

The OBSERVER

The Newsletter of the Twin City Amateur Astronomers, Inc.

November 2002 Volume 27, Number 11



Club Notes —Sandy McNamara

GENERAL MEETINGS are held the second Monday of each month, 7 PM, at the ISU planetarium. The next meeting is scheduled for Nov 11. Planetarium director Tom Willmitch will be presenting a FREE presentation of the current show.

SGO UPDATE
- The 12-in LX200GPS telescope at Sugar Grove Observatory

has been paid off finally and most of the keyholders have been oriented on how to operate it. Since we have a nice place to keep it now, it was decided at the last BOD meeting to restrict loans of the 16-in so as to make it available full time at SGO for member use. Special requests

for short time loans (to attend a star party, for instance) will be honored. The SGO building is open whenever a keyholder is present to supervise operations (at most POS and MOOS or by request/invitation). The Sugar Grove Nature Center grounds

are **always** available to any TCAA member wishing to observe from a safe dark-sky site.

MOOS/POS - The next MOOS (Member Only Observing Session) is scheduled for

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Free Planetarium Show!!
See Club Notes for details

TCAA Calendar

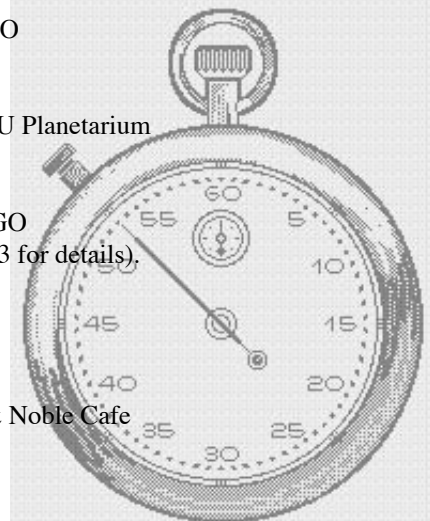
Saturday, 9 November, 2002, 6:00-8:00 PM, SGO
Public Observing Session.

Monday, 11 November, 2002, 7:00-9:00 PM, ISU Planetarium
TCAA Meeting, with free planetarium show!!

Tuesday, 12 November, 2002, 5:30-7:30 PM, SGO
Brigham Elementary Observing Session (see p. 3 for details).

Saturday, 30 November, 2002, Dusk-??, SGO
Members-Only Observing Session.

Monday, 2 December, 2002, 7:30 PM, Barnes & Noble Cafe
TCAA Reading Group.



The Observer

The Newsletter of the TCAA, Inc.

The Observer is a monthly publication of the Twin City Amateur Astronomers, Inc., a non-profit organization of amateur astronomers interested in studying astronomy and sharing their hobby with the public.

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Articles, ads, etc., are due by the last weekend of each month. Items may be e-mailed to: mprogers@mac.com, or jmemken@ilstu.edu

Dues

\$25.00 per household, per year
\$15.00 for members over 60
\$12.00 for newsletter only
\$ 1.25 for a single newsletter copy

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Saturday, Nov 30. Darkness comes early now (sunset 4:33 PM, astronomical twilight 6:08 PM) so it is possible to get several hours of observing and still be home before the 10 o'clock news starts. POSs (Public Observing Programs) are scheduled for Saturday, Nov 9 and Saturday, Dec 7 from 6 to 8 PM. Member support at these is always needed. Now is also the time of year that the TCAA is getting numerous requests for presentations from school and scout groups, both for day-time and evening time slots. Schools in particular are having financial problems this year and are utilizing the resources of organizations such as the TCAA as a substitute for more expensive field trips. If you are able to help in ANY way with these (no experience necessary!), contact any board member.

TCAARG - The TCAA Reading Group forum, temporarily being utilized as a beginning astronomy class for interested TCAA members is scheduled for the first Monday of each month at Barnes & Noble bookstore beginning at 7:30 PM. This group has been having poor attendance. If you have any ideas for this time slot, either as a rejuvenated book discussion group or other interest, you are invited to suggest them at any TCAA meeting or by private communication to any member of the board of directors.

The TCAA Board of Directors met in September; minutes of the meeting appear elsewhere in this newsletter. The primary topics of discussion revolved around arranging TCAA activities for the rest of the year and finances.

SPEAKER NEEDED FOR FEBRUARY BANQUET - We need to start looking for someone to present the keynote speech at the February banquet; arrangements with this person will need to be completed by Jan. If anyone has ANY suggestions OR knows of a contact person who might be able to introduce us to a possible speaker, please contact any board member as soon

as possible. There is a small honorarium associated with this talk and all expenses will be reimbursed.

VOLUNTEERS NEEDED TO SERVE ON NEXT YEAR'S BOARD OF DIRECTORS - According to our bylaws and in accordance with state of Illinois regulations, the TCAA is governed by a board of 5 directors elected annually at the February banquet meeting. Several current members of the TCAA board of directors have already served at least two consecutive terms (including myself) and need to take a sabbatical. Any member in good standing is eligible to serve as on the five-person board. You do not, I repeat, NOT need to have expertise in any area of astronomy (although an interest is helpful). All that is needed is a willingness to make decisions that effect how our organization is operated. The amount of time involved is minimal. This is your chance to ensure that the TCAA continues to develop in a direction that not only meets the needs and wants of our members but also satisfies our goal of continuing science education to the general community. If you would be willing to have your name placed on the ballot please contact any director.

INCREASE IN MEMBERSHIP DUES
A motion was passed at the last board of director meeting to request an increase in membership dues. Formal vote on this will be presented at the February banquet special yearly meeting. The TCAA has had no increase in membership dues for over 10 years despite rapidly rising costs of operation. The suggested increases will be \$15 for family membership (from \$25 to \$40), \$10 for seniors & students (from \$15 to \$25), and \$13 for newsletter only (from \$12 to \$25). The keyholder fee (\$10 initial and \$5 yearly in addition to regular membership dues) was left as it is. These increases are not out of line

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with what other astronomy groups are using and are little more than the cost of an evening's meal for the family at many of the local restaurants

Few members realize what it costs the TCAA to offer your membership benefits and also fulfill our chartered goal of educational outreach. With an average number of 75 members, the cost (and savings) per member breaks down as follows.

1) Newsletter Costs - this is our most expensive benefit. The Observer costs approximately \$14.40/year for each person it is mailed to (12 pages at \$.05/page to copy & collate + \$.60 postage X 12 issues). Current subscription-only fees do not even cover this cost. Currently a private individual is donating much of this cost but this needs to be addressed.

2) Abrams Planetarium subscription cost the TCAA \$211 last year. This is about \$2.80 /member; if you subscribed individually, the cost would be \$10 /yr.

3) Astronomical League Membership with its attendant benefits cost the TCAA \$244 last year. This is about \$3.25 /member; if you join the AL as an individual, the cost is \$25/yr.

4) Liability Insurance costs \$150/yr or approx \$2 /member. This insurance is *required* for the TCAA to sponsor any activity anywhere but on a member's private property (where their personal insurance would be expected to be in effect)

5) Observatory Expenses. Most of our costs for building and maintaining SGO have been donated by private individuals. Although the Sugar Grove Nature Center has not yet presented us with a bill for electricity, they are within their rights to do so at any time per our agreement with them. We need to be prepared for routine maintenance items on the building as well as possible corrective construction on the pier. In addition, if we are to use the

facility to augment our educational services as well as increase member usage, we are looking at possible costs to install phone lines for Internet support of the computer and telescope there.

6) Loaner Telescope Expenses. Our loaner telescopes are in need of new eye-pieces and entry level sky atlases to use with them. Our current budget has not allowed this, but purchase of the items would greatly increase the usability of these telescopes.

7) Educational Support Expenses. The TCAA is chartered as a nonprofit educational organization. Part of our duty is to provide educational programs to schools and the community as a whole to the best of our abilities. Aside from the POS, last year the TCAA gave over 20 presentations to various school, scout, and church organizations. The equipment to give these presentations (projection equipment, computers, handouts or other visual aids, etc) is being borrowed from various individuals each time we need them. It would be nice if the TCAA could provide minimal support of both equipment and reference materials to all members who wish to assist in various presentations.

If you've been keeping track, you will notice that your benefits are worth much more than what you pay in TCAA dues even at the higher suggested dues level (and I haven't even touched other available benefits such as reduced magazine subscriptions, loaner telescopes, and the lifelong friendships you can make). In addition, please remember that the support you give with your yearly membership dues payment is being used to promote general science (and astronomy) education to as many children and adults as our resources permit. In our modern society, the skills necessary to understand this type of learning and technology is essential to the success of both children and adults.

Observing Session

— Michael P. Rogers

THE TCAA has hosted several observing sessions for area youth groups in the last two weeks. If you have missed out on the joy of hearing children gasp with amazement and awe when you show them some celestial wonder, then fear not: we have yet *another* observing session coming up in the near future.

The Brigham Elementary School 5th grade class will be gathering at the Sugar Grove Observatory, on the 12th of November, from 5:30 - 7:30 PM. If the weather cooperates, we might have 50 students plus parents and siblings, so the more TCAAers out there, the better! If you have a telescope, great: if not, you can help with crowd control, or just serve as resident expert.

If you are interested in helping out, please send a message to the TCAA mail list., or e-mail yours truly at mprogers@mac.com.

TCAA Members:

Please accept a donation to the Observatory Fund in the name of my mother and TCAA member, Evelyn Timke (1915 - 2001).

The donation is made in loving memory of her quiet intelligence and love of learning.

Al Timke

THROUGH THE LOOKING GLASS: REFLECTIONS ON THE HISTORY OF ASTRONOMY

Copernicus' Quiet Revolution

— Jim Swindler

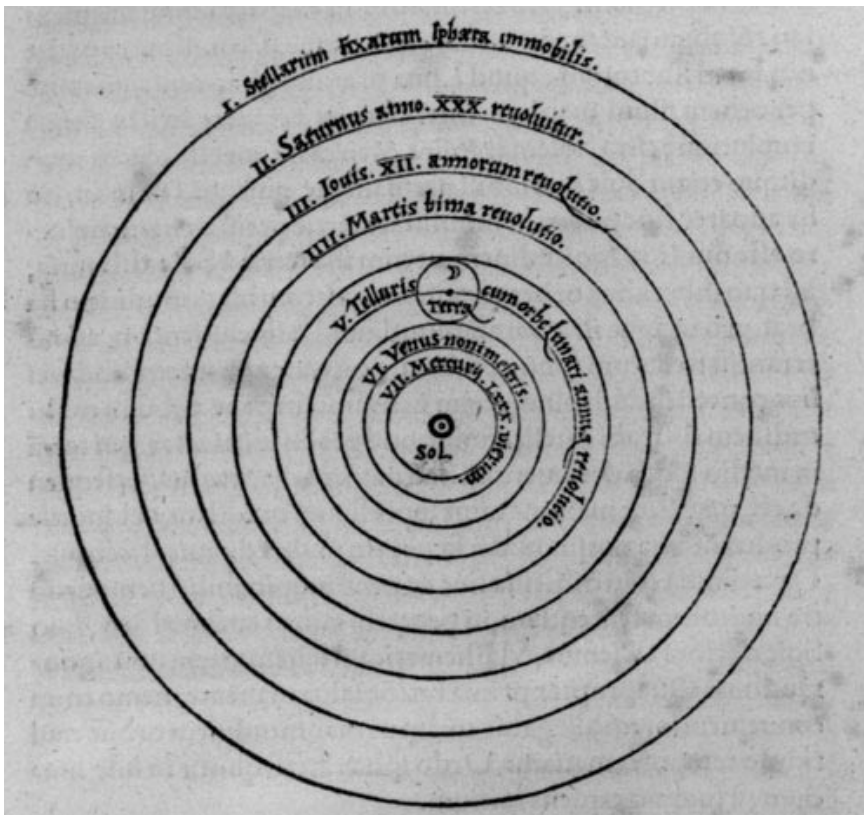
1543 was a most remarkable year in the history of science. That year saw fundamental revolutions in both physical and life sciences. Vesalius published his great anatomy, *On the Fabric of the Human Body* and Nicholas Copernicus published *On the Revolutions of the Heavenly Orbs*. These books overthrew uncritical dependence on ancient Greek authorities and proved the two pillars upon which all of modern science is built, precise observation and mathematical theory. We should see the rise of modern, heliocentric astronomy as a part of the Platonic revival against Aristotelianism that accompanied the European Renaissance of the 15th to 17th centuries. Platonists have always been impressed with Pythagorean mathematical methods in “natural philosophy” and it is with the work of Copernicus that the tradition is revived. Europeans began to graft Pythagorean mathematical philosophy onto Christian faith with the result that they began to see God as an omniscient mathematician.

By 1500 the prevailing Ptolemaic system had sprouted some 79 epicycles and eccentrics to account for planetary movements, but it was widely recognized that some of these could be eliminated as merely apparent if some motion were attributed to the earth. Copernicus recognized three motions in the earth: daily axial spin, annual heliocentric revolution (between Venus and Mars) and “Great Year” wobble of the axis. He retained the Greek conception that the stars are “fixed.” He said his theory “bound together ... all the planets and the spheres and the heaven itself [so] that in no single part could one thing be altered without confusion among the other parts and in all the universe.”

It was widely acknowledged that the calendar was in serious need of reform and a conference was called in Rome. Copernicus, who was Polish and had studied mathematics at Cracow attended. An accurate calendar, one that could predict

the equinoxes and the moon's phases was needed to determine the dates of holy days, especially Easter. As early as 1507 Copernicus recognized the greater simplicity of the heliocentric hypothesis and was able to cite ancient sources for its authority, particularly Cicero and Plutarch. (It is, however, notable that he crossed out a reference to Aristarchus in his 1543 manuscript.) This simplicity was realized in calculating the tables of positions of sun, moon and planets. Copernicus' principle was that for “any motion attributed to the earth there will appear on all bodies outside the earth a motion of equal velocity, but in the opposite directly, as though these objects were moving past the earth.” Copernicus was invited to comment on proposed reforms to the calendar in 1514 but declined because the thought “the movements of the sun and moon were not know with sufficient accuracy.”

Although he founded an observatory at Frauenburg, Copernicus is not much remembered for observational discoveries. Instead, for the most part, he used existing data. Where Ptolemy's system required ad hoc solutions, his new model easily explained why Mercury (which he is said never to have observed) and Venus are always close to the sun; why earth periodically passes Mars, Jupiter and Saturn making them seem to reverse their usual trajectories (retrograde motion); why the equinoxes precess over thousands of years (as Hipparchus observed); and, assuming they are at a vast distance from the earth, why the stars do not appear to move relative to one another. On the other hand, Copernicus was perhaps a bit too Pythagorean, for he retained the Greek idea that celestial motion is circular, which obliged him to build 34 epicycles and eccentrics into his model. This was corrected and the whole system simplified only when Kepler proposed parabolic orbits two generations later.

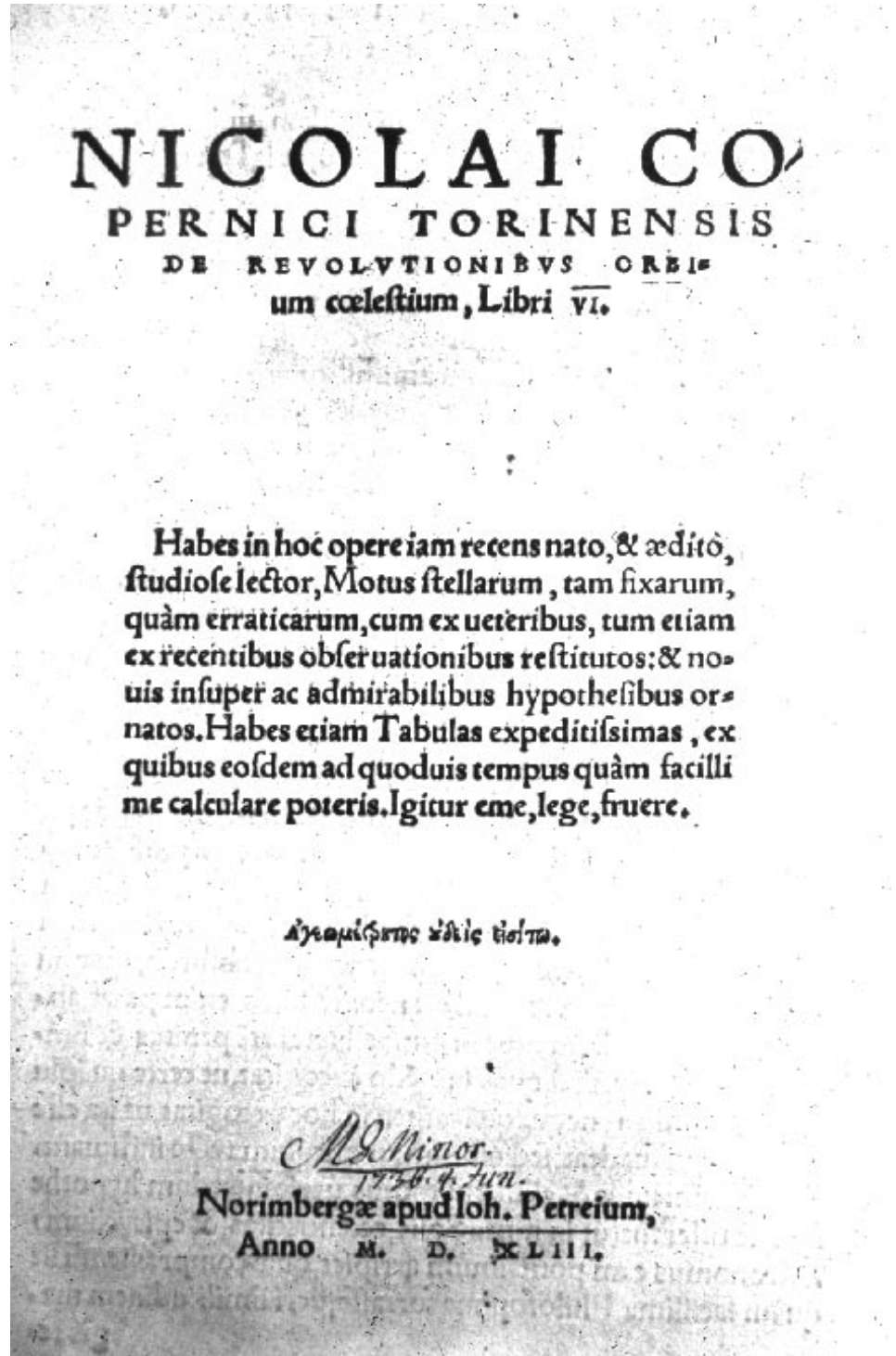


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In 1512 and again in 1530 Copernicus described his new system in writing, complete with celestial tables, but he hesitated to publish for fear of being renounced as a heretic. Nevertheless his 1530 manuscript, on which Widmanstadt lectured in Rome with the Pope's approval, circulated among mathematicians and astronomers and generated enough interest so that Copernicus was invited by a cardinal to make a full presentation of his views and Rheticus offered to help see it through to publication. The book finally appeared in 1543, complete with a dedication to the Pope and a preface written by Osiander, a Ptolemaic Lutheran minister, but attributed to Copernicus himself, claiming that the theory did not purport to describe the actual heavens but was merely a device for calculating planetary positions (Osiander's authorship was shown by Kepler in 1609). It is said that Copernicus lived just long enough to see the first copy of his book as he lay dying from stroke on May 24.

Copernicus' masterpiece was at first ignored, no doubt partly because of Osiander's preface but also because only a few hundred copies were printed and it was very expensive. It was not reprinted until 1566 in Switzerland. The church took the trouble to ban the book only after Galileo's sensational defense of the new theory early in the 17th century. It was not removed from the list until 1835. By then, the Copernican revolution had permanently removed mankind from the center of the universe and the war between science and religion was about to turn away from astronomy to the life sciences.



Minutes of the TCAA Board of Directors Meeting, 9/24/02

— Sandy McNamara

AS ANNOUNCED to the general membership, the open meeting was called to order at 6:30 PM in the conference room of LYB inc. In attendance were board members S. McNamara, D. Miller, D. Meyer, D. Miller, J. Swindler, and D. Yockey. Duane presented the latest treasurer's report and the general financial status of the club. Since sufficient funds were available, it was moved and approved by all present to pay off the outstanding loans for the LX200GPS. After a discussion of TCAA finances and rising expenses over the years, it was moved and approved to present a resolution for vote at the next annual meeting to raise membership dues to \$40/family or \$25 for senior, student, and newsletter only memberships. Actual vote for dues changes must be at February annual meeting since this involves a change to the bylaws but time must be allowed for publication of announcement of vote to change. Duane offered to look into the AL's insurance offerings to see if the TCAA can possibly obtain less expensive liability insurance through that organization.

Stabilization of the telescope pier at SGO was discussed. The general consensus was that problems with motions in the pier will need to be addressed eventually but that they are not severe enough to prevent productive use of the facility until a definitive solution can be found. There have been several relatively inexpensive plans to stiffen the main pier support pole that have been presented and it was the general consensus that any nondestructive modifications be approved if the member suggesting them was able to arrange having the work done. The 10-in loaner telescope has been on loan for over a year with the member involved dropping email access and not in contact. Sandy agreed to try and contact the holder to see about return of the telescope. It was suggested and agreed by all that the 16-in loaner telescope should be restricted from general loans and kept at SGO. The 16-in is

too heavy to be easily portable and will be easier for all members to share at the darker skies of Funk's Grove.

MOOS and POS dates/times were approved as scheduled through Jan 2003. Poor attendance at the TCAARG meetings were discussed and it was suggested that if members do not want to revive the reading group or utilize the time slot for another purpose that it might be disbanded; we will wait a few months and monitor the attendance. Monthly general meeting topics were discussed and it was suggested that we NOT hold a general meeting in December. Usually the TCAA holiday party is held instead of a general December meeting, but this has been poorly attended the last few years. It was the general consensus that most people are busy in the holiday season so another party is not being planned. If a member would like to host a Christmas party, it will not be discouraged, but the BOD will not pursue arranging one. Possible program topics suggested for general meetings included use of computers with telescopes, light pollution problems and solutions, and southern sky observing; Sandy will give the October presentation on planetary nebula.

Since the last two years have been very successful, it was moved and approved that we again have a potluck dinner at SGNC for the annual anniversary meeting and banquet in February. Sandy announced that she will not be serving on the BOD next year and will be asking for volunteers from the TCAA membership to help fill the roster for election at the February meeting. Pending approval of the new BOD, Duane has agreed to serve as treasurer for at least another year. All present were asked to look around to find a possible speaker for the banquet.

The meeting was adjourned at approximately 8 PM.

Remember...

ISU/TCAA Skyline is waiting for you!

438-5007

Planetary Nebula

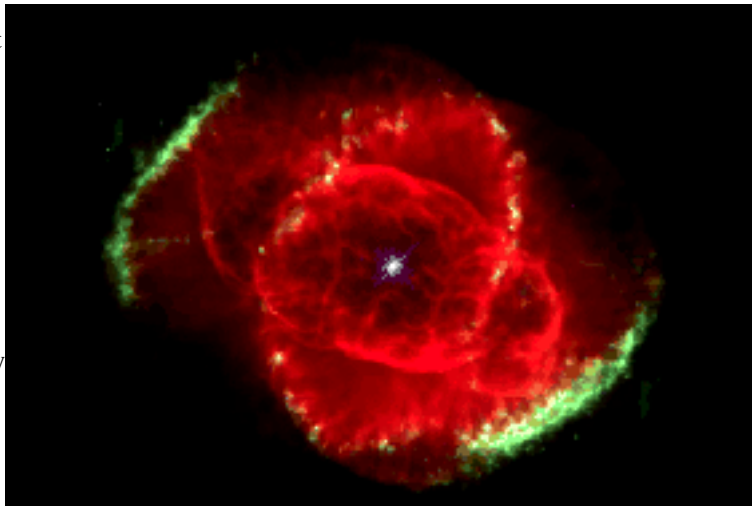
- Sandy McNamara

DESPITE the name, these objects are totally unrelated to “planets”. William Herschel invented the name “Planetary Nebula” (PN) for these objects in his classification of nebulae in 1784 because he thought those he had seen resembled the planet Uranus that he had recently discovered. A PN forms near the end of a star like our Sun’s life when its nuclear reactions come to an end in its core while helium burning goes on in a shell. The gravity from the material in the outer part of the star forces the inner parts to condense and heat up which drives the outer half of the star away in a brisk stellar wind, lasting a few thousand years. The stellar core remains as an extremely hot, small central star (a “white dwarf”) while the expanding gas shell is excited to shine by the high-energy radiation from the central star and is then visible as a planetary nebula.

The radiation emitted by the planetary nebula is remarkable because of its peculiar spectrum. The spectra of planetaries consist of emission lines, but unlike most types of emission nebula 90 to 95 % of the visible light is emitted in one emission line only, occurring at 500.7 nm (5007 Angstrom), in the green part of the spectrum. This peculiarity makes planetary nebula brightness differ significantly if determined with various methods. These objects are often considerably brighter (up to 2 magnitudes, a factor of more than 6) visually than photographically, because the 5007 Angstrom line lies close to the highest sensitivity of the human eye while films are often least sensitive in the green part of the spectrum. The problems in measuring planetary nebula brightness also make determining the exact size and distance of these objects difficult.

The dying stars we observe as “planetary nebulae” have such a range of brightness,

size, form, and structure that there is no single observing technique that works best. There are very small, bright PN, there are large, very dim PN, and of course there are many small AND dim PN. However, telescopes of even moderate aperture (3 - 6 inches) are capable of detecting numerous types of PN’s. Aside from finding the darkest skies around you, there are several observing methods that can help with these interesting and often beautiful objects.



NGC 6543 (Cat’s Eye Nebula)

This magnificent planetary nebula is another prominent northern object missed by Charles Messier and discovered by William Herschel, on February 15, 1786. The Cat Eye nebula was the first planetary nebula which was spec-

troscopically investigated and displayed its typical (and peculiar) line spectrum to the English amateur astronomer William Huggins, in 1864. NGC 6543 is situated almost exactly in the direction of the North Ecliptic Pole. This means that the normal vector of Earth’s orbital plane (and also the total angular momentum vector of our solar system) points to a direction very close to this nebula, and that those diagrams of planetary orbits in the yearbooks and magazines represent the view of them from this planetary nebula.

4) “Blinking”. Many small PN can be difficult to tell from normal field stars. A helpful technique to tell which “star” is the PN is to hold a nebula filter with your fingers between the eyepiece and your eye and then move the filter in and out of the way several times. Normal stars will dim while looking through the filter while the PN will remain essentially the same brightness.

To find the Cat’s Eye, move 5 degree S of 34 Dra which forms part of naked eye triangle between Polaris and head of dragon. This PN is very bright but small so you might breeze past it as “bright star” if not aware. It reminds me of the Ring Nebula

1) Use a narrowband nebula filter (Ultra-Block, UHC, OIII). Nebula filters work by allowing only light of certain frequencies to pass through, the frequency at which PN shine. The PN appears brighter because the background becomes darker while the light of the PN passes through. Actually even the nebula is slightly dimmer so on the smaller telescopes you may see no improvement or a faint nebula may disappear completely when using a narrowband filter.

2) Try pulling a dark cloth or hood over your head while observing; a large cloth that drapes over your head, shoulders, and eyepiece works best. This eliminates stray and reflected light while viewing, even under dark skies.

3) Use averted vision to view larger or

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but twice as bright and only 1/20th the size.

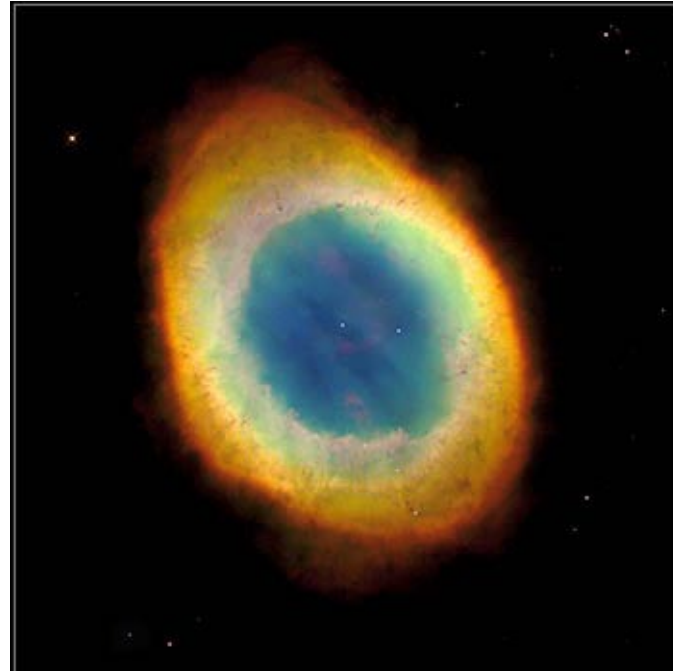
M57 (Ring Nebula) The famous Ring Nebula M57 is often regarded as the prototype of a planetary nebula, and a showpiece in the northern hemisphere summer sky. Recent research has confirmed that it is, most probably, actually a ring (torus) or cylinder of bright light-emitting material surrounding its central star, and not a spherical (or ellipsoidal) shell. Viewed from this equatorial plane, it would thus more resemble the Dumbbell Nebula M27 than its appearance we know from here: We happen to view it from near one pole.

M57 was the second planetary nebula to be discovered (in January 1779), 15 years after the first one, M27. Antoine Darquier de Pellepoix, who discovered the Ring Nebula only a few days before Charles Messier found it, described it as “a dull nebula, but perfectly outlined; as large as Jupiter and looks like a fading planet.” This comparison to a planet may have influenced William Herschel who introduced the name “Planetary Nebulae”. Oddly, the inventor of the name “Planetary Nebula” did not count the Ring Nebula as one of this object class, but described it as a “curiosity of the heavens”, a peculiar object.

M57 is very easy to locate about halfway between Beta and Gamma Lyrae. Small telescopes will show a dim almost circular glow while an 8-in telescope will reveal a broad sl oval nebula

NGC 6826 (Blinking Planetary) Not to be confused with the observing technique of “blinking” a PN with a filter, this PN is famous for having a visible central star useful for illustrating one of the effects using averted vision where an object can be brighter or dimmer or even appear and disappear depending on if

you are looking directly at it or off to one side. Look for the PN 1/2 degree E of 16 Cygni (a pretty matched white double star looking like a pair of headlights in a low power eyepiece!). Once you’ve located



it, use high power (150x) and experiment with looking directly at the center then looking off to the side, towards the outer edge of the nebula. Which way does the PN seem brighter? And can you see the central star blink on and off depending on how you are observing it?

M27 (Dumbbell Nebula, NGC 6853)

The Dumbbell Nebula M27 was the first planetary nebula ever discovered. On July 12, 1764, Charles Messier discovered this new and fascinating class of objects, and describes this one as an oval nebula

without stars. We happen to see this one approximately from its equatorial plane; from near one pole, it would probably have the shape of a ring, and perhaps look like the Ring Nebula M57.

You can sweep up M27 at the 4th corner of a rectangle formed by epsilon-gamma-beta CYG. One of the brighter PN, it is visible in binoculars or finderscopes as a dim sl fuzzy spot. No better details at higher magnification. Small telescopes will show an almost rectangular glow while a 6 to 8-in telescope reveals the double central condensations which give this nebula its “apple core” or dumbbell appearance.

NGC 7009 (Saturn Nebula)

The Saturn Nebula was one of the first discoveries of William Herschel when he started his great survey in 1782. Lord Rosse named it the Saturn Nebula in the 1840s because of its appearance, which faintly suggests the planet Saturn with rings nearly edge on. You won’t see the extensions that give it its name in small telescopes but the nebula is easily located. Look for an out-of-focus blue-green star just a degree W of the naked eye star nu AQR.

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NGC	Object	CON	RA h m	DEC d s	Size arc sec	MAG PN	mag of central star
6543	Cat’s Eye	Dra	17 59	+66 38	22” x 16”	8.1	11.3
6720	M57-Ring Nebula	Lyr	18 54	+33 02	86” x 62”	9.5	14.1
5826	Blinking Planetary	Cyg	19 45	+50 31	27” x 24”	8.8	10.7
6853	M27-Dumbbell	Vul	19 59	+22 43	480” x 240”	7.3	15.8
7009	Saturn Nebula	Aqr	21 04	-11 22	28” x 23”	8.5	11.9
7293	Helix Nebula	Aqr	22 30	-20 48	960” x 720”	6.5	13.4
650/651	M76-Little Dumbbell	Per	01 42	+51 34	140” x 70”	11.5	17.6

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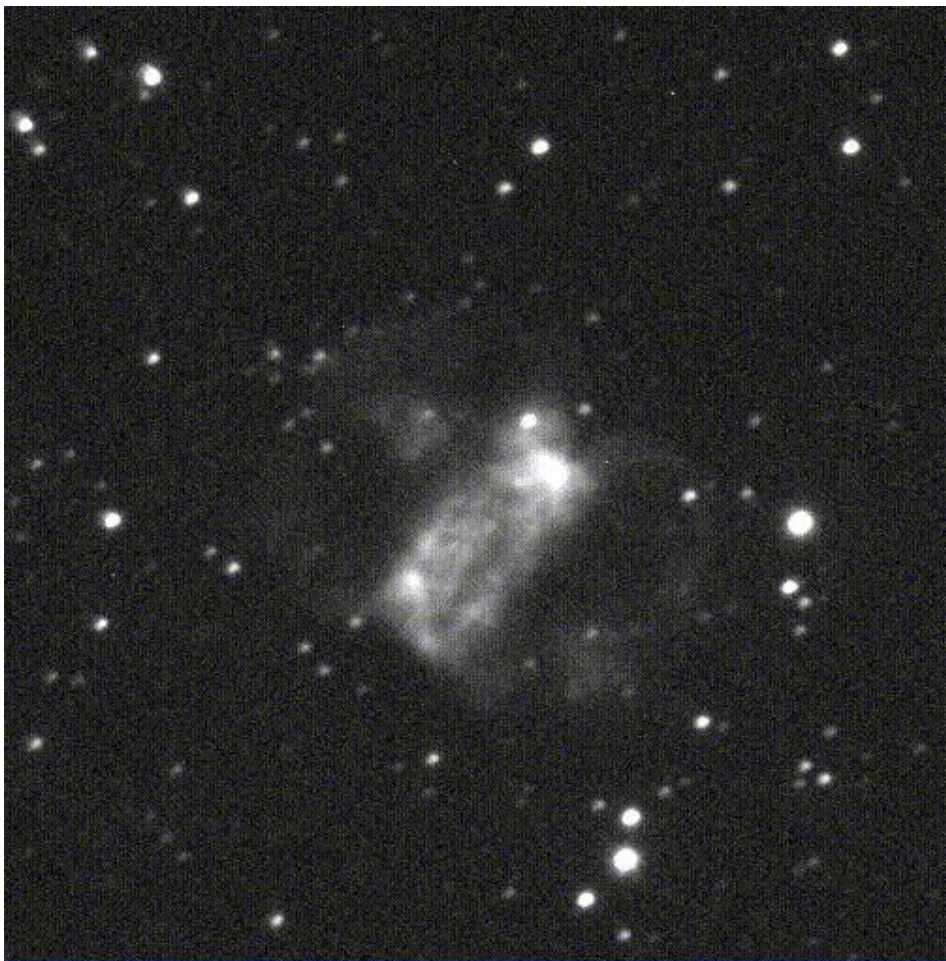
NGC 7293 (Helix Nebula) - The popular name of Helix refers to the nebula's twisted structure visible on photographs. The Helix Nebula is one of the closest of all planetary nebulae: Lying at a distance of perhaps 450 light years, it is the only planetary nebula for which a parallax could be obtained by ground-based observations. It is also one of the largest planetaries known: Its apparent size covers an area of 16 arc minutes diameter, more than half of that of the full moon; its halo extends even further to 28 arc minutes or almost the moon's apparent diameter. Although the nebula is quite bright, its light is spread over this large area so that it is not an easy object for visual observing. It is easily located but barely visible in a 6-in telescope withOUT a nebula filter, as a slight lightening of the background sky. An UltraBright or UHC

filter enhances it much. A low-power, wide-field eyepiece is almost essential to view this object. Through a telescope or binoculars, it resembles a large, ghostly wreath. To truly appreciate the subtlety of this object, you need only defocus a magnitude 6.5 star until it reaches half the moon's diameter. Then you'll know why observers can be forgiven for not easily detecting the Helix.

M76 (Little Dumbbell) Among Messier's planetary nebulae, M76 is the second dimmest at magnitude 11.0. If you check a catalog of PN, you'll notice that nearly 2 dozen other planetary nebulae are brighter. Was Messier a careless, sporadic observer or a lazy recorder of objects? Not necessarily. Another look at our listing reveals that M76 is among the larger planetaries as are the other three that he knew of.

Others brighter than M76 were probably visible to Messier but near-stellar objects didn't attract his attention. Remember that he was a comet hunter and made it his business to record "impostors" so that he and others like him did not have to sound false alarms. To Messier, M76 seemed cometary. M76 was given two NGC numbers by Herschel because he suspected it to be a double nebula with two components in contact. NGC 651 is the North following (East) part of the nebula.

The appearance of M76 resembles to some degree that of the Dumbbell Nebula M27. Most telescopes will show a small rectangular nebulosity with higher magnifications showing 2 areas of condensation toward each end of the rectangle. Most probably, the main body (the bar) is a bright and slightly elliptical ring we see edge-on.



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TCAA Treasurer's Report – September, 2002

– L. Duane Yockey, Treasurer

OPERATING FUND BALANCE – August 31, 2002 -

\$ 1,126.91

Income

Shaukat & Farida Goderya (dues renewal) -
Kayla Walstrom (dues renewal) -

\$ 25.00
\$ 25.00

Expenses

Transfer to Observatory Fund

\$ 780.00

OPERATING FUND BALANCE – September 30, 2002 -

\$ 396.91

OBSERVATORY FUND BALANCE – August 31, 2002 -

\$ 742.41

Income

Interest (July, August & September)
Transfer from Operating Fund
Evelyn Timke Memorial LX-200 Donation

\$.18
\$ 780.00
\$ 500.00

Expenses

LX-200 Notes

\$1,400.00

OBSERVATORY FUND BALANCE – September 30, 2002 -

\$ 622.59

TOTAL TCAA FUNDS – September 30, 2002 -

\$ 1,019.50

Respectfully submitted,
L. Duane Yockey, Treasurer

The Observer Crossword

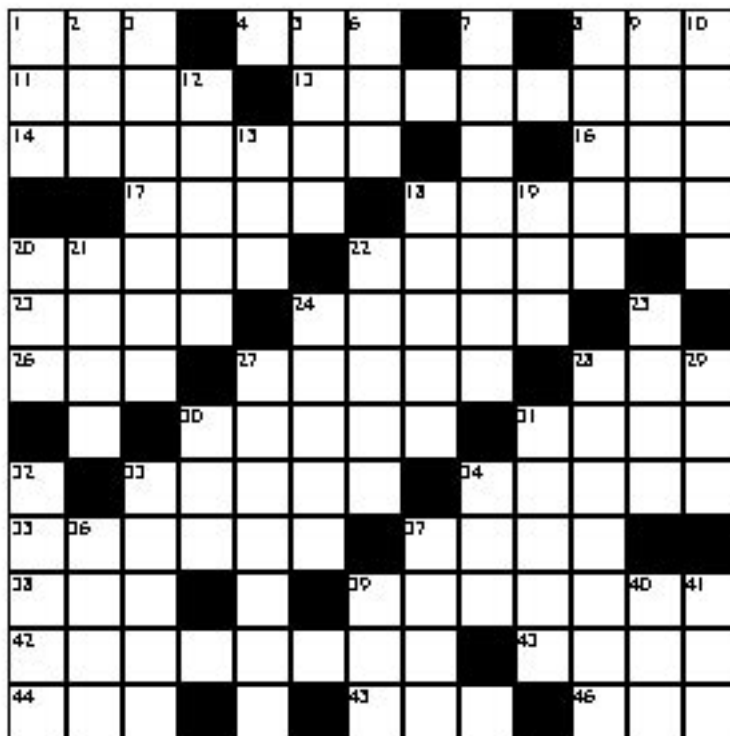
—Observer Staff

ACROSS

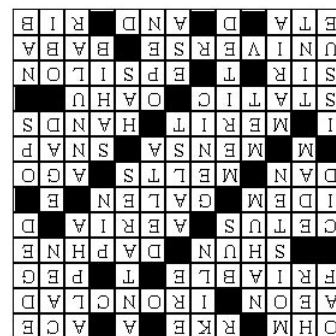
- 1 The unit of electrical resistance
 4 Edmund Scientific eyepieces
 8 Very skilled person
 11 Great age
 13 Unbreakable
 14 Crumbly
 16 Fastener
 17 Keep away from
 18 Nymph of Greek myth
 20 Constellation : The whale
 22 Operatic feature/bright region on Mars
 23 As previously given
 24 Physician
 26 Son of Jacob
 27 Thaws
 28 Gone by
 30 Altar stone
 31 Crack
 33 Worth
 34 Clock pointers
 35 Lacking movement
 37 Island of Hawaii
 38 Title of a knight
 39 5th Greek letter
 42 The Cosmos
 43 Small yeast cake
 44 7th Greek letter
 45 Besides
 46 Curved bone

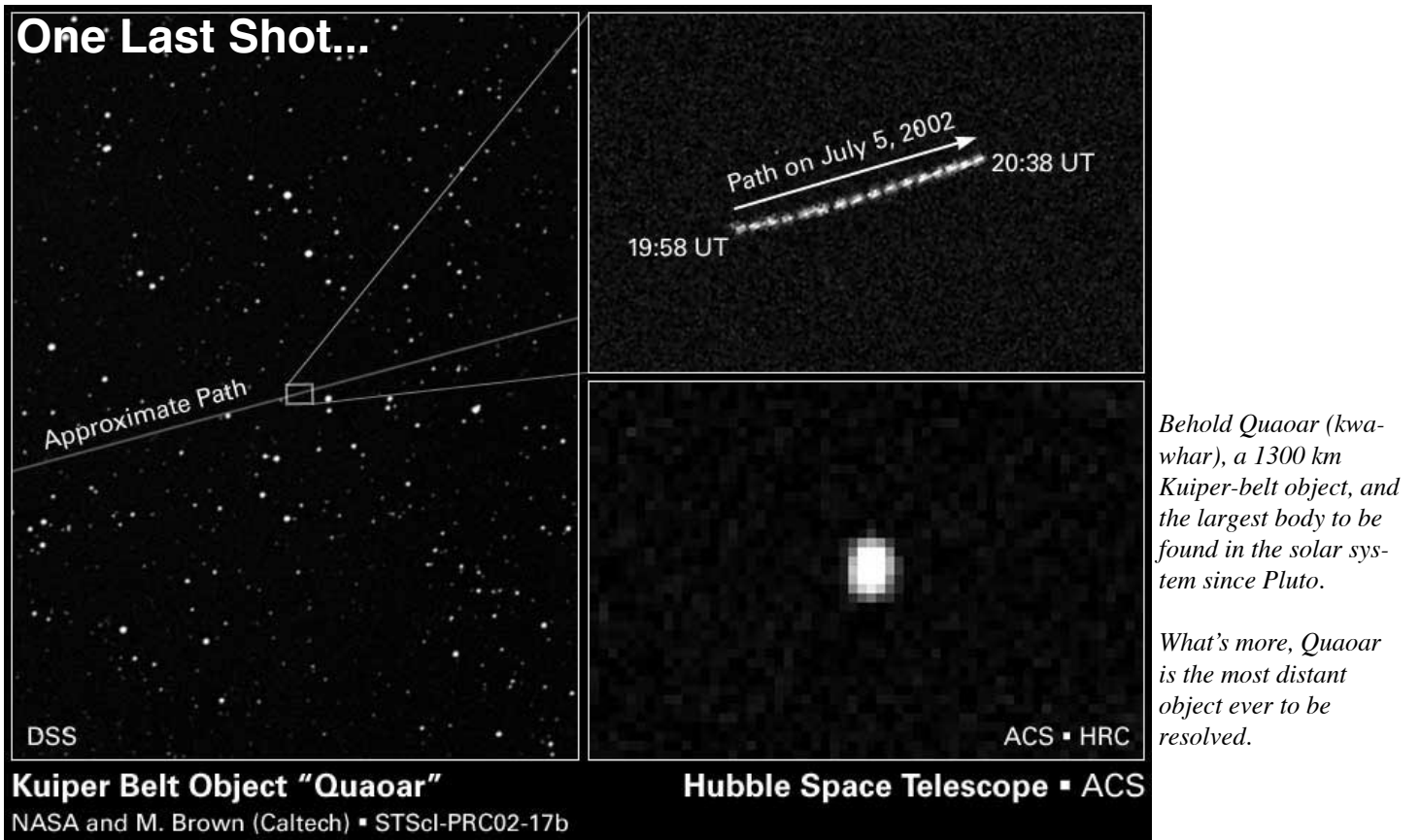
DOWN

- 1 Idiot
 2 Pronoun
 3 Make moist
 5 Furnace
 6 Before
 7 Alternative name for Alpha Scorpii
 8 These radiation particles are helium nuclei
 9 City in NW France
 10 Having an edge
 12 Book of the Bible
 15 Passenger vehicle
 18 4th Greek letter
 19 Slender metal fastener
 20 Spanish hero
 21 Yellow cheese coated with red wax
 22 City in central Belgium
 24 Arising from a gene
 25 Mild oath
 27 Deserved



- 28 A "near-miss" eclipse
 29 Roman goddess of plenty
 30 Encountered
 31 Indian form of address
 32 Point in question
 33 Lunar 'seas'
 34 Possesses
 36 Hue
 37 A type of star cluster
 39 Ariane's developer (abbr)
 40 Japanese sash
 41 Arrest





The OBSERVER

The Newsletter of the Twin City Amateur Astronomers, Inc.

Michael Rogers & Jean Memken, Editors
 2206 Case Drive
 Bloomington, IL 61701

Dues Due?

The Dues Blues

If you see a check in the box above, it means **your dues are due**. To retain membership -- and with a new observatory, why quit now??? -- please send \$25 to our esteemed treasurer:

Duane Yockey
 508 Normal Avenue
 Normal, IL, 61761

As always, thank you for your support!!