

## Upcoming Events

### January

- 22 New moon.

### February

- 2 Tuesday, 7:30 PM, Science Museum auditorium. Member Chuck Schein will speak on CCD cameras, including one he's built. The annual business meeting will be held, to vote on the 1993 budget and proposed amendments to the MAS constitution.
- 21 Mercury at greatest eastern elongation; best 1993 evening view is around this date.

### March

- 2 Meeting, Tuesday, 7:30 PM, Science Museum Auditorium. Speaker to be announced.
- 7 Full moon.
- 13 Waning gibbous moon occults Delta Scorpii at dawn Saturday; disappearance 5:23 AM, re-appearance 6:37 AM CST in the Twin Cities.
- 19-20 Star Party. Location to be announced.
- 22 New Moon.
- 26-27 Star Party. Location to be announced.

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Call (612) 643-4092 for up-to-date information on MAS events.



**Astronomy Represented at  
WRTC Fun and Fitness Fair**  
By Randall Wehler

Bringing amateur astronomy to the public is recognized as an important aspect of club activity. To give interested people a glimpse of the hobby and a hands-on feel of the observing equipment used can be rewarding indeed.

On Nov. 18, 1992, Willmar Regional Treatment Center (WRTC) sponsored its fourth annual "Fun and Fitness Fair." This annual event gives the treatment center employees and others a chance to see, up front, the leisure activities of staff and outside presenters.

WRTC utilized three large rooms this year to feature leisure activities and also health promotion awareness. Display tables included activities such as home crafts, nutritious cooking, collections of various types, taxidermy, photography, astronomy, etc.

Yes, astronomy was a new area covered this year, thanks to the efforts of Patrick J. Thibault. He is a registered nurse in the WRTC psychiatric unit.

Pat has been an active amateur astronomer for over seven years. Two years ago he started the Willmar Area Astronomy Club (WAAC).

His display included a Meade 8-inch, f/6 reflector and a table of materials including astronomy books, star charts, atlases, magazines, product catalogues, and an assortment of observing accessories.

Pat has an infectious enthusiasm for amateur astronomy, and most people who came by seemed interested in what he had to offer. Hopefully, a few people caught the astronomy bug.

Pat has always been willing to get individuals started in the hobby on a one-to-one basis, or he at least informs them of what is available to them if they come to club meetings.

During the fair, Pat kept a log of questions asked about his telescope. Gemini readers may find interesting what questions persons asked.

The numbers in parentheses indicate how many persons asked the question or one very similar to it. None of the persons identified themselves as current or former amateur astronomers.

1. What is the power? (8)
2. What do you look at? (3)
3. How much did it cost? (2)
4. Where do you set it up? (2)

**Minutes**

Submitted by Max Radloff & Stuart Levy

**Regular meeting of December 1, 1992**

The program was given by Claia Bryja of the University of Minnesota, who spoke about her search for brown dwarfs in the Hyades cluster. She has found some promising candidates, but they will need more study in order to confirm that they are brown dwarfs.

Elections were held. Steve Korzenowski replaces Mike Kibat as president, defeating Tom Lindquist; John Connery takes Don Day's post as board member at large, defeating Chuck Schein; and Stuart Levy replaces Max Radloff as secretary.

**MAS Board meeting of Dec. 15, 1992**

Tom Kingston and Jim Mason of Wilder have approved our lease; it will be signed as soon as their lawyer reviews it.

The Postal Service approved our non-profit mailing permit.

Max Radloff presented a draft plan for observatory administration. The president will appoint a committee, including at least Max Radloff, Steve Korzenowski and Tom Lindquist, to study the issue and report at the next board meeting, which will be on January 18th.

Possible constitutional amendments were briefly discussed, but no action was taken.

The fate of Gemini was discussed; see the January meeting minutes.

**Regular meeting of January 7, 1993**

This month's event was an auction of astronomical optics and paraphernalia, with proceeds dedicated to the Cherry Grove observatory. Steve Korzenowski and Don Day played auctioneers. Many valuable items were donated, including eight 6" and 8" mirrors supplied by Sherman Schulz. Turnout was good and some lively bidding was seen, raising in all some \$1230. Thanks to all who made this auction a success!

Carl Harstad announced that he's stepping down as the prime mover of Gemini. Unfortunately for the MAS, he can no longer afford the time. Carl will remain in the role of coordinator; Stuart Levy begins serving as editor, and Ben Huset as publisher, beginning with this issue. Dave Schaaf will continue to assist with circulation.

**GEMINI**

Coordination ..... Carl Harstad  
 Editing and Production ..... Stuart Levy  
 Publication ..... Ben Huset  
 Circulation ..... DavidSchaaf  
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# Deep Sky Eye

by Max Radloff

Deep sky observers who have gained some experience and have ventured beyond the brightest and most familiar objects will sooner or later find references in their handbooks to the planetaries J 320 and J 900. With a little digging you will find that the 'J' stands for Jonckheere, but you may still wonder who Jonckheere was and what the hundreds of other 'J' objects are.

Robert Jonckheere (1889-1974) was a French astronomer who one of the major figures of this century in the discovery and measure of double stars. He was from the French part of Flanders, apparently from a family of some money. As a young man in 1905-6 he successively bought refractors of 3, 4, 5, and then 9 inches of aperture. With these he honed his observing skills and gained confidence in his abilities. Although he discovered 70 pairs with the 9-inch, he did not publish his discoveries until he was more experienced. Jonckheere then bought a 35-cm (13-inch) refractor fitted with a filar micrometer modeled on the one Burnham had at Yerkes and placed it in an observatory which he built at the village of Hem. (I have been unable to locate Hem on the map, but it is either fairly close to the city of Lille or somewhat to the northwest on the river Hem near Calais.) After two years, he obtained government support and the observatory became part of the University of Lille.

With the 35-cm, Jonckheere discovered over 1,000 pairs. Observations at the observatory were interrupted by World War I, but Jonckheere was able to continue his work when he received an invitation to use the 28-inch refractor at Greenwich. In 1916, he published measurements of over 2500 new pairs. He later observed with the 80-cm reflector at Marseilles, and over the course of his life discovered over 4,000 doubles. Many of these are either fairly wide pairs in the Milky Way or very faint companions to brighter stars.

Since a double star observer can measure pairs that are elongated, but not cleanly split, it is almost inevitable that some of these elongated objects will turn out to objects other than double stars, especially if the discovery was made with a smaller telescope. J 320 and J 900 were discovered with the 35-cm at Hem and when they were reobserved at Greenwich, Jonckheere noted that they were planetaries rather than double stars. Four other pairs were discovered to be small galaxies. Anyone who has searched a star field for a small planetary or galaxy knows that they can be very difficult to distinguish from a faint double, especially if the seeing is less than optimum.

J 320 and J 900 are both located in the winter Milky Way and are similar in appearance. Both are about 12th magnitude and are rather small and slightly elongated, about 10" by 8". They will probably need an 8-inch at high power to be identified. A smaller scope with a nebula filter might be able to pick them out of the star fields, but they will be stellar in appearance until fairly high power is used.

J 320 is in Orion, located between Bellatrix on Orion's west shoulder and the Hyades. J 900 is in Gemini, a little west of a line joining the feet of the twins. To find them, you will need a good

chart, like the Tirion atlas or Uranometria 2000.0. Although I have observed both in the past, I have not been able to reobserve them so far this winter, as I have been unable to get out on the few clear nights we have had so far.

For those who would like to observe some of the Jonckheere doubles, here are three gleaned from Sky Catalogue 2000.0.

J 323 is in Orion at R.A. 5h 9.9m, Dec. +10 54, magnitudes 8.1 and 10.1, separation 3.4" at position angle 164. A third star of magnitude 10.4 is at 84.6" at p.a. 186.

J 53 is in Monoceros at R.A. 6h 23.8m, Dec. +2 40, magnitudes 7.1 and 10.7, separation 1.8" at position angle 127. A third star of magnitude 9.8 is at 33.9" at p.a. 103.

J 259 is also in Monoceros at R.A. 6h 24.2m, Dec. +7 54, magnitudes 7.9 and 11.8, separation 5.0" at position angle 322.

This fall when I decided not to run again for secretary of the MAS, I also decided to make this the last installment of this column. I have had less time to devote to astronomy and will have to apportion what time I have to fewer activities. For now, the priorities are observing, telescope making (finally finishing the schiefspiegler!), and helping see the Wilder project through to completion. There will be other articles in the future, but not as regularly and they will cover a wider range of topics.

Good luck and clear skies!

## NON-ELECTED POSITIONS

### LIBRARIAN

Max Radloff  
759 19th Ave. N.  
South St. Paul, MN 55075  
(612) 451-7680

### PROGRAM DIRECTOR

Lauren Nelson  
787 Clayland St.  
St. Paul, MN 55104  
Phone: (612) 644-1254

### SOFTWARE COORDINATOR

Michael Kibat  
4717 Nord Circle  
Bloomington, MN 55437  
Phone: (612) 884-0039

## LETTERS

To the Editor:

The Cherry Grove Observatory Project (CGO) got another big boost from the membership from the auction to benefit CGO at the January meeting. It was so successful because people donated such desirable items, particularly Sherman Schultz, and then people bid generously to acquire them. We had fun and a chance to acquire new treasures and toys. CHERRY GROVE THANKS YOU ALL! - ALL of the MANY PEOPLE who have been working or contributing in any way to the success of CGO have the club's (and my own) heartfelt appreciation for the support and effort (and sweat, shivers, and mileage) they have put into it.

I regret that this is the club's season for politics. We all should speak for what we think is right and stick to the issues. I have a responsibility particularly to speak out for CGO, and what seems to me right for the membership. Now is a time when each and every member of MAS should inform himself and speak out on the issues, and for the process to be open, accessible, and fair. - **Tom Lindquist**

To the Editor:

Enclosed is my first submission to Gemini. Astronomy is alive and doing well out here in west central Minnesota! Gemini is looking better and better all the time. I hope to submit further things in the future. Keep up the excellent work! - **Randall Wehler, Willmar, Minn.**

## Astronomy in Review

### Planetary Nebulae: Part I

By Patrick Thibault, Willmar Astronomy Club

William Herschel noted faint nebulae that appeared like ghostly planets. He called them "planetary nebulae," believing those objects were in the initial stage of star formation. Although he was wrong, planetary nebulae do provide important information about stellar evolution, the end stages. And there are more than 1,600 planetary nebulae in our galaxy to study.

A main-sequence star fuses hydrogen in its core, and the rate of consumption of its fuel is determined by its mass. A star that is five times the mass of the sun will spend approximately 60 million years on the main sequence. And a star that is one solar mass will be on the main sequence for 10 billion years. Whatever the rate of consumption, the fusion of hydrogen leads to the accumulation of helium in the core.

When the hydrogen has been completely consumed, the helium in the core becomes hotter, and a shell of hydrogen envelops the core. Fusion continued in the shell which consists of hydrogen. It is during this period of time that the star expands,

and its surface cools to the point of glowing red. It is now called a red giant. The diameter of the star is approximately 1.4 million kilometers.

As fusion in the hydrogen shell continues, it pumps helium ash into the core; the core becomes more massive and hotter. The temperature ultimately reaches 100 million Kelvin, and the helium nuclei form carbon and oxygen. As hydrogen first formed the core itself and later a shell about the core, so also with helium. Helium fusion occurs in a shell surrounding the core of carbon and oxygen. And the outer layers expand to a diameter of several hundred times the sun's.

The star is referred to as an asymptotic giant branch (AGB) star. At this point the star's evolution proceeds rapidly due to the strong wind created by the AGB star. The wind dissipates the outer layers or shells through a mass loss mechanism whose details are unknown.

The mass loss is attributed to the variation in diameter, temperature and brightness or luminosity of the star. Stars like these which vary in their brightness are called Mira variables. They lose mass at about one-millionth of the sun's mass each year, whereas the sun loses about one ten-trillionth of its mass each year.

The AGB star generates a superwind as the star evolves. This superwind drives off the mass of the outer layers, about one ten-thousandth of the sun's mass in a year. Oddly, the speed of this superwind is only 10-20 kilometers per second; this is indicative of the weak gravitational pull of the core.

The superwind ceases once the outer envelope has been blown into space, and the core of the star is exposed. Even though the star has lost a substantial amount of mass, its luminosity is still thousands of times greater than the sun. But the gas clouds surrounding the core cool to 1,000 Kelvin.

At that temperature particles composed of carbon, oxygen, and silicon condense to form an opaque cover about the star, absorbing visible light while re-emitting it in the infrared. And the core temperature climbs to 25,000 Kelvin after the superwind has ended, approximately a few thousand years. The electrons in the core become "degenerate": they are stripped from their atoms, and the ions collide or attach to free electrons. Next time, the dynamics of structure.

Note: Information for these articles comes from *Scientific American*, May, 1992.

## FOR SALE

Meade 2120 LX5 (10" Schmidt-Cassegrain). Asking \$1250. Call Bill Norton, 469-5631 for details. [This is the 10" Meade he brought to the January auction. - Editor]

## AL National Convention Within Reach

The Madison Astronomical Society will be host for the Astronomical League's 1993 National Convention, to be held July 29-31 at the Sheraton Inn and Convention Center in Madison, Wisconsin. Their theme will be "Astronomy from Earth and Space". More info to come later.

### How to Do It

#### How to pay your dues:

Send all membership applications or renewals dues to the MAS treasurer: Barb Brown, 4041 Garfield Ave. S., Minneapolis, MN 55409. Make checks payable to "MAS". The correct amount is:

Regular member with Sky & Telescope	\$33.00
Student member with Sky & Telescope	\$26.00
Student membership without Sky & Telescope	\$ 9.00
Subscription to Gemini	\$ 4.50

Include your renewal notice from Sky & Telescope, if applicable. If your address or phone numbers (home and work) have changed, or if MAS may not have the correct information, include that also.

#### How to change your address and/or telephone number:

Send or give your name, address, home telephone number and work telephone number (if applicable) to the treasurer of the Society, or to Gemini, P.O. Box 26522, St. Louis Park, MN 55426-0522.

#### How to call the MAS information line:

Call (612) 643-4092 for a recorded message, or to leave a message.

#### How to order astronomical software:

Contact the MAS software coordinator, Mike Kibat, 4717 Nord Circle, Bloomington, MN 55437, telephone (612) 884-0039, for most astronomical software. You may receive software at meetings on diskette. You may also be able to download it from the MnAC BBS, (612)884-7812 evenings and weekends only. Publications available on diskette, such as the Floppy Almanac, are usually available through the MAS secretary; see below.

#### How to order publications:

Contact the MAS secretary, Stuart Levy, 3540 33rd Avenue South, Minneapolis, MN 55406, telephone (612) 729-9289.

#### How to order anything else:

All other items available through MAS, such as registration forms for out-of-state astronomical events, are usually available through the MAS secretary; however, specific items may be available through other MAS members.

## New MnAC Computer Files

#### IBM DOS programs:

MOONFAZE.ZIP	87,464	01-03-93	Displays current phase, other info
VPIC.ZIP	257,962	12-01-92	V5 -- Displays/Converts .GIF and others

#### GIF files:

TRITON-2.GIF	69,688	01-03-93	B&W close-up of Triton
TRITON-2.GIF	59,904	01-03-93	Color image of Triton (?)
JUPE-5.GIF	11,008	01-03-93	Montage of Jupiter and Several Moons
BH-1.GIF	47,395	12-04-92	Black Hole? HST image of NGC4261 Disk

The Minnesota Astronomical Coalition (MnAC) BBS carries these and many other files, news items of interest to the astronomical community, and a budding conference on CCD camera construction. Modem users can reach it at 884-7812 *evenings or weekends*, at speeds up to 2400 baud.

## ELECTED OFFICES

#### PRESIDENT

Steve Korzenowski  
1614 Welcome Ave.  
Golden Valley, MN 55422  
(612) 544-8335

#### VICE PRESIDENT

Mike Conley  
14003 Undercliff St. N.W.  
Andover, MN 55303  
(612) 422-0517

#### SECRETARY

Stuart Levy  
3540 33rd Ave. S.  
Minneapolis, MN 55406  
(612) 729-9289

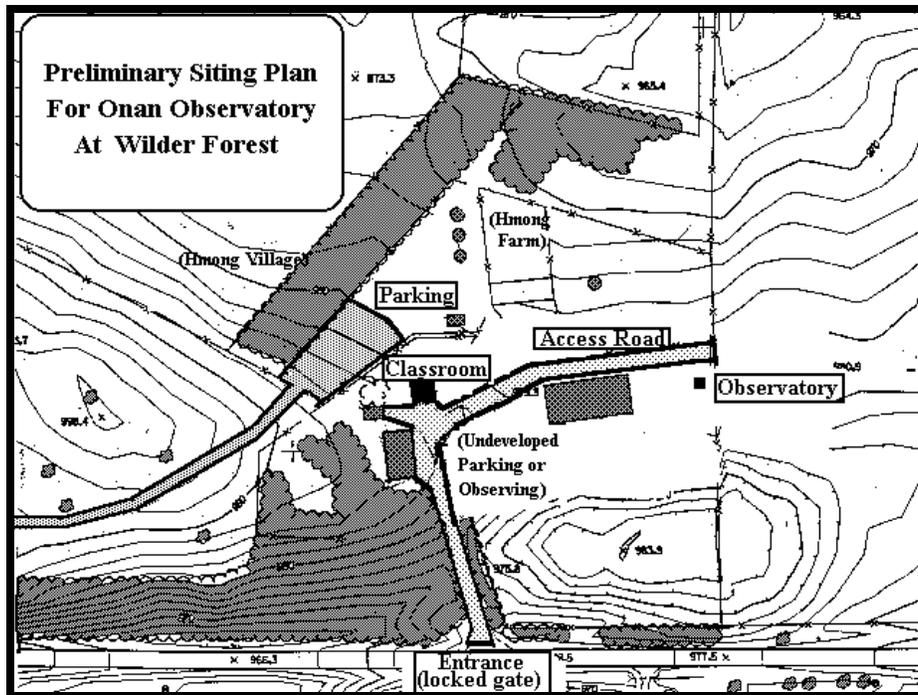
#### TREASURER

Barb Brown  
4041 Garfield Ave. S.  
Minneapolis, MN 55409  
(612) 827-1450

#### BOARD MEMBERS AT LARGE

John Connery  
2400 Wisconsin Ave.  
Golden Valley, MN 55427  
(612) 544-5786

Ben Huset  
1908 W. Co. Road E  
Arden Hills, MN 55112  
(612) 633-5093



A possible location for the MAS observatory at Wilder Forest

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