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## 2011-2012 TCAA BOARD OF DIRECTORS



At the March Board of Directors meeting at Illinois Wesleyan University, photographs were taken of the newly elected 2011-12 TCAA Board of Directors. Shown from left to right are Dan Miller, Tom Weiland (Vice President), Paul Pouliot, Dave Osenga (President), and Tony Cellini.

## MINUTES OF THE TCAA BOARD MEETING MAY 3, 2011

The TCAA Board meeting was held at the office of Duane Yockey on May 3, 2011. President Dave Osenga called the meeting to order at 6:34pm. In attendance were Dave, Tom Weiland, Tony Cellini, Duane Yockey, Paul Pouliot, Carl Wenning, John Werner, William Carney and Lee Green. Bob Finnigan arrived later. The minutes of the previous meeting were approved.

Dave had little executive news to report. Lee had nothing to report as Secretary or as Webmaster. Duane submitted the latest Treasurer's report and noted that fund balance was nearly \$1500 less than last year's levels and that the current Astronomical League dues are waiting payment. He provided the current equipment list to Lee who will incorporate that into the insurance proposal discussed below.

Duane also reported that he attended the NCRAL 2011 meeting in Green Bay and that a detailed report would appear in the next Observer. The Chicago Astronomical Society has offered to host NCRAL 2012 and perhaps the ALCON 2012 as well. This year's ALCON will be held at Bryce Canyon National Park on June 28.

We turned to old business and discussed the club's award plaques. A Lifelong Members plaque was discussed and Carl noted that while these help to document the history of the club they cost around \$100 to purchase. It was noted that only three lifelong members are living, Carl Wenning, Bob Finnigan and Sandy McNamara-Wolford. More interest was shown in having a replacement award to the G. Weldon Schuette Society, which is now full, to honor outstanding members. Possible names including the Distinguished Service Citation and the Distinguished Amateur Astronomers. Carl and Lee agreed to submit possible guidelines for a new award at the next Board meeting.

Discussing the recent current events, Tom noted that the recent ISU Family Science Day was a huge success with many people attending. He thanked Dan, Paul, Lee and Carl for their help. Lee noted that Carl, bringing his telescope and supply equipment from the ISU Physics Department, helped to make our presence so effective. An event at the Challenger Learning Center featuring Jim Simek from NASA's Glenn Research Center had moderate turnout.

Lee noted that our June POS had a conflict with another event at the Nature Center and that we had volunteered to hold our event in the corn crib. A group of Cub Scouts from Chenoa has requested that we hold an observing session that same day and Paul agreed to take the lead on this and William offered to assist. Lee reviewed some of the other event scheduled in the coming weeks and agreed to keep everyone informed about the schedule.

*(Continued on page 2)*

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 THE TCAA BOARD MEETING MAY 3, 2011 (CONT.)

(Continued from page 1)

Included in our upcoming events are more Members-Only Observing Sessions. The April session had 9 member attend an SGO orientation. The May session was cancelled due to clouds and will be rescheduled, but Carl noted that the two Odyssey 10" telescopes cleaned up well and that they had been recollimated and now had new bearings and Tel-Rad finders installed. The June session was discussed and it was agreed that the topic would cover training members on the use of the CGEM telescope, with each participant going through setup and alignment to become familiar with the process.

The new storage space that the Nature Center is planning was raised. William raised a concern about drainage that may need to be raised with the Nature Center.

Discussion turned to keyholder access to the observatory. While previous discussions called for tiered access to the building, it was noted that people need access for a variety of reasons. Lee reported that the group assigned this task had not formally met. The Board discussed a variety of issues on this topic. The consensus was that Board members and officers should possess keys and that money would not be the primary concern for distributing keys. We agreed that members could be trusted to limit their activities to those areas for which they are qualified and that policing of policies was not needed. Duane noted that he wanted keyholders to be identified in the Observer and Lee agreed to provide him the current list.

On a related subject, we discussed obtaining insurance for the observatory and its contents. Lee noted that a comprehensive list of equipment had not yet been compiled and that an accurate list is needed to obtain a reliable quote for the cost of insurance. It was verified that the Nature Center owned the building and that the TCAA would need to insure against casualty, fire and theft only on the content of the building; any insurance of the building itself would need to be obtained by the Nature Center. We discussed the amount of coverage given the remote location, the security measure we have already taken, the amounts of any deductibles as possible factors in the costs associated with such insurance. Lee and Tony agreed to help compile a list of serial numbers and pictures for an insurance application. William and Bob agreed to investigate the possible costs of insurance and to contact the Nature Center about our options to coordinate coverage.

Discussion turned to a proposal to upgrade a T1i DSLR camera donated to the club for use in astrophotography. A round of discussion ensued over the relative benefits of a full-spectrum vs. a band-limited upgrade. It was decided that, given the availability of other cameras and the marginal benefit to the club at large, that no club funds be used for the modification.

The club's social calendar was raised next. Noting that the summer picnic has always been an enjoyable time, we would like to have another such event this year. Several dates were discussed, including the MOOS dates, and several venues were considered. John agreed to organize the event

Tom will be contacting Astronomy Magazine regarding materials available as part of their "Discover the Universe" program which is intended to encourage members of astronomy clubs to organize star parties around the country and world. They have a "Star Party Action Kit" available that includes brochures, magazines, and premium booklets that explain the exciting world of astronomy to newcomers. They also can provide help with publicizing the events with their own network and assist with local media contacts. It is hoped that the materials might help to enhance our scheduled public events.

The next meeting of the Board is scheduled for July 5 with the following meeting scheduled for September 6.

The meeting was adjourned at 8:30pm.

Respectfully submitted,

Lee Green

Secretary

## JIMMY SIMEK TALKS AT CLC

NASA-Glenn Research Center technician Jimmy Simek spoke at the Challenger Learning Center on Thursday evening, April 28<sup>th</sup>. Jimmy, you might recall, was one of several guest speakers at the NCRAL 2010 conference hosted by the TCAA.

The audience was smallish – only about 25 – but attending were TCAAers Dan Miller, John and Joyce Werner, and Bob Finnigan. Making a last-minute appearances were Carl Wenning and Lee Green who had hoped to offer an after-talk viewing session, but the clouds interfered. Carl headed out with Jimmy after the talk for a well-deserved round of drinks at Destihl Restaurant adjacent to Jimmy's hotel.

# A TALE OF THREE CAMERAS By Lee Green

With all the fun we've been having at your new and improved Sugar Grove Observatory, I wanted to share some of our recent results.

We images M1, the Crab Nebula, using three cameras, Bob's STL-11000, my ST-10 and the club's QSI-583C. We used the same exposure times, the same optics and guide configuration and took sets of LRGB images for comparison. While we aimed at keeping all parameters the same, I deviated somewhat in my approaches during image processing to achieve pleasing images with similar exposures.

The three images shown all display the same area of the sky. The difference in image size is due to the difference in the cameras' pixel size. Larger pixels equate to smaller image scale. You see that the ST-11000 image is smaller because its pixels are 9 microns. My ST-10 has 6.8 micron pixels and its image is of medium size. And the QSI-8300 image is larger because its pixels are only 5.4 microns.

Chip size determines the field of view. Larger chip dimensions will cover a wider field of view, so images taken with the STL-11000 would encompass more of the sky than the other cameras. The QSI would show approximately 1/4 as much sky compared to the STL camera, and the ST-10 less still.

The sensitivity of the camera determines how much signal is generated from incident light. Coupled with the sensitivity, but not listed in the table, is the dark current, the signal generated by the electronics in the absence of any light. This dark current builds up over time and becomes the black threshold that must be surpassed by the target in order to be detectable.

Camera	Pixels	Pixel Size	Chip Size	Sensitivity	Filters
SBIG ST-10	3.2M	6.8 microns	14x10 mm	12 uv /e-	Monochrome
QSI-583C	8.3M	5.4 microns	17x13mm	23 uv /e-	Color
SBIG STL-11000	11M	9 microns	37x25mm	13 uv /e-	Monochrome
Next Gen.	16M	9 microns	36x36 mm	23 uv /e-	Monochrome

Figure 1 - QSI-8300C

5.4 micron pixel size



Figure 2 - ST-10

6.8 micron pixel size

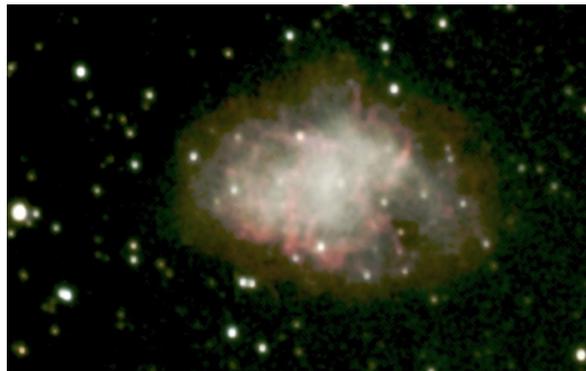


Figure 3 - STL-11000

9 micron pixel size



## APRIL OBSERVERS' LOG

### MAY SKY GUIDE

- |  |   |
|--|---|
| <b>01</b> The Moon passes 8° north of Mercury,<br>2 A.M.             |    |
| Mars passes 0.4° north of Jupiter,<br>6 A.M.                         |    |
| The Moon passes 6° north of Jupiter,<br>2 P.M.                       |    |
| The Moon passes 6° north of Mars,<br>3 P.M.                          |    |
| <b>06</b> ETA Aquarid meteor shower peaks                            |    |
| <b>07</b> Mercury is at greatest western elongation (27°),<br>2 P.M. |    |
| <b>10</b> Mercury passes 2° south of Jupiter,<br>6 P.M.              |    |
| <b>11</b> Venus passes 0.6° south of Jupiter,<br>4 A.M.              |  |
| <b>14</b> The Moon passes 8° south of Saturn,<br>10 A.M.             |  |
| <b>19</b> Mercury passes 2° south of Mars,<br>8 P.M.                 |  |
| <b>22</b> Venus passes 1.1° south of Mars,<br>10 A.M.                |  |
| <b>24</b> The Moon passes 6° north of Neptune,<br>1 P.M.             |  |
| <b>27</b> The Moon passes 6° north of Uranus,<br>8 A.M.              |  |
| <b>29</b> The Moon passes 6° north of Jupiter,<br>10 A.M.            |  |
| <b>30</b> The Moon passes 4° north of Mars,<br>3 P.M.                |  |
| The Moon passes 4° north of Venus,<br>11 P.M.                        |  |

We start this month's log with the complete report from Dave Osenga last month that was somehow truncated. Dave's full report was as follows, "Thursday, March 24, 2011 - My wife, Donna, and I went on our first cruise this week. One of my goals was to do some observing of the night sky while at sea. My first attempts were from the deck of the ship, but because of all the lights, my results were very disappointing. On the evening of Thursday, March 24, I sat on the small balcony outside of our cabin, with my new Celestron 15 X 70 binoculars, looking to the southeast. At first, I was very disoriented, confused, and disappointed that I could not make any sense of the star patterns I saw. We were at about 18 degrees north latitude and 80 degrees west longitude, between Jamaica and the south of the east end of Cuba.

Finally, I recognized Corvus and Crater, which helped me make sense of where I was looking. From there I easily identified Arcturus, Spica, the related constellations. What I was then able to figure out was that I was also seeing, for the very first time, the constellations of Crux, Centaurus, Vela, Antilia, part of Carina and maybe Musca. There were some things that really caught my attention and that helped me figure out what I was seeing. First, I saw several star clusters and nebula in patterns and brightness that just didn't fit with what I was used to seeing. These turned out to include the Eta Carina Nebula, Mel 101, also known as the southern Pleiades, and several NGC clusters and nebula.

What startled and excited me the most after that was to find NGC 5139, the Omega Centauri star cluster, the largest and brightest star cluster in the sky. I was totally unprepared for all of this and could hardly stop looking. This was an evening I will remember for a long time. I do hope it won't be the last time!"

While early April brought several sunny days, the nights were almost always overcast – with clouds forming at sunset and some gradual clearing by dawn. As a result, very little observing and photographing were done during the evening hours. The sky finally cleared somewhat on the evening of Monday, April 11, when Bob Finnigan and Lee Green spent the evening doing photography at SGNC. They left early due to the somewhat hazy sky and prospects for better skies the night following. The next evening, April 12, Lee and Bob were joined at SGNC by Carl Wenning, Tony Cellini, and Tom Weiland. Mark Cabaj also stopped in for an hour with about 15 students from his HCC astronomy class to make some naked-eye and binocular observations, and tour the SGO. Bob and Lee shot photographs of M63 and NGC 4565 during the early part of the evening. Tony worked on observations of binary stars given the presence of the first quarter moon. With assistance from Tony, Bob, and Lee, Carl was able to take his first astrophotos since 1986 when he used single frames of role film in a 5-inch Schmidt camera to photograph Halley's Comet. Everyone had a good time making fun of Carl's "fast" \$239 Celeron-based PC by Compaq, Carl being a dyed in the wool Mac fanatic. Carl enjoyed the ribbing. Despite this minor problem with speed, Carl was able to successfully image the moon, the Orion Nebula, the Christmas Tree cluster, and M82 a galaxy in Ursa Major.

Lee reported, "Bob and I were out several time in April. On April 1 and 6, we use the C-14 to image M81. We determine once and for all that using a piggyback guider with the C-14 resulted in poor guiding due the movement of the main mirror. After moving to the internal guider, we were able to get measurably improved images, although the scope's collimation was found to be difficult to achieve. On April 11<sup>th</sup>, we changed to the C-11 and confirmed that the alignment was accurate. In spite of the Moon and relatively poor conditions, we continued to work using the internal guider and got a few images of M81. On April 12<sup>th</sup>, we imaged NGC4565 and M63, getting good test images of both targets (attached). On April 13<sup>th</sup>, Bob took images of M109 and I took the CGEM [with the 11-inch telescope] out for visual observing of some open clusters."

Tony was out for a little bit of observing on Wednesday night, April 20<sup>th</sup>. He had with him his new refractor. He spent time conducting some star tests on the optics. Tony noted, "It was cold and I didn't really allow enough time for it [the telescope] to cool down, so I didn't really get a good feel for the quality or possible aberrations. I will have to try again when (if ever) it clears again and I have more time for the scope to equalize. Bob was also there imaging M-109, a very nice barred spiral in UMa, with the C-11 HD and getting good results. He was still there when I left around 10:30pm and was going to try moving to M-97 if the skies stayed clear."

## 2011 POS SCHEDULE AND COORDINATORS

The 2011 POS schedule is as follows:

- ☆ June 4: Death of Stars: Planetary Nebulae (4 day old moon) Coordinator: *Lee*
- ☆ July 9: Galactic Travelers: Globular Clusters (7 day old moon) Coordinator: *Carl Wenning*
- ☆ August 6: Small Bodies – Large Impacts (9 day old moon) Coordinator: *Dave Osenga*
- ☆ September 3: Phases of the Moon (7 day old moon) Coordinator: *Carl Wenning*
- ☆ October 1: Jupiter's Moons (4 day old moon) Coordinator: *Tom Weiland*

## RECENT AND UPCOMING E/PO EVENTS

The April 9<sup>th</sup> POS came off without a hitch. According to Lee Green, "We had a good turnout on this warm, cloudless day. Several of us arrived early so we could discuss keyholder issues, but before we got very far into that, people started arriving for the event and we talked with them. As the sun set, more people arrived and we had 30 people for the talk. Paul Pouliot gave a detailed and interesting discussion about how stars formed from giant clouds of interstellar gas and Dave Osenga conducted the sky tour using a laser pointer. We had 8 telescopes set up and viewed a wide variety of celestial objects. Among the 12 members were Bob, Dave, Duane, John, Larry and Nancy, Lee, Paul, Tony, William, Josh and Melissa. Thanks all for making our April Public Observing session such a success!"

Lee also reported via listserv a Palm Sunday event, "The Illinois State University Center for Mathematics, Science and Technology hosted Family Science Day on April 17, 2011. This event brought together the community's education and outreach organizations in one venue. The TCAA had a sponsored a booth at the event and had three offerings, a desktop telescope, a spectroscope and a solar telescope. The desktop telescope consisted of a light source and two lenses that collected and magnified the image. The source had a cross pattern with an arrow pointing right and a dot on top. When the image was viewed through the lenses, the image was upside down and backwards and magnified. The spectroscope effect was demonstrated using a diffraction grating that revealed rainbows from the many white ceiling lights. When viewing gas emission tubes, only certain colors were visible. Young kids, especially, were excited to see the pretty rainbows. Carl brought and manned (with the assistance of Tom Wieland) his CPC 11-inch telescope with a solar filter that let people look at the Sun and sunspots. Carl, Tom, Dan Miller, Paul Pouliot, Lee Green, and Duane Yockey were present for the event and shared our lessons with a steady stream of people throughout the afternoon event. We interacted with hundreds of people and shared our love of astronomy and its allied sciences with all. Thanks guys for helping to make this our biggest and most successful event of the year!" According to the event's host, some 1,400 people were in attendance. More than 50 groups worked to make this event successful. The sponsors hope to make this an annual event.

The overcast skies and rain continued throughout much of April with more than 6 inches of rain falling in McLean County. Carl had intended to provide an observing session for a budding astronomy club at Tremont High School on the evening of April 29<sup>th</sup>, but this event had to be cancelled. The telescope class intended for the next night, April 30<sup>th</sup>, and during the MOOS, was also cancelled.

Looking ahead (so we don't forget about them), the TCAA has scheduled or has been asked to participate in or present the following events now through the first week of May:

- ☆ May 6 (Fri., 8:00 p.m.) Marty Morris' 4<sup>th</sup> grade class at Weldon Springs SRA. Lecture with observing to follow. Coordinator: *Carl* with assistance of *Lee* and *Paul*
- ☆ May 7 (Sat., 9:40 a.m.) Space Day at CLC, The TCAA has been asked to present a 15-20 minute talk about telescopes, astronomy, space exploration, etc. for a class of up to 24 enrollees. Coordinator: *Carl*
- ☆ May 7 (Sat., 8:00 p.m.) May POS – Saturn's Rings – Coordinator: *Carl*
- ☆ May 20 (Fri., 9:00 a.m.-1:00 p.m.) Olympia South Elementary field trip to SGNC – Coordinator: *Lee*
- ☆ June 4 (Sat., 8:30 p.m.): Death of Stars: Planetary Nebulae (4 day old moon) Coordinator: *Lee*

## TELESCOPE TRAINING SESSION FOR CLUB MEMBERS POSTPONED

The one-session, telescope short course for TCAA members slated for Saturday, April 30, has been postponed due to an overcast sky. The two 10-1-inch telescopes have been repaired, cleaned, painted, and laser collimated. Both of these telescopes are on indefinite loan from the ISU Planetarium. Two of the club's Telrad finders, taken from dysfunctional club telescopes and provided by property manager William Carney, have been used to replace the wobbly 6x30 finders currently mounted on these telescopes. Watch the TCAA listserv for announcements about the future availability of this course.



## SGO KEYHOLDER TRAINING CONDUCTED

Nine TCAAers were present for the Keyholder training on Saturday, April 2<sup>nd</sup>. Providing the training were Lee Green and Bob Finnigan. Assisting were William Carney and Tony Cellini. Receiving the orientation were Brian Barling, Larry Leetzow, Dave Osenga, Carl Wenning, and Josh Lindsey.

The session began at 7:00 p.m. with Lee and Bob providing an orientation to the CGE Pro mount, as well as to telescopic and photographic equipment, and an overview of image gathering and processing using Maxim 5 software. Note was made about the need for proper balancing. Etc. It was generally agreed that a considerable amount of one-on-one training would be required to get astrophotographers up to speed. It was noted that club members should learning the basics of astrophotography using the CGEM telescope mount and 11-inch astrograph telescope by Celestron before moving on to work with the telescopes mounted under the SGO dome.

The program run for approximately 90 minutes. As SGNC liaison and frequent E/PO presenter, Carl was given a key so that could access the observatory on an as-needed basis for accessing such things as the projection screen. At this point in time there are now five keyholders: Bob, Lee, William, Tony, and Carl.

## TCAAer POSSIBLY DISCOVERS TWO ASTEROIDS

On April 1<sup>st</sup>, Carl Wenning might just well have discovered two NEO (near-earth orbiting) asteroids during a workshop providing training with the use of Astrometrica software (<http://www.astrometrica.at/>). Really! The two hitherto unobserved NEO asteroids – possibly in orbit around one another – were noted moving in narrowly separated parallel paths in a field where another asteroid was being studied. Carl discovered the presence of the 17.1 and 17.5 magnitude asteroids using a “blink comparator” to examine a star field photographed with the 32-inch reflector at Astronomical Research Observatory located about 12 miles east of Charleston, IL.

At the time, Carl was being personally tutored by Robert (Bob) Holmes, a NASA astronomer who directs the Astronomical Research Institute (<http://ari.home.mchsi.com/>) that has partnered recently with the Eastern Illinois University Physics Department. Robert is now working on finishing a 50-inch telescope that should be installed later this year. Due to the proximity of ARI, the TCAA might want to schedule a field trip some time to see how Robert captures 2,000 to 6,000 images per night in search of near-Earth orbiting objects.

## NCRAL 2011

By Duane Yockey

The 65<sup>th</sup> annual convention of the North Central Region of the Astronomical League was held April 29-30 in Green Bay, Wisconsin. It was sponsored by the Neville Public Museum Astronomical Society. As ALCor of the Twin Cities Amateur Astronomers, Inc., I represented our club as a voting member. There were about 60 attendees representing 14 clubs. In comparison, 19 clubs were represented last year.

The Friday evening previous to the formal convention was reserved for touring the Parmentier Observatory, the Kocken Workshop (with a large array of antique telescopes) and an astro-sketching workshop. It also gave members time to get acquainted and socialize.

The first speaker Saturday morning was Jeremy Perez, who gave an in depth presentation on “Astronomical Sketching”. He went into materials used, techniques, various methods and the benefits of sketching to make optical observing more fulfilling.

Matt Hissem gave a talk on “Mercury: NASA’s Early Days”. He showed pictures of the Mercury spacecraft program, including design, development and missions. He went into each astronaut’s duties in depth. A highlight was a full size Mercury capsule that we could view and even sit in (astronauts do not have claustrophobia!).

Paul Fjeld gave an excellent program on his time as the main artist of the NASA space program. He started when he was only 16 years old and even though he has retired, he is still being asked by the astronauts to design their patches for future missions. His photos and sketches of the astronaut’s views from space were quite stunning.

Russ Durke gave a program on “Hunting Binary Asteroids”. He is doing research on this as an amateur from his back yard observatory in the city of Minneapolis!!! He went into some of the technical aspects of his photometric techniques using two C-14 scopes and several computer programs. He has helped discover over a dozen binary asteroids so far using photometric methods, and has received grants from the Planetary Society to help fund his efforts.

Anthony Kroes spoke on the “Puckett Observatory Supernova Search”. Many amateur astronomers around the world are involved in searching for supernova, and he went into detail about the methods used. They are looking for additional volunteers (who have a computer, an internet connection and some available time).

During the NCRAL business meeting, Rebecca Setzer was elected as the new Chairperson and Charlotte Dupree was elected as the new Vice Chairperson. They will both serve two year terms. Future NCRAL conventions were discussed. NCRAL 2012 is to be hosted by the Chicago Astronomical Society. They were supposed to be present to make a presentation, but were not there. It was mentioned that they have also asked to be the host club for ALCON 2012 and want to do NCRAL 2012 concurrently. It was further discussed that they do not have a firm date (maybe the end of June) or a location. There is some concern about next year. NCRAL 2013 will be hosted by the Rochester Astronomy Club, and NCRAL 2014 will be hosted by the Northern Cross Science Foundation.

The keynote speaker for the evening banquet was Duane Clausen, who discussed “Aurora Astrophotography”. He talked about his techniques and showed lots of beautiful pictures of aurora he had taken in the area, but lamented about the current solar minimum. Things are starting to pick up again. The Regional Award was given, but the recipient was not in attendance. After all the prizes were awarded, the door prizes given out and the host club thanked, the NCRAL convention was adjourned until next year.



## TCAA Treasurer's Report – April 2011

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OPERATING FUND BALANCE – March 31, 2011 - \$ 1,855.16 \*

Income

Randy Gleason (Dues) - \$ 40.00

Expenses

LYB Inc. (Observer copies & postage) - \$ 38.56

Grinnell Mutual (Liab. insurance) - \$ 144.00

Erin Estabrook (newsletter supplies) - \$ 6.78

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OPERATING FUND BALANCE – April 30, 2011 - \$ 1,705.82

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OBSERVATORY FUND BALANCE – March 31, 2011 - \$ 2,242.81

Income

Donation (James Ryan) - \$ 10.00

Interest (1<sup>st</sup> quarter) - \$ 0.52 \*

Expenses

\* None! - \$ 0.00

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OBSERVATORY FUND BALANCE – April 30, 2011 - \$ 2,253.33

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TOTAL TCAA FUNDS – April 30, 2011 - \$ 3,959.15

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Respectfully submitted,  
L. Duane Yockey, Treasurer

### CONSTELLATION OF THE MONTH: LEO MINOR—THE SMALL LION

Leo Minor is a small, dim constellation above Leo and below Ursa Major. The constellation was described by Johannes Hevelius the 17<sup>th</sup> century.

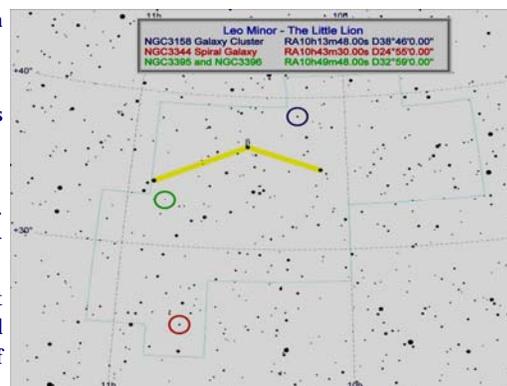
There is no mythology associated with Leo Minor.

Astronomically, Leo Minor is the 64<sup>th</sup> largest constellation covering 232 square degrees and is the 75<sup>th</sup> brightest. The center of Leo Minor reaches opposition on February 23.

There are no named stars in Leo Minor.

Two stars, R-Leonis Minorid and S-Leonis Minois are Long Period Variable (LPV) stars. These LPVs are Mira-type variable after the famous star Mira in Leo Major. Sigma Leonis Majoris is a close binary star system with components that are yellow and blue.

Among the deep sky objects is NGC3158 which is near the center of a tight group of eight galaxies. NGC3344 is a relatively bright spiral galaxy. Two faint galaxies, NGC3395 and NGC3396 are interacting at their edges and the pair has been likened to a butterfly because of their shape.



## 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](mailto:TCAA-subscribe@yahogroups.com). Unsubscribing is just as easy. To unsubscribe, just send a blank email to [TCAA-unsubscribe@yahogroups.com](mailto: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](http://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.

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### The OBSERVER

Newsletter of the TCAA, Inc.

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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**