pisces is a zodiac constellation that lies south and east of Pegasus, south of Andromeda and west of Aries. Pisces is shown as two fishes that are tied by a cord anchored at the constellation's brightest star, Al Rescha.

In mythology, Pisces is seen as Aphrodite and Eros who turned themselves into fish and jumped into the Euphrates River when the monster Typhon attacked the gods.

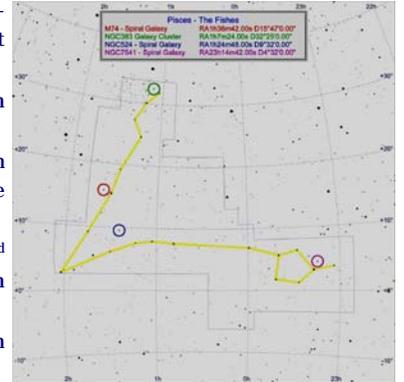
Pisces also contains the origin point of the celestial sphere with coordinates 0h in Right Ascension and 0° in declination. This point has been called the Greenwich of the Sky after Greenwich, England through which the longitudinal line of 0h passes.

Pisces is the 14th largest constellation covering 889 square degrees. It is the 42nd brightest constellation. Pisces reaches opposition on October 3. The Sun passes through Pisces from March 12 through April 18 which includes the Vernal Equinox.

The ring of 5 stars that lies below the "Great Square" of Pegasus is an asterism known as the Cirlet.

Pisces is located away from the Milky Way and contains many galaxies. Two galaxy clusters reside in Pisces, the NGC383 group and the NGC507 group. Many other bright galaxies are also found including NGC128, NGC194, NGC488, NGC524 and NGC628 which is also Messier 74.

The nearest dwarf star is found in Pisces, Wolf 28, or Van Maanen's Star, is a 12th magnitude star that is 13 light years from the Sun. It is thought to have exhausted its supply of helium and collapsed into a super-dense white dwarf about the size of the Earth which only radiates thermal energy.



THE LIFE AND TIMES OF GALILEO, PART 3

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.

This was the scheme of things when Galileo began to examine the world system as presented by Aristotle and Ptolemy. Though no record exists as to the exact time that Galileo rejected the earth-centered or geocentric view of the cosmos, he stated in the year 1597 that he had adopted the views of Copernicus who a century before showed that a sun-centered or heliocentric world system could adequately and more simply explain and predict the future motions of the planets.

No one could tell by naked-eye observations alone that the earth and planets revolved round the sun. Others before him had speculated that this might be so, yet Copernicus was the first to prove mathematically that such a system could simply and accurately explain all celestial phenomena - changes in brightness, risings and settings, seasons, length of the year, motion of the sun through the zodiac, speeds and motions of the planets - using only the assumption that the earth moved. Copernicus' herculean effort to show that the sun resides in the center of the world system was published in 1543 and is known simply as *De Revolutionibus*.

Copernicus saw the realm of the stars immensely far removed from the orbits of the planets. Inside this spherical shell he placed the orbits of Saturn, Jupiter, Mars, Earth, Venus, and Mercury. At the center of this world system was the Sun. The moon orbited round the earth and the planets moved in perfect circles with perfect uniformity round the sun. (Because Copernicus embraced this latter view, he ultimately was forced to include tiny epicycles in his own system to explain the irregular motions of the planets.)

The system of Copernicus explained the rising and setting of the sun, moon, stars, and planets as a result of the earth spinning on its axis once a day. The retrograde motions of the outer planets were easily explained by the more rapid motion of the earth overtaking the slower outer planets making them only appear to shift westward among the background of stars.

According to Copernicus, the sun's apparent annual eastward circuit among the background of stars resulted from the motion of the earth round it. The annual north-to-south migration of the sun that accounts for our seasons was the result of the earth's axis being tilted 23.5 degrees from a line perpendicular to the plane of the earth's orbit. The system was simple, the system was aesthetically pleasing, and yet it was not capable of making predictions any more accurate than those derived from Ptolemy's earth-centered model.

Though common sense would seem to dictate that it was the sun, moon, planets, and stars that circle the Earth daily, Galileo

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THE LIFE AND TIMES OF GALILEO, PART 3 (CONT.)

(Continued from page 6)

still found the Aristotelian view of the world system unacceptable. His studies of motion had shown him that Aristotle was not to be trusted. Rather he felt it more appropriate to look for observational tests to decide the issue. The simplicity of Copernicus' heliocentric view was appealing. Galileo even went so far as to compile arguments against the geocentric worldview and in favor of the heliocentric view. But what Galileo lacked was convincing observational evidence that would decide the argument once and for all. The opportunity for settling the argument was on the horizon.

In 1608 there was a glass worker in Middleburg, Holland, one Hans Lippershey, who ground lenses for spectacles. It's said that one day an apprentice happened to pass one lens in front of another and found that distant objects appeared closer. Amazed, Lippershey mounted the lenses in a tube and attempted to sell the invention to the Dutch government for military applications.

Within a few months Galileo had heard of the invention. True to his nature, Galileo was somewhat skeptical of an instrument that could perform as claimed. Though he immediately grasped such an instrument's significance with regards to scientific inquiry, he was willing to wait for confirmation that such an instrument had indeed been invented. He received that much awaited confirmation from an acquaintance in Paris, who wrote Galileo describing the success of the instrument.

Galileo then set off to study the principles of refraction – the ability of glass to alter the path of light – in an effort to create his own instrument. Within ten months of the original report, Galileo had grasped the concept of the telescope and assembled his own instrument.

Galileo's first telescope was a lead tube with a lens fitted at each end. It had an ability to make things appear three times closer. After several more attempts he was able to construct a superior quality instrument that magnified the view some 32 times. Without paying attention to its use for terrestrial objects, he took to the observation of the heavens. What he saw there began a revolution that would not end until the teachings of Aristotle were overthrown and a new system of the cosmos based upon observation sprang up to replace it.

In late 1609 Galileo turned the telescope to the heavens for the first time. He almost certainly was not the first to do so, but he was the first to make definite use out of the observations. He repeatedly examined celestial objects. He used a great independence of thought to interpret his observations. He showed tremendous insight in understanding their astronomical importance. He found that his observations provided those much needed observations to distinguish between the two world systems, sun-centered and earth-centered. By early in 1610 Galileo published his earliest observations in a work entitled *Sidereus Nuncius*, The Starry Messenger.

Galileo first turned his telescope on our nearest neighbor in space – the moon. What he saw there amazed him and helped convince him further that the Aristotelian concept of the heavens was wrong. Up to this time the moon was thought to be perfect and unblemished. As others had reasoned previously, "How else could it be in heaven?" What Galileo saw there both startled and amazed him.

As had others before him, Galileo distinguished two parts of the moon's face – a lighter part and a darker part. But what he observed there was totally new and unexpected by anyone before him. The light regions were mountainous and covered with huge holes or craters. The dark regions were smooth and relatively free of craters. The moon as a whole was not smooth; rather, it was irregular and filled with valleys, mountains, and planes. In reality it was not unlike the surface of the earth. The moon wasn't "celestial" in the deepest sense of the word.

Galileo's observations convinced him that what he was seeing really were mountain peaks and deep valleys. Shortly after new moon, when the moon appeared as a thin crescent in the western evening sky, he noted several bright points of light standing out in the darkness beyond the illuminated portion of the crescent. With the passage of time he noted that these points became more and more illuminated in the same way that mountain peaks on earth first catch the sunlight and their bases become illuminated only later in the day. He also watched the shadows inside of craters shrink before the encroaching sunlight.

Turning his telescope to the stars, Galileo came to the shocking realization that stars must indeed be incredibly distant if they are at all large like the sun. When the telescope was turned to a tree, it appeared several times larger depending on the magnification of the telescope. When turned to the moon, the moon appeared similarly larger. But when turned to the stars, the size of the star image could not be increased appreciably no matter what the magnification of the telescope. Galileo realized that the size of the star image observed in his telescope related only to brightness – that bright stars had larger images while dim stars had smaller images – that the size of the pattern had only to do with "adventitious fringes" induced by the air. Stars must be so vastly distant that they show up as only points of light, he concluded.

Galileo also realized that his telescope was able to reveal multitude of stars beyond the sixth magnitude that could not be observed with the unaided eye. As an example of this ability to show fainter stars, Galileo charted all the stars visible in the telescope in one region of the sky. In the belt region of the constellation Orion, where the naked eye could reveal only nine stars in the vicinity of the belt and sword, Galileo observed and recorded an additional eighty. In the region of the Pleiades star cluster in Taurus, in addition to the six stars usually visible, he cataloged an additional forty.

In an attempt to answer the age-old question, "What is the nature of the Milky Way?," Galileo discovered that this hazy path of light in the night sky was nothing but innumerable masses of stars. He found that the fainter stars were by far the more abundant and believed that their number was so large as to be beyond the limit of counting.

One of the most important and damaging observations made by Galileo to counter the earth-centered view of the cosmos, were the observations of Jupiter. Observations of Jupiter revealed that it was surrounded by four heretofore-unseen worlds. What is more, they moved to and fro accompanying Jupiter on its path amongst the background of stars.

Up to this point in time Aristotelian scientists argued that one of the reasons that the earth could not be in orbit about the sun was that the moon would be unable to hold its course round the earth. Much to their dismay, Galileo showed in the case of Jupiter this precise phenomenon was happening.

(Continued on page 8)

THE LIFE AND TIMES OF GALILEO, PART 3 (CONT.)

(Continued from page 7)

On the evening of January 7, 1610, an hour after sunset, Galileo turned his telescope upon Jupiter. He noted that there were three “stars” next to the planet. In his record of the account he mentions that he was immediately struck by the fact that these objects seemed to line up almost precisely with the planet and seemed to be of an unusual brightness. Though he thought the situation peculiar, he failed to record his observation.

The next evening Galileo happened to train his telescope on the planet once again, but this time he saw something very different. This time the “little stars” were closer together, all bunched together on the same side of Jupiter. Galileo began to suspect that the predictions of Jupiter’s motion was perhaps wrong and that the apparent migration of the “little stars” to one side of the planet was a result of Jupiter’s motion among the background stars. He regretted that he had not made an effort to accurately record their relative placement the night previously.

Galileo anxiously awaited yet another view, but on the third night was kept from viewing by cloud cover. On January 10th the planet was again visible, but this time only two of the “little stars” could be seen. Galileo was convinced that the third had moved and was situated behind the planet and that the “little stars” were not really stars at all. Rather, they were satellites – little moons – in orbit round the giant planet. Over the following weeks Galileo discovered yet a fourth moon and became convinced that he was observing moons orbiting a planet, moving with that planet round the sun – something the critics claimed could never happen. Galileo was now in possession of an irrefutable bit of evidence that once and at the same time crushed the Ptolemaic earth-centered view and supported the Copernican sun-centered view.

By February of 1610 *Sidereus Nuncius* was in print. The discovery of Jupiter’s four moons showed the incorrectness of the old doctrine that all heavenly motions were centered on the earth. This, coupled with the fact that moons could orbit round an object other than the earth, the irregularities of the moon, the nova of six years previous, all served to discredit the infallibility of Aristotle and Ptolemy.

NCRAL 2010 MARKETING TOOLS

Lee Green and John Werner worked together to produce a 1/12th page advertisement to be included in an upcoming issue of *The Reflector*, the Astronomical League’s national publication. John has also developed an informational flier. Dave Osenga worked with Bianco Design Studio to develop not only the new club logo, but a special rendition of that logo for the NCRAL 2010 meeting. Both images are shown below. Lee continues to work on the club’s www.ncral2010.org website along with a video trailer. A draft version of the video can be downloaded and viewed on the NCRAL 2010 website. Thanks and a tip o’ the hat to these gentlemen for their untiring efforts.



TCAA Treasurer's Report – October 2009

OPERATING FUND BALANCE – September 30, 2009 - \$ 2,559.02

Income

Charles Mosier (senior dues via PayPal) - \$ 26.00

Wudtke family (dues) - \$ 40.00

Expenses

LYB Inc. (Oct. Observer & A.L. Postage) - \$ 36.04

Paypal Fees - \$ 0.87

OPERATING FUND BALANCE – October 31, 2009 - \$ 2,588.11

OBSERVATORY FUND BALANCE – September 30, 2009 - \$ 2,194.29

Income

3rd Quarter Interest - \$ 0.69

Expenses

None - \$ 0.00

OBSERVATORY FUND BALANCE – October 31, 2009 - \$ 2,194.98

TOTAL TCAA FUNDS – October 31, 2009 - \$ 4,783.09

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

- ☆ November 5—Lee speaks to the Popular Astronomy Club in Rock Island about NCRAL
- ☆ November 10—Board and NCRAL 2010 Planning Team meetins
- ☆ November 12—Carl talks to the Champaign Urbana Astronomy Club at Staerkel Planetarium
- ☆ November 14—Members-only observing session at SGNC

WELCOME NEW MEMBERS

John Scherr
Tony Cellini
Nancy Fewkes
George Weiland
Charles Mosier

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

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

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