



# Capitol Skies

The newsletter of the Madison Astronomical Society

June/July 2003

## Jim Kotoski wins MAS Outreach and Education Award

At the banquet on April 11, Jim Kotoski was awarded the MAS Education and Outreach award. Jim has been a science teacher in the Madison Metropolitan School District for 35 years. His



emphasis on experiential and experimental science has made him popular with students. During the banquet at JT Whitney's, no fewer than 2 former students of his came over to introduce themselves and chat with him, one a waitress, the other the wife of an MAS member!

Jim's connection with astronomy is both deep and wide. His students do a two month unit on astronomy every spring. In addition to classroom and internet research, they use the classroom dobsonian telescopes to observe the sun and moon, use the MMSD observatory to obtain pictures of deep sky objects, and connect to an observatory in Australia so they can observe during the school day in Wisconsin.

## Welcome New Members

MAS warmly welcomes the following new members: Ean H. Crennell, Kate Dennis, Andrew Nowlan, and Jeffrey Shokler.

## From the President's Desk

by Neil Robinson

Greetings, greetings fellow MAS'ers,

We had a nice turnout of members for the eclipse watching at Gov. Nelson St. Park on the 15th, and a large turnout of highschoolers. It was a beautiful site from which to watch the eclipse glow over downtown Madison.

The CCD training program continues apace with 4 observing members now qualified for solo CCD-ing, including yours truly. Greg Seleck's patient instruction enabled even my cyber-sloth to accomplish the tasks (with some valuable 12 year-old kibitsing from my son).

Next month's meeting is the June picnic at YRS on Saturday the 14th. Come on out and join the fun! This will also be the club elections for the next year's slate of officers. All current officers are running for reelection except Matt Mills, so we are looking for someone to run for the secretary's position for next year. Come on, folks. Step up to the plate and throw your hat in the ring! (I predict it won't be a bruising campaign).

Finally, check out the stunning two page color insert in this month's newsletter. Thanks to Doc Greiner for printing these pages for us!

## Doc Greiner Donation

At the May meeting of the MAS the members present accepted the gift of a complete Meade LX200 mount from Dr. R. A. Greiner. The purpose of this gift was to insure that the MAS would have on hand all of the parts necessary to fix or otherwise repair either of its two LX200 telescopes. These telescopes are the working mainstays for observation at the Yanna Research Station. Since they have been superceded by a new telescope from Meade, it has become more difficult, expensive and time consuming to have them repaired. With a complete working mount in hand, the MAS has the necessary parts to repair either one of our 12" LX200 telescopes immediately. Then repair or replacement of failed parts can be done on a non-emergency basis.

The MAS thanks Dr. Greiner for this generous gift.

## Calendar

June 14 - Annual MAS picnic at YRS. Business meeting at 4 pm and the picnic at 5 pm. Meat and buns will be provided. Everyone should bring a dish to pass. Observing that night at YRS, weather permitting.

July 11 - A member discussion about Mars moderated by Neil Robinson. Bring whatever experiences you have and be prepared to share with the group.

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Madison Astronomical Society members are active in sharing the pleasures of astronomy with the public, acting as a resource for students and teachers, and exchanging information at Society meetings which occur monthly. The Society continues to pursue its original goal to "promote the science of astronomy and to educate the public in the wonders of the universe."

For more information about the Society, please contact one of the officers listed above.

MAS thanks

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for hosting our web presence.

Visit MAS on the web at:

[www.madisonastro.org](http://www.madisonastro.org)

## Where on Mars...?

by Wynn Wacker

With the closest approach of Mars to Earth in recorded history set for the night of August 26-27, the biennial interest in observing Mars is sure to reach new heights. Even though the declination of Mars will be  $-15^\circ$  at opposition (meaning Mars will be only  $32^\circ$  above the horizon at midnight from Madison), most amateur astronomers will want to seize this historic opportunity to view and/or image the planet. The purpose of this article is to help you answer the questions which are sure to arise - "Where on Mars am I looking and what are those features that I see?"

The first thing to determine is how Mars is oriented in your field of view. If you have a clock drive, turn it off and watch the planet drift through the field of view. The edge (limb) of the planet which first exits the field of view is the preceding (p.) limb. This is the eastern or evening limb of the planet. Clouds which form late in the Martian day appear on this side of the planet. The opposite side is the following (f.) limb. This is the western = morning limb. Clouds, fogs, and frosts which form during the Martian night may be seen on this side of the planet. If you have an equatorial mounting for your telescope, release the declination clamp or turn the declination slow motion adjustment to move the telescope to the north (i.e. "upward"). The southern limb of the planet will be the first to exit the field of view. If you have an altazimuth or Dobsonian mounting, the principle is the same but direction of motion won't be at right angles to the east-west axis.

For a planet like Jupiter, with a polar axis at nearly right angles to the ecliptic and distant enough that there is little phase effect, this above is all you need to get oriented. Mars, however, has an axis tilted at  $25^\circ$  (slight larger than the Earth), so it has pronounced seasons. Further, it is close enough to Earth that it can show a significant phase when not at opposi-

tion. This, the grid of Martian latitude and longitude is constantly shifting as the Earth and Mars perform their celestial dance around the Sun, and there is no convenient ring system to cue off of as with Saturn. To find out more about how Mars is oriented with respect the p.-f. north-south field, you need an ephemeris. The most convenient (and free) can be found in the Mars Section web pages of the Association of Lunar and Planetary Observers (<http://www.lpl.arizona.edu/alpo/>). The discussion below uses parameters found in the A.L.P.O. 2003 Mars Ephemeris.

The general orientation of the planet, the condition of the polar caps, and meteorological patterns all depend on the Martian season. Mars observers use the planetocentric longitude (Ls) of Mars as a convenient index of the seasons. For the northern hemisphere, spring is Ls  $0^\circ$ - $89^\circ$ , summer Ls  $90^\circ$ - $179^\circ$ , etc., with the usual inversion for the southern hemisphere. At opposition this year, Ls =  $249^\circ$ , or late spring in the southern hemisphere, late autumn in the northern.

The tilt of the Martian axis of rotation with respect to north-south line of the field of view is given by the value of the position angle (axis), which is orientation of the axis in degrees west of north (toward the following direction). It is  $346^\circ$  at opposition, meaning the Martian axis of rotation is rotated  $14^\circ$  in the direction of the p. (eastern) limb. It is also important to know the line of latitude on the center of the Martian disk as seen from Earth. This is given by De, the planetocentric declination of the Earth. This is  $-18.4^\circ$  at opposition, meaning that line of Martian latitude runs through the center of the disk.

At opposition, the Martian hemisphere facing the Earth is nearly fully illuminated. At other times Mars can show a significant phase with portions of the disk in shadow. This is described by the position angle defect (defect) which is

the angle between the Sun and Earth as seen from Mars measured westward from the Sun-Mars line. It is  $0^\circ$  at opposition, close to  $251^\circ$  near the end of June, and  $66^\circ$  near the beginning of November. The phase ratio,  $k$ , is the illuminated fraction of diameter of the planet through the widest part of the shadow crescent. The planetocentric latitude of the Sun,  $D_s$ , can be used in conjunction with the other values to calculate how the crescent of shadow is oriented with respect to the disk.

This gives a description of the orientation of the disk of Mars and its shadow. If it seems too much, and if you have software to interpret PostScript files, you can try using the Mars Viewer 2.0 at [http://ringmaster.arc.nasa.gov/tools/viewer2\\_mar.html](http://ringmaster.arc.nasa.gov/tools/viewer2_mar.html) to generate a diagrammatic disk, with or without coordinate lines. The site is devoted to diagramming planetary rings, so some of the menu items may seem a bit odd. For simple visual observations, you may be able to get all you need from the diagrams June issue of *Sky & Telescope* on p.94.

All this still leaves the question of what planetary features you are looking at. To figure this out, you need the central meridian (CM) value at 0 h Universal

Time from the ephemeris and a map of Mars. The CM is the Martian longitude running through the center of the disk. A Martian day (called a Sol) is about 37 minutes longer than an Earth day, so the CM longitude increases at a rate of  $14.6^\circ$  per hour. For example, 11 pm CDT equals 6 h UT on the next date. On the night of opposition (August 27th UT), the CM is  $337.6^\circ$  at 0 hr UT. The CM at 6 hr UT is  $336.7^\circ + 14.6^\circ * 6 = 425.2^\circ - 360^\circ = 65.2^\circ$ . The A.L.P.O. website has a Martian map, but an even better pair of maps appears on p.97 of the June S&T. The top map shows Mars as seen by telescopic observers. At 11 pm the dark region Aurorae Sinus will be just p. the center of the disk with Solis Lacus just following and to the slightly south. Mare Acidalium and Niliacus Lacus may appear as a dark mass on the north preceding edge of the disk. The bottom map shows the topographic features found by spacecraft, and reveals that it is great canyon complex of Valles Marineris that is running through the center of the Martian disk.

Now that you can find your way around Mars, let's hope that the weather cooperates and a possible Mars-wide dust storm doesn't obscure the surface. Clear skies! – both of them!

## CCD Training Continues

by Greg Seltek

Another CCD training class will be held on Saturday, June 14th at 2pm at YRS. That's the same day as the picnic, only a few hours earlier. This training session will go over the basics of how to use the CCD camera and telescope. Once you they completed the classroom training, observing members have the opportunity to attend 2 more hands-on sessions with the CCD camera. Once an observing member has demonstrated the ability to use the equipment on their own, they will become 'qualified' on the CCD camera, and can use it at their leisure. Please call or e-mail me if you would like to attend this classroom session. My phone number is 848-6301, and my e-mail address is [orion2598@hotmail.com](mailto:orion2598@hotmail.com)

For those of you who have already completed the classroom training, but have yet to take the hands-on sessions, Saturday may also present the opportunity to continue the training (weather permitting). Please let me know if you would like to sign up for the hands-on sessions, as space is limited for these.

Congratulations to Neil Robinson, who became the 6th MAS member to be qualified on the CCD camera!

## May Lunar Eclipse Event Well Attended

by John Rummel

After an afternoon and early evening cloud scare, Madison observers of the May 15-16 total lunar eclipse were rewarded with clear skies and a picture perfect evening for eclipse observing. A few images are provided on the two-page color insert in this month's newsletter.

I was part of a group of about 150 that gathered on the beach at Governor Nelson State Park that evening. The crowd was primarily made up of Madison Metropolitan School District students and their families. Science teachers at Memorial and West High Schools, and Spring Harbor Middle School offered their students extra credit if they ob-

served the eclipse. Several MAS members were in attendance with telescopes and binoculars, but as the crowd quickly learned, naked eye observing is just as rewarding for an event such as this.

I spent the evening glued to my C8, which I was using in combination with my new Nikon Coolpix 4500 to capture the eclipse photographically. Nearly everyone wanted to look at the image of the moon in the tiny LCD viewfinder, and many were fascinated to learn that such a marriage of a digital camera and a telescope was possible (mine was made possible by the use of a Digimount

Adaptor). One 8th grade student who had a digital camera wondered if he could accomplish the same thing. I had him point his camera (an inexpensive point and shoot digital) down the eyepiece of my little 80mm refractor. He was thrilled to capture an image of the partial eclipse that was very clearly focused. This youngster spent the rest of the evening at that telescope, keeping it pointed at the rising moon, giving looks to passers by, and taking a slew of photos with his camera. I think this young man received an extra dose of extra credit from his teacher the next day!



Capitol Skies  
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First Class

MAS would like to thank:

**PRINT-TECH**

and Tim Stanton for printing  
the newsletter and

**IDC**

for hosting our web presence

This resource list is made up of people who have special interests which they are willing, even eager, to share with others in the Society. Many members, not listed, also are interested in particular aspects of astronomy and have considerable expertise in viewing and imaging the skies. Members are encouraged to come to the monthly meetings, not only to get to know the other members, but to discuss and enjoy their special or general interests in various aspects of astronomy. This is a Society of beginners and experienced amateurs. From time to time we have seasoned professionals attending. The meetings are a good time to meet these people as well. See you there.

### Resource People and Special Interests

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