

Gemini

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In the pages of the Gemini

- Watch This Space**
By Jon Hickman...Page 2
- Duke Skywatcher...**Page 4
- Sisters in the Stars**
By Jackie LaVaque...Page 5,8
- A Report on the
Transit of Venus**
By Mark Petersen...Page 6
- Summer Solstice Astro
Swap Fest...**Page 7
- ASTRONOMY 101**
By John Young...Page 8
- Update on the Minnesota
Planetarium and Space
Discovery Center**
By Parke Kunkle...Page 9
- Big Glass on the Prairie BAD
Update-April 2005**
By Deane Clark...Page 9
- Road Trip SIG:
Nebraska Star Party 2004**
By Gene Kremer...Page 10-11
Web version only
- MAS Memberlist**
pages...12-15

Research SIG: Recent Photometry from the Big City

By Russ Durkee

Imaging from the middle of Minneapolis? No problem. My Observatory, "The Shed of Science" is located deep within the Minneapolis light dome. Light pollution is an issue, but it does not prevent me from doing high quality photometry. You might be familiar with Michael Koppelman's work at his "Starhouse Observatory" or the MAS research SIG. I make up the other half of this small, but active group. On most clear nights you can find us at our respective observatories "taking data", baby-sitting our telescopes, hoping for a nap before sunrise. Our goal is to measure subtle changes in brightness of our targets using differential photometry. My main interest is the measurement of asteroid light curves. This is a summary of a few interesting projects from the last few years that will hopefully inspire some of you to join in on the fun!



The Shed of Science

Russ Durkee's Shed of Science utilizes a Celestron 14" SCT, Astro-Physics 900 equatorial and an SBIG ST10XE.

My main targets at The Shed of Science are asteroids. Since these wanderers are never in the same place from night to night, a very accurately aligned mount with goto capability is necessary. My current setup allows me to perform photometry on asteroids down to 16th magnitude or so using 2-3 minute exposures.

During the planning stages of the observatory in the late 90's, my primary goal was astrometry and asteroid hunting. Finally, in the winter of 2003, I put together my imaging rig and completed my observatory. By spring, I taught myself the basics of imaging and made my first attempts at astrometry, or measuring the positions of asteroids. In July of 2003, I made measurements of a few nearby asteroids with sufficient accuracy to receive an official observatory designation (H39, "Shed of Science") from the International Astronomical Union: Minor Planet Center.

Since the late 90s however, large surveys like LINEAR and Spacewatch rapidly discovered most of the asteroids within range of the 11" telescope I had. The days of easy asteroid hunting were over. I knew that switching my

Continued on Page 3

WATCH THIS SPACE

By JonHickman

Scott writes: "I just wanted to say "hi" to everyone. I just bought an Orion XT8 Dobsonian and was wondering if anyone is willing to share any good or bad qualities of the scope. This is my first. Couldn't decide between the Orion Astroview 90mm EQ or the XT8. Might be having second thoughts on the XT8 that I bought."

We reply: "As a previous owner of the Orion 120's and a 10" DOB, be very thankful you went with the dobsonian! The most frustrating part of owning ANY scope is learning your way around the night sky. Having to do this PLUS figure out an equatorial mount at the same time is really tough! The beauty of the dobsonian design is the simplicity of use, just point it and look. The trick is always, what do I look at, or how do I find...?"

Both questions are answered with time. First a few things you won't see: huge images of Saturn or Jupiter filling the entire view of the telescope with bright, bold rings, lines, etc.; stars big and bright as the sun; the flags at the lunar landing sites; bright, colorful nebulae and galaxies. My wife's most frequent comment about astronomy was always: "I don't get it, they're still just a bunch of white dots!" Stars through a telescope look like...stars, some will show color that may not be apparent to the naked eye, but for the most part they are still just small dots.

Planets will show more detail, but the majority of the detail will come as you view the same item over and over again. Your eye will become trained to see more and more detail. Nebulae and galaxies are in the range of what are commonly called: "faint fuzzies". And that is very much how they appear when you first begin to view them. Little grayish or greenish fuzzy patches. And the harder you stare at them, the harder they will be to see!

So, where to start? Start with what you know. You probably know the Big Dipper and Polaris, the North Star. Point your scope to Polaris. Did you know it is a double star? Even modest power will show two stars where you've always thought there was just one!

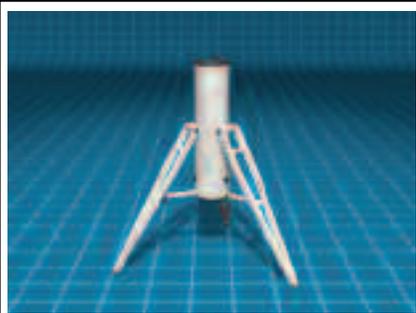
Examine the stars of the Big Dipper. Take time to learn how the telescope moves as you look from star to star in this familiar pattern. Keep your eye to the eyepiece as the telescope is positioned from one star to the next. Observe how the telescope moves one direction, but the stars seem to move in the opposite direction. Now look up at the sky where the scope just traveled. What happened to all those other stars you saw? White dots, yes, but MANY more white dots than the naked eye can see.

Now is a great time to view Jupiter. From the setting of the sun and on through the entire night, Jupiter is available for viewing! Aim your scope on it, and take the time to let your eye soak in what it sees. Use low to medium magnification to start, slowly the bands will emerge, perhaps even your first view of the Great Red Spot (GRS). Early in the evening, Saturn is well placed in the western sky, and while it isn't HUGE, it is quite well defined. After years of astronomy, I'm still in awe every time I see Saturn through a scope!

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The moon is another great target, especially on nights where it isn't full or new. Take time to slew (move) your scope across the line where light meets dark (called the terminus). This will provide great contrast for viewing and its amazing what you can see. (Unfortunately, most backyard scopes will resolve down to a few miles at best, so the flags, etc of the 60's lunar missions aren't visible).

Pick a section of sky where there are not many stars, Point your scope there and be amazed at what you can see. Start learning the other bright constellations, these will become your guideposts to finding other interesting details. Most of all have fun! Enjoy our warming spring evenings and look at everything and at nothing in particular! Drink it in and let the stars fill your mind and your soul with wonder.

GEMINI INFO

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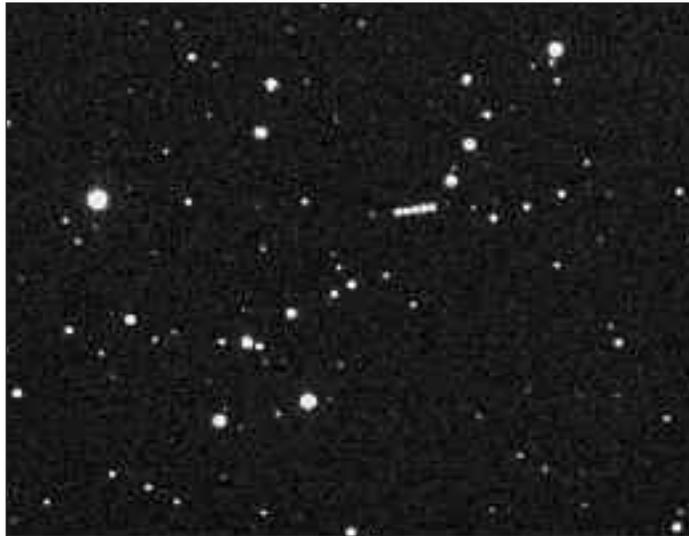
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focus to photometry would make the most productive use of my observatory. There are 200,000 + asteroids out there and only 1000 or so have had their rotation rates measured. I wanted to do original research and maybe make a few discoveries along the way, and asteroid photometry fit the bill quite nicely.

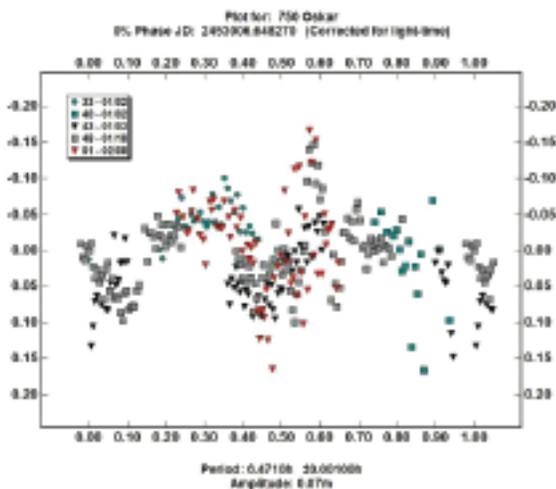


Motion of asteroid 62 Erato over a three-hour period on January 14, 2005.

Field of view is about 18 arc minutes across. At the time these images were taken Erato was about Magnitude 13.1 and 1.8 AU from Earth. Erato is approximately 71 miles in diameter.

Asteroid Light Curves

Once I learned the basics of photometry, I began working a few asteroids. I quickly learned that their irregular shape can create noisy light curves requiring observations over many nights. After a few months’ practice, I had a light curve of asteroid 750 Oskar. It was not especially pretty, but it was my first reasonable result.



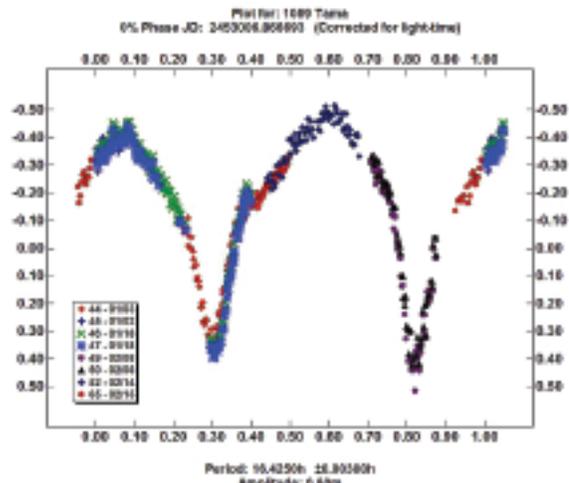
Light curve of asteroid 750 Oskar.

Y-axis is magnitude change and X-axis is phase time, January 2004.

As I compiled Oskar’s light curve, I noticed a second asteroid in my images. The second object turned out to be the

asteroid 1089 Tama. The following day I learned that an observing campaign on 1089 Tama was being coordinated by Geneva Observatory in Switzerland. I contacted the principal investigator of the project and sent him my measurements from the previous night. The unusual light curve indicated it was not a single tumbling rock, but a binary! In fact, 1089 Tama probably represented the first binary asteroid identified exclusively by amateur astronomers. Subsequent observations at The Shed of Science over six nights in January and February, 2004 resulted in a high quality light curve clearly showing mutual eclipses of the primary and companion asteroid. Alan Harris of the Space Science Institute calculated that the primary was probably an elongated body 9 by 13km with a secondary body 7 km across separated by about 20 km. At the time of my observations, 1089 Tama was approximately 93 million miles (1AU) from Earth.

A few days later, the discovery was announced in an International Astronomical Union Circular. Over the next seven months, I was fortunate enough to be involved in the identification of two more binary asteroids, 1313 Berna and 850 Frostia, and a new variable star! By the end of 2004, I had worked about 10 different asteroids resulting in four publications with several more on the way.



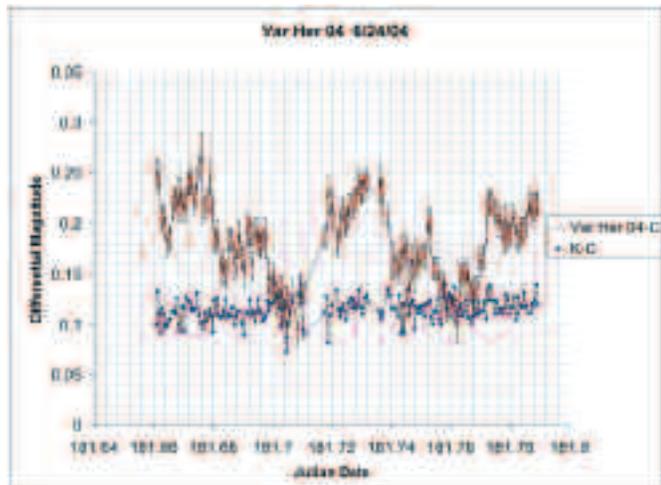
Light curve of 1089 Tama compiled from Shed of Science data.

The curve represents the change in brightness of the binary pair as they orbit and eclipse one another.

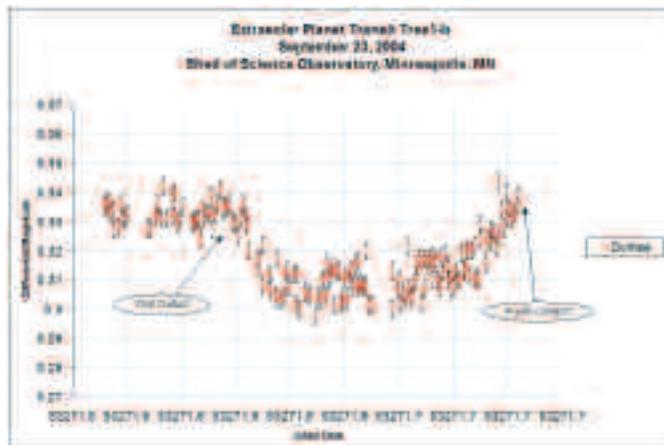
CBA Minnesota: The ecliptic becomes low in the sky during the summer months, and so do most of the asteroids. My targets change to cataclysmic variable stars for the Center for Backyard Astrophysics (CBA) and the American Association of Variable Star Observers (AAVSO). Cataclysmic variables are binary systems consisting of a red dwarf and a white dwarf so close together that the secondary is pulling material from the primary. These eruptive systems are monitored by the worldwide CBA network.

Michael Koppelman and I collaborate on these objects as CBA Minnesota. We coordinate our observations so we do not duplicate our efforts, making the most efficient use of our precious observing time. Michael has put together a great website to catalog our data at www.cbamn.org . We

are looking for other Minnesota photometrists to join us in this project. The CBA and the AAVSO make it very easy to become involved in backyard research and we hope CBA Minnesota will make it even easier for local astronomers to collaborate and combine data.



Light curve of Cataclysmic Variable Star Var Her 04.
The upper line represents the variation in brightness of the system and the lower and flatter line are measurements of two nearby non-variable stars.



RRD Stars

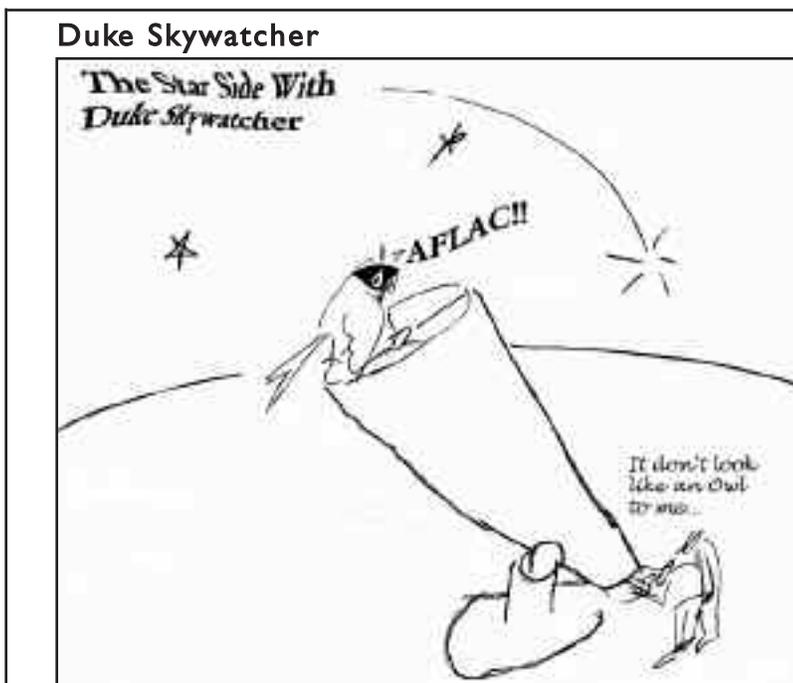
Last year Michael Koppelman and I collaborated with Patrick Wils in Belgium, Douglas Welch of McMaster University in Canada, and J. Vidal-Sainz in Spain to build a light curve of a rare and unusual double mode variable star. Only a few dozen of these stars have been discovered in our galaxy and are noteworthy because they vary in brightness at a number of different frequencies over time. These stars are useful in testing theoretical stellar pulsation models. Over a period of several months, we put together a very comprehensive light curve of this fascinating object.

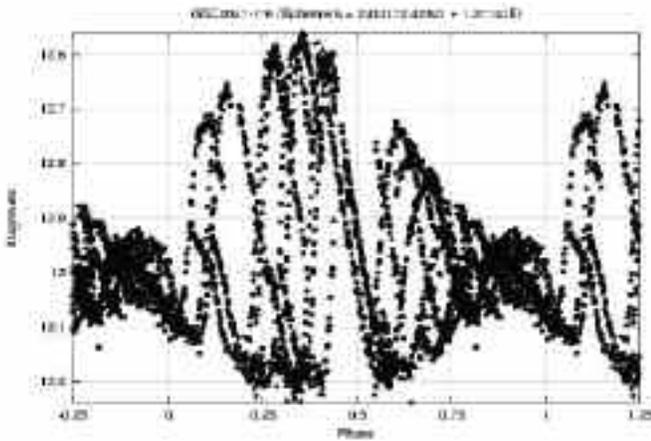
Extra Solar Planets: By monitoring stars with suspected planets, I can also capture subtle dips in brightness caused by a planet crossing the face of the star. These observations must be very carefully done to detect the tiny .02 magnitude dip of the primary star as the planet transits. Imagine detecting a Jupiter sized planet transiting the face of a star 500 light years away and you get the idea.

Michael presented our work at the American Astronomical Society Meeting in January, 2005. Currently we are working another RRD star that should yield equally interesting results.

In August of 2004, a 4-inch telescope (on a modified LX200 mount) in the Canary Islands detected the transit of a planet across the face of a star called TrES-1. One clear night in September 2004 the transit of Tres-1 would be visible from Minnesota. So, I monitored the star and took data through the predicted time of the eclipse. The .02 magnitude dip was clearly visible in my data.

My data were combined with a number of other observers and published a few weeks later in the Journal of the AAVSO. Some of the results showed a very slight brightening before and after the eclipse. The results are not conclusive, but could represent brightening by debris or a ring of material around the planet. Sky and Telescope noticed our publication and wrote an article about the possible discovery on their website. Recent observations with the Hubble Space Telescope should answer this question definitively in the near future.





Light curve of double mode Lyrae star GSC 3047:176, Koppelman, Wills, Welch, Durkee, and Vidal-Sainz

Conclusion

It is a very exciting time for backyard astronomers. Advances in CCD technology, goto mounts, and software, allow small observatories like The Shed of Science to conduct original research like never before. If you know your way around a CCD camera, it is pretty easy to get started on your own research. If you are interested in joining in on the fun, check out the MAS research SIG or contact Michael Koppelman or me directly. In no time you could be making discoveries of your own.

Sisters in the Stars

By Jackie LaVaque

Greetings to both the female and male readers of this column. I should probably tell you up front that I don't plan to make "Sisters in the Stars" a regular column, but I thought I would try it out for a couple of issues to see how it's received.

I've been a member of the MAS for about four years now. There are more female members now than when I joined, but we are still in the minority. I would certainly like to encourage more female membership in MAS. So this month, I'd like to take a quick look at several pioneering women who made huge and lasting contributions to the science of astronomy, usually in spite of firmly-entrenched notions of what sorts of careers were "suitable" for the women of their time.

- Hypatia of Alexandria. Often considered to be the first woman astronomer, she lived in the late 4th century A.D. She was raised by her father, Theon— her mother is not mentioned in most accounts of Hypatia's life, and it is likely she died when Hypatia was very young. Theon trained his daughter in mathematics, science, philosophy and the arts. She was a philosophy teacher and wrote many books on mathematics, such as the 13-volume Commentary on the Arithmetic of Diophantus. She also wrote The Astronomical Canon and edited her father's third book, a commentary on Ptolemy's

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Micheal Koppelman's Site
www.lolife.com

CBA Minnesota
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Minor Planet Mailing
List Information Site:
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Center for Backyard Astrophysics
cba.phys.columbia.edu

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Almagest. She is immortalized in a serene lunar crater that's not far from the shores of Mare Tranquillitatus.

- Caroline Herschel. Born in Germany in 1750, her father gave her a rudimentary education, despite the disapproval of her mother. She seemed destined to a dreary existence as a scullery maid until she joined her brother William in England, at his insistence. Trained as an opera singer, Caroline instead took up the task of helping her brother with complex mathematical calculations based on his observations. After William discovered the planet Uranus in 1781, he became a full-time astronomer, and Caroline's capabilities became more valuable to him than ever. When William traveled, Caroline would observe on her own. She became famous in her own right for having discovered three nebulae and eight comets. She was awarded honorary memberships in two astronomical societies, as well as several medals— this during a time when women simply weren't eligible for memberships in astronomical societies.
- Maria Mitchell. Born in 1818 on Nantucket Island, Massachusetts, Maria Mitchell's father was an astronomer that encouraged his daughter to aspire to higher education. Such was not usually the case for most women in the early 19th century, but Mitchell

Continued on Page 8

A Report on the Transit of Venus on June 8, 2004

By Mark Petersen

I had been looking forward since the mid-1990's to the transit of the planet Venus on June 8, 2004 which would cross the Sun for the first time since 1882. A transit of the planet Venus is visible only once (or twice) over the span of two lifetimes. Transits of the planet of Venus come in pairs spaced 8 years apart. The second transit of this current pair is going to be on June 5-6, 2012 and after that it will be in the year 2117 for the first of the next pair.

The planet Mercury transits the Sun much more frequently, about 13 times a century. I have seen several of those, the first being 1970 and the last being November 15, 1999. The next transit of Mercury will be in November 2006 and if the clouds permit, visible from Minnesota.

I had looked at the maps in the February 1995 issue of Sky & Telescope showing the sides of the Earth pointing toward the sun for entry and exit times of the transit of Venus in 2004. In Minnesota we would only be able to see the very last stages of the transit. From Europe one would be able to see the entire 6-hour event. I had planned on being in Europe for the Transit of Venus but that did not work out.

The Twin Cities we were only going to see the last hour of the event, with the Sun only being up 7.3 degrees at the time the planet was going to be last visible on the disc. The sun of course rises in the northeast at that time of year, so the more north and/or east you are the more it would be possible to see.

That is, if clouds did not interfere. About one week prior to the event I started paying close attention to the weather forecasts not just the Twin Cities, but other locations within a 1 days driving distance such as Thunder Bay Ontario, Duluth and the Milwaukee area. Of particular help was the online web site <http://cleardarksky.com/csk/>

I scheduled three days of vacation, centered around the day of the transit, June 8th. I also scouted out a site close to my home that had a good northeast horizon. I found a site that was in a park with easy close by parking.

As the day of the transit got closer I became increasingly concerned about the prospects of seeing the event from Minnesota. Several times each day I would check the local and prospective alternative viewing locations on the web. I finally decided on the morning of the day before the transit that it would be best to go somewhere else in the hope of seeing the event. It was time to get out of Dodge. The on line forecasts indicated that southeastern Wisconsin had the best probability. This is an area we know well, having some relatives that live there. I knew of just the spot to view the early morning transit from, so we did not have to go out that night and scout for a suitable location. We would also gain some additional transit time and the sun would be a few degrees higher in the sky being near Milwaukee.

My wife and I left Minnesota just after noon, hoping that those still in Minnesota would somehow get to see the transit despite the forecast. We arrived at our destination in the early evening and did not stay up too late. We set the alarm for



around 4 AM and arrived at our viewing location about _ hour before the predicted sunrise of 5:18 AM.

The sky was fortunately clear with a humid morning haze on the horizon. I set up 3 pieces of equipment on separate tripods in a line perpendicular to point where the sun would soon rise. I had a Meade ETX-90 with 35 mm film camera, a Celestron-90 and a Sony Digital Camcorder that has a 25X optical zoom and a 2X tele conversion lens on a motorized alt-azimuth panner. Both 90 mm scopes were equipped with Thousand Oaks Optical solar filters and the camcorder was fitted with a homemade solar filter assembly using Tuthill material over the 2X tele conversion lens.

I started the camcorder before the event started and it ran for the entire length of the transit. I also used camcorders to record the Annular Eclipse of 1994 from Indiana and the Total Solar Eclipse of 1998 off Aruba in the Caribbean on a cruise ship. The camcorder, besides the visual images, provide an audio recording of the event which allows one to relive the excitement by listening to the playback, something that images cannot convey. During the Total Solar Eclipse of 1998 off Aruba, it was like continuous cheering after touchdowns during a football game. A Total Solar Eclipse, when shared with a lot of people in close proximity is a very vocal affair!

After set up we waited for the sun to rise. The sun rose state-ly behind a low bank of humid haze. Finally the Sun cleared the low haze and there it was! The planet Venus was there, clearly seen with the naked eye as a very small black dot next to the lower right edge of the sun. A truly magical moment that I will never forget. With the sun so low in the sky and the light from the Sun was being greatly filtered and we were able to look at the sun without any eye protection. We also used binoculars without filters during those first few minutes. What a sight!

This did not last long. After a few minutes it was impossible to view the transit because the sun was not bright enough to view the sun through solar filters. This was something I did not expect. The transit was only going to be visible for just over an hour and these precious minutes were lost when we could not see the transit. Keep that in mind if you get to see the Transit of Venus in 2012 from Minnesota!

I had tried to maximize the time available to view the transit and set up the scopes and camcorder to track the sun in one axis of the tripods. This proved to be a mistake. It turned out there was plenty of time to realign the tripods, when we could not view the transit. The video of the sun rising has a tilted horizon. See the still image of the sun against high voltage tower.

We took turns looking through the Meade ETX-90 and Celestron-90. I took pictures of the transit through the Meade ETX-90, which yields an effective focal length of 1450 mm. The camcorder needed constant attention to track the sun.

I did not see any "Black Drop Effect" as the planet exited the

Sun. It took about 20 minutes for the planet to exit the Sun. Too soon the transit was over and the entire day lay ahead. We packed up and celebrated afterwards at a local coffee house. It clouded up around mid morning and stayed that way the rest of the week, but I did not care.

I feel very lucky to have seen the last scene in the first act of a two-act play. I am hoping to see the entire second act in June 2012. To see the entire transit in 2012 one will have to travel away from Minnesota. From Minnesota it will be possible to see the start of the transit and it will be about half way across the face of the sun when the sun sets. I think the northwestern part of Australia would make a great location to see the transit of Venus in 2012. 🐼



Summer Solstice Astro Swap Fest

This summer, The MAS, in cooperation with Dan Fish at Radio City, will be conducting an Amateur Astronomy Open Air Flea-Market/Swapfest. You may buy, sell or swap amateur astronomy related equipment. Sellers must provide their own card table for displaying equipment and their own price tags. Other than that, there are no charges or fees for buying or selling.

Dan Fish, the owner of Radio City, in Mounds View, has agreed to host the event Saturday, June 18th, in his parking lot. Dan will have canopies setup so we can protect our equipment from rain (if you have VERY LARGE equipment, please bring your own rain protection). He will also probably have a TeleVue telescope with a Coronado hydrogen-alpha solar filter on display for looking at solar prominences. Dan's store will be open if attendees wish to look at his stock of equipment and books. Newbies, please note that Radio City carries telescopes and accessories as well as radio equipment.

9:00 AM to 10:00 AM

Setup used equipment for sale in Radio City's parking lot under the canopies.

10:00 AM to 2:00 PM

Buy, sell, and swap amateur astronomy equipment! Hot dogs and pop will be available on-site freshly cooked by MAS vol-

unteers. For this year, there will be NO fee for buying or selling equipment! A nominal fee may be charged for hotdogs and pop to recover costs. Buyers and sellers can come and go as they wish during this time period, but everyone is responsible for their own equipment.

2:00 PM

Tear-down and clean up. Any volunteers that would like to help tear down canopies and pick up the grounds will be appreciated.

This event is will be a "first of kind" outdoor Swapfest/Flea Market for ONLY amateur astronomy equipment (open to the public as well). DON'T MISS IT!

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showed great aptitude for science early on. In 1847, Maria discovered her first comet. Later, she became an astronomy teacher at Vassar. She held her students to a very high standard of intellectual achievement.

Mitchell was the first woman appointed to the Academy of Arts and Sciences, in 1848. She was the first woman named to the Association for the Advancement of Science, in 1850. She was the first woman to become an astronomy professor in the U.S., in 1865, and she was the first woman elected to the American Philosophical Society, in 1869.

- Henrietta Leavitt. Henrietta Leavitt was born in Massachusetts in 1868. She attend college at Oberlin and Radcliffe College. During her senior year, she decided to make astronomy her career. During her prolific career, she discovered more than 2,400 variable

stars, about half the known total in her day. She studied and described the period-luminosity relationship of these stars, which are now known as cepheids (after the archetype variable star, Delta Cephei). She tirelessly studied and measured stellar brightness on hundreds of photographic plates over a period of many years. Though the academic prejudices of the time dictated that she could not use her intellect to the fullest, Henrietta Leavitt was remembered by a Harvard colleague as "possessing the best mind at the Observatory."

So, dear members, if you have a daughter that's a stargazer, please do encourage her to further her studies in astronomy and the sciences in general. Like one of these pioneering Sisters in the Stars, she may someday go on to make one of her own great discoveries. ■

Astronomy 101

By John Young

Okay, so you have recently discovered that astronomy can be a fun hobby. You have perhaps gone to a few MAS meetings, looked longingly at the confusing array of scopes in the catalogs and at the star parties, sheepishly dipped your toes in the unknown waters of stargazing. Maybe you have bought your scope already and you have your planisphere. Maybe you have figured out certain counterintuitive imponderables such as, "why do astronomers look at things at the lowest magnification, rather than the highest? And why do "smaller" eyepieces afford larger magnification? "So you are saying those little 6 mm eyepieces magnify MORE than a 40 mm eyepiece?!" And you are beginning to understand why the things you see through those eyepieces look little like the stunning pictures

>Welcome to the wonderful world of beginning astronomy! What should I do first? What should I buy first? What should I LEARN first?

Simple.

you see in the glossy magazines.

Welcome to the wonderful world of beginning astronomy! What should I do first? What should I buy first? What should I LEARN first? Simple. (The opinions expressed herein are those of this author and reflect only on him.) The first step is actually the cheapest.

Constellations. The cheapest sky guide, the most important first step. The heavens move in specific ways. Your sky, excluding the moon and the planets, seems to be unchanging, even though elements of it are racing away and towards each other at breakneck speeds. The planets and the moon (and asteroids and comets) all seem to move around in front of the unchanging backdrop of the heavens...the "celestial sphere". How do we find things?

We find them in relationship to the constellations.

Constellations are groupings of stars that "appeared" to look like something to ancient astronomers. We now know that the stars in those groupings are not necessarily even close to each other...they just appear to be because of our vantage point on earth.

But constellations perform a most wonderful purpose. They help us pinpoint things in the sky. (Please remember this astronomer/author has been a member of the MAS less than a year) When I started out last spring with my computer print-outs of the night sky, I was determined to learn all I could. The Big and Little Dippers aren't even constellations! They are asterisms, part of Ursa Major and Ursa Minor. And guess what? Draco winds his wiggly body between them!

Constellations, with some exceptions, are hard to find at first. I spent nights on my deck last year with star charts trying to learn one or two new ones every clear night. I looked up, looked at the chart, looked up again. Finally, the constellations took shape. "Oh yah, I see it now! There it is!"

Each clear night I would run through the constellations I knew, adding a new one if I could, "Ursa Major, Ursa Minor, Draco the Dragon, Arcturus in Bootes, Cygnus the Swan with Alberio and Deneb, Corona Borealis, Cassiopeia, Sagittarius..."

As the seasons changed I was sad to see old familiar friends descend below the horizon, but soon delighted in learning new friends in the winter sky...the unmistakable, glorious Orion and his famous belt.

The point is that most celestial events happen in some position relative to the constellations. Want to set your "goto" telescope to Rigel? Better know where it is. Want to see the Ring Nebula? You'd better know where Lyra is. Want to find comet Machholz? Want to find M55? To find anything in the sky, you must first know the constellations, and you don't even have to have binoculars for that! ■

Update on the Minnesota Planetarium and Space Discovery Center

By Parke Kunkle

On April 11, 2005 the Minnesota Legislature and the Governor granted the \$22 million to design and construct the MN Planetarium and Space Discovery Center in conjunction with the central library in Minneapolis.

Thank Rep. Margaret Anderson-Kelliher, Sen. Ketih Langseth, Rep. Dan Dorman, and Stan Hubbard. Please

thank them and your local legislators too. Thank you to all MASers who contacted their legislators and the Governor. It helped!

Stay tuned as we reevaluate what we can do for \$22 million and how much we will need to raise privately. We'll keep you updated and thanks again all. 🐼

Big Glass on the Prairie BAD Update-April 2005

By Deane Clark

Have you ever thought to yourself as you peered through your telescope (or someone else's), "I don't know, maybe it's a spiral", or "So, it's supposed to look like an owl, eh?", or "What the heck is a 'festoon' supposed to look like?", or "How can anyone see 5 moons around Saturn?" Well, if you're an MAS member whose aperture envy is making you miserable but you don't have the space or mucho dinero to solve that problem yourself, the MAS has the pill to cure your ill. It's called the BAD, but it's very GOOOOOD. We speak, of course, of the 24" Starmaster Dobsonian now housed in its new home at our Cherry Grove dark sky observing site.

Almost three years ago, several MAS members decided that a club of our size ought to be able to come up with the funds to buy the dream scope with the knock-your-socks-off aperture that most of us could not afford ourselves. After a little more than a year of fundraising, we bought the scope, and housed it temporarily in the lawn mower shed behind the existing 16" observatory at Cherry Grove. It started providing the views we'd all been hoping for right away, but there was still a significant hassle factor, since the scope had to be disassembled to fit in its cramped new home. To bring this story up to date, after the donations and efforts of dozens of MAS members, and even a few non-members, we successfully completed a new building at Cherry Grove last November in which to store the Starmaster fully assembled. It now has its very own 10x12 foot storage shed with a nice paved sidewalk in front on which it can be rolled out and set up in a couple of minutes by one person. It is amazingly easy to use for such a large telescope, with very smooth motions. In the future, we

hope to make it even easier by adding tracking to it, so we can concentrate more on observing and less on nudging it along to keep the object of our fascination in view.

The coolest thing about this is that, YOU, as an MAS member, can be viewing spiral structure and dust lanes in galaxies, festoons on Jupiter, spooky planetary nebulae, and fields full of so many galaxies you get lost, just by investing a few hours of driving and getting trained in on this big BAD beast. We typically do training on a Saturday afternoon around New Moon or Last Quarter, with training going into the evening so everyone gets a chance to do some observing as well. Training covers how to safely set up, use and store the scope, protect it from harm, collimate it, and use the accessories, such as dew control, finders, and digital setting circles (DSCs). After your training, you have the opportunity to purchase your own key to the new BAD shed for \$5. (Keys to the Cherry Grove warming house are another \$5, if you don't already have one.)

If you are interested in getting trained-in, just contact Deane Clark at drclarkjr@mn.rr.com or 612-922-9638, or just wait for a training session to be announced on the MAS e-mail list and the web site discussion forums. If you would like to make a donation to help us add tracking to the Starmaster, you can also contact Deane, who will be glad to help relieve you of your burdensome funds.

Remember, it's YOUR scope, and it's there for YOUR use, so take a nice drive in the country some time and check it out! 🐼



New batch of trainees for April 2005 Dave Venne, Dave Wieber, Cort Sylvester, Larry Gray, Doug Brown



The 24 inch Starmaster and its new home

Road Trip SIG: Nebraska Star Party 2004

By Gene Kremer

MAS members known to be there: Bill Bynum, Gene Kremer, Michael Kauper, Tom Youngblood, and others.

This year's NSP is July 31 to August 5, 2005.

Summary:

- Great, roomy observation site.
- Awesome dark skies!
- A few good programs.
- Many door prizes.
- Great for a family vacation.
- Meals catered most nights.
- Well organized.

Some things to consider:

- Notorious for high winds and beautiful, intense thunder storms.
- High temperatures make uncomfortable camping. Shade or camper with AC is essential.
- Some lodging 5 miles from site; other lodging 20 to 30 miles, moderately priced.



Observation site

• Meals are heavy on the beef, low on veggies & fruits. The picture that comes to my mind about the Nebraska Star Party is the wonderful Milky Way with all the dust lanes/dark nebulae standing out in stark contrast when clear, skies are magnitude 7. We were that lucky only two nights of five this year (last year it was clear every night). I was able to find some very faint galaxy clusters.

The observing field is huge; the hilliness tends to spread people out, too. There is an "early hill" close to the road and parking for folks leaving before sunrise.

The party runs from Sunday (Saturday for some) through Friday nights, and is set up with travelers in mind. The reservoir, beach and other activities that are kid friendly make this an excellent family vacation. The door prizes are separated into adult and children's and I think most all kids got a door prize of some kind; there must have been forty under



age 12 and they all were well behaved and a joy to have around. At least a dozen teen-agers were there also. Thursday, there are organized paddle trips down the beautiful Niobrara River, which is part of a refuge in that stretch.

Many of the organizers are from the Omaha area and are rightfully proud of their dark sky site. Five observing lists were available, including one of dark nebulae in Sagittarius that draws on the site's strong point. They have support from major manufacturers, and at least five vendors were in attendance. The swap meet was nice, also.

Meals were catered, most at reasonable cost. This is beef country, and the portions show it. Alternatives were available on request, but you might get funny looks <grin>. Two of the meals were also designated times for door prize drawings, plus another taking place after the programs on Friday.

I missed most of the programs due to packing up, but caught most of the last which was an excellent talk and slide show on lunar observing. One other short talk on video photography was included in the Monday night ice cream social (free).

My wind cover -- sewn together in the last week before the NSP -- did yeoman duty. At least two thunderstorms passed through without damage to the scope. Two other dobs near us lost their desert storm bags, one tipped over, and a Kendrick tent was taken out and tipped over including the LX200 that was inside it. A larger dob that tipped over down in dob valley was reported as severely damaged. Those that



As you can see, there is plenty of space!



There is also a "Valley of the Dobs" that is more wind protected for large dobsonians. I saw no electric power on site, although it is reportedly available at the facilities.



The Door Prizes!

•Prairie Stargaze – July 7-9, 2005

•Nebraska Star Party - July

Chippewa Valley - Northwoods - Eau Claire, WI - August
A small, but very professionally done party. And it's less than three hours away. Good camping, reasonable viewing, good folks and group meals. Some very nice programs.

•AstroFest - Illinois - September 8-10, 2005

One of the best astro flea markets around with most of the major vendors. Fair to poor viewing, but some very good programs. Some camping on-site.

•ICSTARS Star Party - Missouri - October 9-11, 2005

A great, family oriented star party hosted by tour guides and photographers Vic & Jen Winter. This has been the weekend after the Great Plains Star Party which is southwest of Kansas City, but that website is not up yet. A great trip would be to do them both in about 10 days.

•Okie-Tex - Oklahoma - October

Great viewing, big winds. See the Winter 2004 issue of Gemini. 🐉

could weather-vane were OK. The winds and storms are as reputed, but reasonable precautions seem to work.

The party seems to be timed for summer vacations. I would love to go back to observe in the area, but would choose to do so in the Spring (more probable cloudiness) or Fall when weather is more clement and birding is a highlight. The parking lot at Lovejoy Ranch B&B is astro friendly and just as dark.

Michael enjoyed walking among the telescopes at night, sharing his new Kendrick laser alignment tool, which uses the recently developed "barlowed laser" for greater accuracy. People were friendly and talkative, with beautiful views to share. Michael reports that this party had more than the usual number of women observing on their own, and using their own equipment, a nice plus and a credit to the sponsoring clubs.

There are many reasons to go back.

Here is a list of remaining 2005 Star Parties which you might wish to investigate:



The Vendors



Camping Grounds

2005 Onan Observatory Public Star Parties

Star parties are held on Friday if weather permits, otherwise on Saturday. Call (952) 467-2426 after 6:00 p.m. on a star party date to hear whether it will be held.

Date	Event	Time
05/13/2005	Public star-gazing at Onan Observatory	10:00 PM
05/14/2005	Public star-gazing at Onan Observatory	10:00 PM
06/17/2005	Public star-gazing at Onan Observatory	10:00 PM
06/18/2005	Public star-gazing at Onan Observatory	10:00 PM
07/15/2005	Public star-gazing at Onan Observatory	10:00 PM
07/16/2005	Public star-gazing at Onan Observatory	10:00 PM
08/12/2005	Public star-gazing at Onan Observatory	10:00 PM
08/13/2005	Public star-gazing at Onan Observatory	10:00 PM
09/02/2005	Public star-gazing at Onan Observatory	10:00 PM
09/03/2005	Public star-gazing at Onan Observatory	10:00 PM
09/23/2005	Public star-gazing at Onan Observatory	10:00 PM
09/24/2005	Public star-gazing at Onan Observatory	10:00 PM
10/21/2005	Public star-gazing at Onan Observatory	10:00 PM
10/22/2005	Public star-gazing at Onan Observatory	10:00 PM
11/04/2005	Public star-gazing at Onan Observatory	10:00 PM
11/05/2005	Public star-gazing at Onan Observatory	10:00 PM

Directions to the Star parties

Metcalf

Metcalf is the grassy parking lot of Metcalf Nature Center, about 20 miles east of St. Paul along highway 94. About 6 miles E of the 694/494 crossing is county road 15 (Manning Ave.). Turn right, then left onto the frontage road and continue east, crossing over county road 71. Turn right (south) onto Indian Trail; follow it 1.1 miles to an chicken-wire gate on the right, (marked by three blue reflectors), opening onto a dirt driveway, which is the entrance to Metcalf.

Baylor Regional Park

Baylor Regional Park is roughly 25 miles W of the SW corner of 494. Head west on highway 5, through Waconia, to Norwood Young America. Turn right onto county road 33 and follow it about 2 miles to the park which is located on the right (east) side of the road. When entering the park stay to the right, follow the park road roughly $\frac{1}{2}$ of a mile. Card-Carrying MAS members may observe at Baylor at any time; call the park caretakers Steve and Margo by 7 p.m. in advance at 952-467-6488.

When visiting Baylor Regional Park, MAS members are requested to NOT PARK OR DRIVE on the grass. Annual Parking Permits (not required for observing) can be purchased for \$20 in the following ways:

- Mail a check to Carver County Parks, 11360 Hwy 212 W, PO Box 330, Cologne, MN 55322
- Call the Park office at 952-466-5250, can be paid with Master or Visa Cards.
- Through the honor box or gate attendant at either Baylor or Lake Minnewashta Regional Park.

For additional information about the Carver County Park system visit the park web site at www.co.carver.mn.us/parks or contact the park office at 952-466-5250.

Cherry Grove

Cherry Grove is about 20 miles south of Cannon Falls. Head south on Hwy 52. Around 6 miles south of Cannon Falls, take a right onto Goodhue County 1 and follow it around 16 miles, where it ends in a T with Dodge County A. The observatory and warming house are at your right, nestled in the corner of the T.

2005 Star Parties

Star parties are held on Friday if weather permits, otherwise on Saturday. Call (952) 467-2426 after 6:00 p.m. on a star party date to hear whether it will be held.

Date	ALT	Event	Location
04/29/2005	04/30/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
05/06/2005	05/07/2005	Star Party: Cherry Grove	Cherry Grove Observatory
05/13/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
05/14/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
05/13/2005	05/14/2005	Star Party: Metcalf	Metcalf Nature Center
05/27/2005	05/28/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
06/03/2005	06/04/2005	Star Party: Cherry Grove	Cherry Grove Observatory
06/10/2005	06/11/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
06/17/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
06/18/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
06/24/2005	06/25/2005	Star Party: Metcalf	Metcalf Nature Center
07/01/2005	07/02/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
07/08/2005	07/09/2005	Star Party: Cherry Grove	Cherry Grove Observatory
07/15/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
07/16/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
07/15/2005	07/16/2005	Star Party: Metcalf	Metcalf Nature Center
07/29/2005	07/30/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
08/05/2005	08/06/2005	Star Party: Cherry Grove	Cherry Grove Observatory
08/12/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
08/13/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
08/12/2005	08/13/2005	Star Party: Metcalf	Metcalf Nature Center
08/26/2005	08/27/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
09/02/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
09/03/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
09/02/2005	09/03/2005	Star Party: Cherry Grove	Cherry Grove Observatory
09/09/2005	09/10/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
09/23/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
09/24/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
09/23/2005	09/24/2005	Star Party: Metcalf	Metcalf Nature Center
09/30/2005	10/01/2005	Star Party: Cherry Grove	Cherry Grove Observatory
10/07/2005	10/08/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
10/21/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
10/22/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
10/21/2005	10/22/2005	Star Party: Metcalf	Metcalf Nature Center
10/28/2005	10/29/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
11/04/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
11/05/2005		Public star-gazing at Onan Observatory	Carver County's Baylor Regional Park
11/04/2005	11/05/2005	Star Party: Cherry Grove	Cherry Grove Observatory
11/11/2005	11/12/2005	Star Party: Metcalf	Metcalf Nature Center
11/25/2005	11/26/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
12/02/2005	12/03/2005	Star Party: Cherry Grove	Cherry Grove Observatory
12/09/2005	12/10/2005	Star Party: Metcalf	Metcalf Nature Center
12/23/2005	12/24/2005	Star Party: Baylor	Baylor Regional Park (Onan Observatory)
12/30/2005	12/31/2005	Star Party: Cherry Grove	Cherry Grove Observatory



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and follow the subscription instructions.

There is a general list (MAS) as well as special interest group (SIG) lists. Archives of the lists are also available by visiting the listinfo page for a specific list.

The MAS list has about 40% of the membership on it.