

Gemini

a publication of the Minnesota Astronomical Society



<http://www.mnastro.org>

October 2006
Volume 31 Number 5

In the pages of the Gemini

NOTES FROM THE SECRETARY - BOARD ELECTIONS

By Steve Emert...Page 2

THE BEGINNER'S SPECIAL INTEREST GROUP

By Jackie LaVaque...Page 4

ONAN OBSERVATORY UPDATE

By Dave Olmstead...Page 4

GONE WITH THE LIGHT

By Laura Eagen...Page 5

MINNESOTA PLANETARIUM UPDATE...Page 5

30 YEARS AGO IN GEMINI

Bob Schmidt...Page 5

AMATEUR TELESCOPE MAKERS (ATM) UPDATE

By Ben Mullin...Page 5

DANCIN' IN THE MOONLIGHT

By Michael Kibat...Page 6

DARK SKY SELECTION COMMITTEE REPORT

By Greg Haubrich...Page 6

ONAN IMAGES

By Russ Durkee...Page 7

NEW PRODUCT REVIEW - DG SPECTROSCOPE

By Ron Bubany...Page 8-10

JOES RETIREMENT...Page 8

DUKE SKYWATCHER...Page 9

Astronomy on the Prairie "The Meteorite Hunter"

By Glenn Lee

On August 24th, Northfield residents were treated to a rare meteorological occurrence when hailstones the size of baseballs rained down for several minutes on the town. Windows shattered, roof shingles disintegrated, cars took on the appearance of dimpled golf balls, and insurance adjusters cancelled all of their plans for some time to come. Fortunately, there were no major injuries, but the town was hit hard. Damage was visible everywhere. Many people commented that they'd never seen anything like this before and settled down to the work of cleaning up and looking at their insurance policies.

As I collected a few of the larger specimens and froze them, I noticed that there were tiny craters in the lawn where the larger stones had impacted the rain-softened soil. From somewhere the thought came to mind - Is this why they call it "Meteorology"?

It turns out that the term comes from the Greek language. Aristotle, in his book *Meteorologica*, describes many kinds of atmospheric phenomena. Everything from wind to rain to snow and even to fiery stones from the sky was a kind of "meteor". Eventually, the term narrowed in meaning to its current usage. To get our terms straight, a meteor is:

"The luminous streak lasting seconds or fractions of a second and seen at night when a solid, natural body plunges into the Earth's (or another planet's) atmosphere. The entering object is called a meteoroid and, if any of it survives atmospheric passage, the remainder is called a meteorite.

If the apparent brightness of a meteor exceeds that of the planet Venus as seen from Earth, it is called a fireball, and when a bright meteor is seen to explode, it is called a bolide."—www.answers.com

Through the subsequent ages, meteors and meteorites, though now linguistically stable, remained mysterious. Aboriginal people in remote parts of the world worshipped them and Thomas Jefferson, not a stranger to science, claimed in 1809 that he would rather "believe that Yankee professors would lie, than that stones would fall from heaven." In our own enlightened times, we feel comfortable in our knowledge of their origin, classification, and what they tell us about the universe that we live in. What often gets lost in the scientific scheme of things, though, is that thrill that we get watching the incandescent streaks in the sky and hearing the stories of everyday life interrupted by these cosmic visitors.

In August, 1923, the allure of the fiery stones from the heavens captured the attention of a young biology professor in McPherson, Kansas. His name was Harvey H. Nininger. At a time when meteorites were mere curiosities and science took little notice of them, an unusual article about meteorites in a scientific periodical captured his attention and Nininger began to wonder what meteorites could tell us about the universe. Being of a practical turn of mind, he then wondered how best to observe and find these unique objects.

His chance came on the evening of November 9th, 1923. While walking home from an evening college program with a colleague, he witnessed a spectacular sight. In Nininger's words:

"Suddenly a blazing stream of fire pierced the sky, lighting the landscape as though nature had pressed a giant electric switch. The blade of light vanished with equal suddenness, leaving a darkness seeming thicker than before.

Continued on Page 3

Notes from the Secretary - Board Elections

By Steve Emert

Ahh, autumn! Time for earlier sunsets, clearer, less humid skies, hot cocoa getting spilled on your star charts, and... time to start thinking about MAS Board elections!

Yes, it's that time again! Every year, the MAS holds elections to elect (or re-elect) exactly one-half of the six member Executive Board. This year, the positions opening are President, Secretary, and Board Member At Large. Mike Kibat (President), Steve Emert (me!, Secretary) and Greg Haubrich (Board Member At Large) have all decided not to run for re-election, letting others join in the fun for the next two years. The new board members will join Ben Mullin (Vice President), Bob Benson (Treasurer), and Jon Hickman (our other Board Member At Large) in the always fun, often humbling, and occasionally exciting turn at the rudder of the pleasure cruise of the "S.S. MAS"!

By the time you read this in Gemini, we'll have appointed a Nominations Chair who will oversee the elections. The Nominations Chair will have been appointed by September 15th, and you can find who this is in the discussion forums or from the email announcing it on the MAS mailer.

Anyone considering running for any of the three positions can submit their name to the Nominations Chair in writing (including email and forum messages) before the November 2nd MAS Meeting at the Science Museum. We will also accept nominations at the November 2nd meeting of the MAS. Nominations will close at the end of that meeting.

During the December 7th meeting of the MAS, members will vote to elect their choice of the nominees that have run for the three Board positions. If you are unable to attend the December meeting and would like to vote by absentee ballot, you can request a ballot by November 15th, by contacting the Nominations Chair, or by contacting the Secretary (again, me!) by mail, email, or by web forum Personal Message. Send mail requests to me at the MAS' PO box address. Email requests sent to info@mnastro.org or directly to me at Lakeaires@msn.com will reach me. Your filled out absentee ballot must be received by November 30th.

What are the duties associated with each of these positions? Actually they are not that hard and don't consume that much time - unless you want them to. Here is a quick rundown:

Board member term begins at the January General Meeting. At the January Board meeting, both the outgoing and incoming Board members will be present in order to transition duties. All Board members are expected to attend monthly MAS Board meetings (unless absence is unavoidable due to external circumstances).

The President's job includes presiding over the monthly MAS General Meetings and the monthly Board meetings. Generally, the President will make the announcements at the General meeting and conduct any necessary business. The President drafts the agenda for the Board meetings and attempts to keep MAS activities on track.

The Secretary's tasks include taking minutes at the Board meeting and submitting them to the Board. The Secretary gets email inquiries to info@mnastro.org and replies or handles them as needed. Also, the Secretary updates the MAS Answering Service message that is heard for the next week after weekend star parties have been completed (the Observing Chair, Bill Kocken, makes the star party go/no-go message) and also picks up and handles any inquiries on the MAS Answering Service.

The Board Member at Large jobs include working with the other MAS Executive Board members to execute to the MAS Mission Statement/Constitution Preamble. This can take the form of almost any support role, both inside and outside the MAS that the Board Member may decide to take on or to help facilitate. In general, you, as a BMAL candidate should try to leave the MAS better at the end of your term than you found it at the beginning of your term.

If you have any inclination to run for a board position, please do so! It is a lot of fun, it doesn't consume that much of your time, it gives you a way to keep abreast of activities in the MAS and happenings in the night sky, and it is an excellent way to get to know more of the other club members and gain more insight into the history of the MAS.

GEMINI INFO

Editors

Brian Litecky
Ron Bubany

Circulation

John Treadwell

"Gemini is published 6 times annually by the Minnesota Astronomical Society."

Electronic submissions for Gemini may be sent to:

blitecky@yahoo.com
bubanyrc@masrepository.org

Hardcopy items should be sent to:

Minnesota Astronomical Society
Attn: Gemini
P.O. Box 14931
Minneapolis, MN 55414

Send all MAS membership dues, change of address cards, subscriptions and renewals to the current MAS Membership Coordinator. See "How to pay your dues" on the last page of this newsletter.

MAS Officers

President: Mike Kibat

E-Mail: kibatme@visi.com
952-884-0039

Vice President: Ben Mullin

E-Mail: benjamin.t.mullin@gmail.com
651-784-7469

Treasurer: Bob Benson

E-Mail: rrbsn@earthlink.net
952-937-5451

Secretary: Steve Emert

E-Mail: lakeaires@msn.com
651-426-2502

Board Member: Greg Haubrich

E-Mail: greghaubrich@comcast.net
763-421-4736

Board Member: Jon Hickman

E-Mail: jon@thehickmans.com
763-476-4021

Momentarily, Professor Craik was speechless. Then he saw that I was bent over, making a mark on the sidewalk. He asked me what I was doing. I remember telling him I was going to find that meteorite and that I was plotting its path from where I saw it. He laughed, but I was serious. I will never forget the conversation that followed.

“Do you really think that something has actually come to earth?” he asked.

I was certain of it.

“Well, where do you think it landed?”

“Probably within 150 miles,” I estimated.

He laughed again. “Now I know you must be kidding”.

“No, I’m serious, and I’m going to hunt for it.”

“Has such a thing ever been done?”

It was the question that has followed me all of my life, thrown at me whenever I have proposed something new. Find a Falling Star, 1972 Nininger was as good as his word. In the following days, he published an advertisement in the larger newspapers in Kansas. In the ad, he invited witnesses to send them their first-hand reports of the meteorite sighting and specifically requested information on the witnesses’ location, direction of the fireball, height above the horizon, and a description of any sounds associated with the event. Reports poured in and Nininger was swamped with data. Eventually he found that interviewing witnesses in the field was a more effective way of gathering information.

After defining the approximate path of the meteorite, Nininger recognized the difficulty of locating individual fragments by himself. One fact about meteorites worked in his favor. A meteorite often will burst during descent and its fragments rain down over a wide area. More people would have witnessed impacts. With this in mind, he devised a very successful strategy. He decided to make public appearances to educate people and enlist their help in the search. Not the shy type, Nininger showed up early for a Sunday church service on one of his early field trips and got permission to make a three minute announcement. The congregation, accustomed to the idea of biblical miracles, nonetheless must have been amazed to hear about rocks falling from the firmament into their own fields and backyards. At the conclusion of the service, Deacon A.M. Brown approached Nininger and confided that he had plowed up a very unusual rock four years before. Clearly, this was not part of the sought-after fireball, but when Nininger looked at the 41-pound rusty stone, he knew at once that it was a meteorite - his very first

specimen. But it was his next action that started him on the path of a lifetime of collecting. He paid Deacon Brown for the meteorite, calculated at the rate of \$1.00 per pound. Nininger never revealed exactly how he arrived at this rate of remuneration, but having put the discovery on a cash basis won him instant attention in a way that his public lectures could never do.

The only other meteorite recovered during this search was an eleven-pound stony meteorite plowed up by a farmer. Ironically, this proved to be from a much earlier fall, but the lesson that Nininger derived was that meteorites were far more common than previously thought. This did not deter people from placing value on them once they discovered that the young professor from McPherson would pay good money for the strange rocks that fell from the skies. Nininger’s time eventually came to be taken up with collecting and cataloguing meteorites. He found the scientific literature on the subject to be sparse. After intensively researching the subject he soon became known as an authority on the subject.

Eventually, Nininger found himself in a curious position. The scientific community still did not place much importance on meteorites, but public interest and curiosity had been aroused. For the rest of his life, Nininger devoted himself to two intertwined tasks. He worked tirelessly to interest scientists in the educational and research value of meteorites. In this, his progress was slow but sure. It wasn’t until the 1950’s that institutions like the British Museum, The Smithsonian Institution, and the National Science Foundation began to take an interest in funding meteorite purchase and research. Much of this attention was the result of well-known astronomers like Gerard Kuiper and Fred Whipple, both of whom befriended Nininger and advocated for him in the upper reaches of academia.

In his second task, Nininger met with success as well, though the route was a hard one. He traveled extensively and acquired one of the world’s largest collections of meteorites. In a real sense, meteorites became the currency of Nininger’s life. He built a museum in Arizona to house his collection, lectured, wrote several books, and even paid the tuition for his daughter’s education at Carleton College with a donation of stones from his collection.

More than any single individual in history, Nininger awakened the public to the adventure of tracking down meteorites, and backed it up with solid scientific work. His books on the subject are filled with vivid first hand accounts of his efforts and are well worth reading: *Our Stone-Pelted Planet* (1933), *Out of the Sky* (1952), and *Find a Fallen Star* (1972). ■

The Difference Is ...



Henderson & Hoen
Honesty • Integrity • Experience

Edina Realty.

Dark sky or bright city lights, we can help you buy or sell your home where ever it is. Like you, we are MAS members and will work hard to find you the best home and location for your needs. Call Sharon or Lauren today and make it happen.

763-464-2376

EXCEPTIONAL PROPERTIES

The Beginner's Special Interest Group

By Jackie LaVaque

The MAS Beginner's Special Interest Group ("BSIG") welcomes you!

On behalf of the MAS BSIG, I'd like to welcome you to get to know the night sky. Your BSIG coordinators are myself (Jackie LaVaque) and Bill Bynum.

Those of us who've been in the hobby of amateur astronomy for a while will probably recall (with a mixture of both fondness and trepidation) the days when we cut our observing teeth. Nowadays, amateur astronomers have a great variety of equipment from which to choose, from simple refractors on alt-azimuth mounts, to 'push-to' Dobsonians to large go-to Schmidt-Cassegrain scopes that require some time and a steeper learning curve. We're well aware that many beginners may feel stymied by the complexity of new equipment and would be best served by having someone help them to learn how to use it. Others might want some friendly assistance on night-sky navigation and how to find things up there. Perhaps you would like some suggestions on the best books and star charts for beginners. Maybe you'd like all of the above.

We can help you with all of that! The purpose of the BSIG is to introduce you to the many facets of amateur astronomy, help you get the skills to be able to go out and observe on your own, to have a group of people of similar experience that can go out and

observe together, and to provide some more experienced amateur astronomers for you to use as a resource.

The BSIG feels that there is no better substitute for learning the sky than time spent at the eyepiece, so our main activity will be viewing the night sky, whether through your own instrument or a borrowed one. We will also observe using just our eyes and with binoculars too. In addition to stargazing, we will have cookouts, informational sessions, guest speakers, "show and tell" and other fun activities. We hope to meet every other month at local parks, MAS facilities, or other venues as needed.

The next BSIG meeting will take place at Metcalf Nature Center in Afton on October 14, 2006. Directions to Metcalf can be found at this link - <http://www.mnastro.org/facilities/metcalf.htm>. We'll be working on finding skills, reading star charts and the basics of star hopping. Bring your scope, binoculars or just your eyes, and be prepared to do some observing. The event will be weather dependent and start at approximately 6:30 p.m.

Don't forget, there is also a BSIG sub-forum in the MAS forums- feel free to stop in and introduce yourself, ask questions, or offer suggestions as to what YOU would like to get out of this group. No question is too basic, and you'll find lots of friendly assistance and advice on this forum.

We hope to help you get the most out of the start of your journey towards making the night sky a familiar old friend. Clear skies! 🍷

Onan Observatory Update

By Dave Olmstead

What a year of growth it has been for our Onan Observatory. Our benefactor has bestowed Onan with a wealth of new telescopes and equipment that have given all of us in the MAS an opportunity to experience "state of the art" amateur astronomy. Many have also contributed time and energy to set up the new equipment, install our video system and train Keyholders on how to use this amazing new collection of fine optics, cameras and precision mounts. I think it is safe to say that we now have one of the premier society operated observatories in the Midwest - and quite possibly beyond.



So, just when you thought it was about as good as it gets another addition to the observatory will go online late this fall and over the winter. Our benefactor has supplied the observatory with a new 16" LX200 GPS SMT telescope! The Onan Committee has decided that late into fall and through the winter months we will replace the venerable Larson Telescope with our new LX200. The new telescope will be mounted in alt-azimuth fashion with a custom-made metal pier interface between it and the concrete pier that the

Larson resides on now. The new scope will be designated for visual use primarily, and no doubt a wide field refractor in the four-inch class will be riding on top of it. The LX200 will provide accurate go-to and tracking, which will enhance public evenings and personal use as well. Cool, huh?

So what of the Larson Telescope, you may ask. The MAS Board and the Onan Committee would like to see the Larson continue to be used in an outreach capacity. Where that might be will be the topic of discussion for the Board in coming months.

The Larson is no lightweight and will require careful disassembly and moving to wherever it will be heading. The Committee has suggested that a plaque be placed on the mount to commemorate its service to the MAS and to honor those responsible for bringing it into the service of our outreach endeavors.

Join us at the Onan Observatory when we crank up the new LX200 in the coming months. I'm sure that training sessions will begin prior to Astronomy Day 2007 so watch for notice of that on the Forums or in the coming issues of Gemini!

Clear skies! Dave Olmstead Onan Observatory Chair 🍷



Gone With The Light

By Laura Eagen

John Marshall High School Rochester, MN

I would like to thank Michael Koppelman and Greg Haubrich for providing information on how to get a list of possible visible stars in my area - Greg actually sent me a spreadsheet with information about 10933 stars and Michael pointed me to the VizieR web site.

Thank you guys!

My project explores how atmospheric light pollution affects visibility of stars in the Rochester area. I predicted that only half of the stars could be seen from the center of the city, and the number of visible stars would increase linearly with the distance from the city center.

Light pollution is measured using "limiting magnitude", which is the visual magnitude of the dimmest star that can be seen. To

Frank Parisi appointed to lead Minnesota Planetarium and Space Discovery Center project Planetarium to complement the new Minneapolis Central Library

August 14, 2006 (MINNEAPOLIS) The City of Minneapolis today announced the appointment of Frank Parisi as interim executive director for the Minnesota Planetarium and Space Discovery Center. The city funded the one-year position to plan and launch the new planetarium to be built atop the new Minneapolis Central Library. The new center, which will draw 165,000 visitors per year, is expected to open Fall 2009.

"Frank Parisi has the perfect combination of business skills and community leadership," said Steven Bosacker, Minneapolis City Coordinator. "He is passionate about education and passionate about Minneapolis - a great combination. We are very pleased that he is willing to take on this exciting project."

Most recently, Frank Parisi was senior vice president and senior counselor at Fleishman-Hillard public relations in Minneapolis.

30 Years Ago in Gemini

From the archives of Bob Schmidt

PROCRASTINATORS TAKE NOTE!

Glue this article to the rear of a bull moose. Find a discarded railroad turntable and hook it to a variable-rate clock drive. Now hook clock drive to a generator driven by 600 hamsters on an exercise wheel.

Amateur Telescope Makers (ATM) Update

By Ben Mullin

Fellow MAS ATMers take note. After a summer hiatus we have another ATM gathering scheduled. The gathering will be held in the front room of Bill Volna's shop. Bill will be official popcorn maker and a participant this time and not the star of the show. The star of the show this time will hopefully be you. Bring your pro-

ject, plans, or questions and let's talk ATMing in good company. Tuesday, October 24, 2006, 7 p.m.

determine the limiting magnitude, I picked 5 constellations that were easily seen if you looked straight up. I went to various locations and marked the stars that I could see on printed star charts. I used "Where the Stars Are" software to determine the visual magnitude of the stars that I had identified. I also built a Dark Sky Meter (DSM) to measure the brightness of the sky in each observing location. By charting the observed limiting magnitude against the DSM data, I was able to determine a formula for estimating limiting magnitude from the DSM. I used an on-line star catalog called VizieR to build a list of the stars that could possibly be seen from Rochester at some time during the year.

My experiment showed that light pollution has a much more dramatic effect in Rochester than I predicted. I calculated that only 6.2% of the stars can be seen from the center of Rochester, 11.1% from Essex Park (4.5 miles from center), and 63.0% from a location north of the city (8 miles from center). ■

Before joining Fleishman-Hillard, Parisi was senior vice president and chief communications officer for Cowles Media Company and the StarTribune Company. He has also held communications positions with Cray Research, United Technologies Corporation, Getty Oil Company and Trans World Airlines. Parisi serves on the executive committee of the Minneapolis Regional Chamber of Commerce and on the boards of directors for the Better Business Bureau, the Minnesota State Fair Foundation, Achieve Minneapolis, the One Percent Club and the Institute for New Americans.

The Minnesota Legislature has already authorized \$22 million in bonds for the new planetarium, and a capital campaign will be launched to raise up to \$21.5 million in private contributions.

The Minnesota Planetarium and Space Discovery Center is a 501c3 organization operated by the Minnesota Planetarium Society. For more information about the Minnesota Planetarium and Space Discovery Center, visit www.mplanetarium.org or call Frank Parisi at 612-370-9116. ■

Orientate rear of moose toward a MacDonald's hamburger stand on Pluto. Make moose stand still by placing Elmer's glue around his hooves. Entertain him by hanging brass bells in his antlers.

Maintain article in this position for five overcast nights in January. Now examine it in a darkroom. If it glows, the moose has been eating fireflies. If it doesn't, that proves you should join the Twin City Astronomy Club. ■

The address to Bill's shop may be found at www.volnaengineering.com or by contacting me via email or phone (both may be found with the board member info elsewhere in this publication).

Ben Mullin ATM SIG Coordinator ■

Dancin' in the Moonlight

By Michael Kibat

Fred Astaire movies are the best. Not so much the movies themselves. Too often they suffer

from paper-thin plots that exist only to provide Astaire an excuse to cut loose and display his unparalleled dance skills. It is these dance scenes that keep me glued to the screen in spite of silly story lines and implausible characters. And my favorite dance sequences are those in which Fred and Ginger Rogers, his glamorous dance partner, 'trip the light fantastic'.

He wears a classic, long-tailed black tuxedo. She, a shimmering white, floor-length gown that billows and sways with the slightest movement. Fred leads. She follows. Together they glide across an impossibly expansive dance floor, swooping and swaying in perfect synchronization to the music of an orchestra unseen. They are always in close contact, seeming not as a couple but as a single dancer. Their movements are so fluid and effortless that at times they seem to defy gravity, floating just slightly above the floor, rather than dancing upon it.

I find myself enraptured, and just a little envious. As the scene comes to a close, I accept the harsh reality of my situation — I will never duplicate Astaire's moves on any earth-bound dance floor. But when I enter the observatory to operate the telescope that it houses, all this changes. For a few, brief hours I am Fred, and the telescope, my Ginger.

I shun the formality of a tuxedo for more practical attire, preferring multiple layers of clothing, selected for comfort, not style. My partner, like Astaire's, is decked out in white. Not in a gown of delicate, diaphanous chiffon, but rather one of cold, unyielding steel.

Astaire's dance partners often seem mere wisps of women. My partner tips the scales at one-half ton. And yet, thanks to the

interaction of bearings, axles and counterweights, our movements are as fluid and smooth as our human counterparts'. Mass, inertia and momentum join forces, as I use my entire body to lead my partner through the steps of our dance. Like Astaire and his partner, we swoop and sway as one, under the canopy of the night.

Unlike Fred and Ginger, our orchestra is not unseen, though it is unheard. Each star above our dance floor is a silent, solitary instrument in an orchestra of glorious light. The score followed is not the result of human inspiration. It is rather, the divinely designed and directed music of the celestial spheres.

Occasionally, there is a tap on my shoulder followed by a request to 'cut in'. I politely step aside and allow others to take up the dance. Some are skilled. Others step on toes. But all come away with a deep appreciation of their dance partner's grace and technical ability.

There are some in our group who don't appreciate the dance. Maybe it is because they've not taken the time to learn its intricate steps. Possibly they lack patience. Or they prefer a more passive interaction, satisfied with simply enjoying the visual music of the night sky. Sometimes they talk of 'improving the telescope' by installing digital setting circles or computerized slewing controls to eliminate the real or perceived burden of the dance.

But for me, the dance is neither hindrance nor barrier, but a welcome and integral aspect of my observing experience. It is a tactile connection with the glories of the universe opened to me through the alchemy of steel, aluminum, glass and photons.

I doubt I'll ever tire of the dance or the heavenly harmonies that inspire it. And to those with 'two left feet' — automate the telescope if you must, but please, include an on/off switch. As Fred Astaire's contemporary, Gene Kelly sang in that great MGM musical, "Singin' in the Rain!"..."Gotta dance!" ■

Dark Sky Selection Committee Report

By Greg Haubrich

Dark Sky Quality Meter Readings were taken of the Audubon Center near Sandstone by Nathan Nesje that obtained a reading of 21.55 mag/arcsec² (however, there is a large light dome to the south (Hinckley) that took out Sagittarius entirely). Also, to the east, Sandstone was clearly visible. Obviously, this isn't going to work for a permanent MAS dark sky site.]

Errata: The Baylor/Onan Dark Sky Meter reading was incorrectly stated at 21.30 in the last DSS update. It should have been 21.03

Better results are being obtained with the Long Lake Conservation Center effort (LLCC):

1. I gave a presentation on the MAS and the DSS effort to the Aitkin County Park Board at LLCC on July 17. The Park Board voted unanimously to support the MAS DSS effort at the LLCC.
2. At the MAS Board Meeting, the MAS Board voted unanimously to support the LLCC as a potential MAS Dark Sky Site.
3. August 25, 26, four MAS Board Members and four Dark Sky Site Committee Members met at LLCC for a negotiations with

the LLCC, a tour, Dark Sky Evaluation, and of course: Observing! The negotiations went well (see more detailed trip report on the MAS web DSS forum). The skies were very dark with no light domes seen and even the Zodiacal Light was faintly visible even through a thin haze/cirrus that night (Ron Bubany and I had seen the Zodiacal light much brighter a month earlier). Overnight accommodation will be available at no charge to MAS membership. No charge or outreach requirement for individual MAS attendees of Star Parties at LLCC will be required (including overnight accommodation).

4. The DSS Committee is drafting a Memorandum of Agreement between the LLCC and the MAS. This will need to also get approved by the MAS Board.
5. The LLCC has recently received the request to reserve 18 Friday/Saturday pairs to potentially reserve for MAS Star Parties for 2007. We need to hear back what weekends can be scheduled by LLCC.
6. The total cost to the MAS is \$200 plus quantity 4 Astronomy Outreach Events to LLCC (roughly quarterly).

If all goes well, MAS Star Parties at LLCC will begin in the spring of 2007!

Clear Dark Skies! Greg Haubrich MAS Board Member at Large and Dark Sky Site Committee Chairman. Onan Observatory ■

Onan Images

By Russ Durkee

These images were taken with the Onan Observatory's StellarVue 152 using an SBIG ST10XE and .67 Astro-physics reducer. Images are made from ten exposures of one minute each.

Considering that these were taken on a bright moonlit night with lots of atmospheric haze, these images demonstrate the awesome capabilities of the new imaging gear at the Observatory! ■



New Product Review - DG Spectroscope

By Ron Bubany

Have you ever wished you could expand a step or two beyond observing the sky? Perhaps, like me, you have toyed with the idea of capturing spectrographic data from the stars. Unfortunately, until now, the equipment for doing this has been too costly.

Not any more! The June issue of Astronomy Magazine recently described a new product for capturing and analyzing stellar spectrums - at a cost well within our means. This product is the DG Spectroscope selling in a price range of \$99 to \$185.

I wasted no time in logging on to the company web page (<http://www.vreh.com/optics/index.phtml>) to learn more. I found that this is a simple filter that will attach to the lens of supported cameras, or for visual use with an eyepiece, and produce spectra from star images in the field of view. In my case, I ordered the basic unit that screws into the eyepiece of my Meade DSI Imager. An advanced unit is also available, but it is not recommended for beginners like me. So, even though the advanced unit is more precise, I decided to stay with basic functionality.

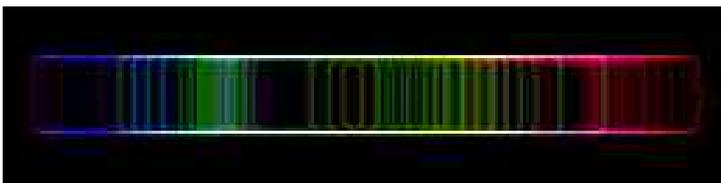
In addition to the spectral filter, the product includes a CD containing documentation and a number of useful software programs. One of these programs, a spectral analysis spreadsheet, can be used to identify elements contained in the spectrum as well as red shifts caused by movement of the star.

My new DG Spectroscope arrived promptly via US Mail and I was out that same night doing a test image of a few bright stars and their spectra.

Capturing the spectrum was as simple as pointing the DSI camera with filter inserted at the target star in the same manner as one would do for capturing a normal photograph. The star image and spectral line appeared clearly on my laptop's screen. I proceeded to focus the spectral image (this is important - focus on the spectrum, NOT the star, as they do not reside in the same focal plane) and then ran 20 four second exposures using the Meade Autostar software. I captured one image in black and white and another in color.

The resulting image has a blurry Arcturus to the left and a thin line representing its spectrum to the right. This can be processed later in the comfort of one's office. There are two ways to go, as described next.

If all you want is a "pretty picture" of the spectrum, you can use imaging software to bring out the detail. The documentation for the product describes how to do this using Adobe PhotoShop. The key step in the process is to use a motion blur filter to expand the image vertically. This will reveal the spectral lines. A "glowing edge" filter is then used to bring out the lines in very nice detail. Here is my picture of the Arcturus spectrum



If you want to do more than just pictures, you can use the supplied spectral tool (spreadsheet) to analyze the chemical elements in the spectrum. You do this by measuring the image

from the target star to the yellow/red transition point in the image and recording the value in millimeters in the spreadsheet. Next, you measure from the star to the spectral line you are interested in and record the value on the spreadsheet. The spreadsheet then calculates the wavelength of your spectral line (in nanometers) and displays it. From there you can go to a table of chemical elements and identify the element in your spectrum. Twenty of the most common values are included right on the spreadsheet. In my example (see included image) the element iron (FE) was identified.

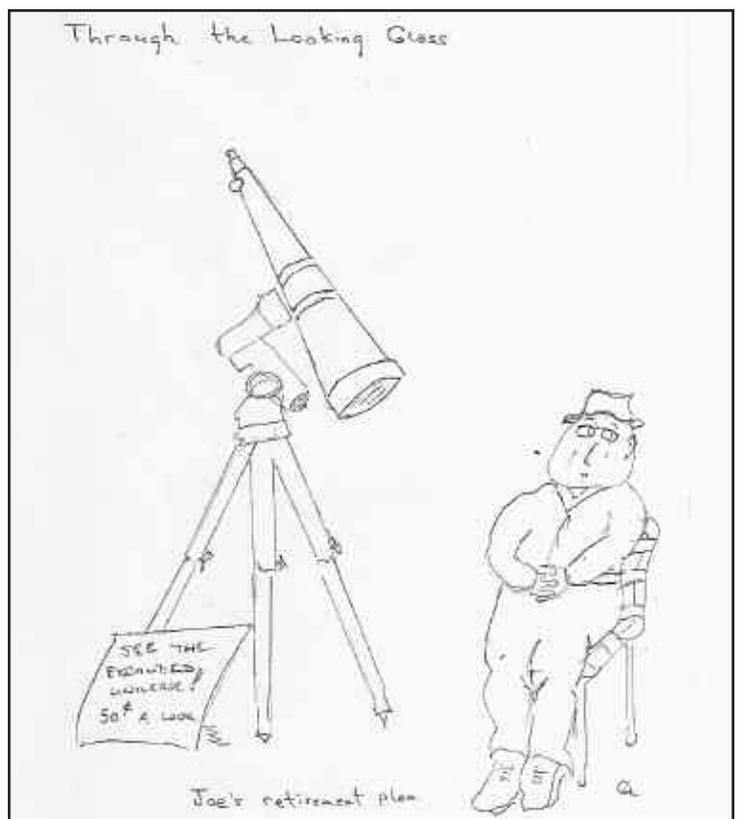
It's not magic. The whole calculation hinges on the fact that yellow transitions to red in a spectrum at precisely 590 nanometers. Simple arithmetic can then determine the wavelength of the target element. Here are pictures of the measurements and spreadsheet. See Figure 1 on page 10.

For those who wish to really do serious spectroscopic analysis, the Visual Specs (Vspec) software is included. This software gives you a powerful and extensive toolbox for analysis of spectral data.

Using Visual Specs you can:

- Create spectral profile files from *.pic or *.fit images with either automatic or manual extraction of the spectral profile
- Wavelength calibration
- Specific processing: extraction of continuum, filtering, composition
- Analysis and quantification: calculation of full width at half-maximum, signal-to-noise ratio, calculation of equivalent line width
- Comparison of profiles: superposition, recalculation in wavelength, animation, exporting to *.bmp or text-compatible

Joes Retirement

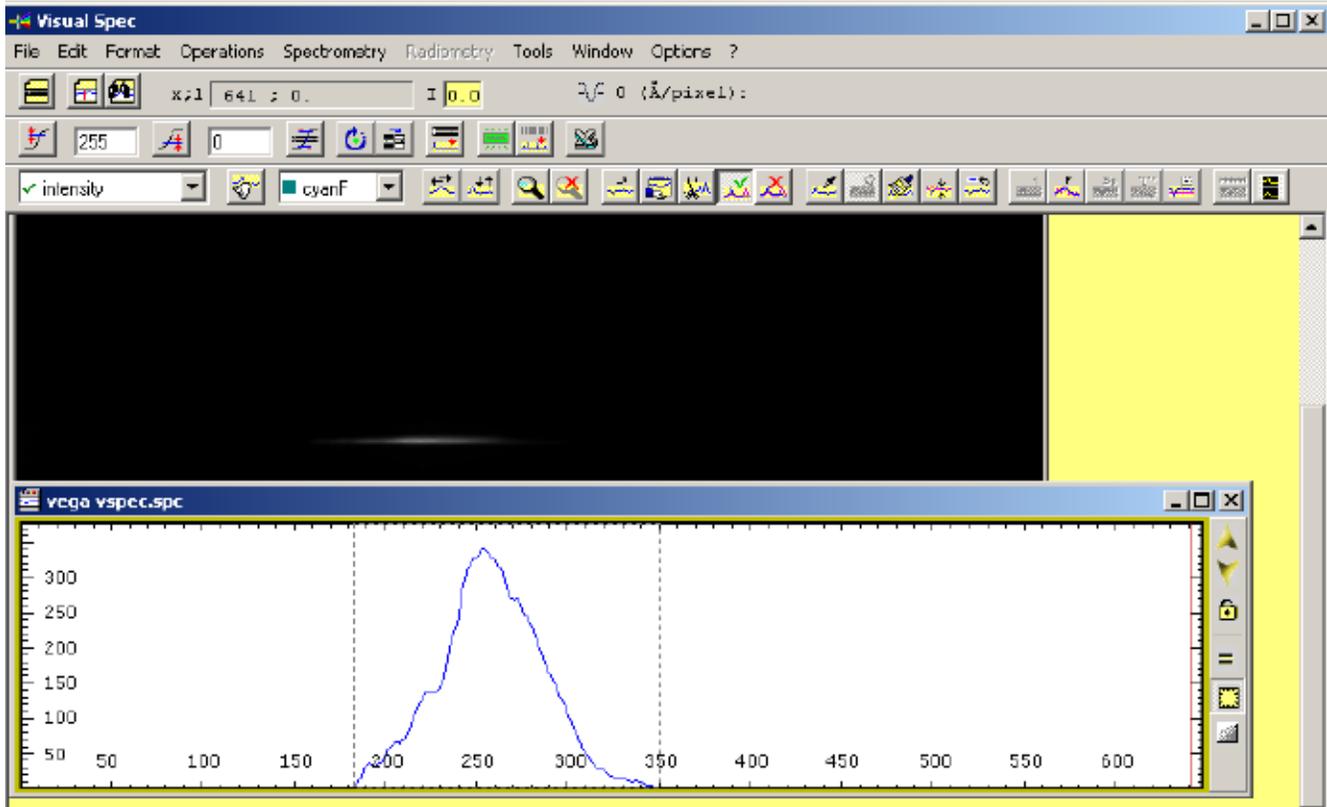


ible tables

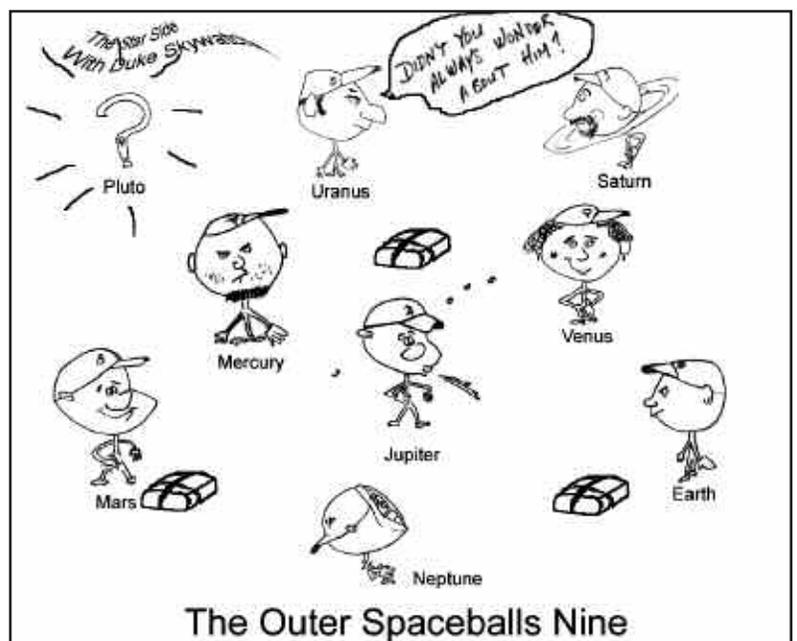
- Identification of chemical elements referring to a database of wavelengths
- Access to a library of standard spectra from different spectral types
- If you have Excel, search for the spectral type of a star in the Bright Star Catalog

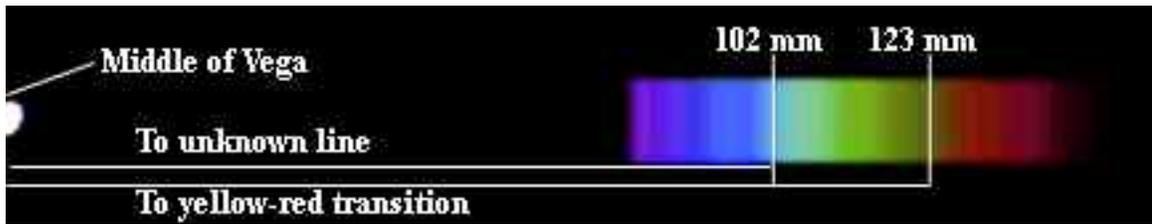
I ran a few initial profiles with the program and am including my plot of Vega in the image shown below. This plot is just the first of several steps and would need additional work to be useful. I intend to study the product documentation further to learn how to fully exploit the tool. Right now it is all just a little bit "over my head".

There is much to this package and it is well worth the investment. I have only just touched the surface of its content and capabilities. To really get into the details and options, I encourage you to visit the company web site specified at the beginning of this article. You just might be glad you did! 🐼



Duke Skywatcher





UCC Copyright 2005 by Comitec		Spectral Line Determination Tool		TYPE A1/B1/D1 - Compact Spectrum DG Filter	Individual Camera	Calibrations
		From a Known Base Line Distance		Camera	Ref. Wavelength	
Delta Grating:	0.000	(+/-)		LPI + B1-S	590.000 nm	Pixels 362.327
Grating:	500.5	(lines/mm)				
Input:	590	(nm)				
		^ 590 nm = Yellow/Red interface				
Input:	123	(" / mm)				
Input:	102	(" / mm)				
Output:	496.070	(nm)				
R.S. velocity:	-14.0	(+/-) km/s				
Name	Spectral Lines (nm)	Base Line Distance Units (" / mm)				
Oxygen	760	163.7				
Oxygen	687	145.7				
H-alpha	656.285	138.4				
Oxygen	628	131.8				
Sodium	589	122.8				
Titanium	547	113.3				
Iron	527	108.8				
Magnesium	517	106.6				
Titanium	500	102.9				
Iron	496	102.0				

Figure 1

2006 Star Parties

Star parties are held on Friday if weather permits, otherwise they are rescheduled for Saturday.

Call the MAS hotline at 952-467-2426 after 5 p.m. (3 p.m. in the winter) to hear a message about the status for that night.

Public stargazing nights at Onan Observatory at Baylor Regional Park are staffed and held whether it is clear or cloudy.

Date	Alternate or Time	Event	Location
9/30/06	7:00 pm - 10:00 pm	Public Stargazing at Onan	Onan Observatory. Fair or foul weather event
10/13/06	10/14/06	Metcalf star party	Metcalf Nature Center
10/13/06	7:00 pm - 10:00 pm	Public Stargazing at Onan	Onan Observatory. Fair or foul weather event
10/14/06	7:00 pm - 10:00 pm	Public Stargazing at Onan	Onan Observatory. Fair or foul weather event
10/20/06	10/21/06	Cherry Grove star party	Cherry Grove Observatory
10/20/06	7:00 pm - 10:00 pm	Public Stargazing at Onan	Onan Observatory. Fair or foul weather event
10/21/06	7:00 pm - 10:00 pm	Public Stargazing at Onan	Onan Observatory. Fair or foul weather event
10/27/06	10/28/06	Baylor star party	Baylor Regional Park (Onan Observatory)
11/10/06	11/11/06	Metcalf star party	Metcalf Nature Center
11/17/06	11/18/06	Cherry Grove star party	Cherry Grove Observatory
11/17/06	7:00 pm - 10:00 pm	Onan Observatory.	Fair or foul weather event Leonid Meteor Shower
11/18/06	7:00 pm - 10:00 pm	Public Stargazing at Onan	Onan Observatory. Fair or foul weather event
11/24/06	11/25/06	Baylor star party	Baylor Regional Park (Onan Observatory)
12/8/06	12/9/06	Metcalf star party	Metcalf Nature Center
12/15/06	12/16/06	Baylor star party	Baylor Regional Park (Onan Observatory)
12/22/06	12/23/06	Cherry Grove star party	Cherry Grove Observatory

Directions to the Star Party Locations

For maps and further details about the sites, please go to our website at www.mnastro.org/facilities. You can also check the MAS online calendar at www.mnastro.org for a complete schedule of all MAS events.

Baylor Regional Park

To reach Baylor Regional Park, head west on Minnesota Highway 5, through Chanhassen and Waconia, to the town of Norwood-Young America. Turn right onto Carver County Road 33 and continue approximately two miles north. Baylor Regional Park is on the right side of the road, marked with a prominent sign. When entering the park, stay to the right and follow the road approx. 1/4 mile.

For an alternate route from the southern suburbs, take U.S. Highway 212 west to Norwood-Young America. Turn right at the second traffic light onto Carver County Road 33. Continue two miles north to the park entrance.

When visiting the Baylor Regional Park, MAS members are requested NOT TO PARK OR DRIVE on the grass. There is a parking lot just past the observatory.

Cherry Grove

Cherry Grove is located south of the Twin Cities, in Goodhue County, about 20 miles south of Cannon Falls. To reach Cherry Grove, head south on Highway 52. On 52 about six miles south of Cannon Falls, and just past the Edgewood Inn, is a large green highway sign for Goodhue County Rd. 1 "WEST". Turn right, and follow County 1 straight south for about sixteen miles until you arrive at a "T" intersection with County A. The observatory is immediately at your right, nestled in the shoulder of the "T". Parking is permitted on the site, or along the road, preferably County A.

Metcalf

To reach Metcalf, head east from St. Paul along Hwy. 94. About four miles east of the I-694 / I-494 crossing is Minnesota State Highway 95, also known as Manning Avenue (exit 253). Turn south (right turn) and then almost immediately turn left onto the frontage road (Hudson Road S). Continue east on the frontage road for about one and one-half miles. Turn right onto Indian Trail, checking the odometer as you turn. Follow Indian Trail south for just about one and one-tenth miles, where you'll see an unmarked chain-link gate on the right, opening onto a dirt driveway with slight up-slope. This is the entrance to Metcalf.



MN ASTRONOMICAL SOCIETY

P.O. Box 14931
Minneapolis, MN 55414

ADDRESS SERVICE REQUESTED

NON-PROFIT
U.S. POSTAGE
PAID
Minneapolis, MN
PERMIT NO. 1407

How to pay your dues

Your MAS membership expires at the beginning of the month shown on your Gemini mailing label. Send your payments to the MAS Membership Coordinator at: Minnesota Astronomical Society, Attn: Membership Coordinator, P.O. Box 14931, Minneapolis, MN 55414. Make checks payable to MAS or you can pay by PayPal on the MAS web page. The current annual membership dues and subscription fees are: \$24 for regular memberships (\$56.95 including a Sky and Telescope subscription discounted to the annual member subscription rate of \$32.95), \$60 for patron memberships (\$92.95 including Sky and Telescope subscription) and \$12 for student memberships (\$44.95 including Sky and Telescope subscription).

To Renew Your Sky and Telescope Subscription

If you get Sky and Telescope at the club's discounted rate, you must renew your subscription through the club. When you get a renewal notice from S&T, send the notice along with a check for the amount indicated on the notice (currently \$32.95) to the MAS Membership Coordinator at: Minnesota Astronomical Society, Attn: Membership Coordinator, P.O. Box 14931, Minneapolis, MN 55414. Make your check payable to MAS. If desired, you may renew your MAS membership at the same time, and write one check to cover both payments.

To subscribe to the MAS e-mail list visit:
<http://lists.mnastro.org/mnastro/listinfo/>
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.