

# The OBSERVER

The Newsletter of the Twin City Amateur Astronomers, Inc.

August 2003 Volume 28, Number 8

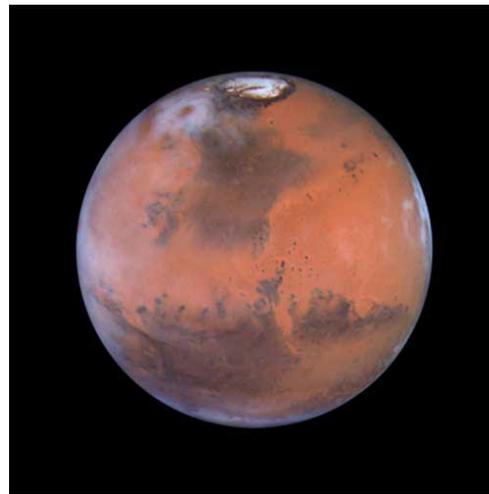


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## Mars! Now What? – Sandy McNamara

**O**K, YOU'VE WAITED impatiently to see Mars as it hasn't been seen in almost 60,000 years and now you've DONE it! It was big. It was bright. You gazed in awe at the bright polar cap and roughly sketched those dark markings to see if you can identify them from a picture later. You've allocated an evening and the telescope is all set up so what do you do now?? After you've finished with Mars, there are a number of noteworthy items nearby to turn your attention toward. There are even two other reasonably bright planets in the evening sky.



First, stretch a little after peering intently through the eyepiece at Mars and look about 3 fist widths westward to locate the large lopsided triangle of Capricornus. Alpha Cap is the star marking the top right corner of the triangle and, with a separation of about half the famous Mizar/Alcor pair, is an easy binocular double star and yet another "double-double". After enjoying the wide pair, zoom in on each star for some high power observing and try to spot their smaller companions. Smaller telescopes should have no problems detecting the

*continued on page 4*

## See Mars Up Close and Personal Details, p. 3

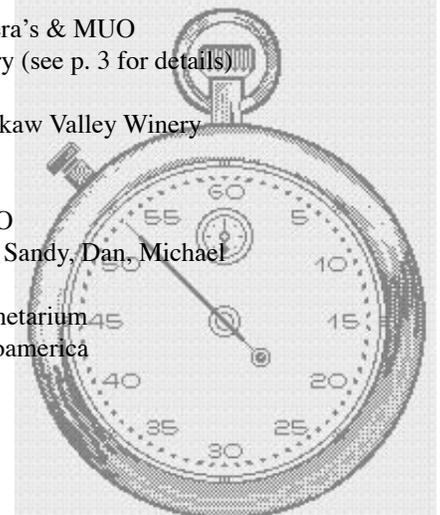
## TCAA Calendar

Friday, 22 August, 2003, 7:00 - 10:00 PM, Panera's & MUO  
Field Trip to the Millikin University Observatory (see p. 3 for details)

Saturday, 23 August 2003, 6:00 PM - ??, Macinkaw Valley Winery  
PAS/TCAA Star Party (see p. 3 for details)

Saturday, 30 August, 2002, 8:30-11:30 PM, SGO  
Public Observing Session. Coordinators: Carl, Sandy, Dan, Michael

Monday, 8 September, 2003, 7:00 PM, ISU Planetarium  
TCAA Meeting. Topic: A Virtual Tour of Mesoamerica



## 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.

### TCAA Officers

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#### Editorial Correspondence:

The OBSERVER Editors  
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Bloomington, IL 61701

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

\$40.00 per household, per year  
\$25.00 for members over 60  
\$25.00 for newsletter only  
\$ 2.50 for a single newsletter copy

## TCAA Frequently Asked Questions

—Michael P. Rogers

**F**OR THOSE OF YOU who have recently joined, or are a little unsure about what it is that we *do* as a club, we present, for your reading a pleasure, a few frequently asked questions (and answers).

#### When do you meet?

We have one meeting a month, on the second Monday of the month, from 7-9 PM, at the ISU Planetarium.

#### Once a month? Is that it?

Well, no: we also have two scheduled observing sessions a month, on Saturdays. The first, a Public Observing Session (POS) is open to anyone interested in astronomy. The second, a Members-Only Observing Session (MOOS), is restricted to members and guests. The date and time are tied to the moon, but the schedule appears on p. 1.

#### Two observing sessions? Is that it?

Who let this person in, anyway? To answer your question, no, individual members also conduct ad hoc, impromptu observing sessions as the spirit moves them and celestial events warrant, sometimes alone, sometimes inviting others.

#### What happens at a TCAA meeting?

We start with a brief (10-15 minute) business meeting, when the President discusses previous and scheduled events. Then, revived by snacks and soft drinks, we have a presentation of some sort. The nature of the presentation varies widely — it might be a planetarium show, a software or telescope demo, a PowerPoint presentation, etc. — but it always has something to do with astronomy.

#### I'm a complete novice when it comes to Astronomy: what do you have for me?

Our meetings do not tend to be particularly technical, so that anyone ought to be able to benefit from attendance. Also, the opportunity to rub shoulders with more knowledgeable members can help you to get fired up about astronomy.

#### Can my kid join?

Sure, we are a child-friendly group. Our meetings are always attended by at least 3 gregarious children, ages 6, 11, and 13.

We do not have any activities *specifically* geared to children right now, but it has been our experience that children have even more fun, looking through telescopes, than the adults.

Our meetings are, as we have said, not hugely technical: so a bright 10 or 11 year old could probably appreciate them as much as the adults.

#### What happens at an observing session?

We set up telescopes, and look at the wonders of the universe (or, during a lot of our Summer observing sessions, at the wonders of cloud banks :-)

#### I don't have a telescope!

No problem! You don't need a telescope to enjoy astronomy, you don't even need to go *outside* to enjoy it. Arm-chair astronomers have found that an easy chair, a reading light, and a good magazine/book on astronomy are all that you really need to "do" astronomy. You can adjust the climate as you see fit, avoid insects or frostbite as the season dictates, and often, looking at images taken by telescope heavyweights such as the Hubble Space Telescope, see a lot more detail.

#### I repeat, I don't have a telescope!

If you have your heart set on observing, you can see a whole lot with just the naked-eye and a map of the constellations.

Binoculars tend to be a cheap and in many cases very enjoyable way to get into observational astronomy.

If you simply must have a telescope, the club has "loaner scopes" available for members to check out, just like a library book.

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## Millikin University Observatory Field Trip

— Michael P. Rogers

**H**IGH ATOP THE Leighty-Tabor Science Building, on the beautiful Millikin University campus, stands an amazing 20" behemoth, a telescope of uncompromising quality, truly one of the great wonders of the world.

Well, at least that's what the marketing brochure said, anyway. It really is a 20" telescope, however, and it is very, very large. And, thanks to our very own Dan Miller, we have an opportunity for a field trip.

Since Mars is going to be closer to Earth than it has been for 60,000 years, this seemed like a splendid time for a field trip.

So, synchronize watches, fire up the Mission Impossible theme, and listen closely, because this Friday, 22 August, we are *going places!*

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## PAS/TCAA Star Party

— Rich Tennis

**T**HE PAS/TCAA star party is an evening only event for Saturday, August 23rd (rain date Sunday, August 24th).

The event starts after 6:00 P.M. and continues until dawn and is hosted by the owner of the winery, Mackinaw Valley Vineyard, Paul Hahn. Restrooms are in the winery. The winery is located on Route 9 and about three miles east of Mackinaw. There is a sign on the south side of the highway directing you to the winery, which is visible from the road. There will be a powerline for telescopes hookups. From Springfield, take the I155 turnoff from I55 at Lincoln up to Route 9 and turn left, east, and drive past Mackinaw until you get to Mackinaw Valley Vineyard.

There is no cost for the evening viewing, however, you may want to get a bottle or two of his award winning wine.

We are not providing camping facilities at the site. There is a campground near Mackinaw called Kentuckiana Kampground, 309 449-3274, located about 6 miles south of Mackinaw. \$19/night for hookup. If more details are needed, I would recommend calling them directly. However, I will be getting a map from them that I could e-mail if that would help.

Hope to see you all at the second annual PAS/TCAA Star Party. If you need more information, don't hesitate to get back to me (309 467-3597).



*continued from p. 1*

faint companion of Alpha-1 (the slightly dimmer of the two to the west). Alpha-2 is more of a challenge because its companion is fainter and closer.

Sweep 8 1/2 degrees due east of Alpha Cap to locate the globular cluster M 72, visible in finderscopes as a slightly fuzzy “star”. M72 is a fairly bright, moderately large globular cluster with only a slightly condensed central area; your typical globular “fuzz ball”. It does, however, provide a good jumping off place for star hopping to several other items in the area. M73 lies a little over a degree to the east, NGC 7009, the “Saturn Nebula”, lies just under 3 degrees to the northeast, and the planet Neptune is lurking about 5 degrees south.

M73 (NGC 6994) can be found 1.5 degrees east of M72 but is something you’ll want to locate only to finish the Messier list. There is some argument whether this is a poor open cluster or just an asterism. It consists of a small triangle of dim stars with a 4th dimmer star just to the W. While Messier apparently thought there was some nebulosity associated with the group, he must have been having a bad night since there is none actually there (unless your eyepiece is dewed over!)

A little over 2 degrees ENE of M73, about 2 degrees west of 4<sup>th</sup> magnitude nu Aqr, lies the bright planetary nebula NGC 7009, the Saturn Nebula. It is relatively easy to find but is small enough to be skipped over as merely a field star at first glance. In my 8-inch telescope, the

Saturn Nebula appears as a greenish out-of-focus “star” at low power. 160x shows a bright, small, slightly oval blur oriented approximately E-W. The “ansae” (small projecting arms of nebulosity on each side of the disk) that inspired its common name are visible only with larger telescopes on a good night.

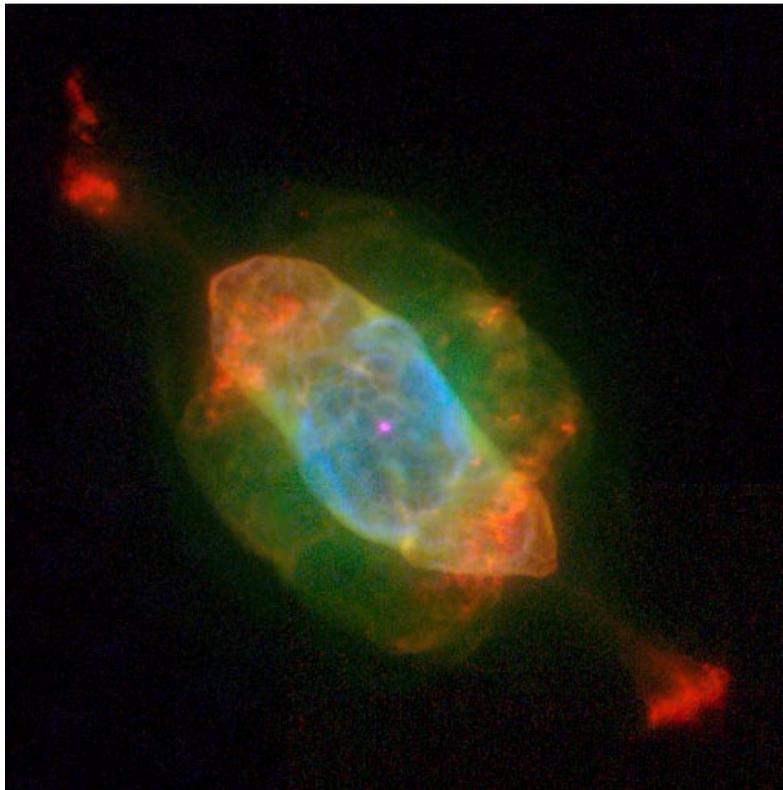
Although vastly outshone at the moment by their smaller sibling, Neptune and Ura-

astronomy.com; at computerized charting program can also provide accurate positions at any given time. At the end of August, Neptune lies 4.9 degrees due south of M73, 2.8 degrees west of 4<sup>th</sup> magnitude theta Cap and one half degree NNW of 5<sup>th</sup> magnitude star 19 Cap. Even through a telescope, at low magnification these two planets can be passed over as bright “star”: however higher magnifications reveal their tiny disk. Color can be a hint even at lower magnifications; often Neptune has a slightly bluish tint and Uranus a faint tinge of green.

Moving past the eastern edge of the Capricornus triangle, we stop at M30 (NGC 7099), a bright globular cluster about 27,000 light years distant. M30 is easily visible in 10 x 50 binoculars as a fuzzy “star” less than 1/2 degree W of the reddish 5<sup>th</sup> magnitude star 41 Cap. Small telescopes will show a fairly bright circular glow; an 8th magnitude star very close to the western edge can make this edge seem a little brighter. My 8-in shows a typical fuzzy GC with brighter center. Larger telescopes can begin to resolve little sparkles of stars around the edges.

Sweep two full handspans above M30 to find one of the showpiece objects in Aquar-

ius. NGC 7089 (M2) is a bright, well-compressed globular cluster about 37,000 light years distant. Visible in binoculars or finderscopes as a glowing spot of light located 5 degrees north of 5<sup>th</sup> magnitude beta Aqr; it forms a nice triangle with the bright stars epsilon Peg and alpha Aqr. An 80 mm telescope will merely show a



*NGC 7009, the Saturn Nebula, as imaged by B. Balick (University of Washington), using the Hubble Space Telescope's Wide Field Planetary Camera 2*

nius are bright enough to be spotted in binoculars if you know where to look. Like all planets, the exact position of Neptune & Uranus changes slightly from night to night (although these giants aren't moving as fast as little Mars). Finder charts for Uranus and Neptune can be found in recent issues of both *Astronomy* and *Sky & Telescope* magazines as well as on the WWW at [skyandtelescope.com](http://skyandtelescope.com) or

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bright circular glow but my 8-in telescope begins to resolve small stars around the edges.

The planet Uranus also lurks in Aquarius this year, above and to the right of bright Mars. If you've been watching Mars much, you may have noted that it is moving westward as seen against the background stars. It will continue to do this until Sep 29 when it will end its "retrograde loop" and begin moving eastward again. As moves along, our brightest wanderer loops near Uranus and in mid-October it appears less than 3 degrees SE of the larger planet. In mid-August, Uranus lies a little over 8 degrees WNW of Mars, by the end of the month Uranus lies 6 degrees NW of Mars and by mid-September it lies slightly less than 5 degrees NNW of the red planet. At 6<sup>th</sup> magnitude, Uranus is easily visible in binoculars as an apparent 6<sup>th</sup> magnitude "star" less than a degree south of 5<sup>th</sup> magnitude 38 Aqr. High magnification in a telescope will show its tiny disk.

Our last stop of the evening lies south of Mars. The famous Helix Nebula, NGC 7293 is one of biggest and brightest planetary nebulas in our skies since it is rela-

tively close (probably less than 300 light years away). In mid-September, Mars will pass almost exactly midway between Uranus and NGC 7293, but this is a poor time



*Uranus, as seen from Voyager*

to observe the Helix because moonlight will obscure the nebula. The Helix has a reputation of being difficult to observe however can be viewed even in small telescopes and is one of only a handful of deepsky objects selected for the beginner's Universe observing program. The prob-

lem is that its size (about 1/2 that of the full moon) means that the nebula is so spread out that individual parts of it appear dim and have a low contrast against the

background sky. The secret is to observe from a rural location under a moonless sky, use a low power wide field eyepiece, and a nebula filter (either an Ultrablock, UHC, or OIII) which increases the contrast with the background sky. The Helix's hiding spot is easily located midway between the 5<sup>th</sup> magnitude stars upsilon and 57 Aqr but it is often barely visible as only curiously circular slight lightening of the background sky if you are using no nebula filter. In my 8-in telescope equipped with a UHC filter, the nebula reveals itself as a large, round, ghostly nebulosity of fairly even texture with a gradual loss of bright-

ness toward the center; several faint stars can be seen embedded within the nebula. Using a 12-in with UHC shows hints of helical nature visible as faint non-even streaking in the outer 1/3 of the circumference.

#### Technical Information

Object	Con	Typ	RA	DEC	Mag	Size/Sep	Notes
Alpha-1 (5) Cap	Cap	DS	20h 18m	-12d 31'	4.2/9.2	45.4"	PA 221
Alpha-2 (6) Cap	Cap	DS	20h 18m	-12d 33'	3.6/11.0	6.6"	PA 172
Alpha Cap (5/6)	Cap	DS	20h 18m	-12d 33'	3.6/4.2	378"	PA 291
Neptune	Cap	P	20h 54m	-17d 28'	7.8	2.3"	data 8/30/03
NGC 6981	Cap	GC	20h 54m	-12d 32'	9.4	5.9'	M 72, class IX
NGC 6994	Cap	OC	20h 59m	-12d 28'	8.9	2.8'	M73
NGC 7009	Aqr	PN	21h 04m	-11d 22'	8.5	28.1" X 22.9"	Saturn Neb, CS mag 11.9
NGC 7089	Aqr	GC	21h 34m	-00d 49'	6.5	12.9'	M2, class I
NGC 7099	Cap	GC	21h 40m	-23d 11'	7.3	11.0'	M30, class V
Uranus	Aqr	P	22h 11m	-12d 02'	5.7	3.7"	data 8/30/03
NGC 7293	Aqr	PN	22h 30m	-20d 48'	6.5	960" x 720"	Helix, CS mag 13.4
Mars	Aqr	P	22h 35m	-16d 01'	-2.9	25.1"	data 8/30/03

For those of you working on varied observing projects, NGC 6981, NGC 6994, NGC 7089, and NGC 7099 are on the Messier List, alpha Cap is on the AL double star list, NGC 7293 is on the AL Universe Club list; NGC 7009 is on the AL Herschel 400 list. Uranus, Neptune, and Mars observing projects are included with the AL Planetary Observer's Club.

## Nebraska Star Party '03

— Roy Lawry

**S**EVERAL TCAAers, including Roy Lawry, Brian and Theresa Barling, attended the 10th annual Nebraska Star Party, at the Merritt Reservoir in western Nebraska. For a detailed description of the festivities, check out the article by David Knisley in the [sci.astro.amateur.newsgroup](http://sci.astro.amateur.newsgroup).



*The Merritt Reservoir, next to the campground where the star party has the observing fields.*



*Roy, setting up the PowerBall*



*Tom Miller setting up the 30" Obsession dob up on "dob row"  
A 25" little Obsession is going up behind it.*



*Roy and Mag1 owner and maker of the fine Portaballs, Pete Smitka*

## TCAA Board of Directors Meeting — August 13, 2003

— Carl Wenning, Secretary

**T**HE MEETING WAS CALLED to order at 6:24 p.m. in the conference room of Lewis, Yockey & Brown, Inc. In attendance were board members Dan Meyer, Neale Lehmkuhl, Jim Swindler, Duane Yockey, Carl Wenning, and guest Michael Rogers. The Board addressed the following major topics:

**Finances:** Duane provided the latest Treasurer's Report noting that the club was in good financial shape. It was the consensus that there is no need for club fund raising per se exists at this time. Carl noted that promoting celestial events would probably encourage membership, and that such promotion will have the desired effect. Duane noted that someone needs to check the club web page to make certain that the dues statement on the application form is accurate. Mike will look into this. The following purchases were discussed and approved: constellation slide set from the ASP for \$89.95 and a set of tapes/CD's from the ASP that constitute an audio guide to the heavens for \$29.95. Carl motioned that Sandy McNamara be given the go ahead to make these purchases; seconded by Duane. Motion carried. It was also moved by Jim, seconded by Neale, and carried that \$200 be allocated for the purchase of color/moon filters and eyepieces for club telescopes. Specifics must receive Board approval before actual purchases are made however.

**Property Report:** Dan and Sandy will complete a physical inventory of TCAA possessions soon. Jim and Mike will obtain the TCAA library from Karen Moens; Jim will see to it that loaner cards are created for each book; both will see to it that the library is moved to the Sugar Grove Observatory. Dan will conduct a cleaning of the SBO at 6 p.m. on August 30<sup>th</sup>; volunteers are asked to help by arriving early for the POS slated that night that will focus on Mars.

**Scheduled Activities:** Additional events were reviewed and tentatively scheduled

for club meetings as follows:

- September 8 – MayaQuest: A Virtual Tour of Mesoamerica, Rebecca Wenning
- October 12 – ABC's of Celestial Coordinate Systems, Mike Rogers
- November 10 – Poetry Under the Stars (with space music), Rebecca Wenning
- December 8 – Solstice Party with Greek Astronomy, Carl Wenning, Ewing Manor (?), Carl will check on manor availability
- January 12 – Southern Constellations, Roger Eggleton (?), Carl will ask Roger.
- February 21 – Annual Meeting, Jim Kahler (?) guest speaker, SGNC, with bad weather back up date of 2/28; Dan will contact Gary Woith about Nature Center availability; Carl will contact Jim Kahler.

**Public Observing Sessions:** The following individuals will coordinate the POS:

- August 30 – Carl, Sandy, Dan, and Mike
- September 27 – Jim and Dan
- November 1 – Carl and Dan
- December 27 – Duane and Dan
- January ? (date TBA) – Dan

The names listed are merely those of the coordinators. Coordinators will seek out TCAA membership assistance in performing required duties. The following order of events is recommended for coordinators: (1) promote events through the local media; (2) solicit assistance from TCAAers; (3) select a main topic for the event; (4) conduct a slide show talk; (5) conduct a constellation talk using a flashlight; (6) hold telescope observing session.

Carl motioned that, with the agreement of ISU planetarium director Tom Willmitch, the ISU Planetarium be linked with these events as a "sponsor" so that advantage could be taken of ISU promotional services. The motion received several seconds. In a follow-up discussion, Jim expressed some reticence about the planetarium sponsoring events without some degree of significant input. The motion finally carried 4 in favor, 1 opposed.

**Other Events:** TCAA members are invited to participate in the following events:

- August 22 – Milliken Field Trip; meet at the Panera restaurant in Decatur at 7 p.m.
- August 23 – PAS/TCAA star party in Mackinaw starting at 6 p.m.
- October 11/12 – Sugar Grove Nature Center, a non-profit organization, will host the 1<sup>st</sup> annual "Voices from the Prairie Chautauqua: A celebration of the Illinois Prairie and its People" from 10 a.m. - 4 p.m. each day. They would like to have TCAA set up and table in an exhibition tent. Volunteers are needed to fill 3 two-hour times slots each day. Neale will coordinate this event.

**Generating Member Involvement:** It was noted by several Board members that the association membership doesn't turn out for events as might be expected. It was suggested that a computer auto-dialer be acquired for making reminder phone calls to the membership. Mike will look into the availability of free software. Mike will also generate a survey for inclusion in the *TCAA Observer* to check into membership wants and needs. Mike will see if it is possible to get every TCAA member on the club's listserve as well.

**Fundraising for the ISU Planetarium:** Carl noted how the planetarium is facing difficult financial times, with a possible threat to its ongoing existence. Several ideas were discussed about how best to help the planetarium: an autumn direct appeal for funds from among the TCAA membership, and a winter adult education course with "profits" going to the planetarium were the ideas that seemed most acceptable. It was moved by Jim, seconded by Neale, and carried that before the TCAA moves ahead with this endeavor that Tom Willmitch, the ISU planetarium director, address the Board about fiscal concerns and coordination of efforts, if any.

**Adjournment:** Neale motioned to adjourn the meeting; seconded by Duane. The meeting drew to an end at 8:23 p.m.

*continued from p. 2*

### **Do you have an observatory?**

Yes, indeed: the Sugar Grove Observatory, complete with a research grade 12" telescope, is located about 15 minutes south of Bloomington under reasonably dark skies. After a relatively painless orientation session, keyholders can use this telescope anytime they like!

### **What's the observatory like?**

Come to one of our Public Observing Sessions (the next one is scheduled for August 30th), and see for yourself!

### **How much does it cost to join?**

Less than a dinner for 5 at TGI Friday's: \$40 for a family membership. That includes discounts on Astronomy and Sky and Telescope magazines, a subscription to our own award-winning newsletter, The Observer, as well as membership in the Astronomical League. What a deal!

### **How do I join?**

It's easy. Just send \$40 to our esteemed treasurer:

Duane Yockey  
508 Normal Avenue  
Normal, IL 61761

### **Do you have a web site?**

Doesn't everybody? Online we have a calendar of events, archived copies of The Observer, and more. Visit us at: [twincityamateurastronomers.org](http://twincityamateurastronomers.org)

*continued from p. 3*

Specifically, we will gather at Panera's, on 255 East Ash Avenue, in North Decatur, at 7 PM, on Friday, the 22nd of August. After enjoying a delightful meal (which we can safely assume, since Panera's never disappoints, and the company is sure to be good), we will head out, at about 8 PM, to the observatory, on the Decatur campus.

We hope to spend a few hours playing around with the equipment, including the CCD cameras.

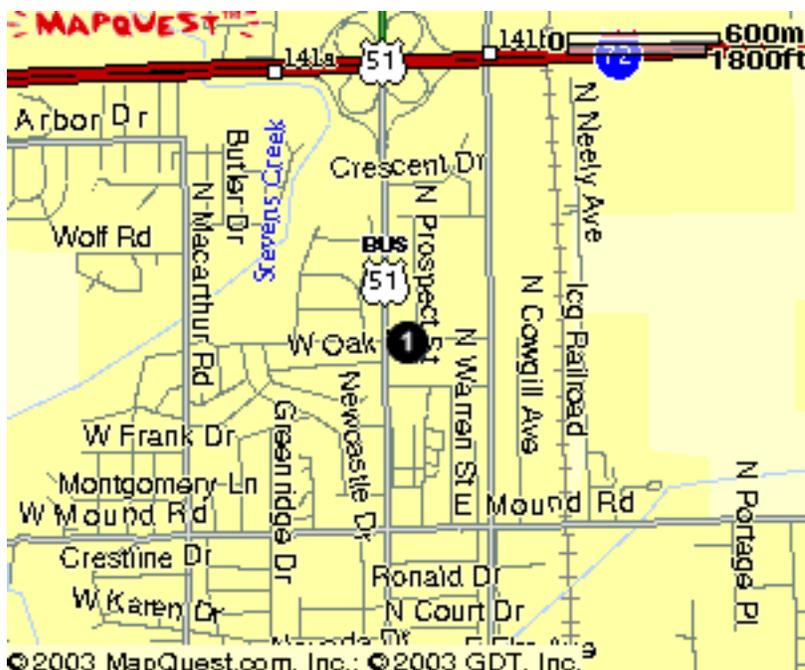
Note that, as usual, if skies are cloudy, we will scrub the mission! If you are unsure as to whether or not we are on, either visit the web site after 4 PM on Friday afternoon, for the definitive word, or give me a call (309-825-6454, 309-828-8655).

If you have any questions, please drop Dan or I (damiller@mail.ilstu.edu, mprogers@mac.com) a line, or contact any of our Board of Directors (contact information is on page 2).

### **Directions to Panera's:**

1. Head south on Route 51 to Decatur.
2. Once under I-72, proceed for approximately 1 mile on Business 51
3. Turn left just past Wal-mart, onto East Ash: Panera's will be on your right, in a strip mall, beside Circuit City.

*Lost? Phone 309-825-6454 and we will talk you in...*



## TCAA Treasurer's Report – July, 2003

– L. Duane Yockey, Treasurer

### OPERATING FUND BALANCE – June 30, 2003 -

\$ 856.11

#### Income

Jim Swindler (dues renewal) -	\$ 40.00
Wallace & Nguyet Strow (dues renewal) -	\$ 40.00
Peter & Janet Moore (dues) -	\$ 25.00
James Wall (dues renewal) -	\$ 25.00
Forest & Geraldine Appleton (dues) -	\$ 40.00

#### Expenses

Michael Rogers (postage) -	\$ 252.00
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### OPERATING FUND BALANCE – July 31, 2003 -

\$ 774.11

### OBSERVATORY FUND BALANCE – June 30, 2003 -

\$ 754.64

#### Income

None	\$ 0.00
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#### Expenses

None	\$ 0.00
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### OBSERVATORY FUND BALANCE – July 31, 2003 -

\$ 754.64

### TOTAL TCAA FUNDS – July 31, 2003 -

\$ 1,528.75

### Listing of Official Sugar Grove Observatory Keyholders (Paid \$10 deposit/\$5 renewal)

*Note: To gain access to the Sugar Grove Observatory, all you need do is contact any of the keyholders (see p. 2 for contact info):*

Jim Swindler (April 2001)  
 Sandy McNamara (June 2001, renewed Jan. 2003)  
 Michael Rogers (August 2001)  
 William Carney (March 2002, renewed Jan. 2003)  
 Neale Lehmkuhl (May 2003)

Duane Yockey (April 2001, renewed Jan. 2003)  
 Dan Miller (August 2001)  
 Dan Meyer (February 2002, renewed March 2003)  
 Vic Connor (August 2002)

# The Observer Crossword

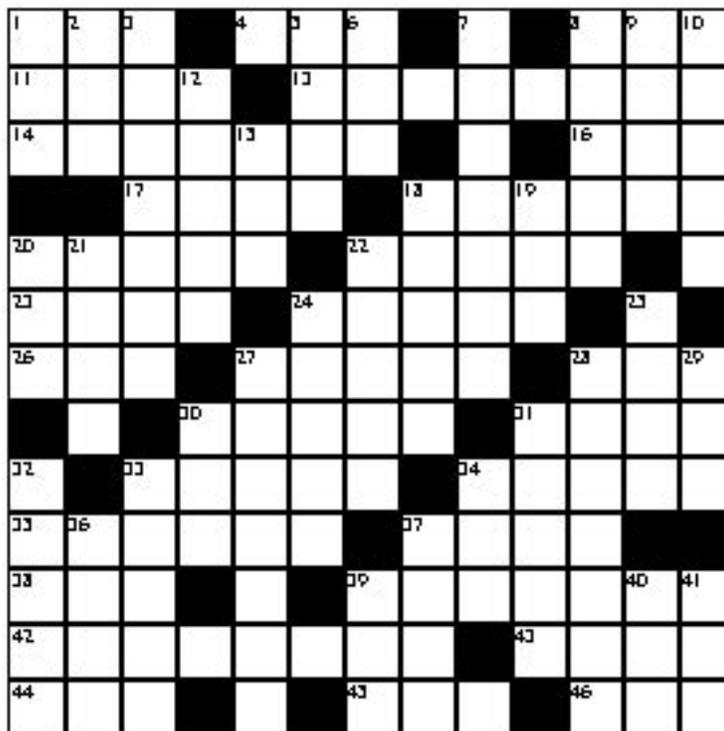
## —Observer Staff

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 Welcome Mat

The Cherubs are proud to be back in action, and welcome our newest members, from the far flung reaches of Princeton, Illinois! A warm August welcome to...



Peter & Janet Moore  
Princeton, IL



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### 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 \$40 to our esteemed treasurer:

Duane Yockey  
508 Normal Avenue  
Normal, IL, 61761

As always, thank you for your support!!