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ANNUAL BUSINESS MEETING AND BANQUET FEBRUARY 7TH

The 49th Annual Meeting of the TCAA will take place on Saturday, February 7th, at ISU's Turner Hall, room 104 – the same location we have used for the past few years. Please put this event in your schedule now and make reservations should you wish to attend.

The event will start with a social beginning at 6:00 p.m., and the banquet will begin at 6:30 p.m. Our business meeting - at which we will elect officers, vote on an amendment to the Bylaws (see following article), and present awards - will start at about 7:15 p.m. You need not participate in the banquet in order to attend the business meeting. Starting at about 8 p.m. we will hear from our keynote speaker Dr. Linda French of Illinois Wesleyan University. The event will conclude around 9 p.m.



Dr. French was trained as a planetary scientist, and currently teaches astronomy, physics, astrophysics, and expository writing at Illinois Wesleyan University. Her current research interests include studying the physical properties of distant asteroids and comets. She is a frequent guest observer at observatories in Arizona, Chile, and Hawaii. She received an A. B. in Astronomy from Indiana University, and M.S. and Ph.D. in Planetary Astronomy from Cornell University. Her talk is titled *What's in a Name? On Asteroids, Comets, and Dwarf Planets* and the abstract reads as follows: Everyone has an intuitive concept of what constitutes a planet. But what one person calls a planet, another might call a "dwarf planet." This ambiguity extends to asteroids (or minor planets), comets, and moons, and it even extends back into the history of the term "planet." We will look at the use of the term, and at examples of borderline objects from the speaker's own research.

As in years past, the ISU Catering Club will serve the meal. Jean Memken has arranged the menu (and provided comments) as follows:

- Parmesan Chicken Breasts
- Stuffed Baked Pork Loin
- Vegetable Lasagna
- Green Beans Almondine
- Caesar Salad
- Fruit tray with dip
- Fresh Baked Rolls (they will raise yeast dough and cook fresh!)
- Cake
- Frozen Punch (they promise not to spill it! :-)
- Party Nuts

The cost of the banquet this year is the same as last – \$15 for adults and \$10 for children 12 and under – and reservations are required. Please get your reservation to Jean Memken as soon as possible (her e-mail is jmemken@ilstu.edu, her phone number is 825-5326). You will then pay at the banquet.

It should be a very nice dinner and the program promises to be a lot of fun. The TCAA is currently looking for door prizes that might be distributed at the meeting. Should anyone have anything they are willing to contribute to this cause, please do bring your donation with you to the meeting.

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

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MINUTES OF JANUARY 27TH BOARD MEETING

President Lee Green called the Board members and officers to order at 6:35 p.m. in the offices of LYB, Inc. Also in attendance were John Werner, Dan Miller, Duane Yockey, Dave Osenga and Carl Wenning. William Carney was unable to attend. The minutes from the Board meeting on 11/25/08 were approved. Duane reported January newsletter expenses and income, but indicated no other activity. Lee noted that progress is being made with the TCAA.US web site, and that when one searches "TCAA" on at least two web search engines, we now come up first in one and fourth in another. He also noted that PayPal will soon be instituted on the club's new web site, and will also allow for online registration of new members and 2010 NCRAL attendees, as well as dues payments and contributions. The following items of old business were then addressed:

- Preparations for the Annual Meeting are ongoing. A draft program was reviewed and approved with two corrections: (1) a question of whether there will be door prizes (Carl will solicit some from the membership) and (2) updates in relation to awards Duane has received from the AL to date. Members have completed Messier, Southern Sky Binocular, Urban Observing, Double Star, and Outreach clubs, but their certificates and/or pins from the Astronomical League have yet to arrive.
- Carl will confirm Annual Meeting reservation information with Jean Memken; it was suggested that reservations be made with Jean and copied to Duane. Carl will ask Jean about having refreshments provided during the social section of the meeting running from 6:00 to 6:30 p.m. The anticipated cost of the banquet meal is approximately \$15/adult and \$10/child.
- The slate of candidates was finalized for the next Board pending any additional nominations from the floor at the Annual Meeting. The following consented to running for the 2009-2010 Board of Directors: Carl Wenning, Dave Osenga, Brian Barling, Dan Miller, and Lee Green.
- The Board passed a standing rule at this point to assist with the selection of this year's award recipients: "All Board members and appointed officers present at the meeting to determine who will receive various club awards (e.g., Schuette, Kieviet, Miller) shall have a voice and a vote." Six nominations were reviewed for three club awards, and four individuals selected to receive them at this year's Annual Meeting. These names will be sequestered until the Annual Meeting. Carl will see to it that the associated plaques are updated in time for the meeting. The group also approved Night Sky Network Award Pins for member contributions: Dan, Carl, and Lee. These will likely be awarded at a later date.
- The Board tentatively approved a new club logo. Offers from two graphic artists were reviewed prior to this decision. It was agreed to "go" with the draft design provided by Emily Henard at an anticipated cost of \$175. (The other proposal for both a TCAA and NCRAL logo was quoted at \$850.) Dave will contact Emily and ask that the logo be updated in the following ways: (1) replace the "toy" telescope with a truss design Dobsonian, (2) better "vertical" spacing around the name TCAA, (3) replace the "Established 1960" with a more readable font, and (4) provide a second version with "NCRAL 2010" replacing the "Established 1960." Emily will produce color and black & white versions of the logo. It is hoped that the revised logo will be available at the Annual Meeting for the membership to approve if so inclined.
- Sign up sheets for the MOOS, POS, and 2009 IYA "Classroom for Kids" sessions were then passed around and various individuals subscribed their names to various dates. These sign up sheets will also be brought to the Annual Meeting.
- Duane noted that he has signed the contract between the TCAA and Holiday Inn for the 2010 NCRAL meeting. More details to be provided in the follow-up NCRAL Planning meeting.

The following items of new business were then addressed:

- Carl read a "hilarious" letter from Sweden promoting amateur telescopes designed to show the surface details of stars from "an unknown father of the pop artist Britney Spears."
- It was agreed that the club's formal address should be that of its registered agent: Duane Yockey, 508 Normal Avenue, Normal, IL 61761.
- \$150 was set aside for William Carney to complete his photography project relating to the club's history.
- The Board agreed to reimburse Carl for recent expenses related to reusable materials purchased for the Grove School presentation and the first "Classroom for Kids" program at Bloomington Public Library as part of 2009 IYA activities. \$12.33 was approved for Christmas tree bulbs and flashlights, and \$73.95 was approved for 10 refracting telescope kits. All materials for E/PO will be housed at SGO for future use. Funds for future such materials were tacitly approved "within reason" for other such events during 2009.
- A brief discussion was held about possibly hosting a 5-day, 4-night astronomy camp for youth using the new lodge at SGNC. The topic was put off for further discussion following the installation of the new Board. Similarly, it was agreed to put off discussion about TCAA participation in Astronomy Day and the residing of SGO for the next Board of Directors.
- A second standing rule was proposed and approved for the management of TCAA award plaques. "TCAA

(Continued on page 8)

MINUTES OF JANUARY 27TH NCRAL PLANNING MEETING

Chair Carl Wenning called the planning team to order at 8:09 p.m. Also in attendance were Lee Green, John Werner, Dan Miller, Duane Yockey, and Dave Osenga. William Carney, Michael Rogers, and Jean Memken were unable to attend. The following items were addressed:

- Duane noted that the contract with Holiday Inn has been signed with a 50-room block. The cost to the TCAA will not rise so long as we can fill 70% of the block.
- The Board had tentatively approved a new TCAA logo. This logo will be modified with “NCRAL 2010” replacing “Established 1960.” As noted in the Board minutes of this date, Dave has been authorized to move ahead with work by Emily Henard.
- Carl has been in contact with AL Sales rep Randy Thompson. It was noted that AL Sales might be part of NCRAL 2010, but only so long as one of the League’s officers will be attending. Carl will keep Randy informed about this meeting in the hope that someone might be able to bring items for sale.
- Following Jean’s e-mailed question to Carl, it was agreed that there would be no fee assessed for vendors. Vendors, however, would be asked to provide a door prize or two.
- Carl showed the updated draft program, and he was asked to make the following changes: (1) ask *Astronomy* magazines Mike Bakich to talk about “Astronomy Then and Now: 1960-2010” replacing Lee in this capacity; (2) move Dan’s talk “Itty Bitty Radio Telescope” to be one of the four solicited talks by amateur astronomers, (3) adjust the time slot for the “Astronomy Then and Now” talk in agreement with the secured speaker, and (4) move the afternoon break later in the day. Carl will see to these changes in the schedule and contact Mike Bakich about speaking.
- Carl has communicated with NCRAL president Gerry Kochen and noted that the “profits” from the conference per se need to go to the region; any additional non-meeting profits can go to the club.
- Carl has been in contact with Ray Watt of the Illinois Dark Sky Star Party in an effort to get TCAAers onto the program next September to: (1) deliver a 15-minute presentation about NCRAL 2010, and (2) talk about astronomical tourism in Chile (Duane and Carl). Ray expressed interest and will be getting back to us.
- John provided updates for the photo competition. He provided a set of updated astrophotography contest rules, a contest entry form, and ballots for a popular choice award. Lee will put these on the TCAA.US web site under the NCRAL 2010 section being developed.
- Lee noted that he is making progress with the TCAA.US web site, and that it will allow for online registration, etc.
- Carl reported that Jean will be checking with Linda Hall Library in Kansas City about a display for Milner Library.
- It was noted that several plan on attending the May 1-2 Cedar Rapids NCRAL meeting: Dan, Carl, John, and Duane.
- Duane noted that a budget subcommittee will form; Dave and Carl have agreed to assist.
- Duane noted that he will go to Normal Theater to see if they will run an astronomy-related classic the weekend of the 2010 NCRAL meeting.
- John agreed to help Dan with the tour planning.

The meeting was adjourned at 8:37 p.m.
Carl Wenning, Chair

BYLAWS AMENDMENT PROPOSED

The membership is hereby put on notice that an amendment to the TCAA’s Bylaws will be considered at the Annual Meeting on February 7th. Members present at the business meeting will debate and vote on the proposed amendment. The Board considered this amendment at its January 27th meeting following the October resignation of Terry Lee Wright from the Board of Directors. He could not be replaced because general membership meetings are currently being held but twice per year (summer picnic and Annual Meeting). Find below Article IV, Section 4 at its currently reads and as proposed:

Removal of Directors (current wording)

Any Director may be removed in accordance with ARTICLE XV of these Bylaws. In the event of removal of a Board member from office, a special election shall be held at the next general meeting of the membership for the purpose of replacing said Director.

Removal/Replacement of Directors (proposed wording)

Any Director may be removed from office in accordance with ARTICLE XV of these Bylaws. In the event of removal or resignation of any Board member, that Board member shall be replaced by an election with remaining Board members and officers serving as electors.

JANUARY EDUCATION AND PUBLIC OUTREACH

FEBRUARY SKY GUIDE

09	Penumbral lunar eclipse, 9 A.M.	
11	The Moon passes 6° south of Saturn, 2 P.M.	
12	Neptune is in conjunction with the Sun, 7 A.M.	
13	Mercury is at greatest western elongation (26°), 3 P.M.	
17	Mars passes 0.6° south of Jupiter, 4 A.M.	
	The Moon passes 0.04° north of Antares, 3 P.M.	
19	Venus reaches greatest brilliancy, 9 A.M.	
22	The Moon passes 1.1° north of Mercury, 4 P.M.	
	The Moon passes 0.7° north of Jupiter, 7 P.M.	
23	The Moon passes 1.7° north of Mars, 2 A.M.	
	Mercury passes 0.6° south of Jupiter, 9 P.M.	
25	Asteroid Ceres is at opposition, 8 A.M.	
27	The Moon passes 1.3° south of Venus, 5 P.M.	

Despite inclement weather conditions, the TCAA has been able to conduct a bit of E/PO during January. On January 9th, Lee Green and Carl Wenning gave a presentation about the moon to the 4th grade science club at Grove Elementary School in Normal. Students spent their time whiteboarding lunar phases, and using representations of the moon, earth, and sun (1" and 4" unbreakable Christmas tree bulbs, and a flashlight respectively) to work out how lunar phases originate. The students were amazed to see the separation of the earth and moon on this scale (10 feet). The 90-minute after school program under the auspices of Mr. Jeff Colledge concluded with a brief PPT presentation about the moon. Thirty-eight students were in attendance, and more than a dozen parents showed up near the end of the event to observe.

The BPL was the site of another E/PO event on Saturday, January 24th. Unfortunately, the event was not properly promoted due to a lack of proper communication between the club and the marketing department over the December holidays. Nonetheless, seven highly interested patrons attended the event, six adults and one child. Lee and Carl represented the TCAA and led activities with pinhole cameras and whiteboards, the assembly of telescopes from a kit, and an NSN presentation about telescopes. The event ran from 1:30 to 3:15 p.m.

The TCAA's adult education course *Exploring the Milky Way* started on Thursday, January 29th with 4 of 6 registered persons in attendance. *Exploring the Milky Way*, will be held on Thursdays from 7 to 9 p.m. at Heartland Community College and concluding with an optional observing session at SGNC on or shortly after February 19th.

JANUARY OBSERVERS LOG

Carl Wenning braved the relatively balmy 22-degree temperature to make additional telescopic observations of the 66% full moon on January 5th. He made six additional observations over the course of about 20 minutes bringing his AL Lunar Club total to 85. On January 8th, Carl – again braving the 22-degree temperature, turned his telescope to the 93% full moon and observed an additional 7 lunar objects. The session lasted just over 20 minutes bringing his overall AL Lunar Club total to 92.

Now here's one for the record books! William Carney courageously observed Comet Lulin (C/2007 N3) from the SGO on the morning of January 16th when the temperature was at *minus* 22°F! William reported via listserv that, "It's about 7-8th magnitude. Clearly visible in the 12-inch. Nice outer diffuse coma with brighter core. A slight hint of tail when out of focus." After viewing the comet, he also tried to search for some Herschel 400 objects for his observing program, but by the time he started these observations light clouds had started moving in and so he couldnt see much. William also reported that he went out the night previously for about an hour (under a relatively warm -10°F temperature) to look for several other comets, but had no luck. Later, William provided additional comments to *The OBSERVER* with regard to these observations.

"I had been wanting to get out and see Comet Lulin for some time. When I saw some of the pictures on the web, I could not pass up another opportunity. Unfortunately, the comet is only visible very early in the morning. With me working every day and being really busy I was not able to take a day off till recently. Wouldn't you know it the day I take off it was about -22°F with a wind chill of -45°F! I went out on Thursday night for a very short time to try to spot an asteroid, but it was too cold to take the time. Still, I set my alarm anyway for the next morning and got up at 4:00 AM. I put on several layers of clothes and got down to SGO about 4:30 AM. It was at least 45 minutes before the scope and computer were up and running. The computer does not like cold weather either and would not boot for some time. I had to go out to the car several times during this time with once my cheeks getting very dangerously cold. Still about 5:20 or so I was able to spot the comet, log it, and even use my new comet filter to enhance the view of the coma. I then warmed up again to try a few Herschel objects but gave up because of their lowness and some light clouds moving in at the time. I had also wanted to spot another close approach asteroid that morning but did not try. Well, spotting the comet in such cold weather was an accomplishment in itself. One thing to keep in mind is that inside a domed observatory you don't feel the wind unless the dome slot is pointed into it. So the wind chill was not a factor, just the cold. You do not get that advantage with a roll off observatory."

The latter part of the month was mostly cloudy, yet a few intrepid observers made it out. On January 22nd William was able to observe Comet 144P/Kushida shining at about magnitude 10.8 among the stars of Taurus. His observations that morning were notable. William wrote, "On 1-22 I observer three comets in less than one hour: C/2006 OF Broughton, 144P Kushida and C/2006 W3 Christensen. All had noticeable comas. I had never spotted three comets in one night before let alone in a hour span." He also noted that his asteroid observations have been hampered by weather and telescope problems.

On the evening of Friday, January 30th, Carl was able to add two more objects to his lunar club observations listing bringing his total to 94. The January MOOS was canceled due to partly cloudy skies and a temperature less than 10°F.

2009 PUBLIC SKY VIEWING SESSIONS

Throughout 2009 – the 400th anniversary of the invention of the telescope – we acknowledge the astronomical work of Galileo in our Public Observing Sessions. A typical public sky viewing session will include the following:

- *Lecture about the featured object.* This 20-30 minute 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 the 12-inch Sugar Grove Observatory telescope and other telescopes at ground level to observe the featured object and other wonders of the heavens.

One, and preferably two, coordinators are needed for all Saturday events as illustrated in the table below. Don't hesitate to volunteer to lead a public sky viewing session if you are qualified to do so.

Date	Times	Sunset	Topic	Coordinator(s)
March 28	8:00 PM ~ 10:00 PM	7:17 PM CDT	The Great Nebula of Orion	
April 25	8:30 PM ~ 10:30 PM	7:46 PM CDT	The Rings of Saturn	
May 23	9:00 PM ~ 11:00 PM	8:13 PM CDT	Galileo's Universe	
June 27	9:00 PM ~ 11:00 PM	8:31 PM CDT	Craters of the Moon	
July 25	9:00 PM ~ 11:00 PM	8:18 PM CDT	Galileo's Telescope	
August 22	8:30 PM ~ 10:30 PM	7:43 PM CDT	Jupiter and Neptune	
September 19	7:30 PM ~ 9:30 PM	6:58 PM CDT	Exploring the Milky Way	
October 17	7:00 PM ~ 9:00 PM	6:13 PM CDT	The Pleiades Star Cluster	

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 updated 2009 public brochure for these sessions can be downloaded from the club's web site: www.twincityamateurastronomers.org

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)	Date	Coordinator(s)
		July 18	
February 21		August 15	
March 21		September 12	
April 18		October 10	
May 16		November 14	
June 20		December 19 (Saturnalia)	

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 months listing, be certain to forward your observing totals to Carl Wenning before the end of the month.

AL Award	Brian Barling	William Carney	Lee Green	David Hahn	Dave Osenga	Carl Wenning	Sandy Wolford	Duane Yockey
S. Skies Binocular 50						50*		50*
S. Sky Telescope 50						52*		50*
Telescope Messier Prov70/Hon110	(110)	(110)	87*	101*	48	(110)	(110)	31
Binocular Messier 50		(100)	42			71*		16
Herschel I Club 400	221	391	400*			400*	(400)	
Urban Club 100		(100)	89			100*		
Comet Club Silver12/Gold30		(23)						
Double Star Club 100	17		7			100*	(100)	
Visual Planetary Nebula Club Basic60/Advanced110						37		
Globular Cluster Club 50						47		
Lunar Club 100	100*	(100)	87			94		
Lunar II Club 100		2						
Asteroid Club Reg25/Gold100		29*						
Outreach Award Basic10/Stellar60/Master160 hours					60+ hours* **	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 TCAA Annual Meeting on February 7th if available. Numbers in parentheses (#) indicate that award has been both earned and received.

Those who have completed the required observations and have properly documented them and sent their reports in a timely fashion to ALCOR Duane Yockey will be eligible to receive AL pins and/or certificates at the club's Annual Meeting on February 7, 2009.

SUNSPOT NUMBERS DOWN

For those of you hoping to do some solar observing, you might have noticed that the Sun has been quite inactive for the past two years. This has led to frustration for some would-be solar observers. Carl Wenning, for instance, purchased an H-alpha personal solar telescope (PST) during the summer of 2007 and has yet to use it successfully to observe the solar prominences that are often associated with sunspots and appear more frequently during sunspot maximum.

The month of December had a total of 28 spotless days, bringing the 2008 calendar year total to 266 spot-free days on the surface of the Sun. This makes it the least active solar year since 1900, and the longest solar minimum since solar cycle nine back in 1848. If this trend continues for just a few more months, the sun will match a period from the early 1800s called the Dalton Minimum, a period of extremely low sunspot count.

Sunspot count records have been kept since around 1610, shortly after the invention of the telescope. Between about 1645 and 1715 very few sunspots were seen on the Sun's surface. This period is called the Maunder Minimum. It coincided with a spell of prolonged cold weather often referred to as the "Little Ice Age". Solar scientists strongly suspect there is a link between the two events – but the exact mechanism remains elusive. Could the recent long, hard winter we have been experiencing be in some way related to the current prolonged sunspot-free interval? This is something to think about.

OPTIMIZING OBSERVATIONS OF DEEP SPACE OBJECTS I

By Carl J. Wenning

I now begin a short series of articles that can help observers improve their telescopic observations of deep space objects – nebulae, clusters, supernova remnants, and galaxies. During the next few months I want to address those factors that have greatly improved my own observing and added immeasurably to my enjoyment as an amateur astronomer. Yes, I greatly enjoy working with the general public, but nothing can beat a good night of observing that provides excellent views of the heavens. I restrict my comments to viewing deep space objects because, frankly, solar system objects require viewing conditions that can be quite a bit different. Nonetheless, many of the things I will mention during this series of articles definitely do apply to observations of planets, comets, asteroids, and such.

A number of factors determine the quality of one's telescopic views. The stability of the atmosphere (seeing), the transparency and darkness of the sky, filter use, dark adaptation, the size and quality of one's telescope (including the mount), and even the powers of one's telescope can adversely affect one's view of the heavens. If one is to optimize telescopic observations, then one needs to understand how these factors interact to produce the best (and worst) telescopic observations.

Telescopes have three “powers” – light-gathering, resolving, and magnifying. Bigger objectives, if well made, produce brighter and sharper images that can be viewed with the use of an eyepiece. The choice of an eyepiece can be critical in optimizing the view.

Perhaps the least understood of the powers of the telescope is magnifying power. I've been reflecting on this aspect of telescopes for several months now, and have resolved to cast some light on this particular power, and provide some implications for eyepiece selection.

Magnifying Power

The magnification of a telescope – the size of an object seen in an eyepiece compared to the size of that same object seen in the sky with an unaided eye – can be determined with a simple expression:

$$\text{Magnifying Power} = \text{EFL}_t \div \text{FL}_e$$

Because the effective focal length of a typical telescope (EFL_t) remains fixed (unless, say, one inserts a telecompressor or Barlow lens into the optical train to change the effective focal ratio of an instrument from $f/10$ to $f/6.3$ or from $f/8$ to $f/16$ respectively), one varies the magnification by using eyepieces of different focal lengths (FL_e). My $f/10$ configured CPC 11” telescope has a focal length of 2800mm . When used with an 18mm eyepiece, I get a magnifying power of $2800\text{mm} \div 18\text{mm} = 156\text{X}$; with the use of a 32mm eyepiece, I get a magnifying power of 88X . The shorter the focal length of the eyepiece, the higher the magnifying power it will provide.

Drawbacks of High Magnifying Power

Many people misunderstand magnifying power. They think “the more the better.” Not so. First and foremost increased magnification reduces image brightness. A telescopic image magnified 50X will appear $2,500$ times (50^2) dimmer than the image obtained with the unaided eye. Granted, this is offset somewhat by the light-gathering power of a telescope, but telescopes rarely provide increased image brightness. This is the province of some of the lower powered binoculars with large objective lenses. Higher magnifying powers also amplify the rate of motion of celestial objects through a field of view, and reduce the field of view making things harder to find. Higher powers also can negatively affect image quality as perceived by the eye as well. If a telescope mount is wobbly, any vibrations will be similarly magnified.

Exit Pupil

Before moving on to lowest and highest useful magnifications for a particular telescope-observer combination, I need to mention a bit about the exit pupil. The exit pupil is the diameter of the small disk of light emanating from an eyepiece. For optimal viewing at lower powers, an observer must place his or her eye at such a position that the eye's pupil is coincident with the eyepiece's exit pupil. If the diameter of one's fully dilated eye pupil is less than the telescope's exit pupil, the observer will see a vignetted image, wasting much of the light-gathering power of the telescope. (This effectively reduces the aperture of a telescope.)

The diameter of the exit pupil of the telescope is dependent on the aperture of the objective and the magnification, and they are related in the following manner:

$$\text{Eyepiece exit pupil diameter} = \text{Aperture} \div \text{Magnification}$$

As the equation shows, lower magnifications produce larger exit pupils, and higher magnifications produce smaller exit pupils. In order to obtain the best low-power views in a telescope, the exit pupil of the eyepiece-telescope combination must match the maximum pupil diameter of the observer's eye. Now, the pupil diameter of the typical adult human eye is mostly a function of age. Young adults on the order of 20 years of age will have a fully-dilated pupil diameter of as much as 7.5mm , whereas someone who is 70 years of age will have a dark-adapted pupil diameter on the order of 3mm . A simple formula relating average pupil diameter of the eye to the adult observer's age (≥ 20) is given as follows:

$$\text{Average pupil diameter} = (-0.09\text{mm/yr}) \times \text{Age} + 9.3\text{mm} \quad (\text{Age} \geq 20\text{yr})$$

Hence, in my case (56 years old) selecting a low power eyepiece-telescope combination that produces an exit pupil of greater than 4.2mm probably would not be advisable.

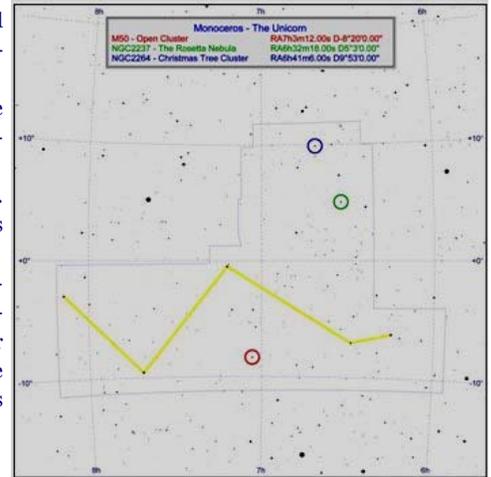
CONSTELLATION OF THE MONTH: MONOCEROS—THE UNICORN

Monoceros lies east of Orion and south of Gemini and Canis Minor and north of Canis Major. Monoceros is pictured as the famous single horned animal facing west towards Orion with its tail below the head of Hydra.

The unicorn is an elusive creature said to have the tail of a lion and the body and head of a horse with a single horn growing from its forehead. Unicorns were thought to have magical healing properties.

The stars of Monoceros are faint and none of the main stars are named. Monoceros is the 35th largest constellation covering 482 square degrees. It is the 52nd brightest constellation.

Located along the Milky Way, Monoceros contains a variety of open clusters and nebulae and few galaxies. Messier 50 is a bright open cluster containing 80 stars. The Rosetta Nebula is a large, but dim emission nebula four times the size of the full moon. Open cluster NGC2264 is also known as the Christmas Tree Cluster due to the shape of the member stars. This cluster lies in the middle of a particularly dense field of stars and nebulae.



MINUTES OF JANUARY 27TH BOARD MEETING (CONT.)

(Continued from page 2)

awards, when conferred, will include a certificate suitable for framing. The associated plaques will remain in the possession of the club.”

- Carl then proposed a Bylaws amendment for consideration by the membership at the Annual Meeting. “Any Director may be removed from office in accordance with ARTICLE XV of these Bylaws. In the event of removal or resignation of any Board member, that Board member shall be replaced by an election with remaining Board members and officers serving as electors.
- In last-minute announcements, the following were made: (1) Carl noted that the enrollment of the upcoming Adult Education course at HCC was up to 6, and that the class would be held in room WDC 1401 and running from 7-9 p.m. starting Thursday, January 29th; and (2) he then briefly pitched a trip to China for the July 22 total solar eclipse there. To date 4-5 TCAA members and friends are considering going.

The meeting was adjourned at 8:08 p.m.

Respectfully submitted,
Carl J. Wenning, Secretary

TCAA Treasurer's Report – January 2009

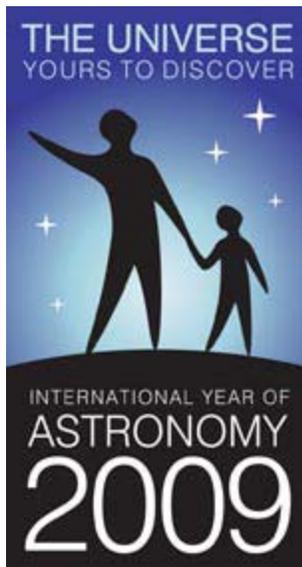
OPERATING FUND BALANCE – December 31, 2008 -	\$ 2,726.54
<u>Income</u>	
None -	\$ 0.00
<u>Expenses</u>	
LYB Inc. (January Observer) -	\$ 16.29
Carl Wenning (Library Program Exp.) -	\$ 86.28
OPERATING FUND BALANCE – January 31, 2009 -	\$ 2,623.97
<hr/>	
OBSERVATORY FUND BALANCE – December 31, 2008 -	\$ 2,118.90
<u>Income</u>	
Interest (Oct. – Dec.) -	\$ 0.84
<u>Expenses</u>	
None -	\$ 0.00
OBSERVATORY FUND BALANCE – January 31, 2009 -	\$ 2,119.74
<hr/>	
TOTAL TCAA FUNDS – January 31, 2009 -	\$ 4,743.71

Respectfully submitted,
L. Duane Yockey, Treasurer

Sugar Grove Observatory

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

Duane Yockey (renewed through 2008)
Michael Rogers (renewed through 2008)
William Carney (renewed through 2008)
Carl Wenning (renewed through 2008)
Brian Barling (renewed through 2008)
Christopher Franklin (renewed through 2008)
David Osenga (renewed through 2008)
Josh Lindsey (renewed through 2008)
Andrew Morrison (February 2008)
Dan Miller (renewed through 2008)
Lee Green (April 2007, renewed through 2008)



FEBRUARY TCAA EVENTS

Thursday, February 5—Class 2 Adult Education Program,
Heartland Community College

Saturday, February 7—Annual Meeting, 104 Turner Hall, ISU

Thursday, February 12—Class 3 Adult Education Program,
Heartland Community College

Thursday, February 19—Class 4 Adult Education Program,
SGNC

Saturday, February 21—Members-only Observing Session,
SGNC Dusk

Saturday, February 28—TCAA Classroom for Kids, “Our Solar
System,” BPL

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/