

THE EVENT HORIZON



ST. LOUIS ASTRONOMICAL SOCIETY

*Devoted to the Interest and Advancement
of the Science of Astronomy*

Volume 20, Issue 2
February, 2010

Mid States Region



Cosmic Rays - What Are They and Where Do They Come From?

Dr. Michael Friedlander of Washington University, will be featured at the February meeting of the Saint Louis Astronomical Society.

Cosmic rays are high energy particles that rain down on Earth from all directions. For some time after their discovery in 1911, their origin and nature remained unknown. Dr. Friedlander will talk about their birth in colossal supernova explosions, and their multibillion year journey through space to reach our detectors and telescopes. He will explain how they guide research by gigantic particle accelerators such as the Large Hadron Collider in Geneva, and also describe their connection with OB associations of young hot stars.

Michael Friedlander is a Professor of Physics at Washington University. His research has been in cosmic rays. In addition to numerous technical publications, he has authored several books for general readers. His most recent book is 'A Thin Cosmic Rain' (Harvard University Press, 2000).

GLOBE at Night 2010 by Mark Jones

3 - 16 March 2010

<http://www.globeatnight.org/>

Last Year's result: GLOBE at NightThe global citizen-science campaign GLOBE at Night 2009 recorded 80 percent more observations of the world's dark skies than the program's previous record—including double the number of digital measurements—thanks in large part to active participation and publicity from the network of 140 countries currently celebrating the International Year of Astronomy 2009 (IYA2009).

Now in its fifth year, GLOBE at Night encourages people everywhere to observe the prominent constellation Orion at least once over a two-week period and compare the number of stars that are visible using their

unaided eyes with a series of charts that show how Orion would appear in skies ranging from very dark to very bright skies. The program is designed to aid teaching about the impact of excessive artificial lighting on local environments, and the ongoing loss of a dark night sky as a shared natural resource for much of the world's population.

The 2009 campaign, held from March 16-28, garnered 15,300 geographically "mappable" measurements of Orion, nearly 7,000 more than the previous record of 8,491 that were contributed in 2007. Measurements were received from more than 70 countries in the 2009 campaign, with 17 countries reporting more than 100 Orion measurements. About 73 percent of the total measurements came from the United States (approximately 11,270 observations), including all 50 states and the District of Columbia, followed by Chile (about 900), the Czech Republic and the United Kingdom (both over 200). Other countries reporting more than 100 observations were Argentina, Australia, Canada, Colombia, Finland, Germany, Macedonia, Mexico, Poland, Romania, South Africa, Spain and Turkey.

In addition, 19 countries contributed another 1,474 "mappable" digital measurements using handheld Sky Quality Meters (SQMs). Two-thirds of the SQM measurements were from the US, with nearly 200 from Chile. Romania and Mexico followed, with over 70 and 60 SQM measurements, respectively.

Full data sets 2006-2009 are posted for download www.globe.gov/GaN/analyze.html; a map viewer that can compare GLOBE at Night data across the years is already available there.

GLOBE at Night is a collaboration between the National Optical Astronomy Observatory (NOAO) in Tucson, AZ; The Global Learning and Observations to Benefit the Environment (GLOBE) Program, in Boulder, CO; the Environmental Systems Research Institute, Inc. (ESRI) in Redlands, CA; the International Dark-Sky Association (IDA) in Tucson, AZ; and the Centro de Apoyo a la Didactica de la Astronomia (CADIAS) in Altovalsol, Chile. NOAO (www.noao.edu) is operated by the Association of Universities for Research in Astronomy Inc. (AURA), under a cooperative agreement with the National Science Foundation.

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President's Corner *by John Newcomer*



" The society has a current need for several volunteers to fill positions "



Volunteers are needed to help SLAS fulfill its mission

Cold and cloudy days are upon us! This is a great time to be an "armchair astronomer" reading the magazines and looking at the photos coming back from the recently-repaired Hubble telescope and the other missions zooming about the cosmos. If you'd prefer to be out under the stars (but not under the clouds), now is a good opportunity to do any maintenance on your gear, or plan out your approach to a Messier Marathon in March.

During January, we scheduled seven outreach events. Three of those were clouded out. Of the four we conducted, 6 volunteers put in 53.5 hours for the benefit of 385 people. Those volunteers earned 20 SLAS Bucks for their effort.

Additionally, new information was provided for several events that occurred in the past. 9 additional Bucks were recorded for that participation. It will be charged to the 2010 SLAS Bucks budget.

On the membership front, you will recall that we have set a goal of having 160 members by the end of 2010. As of mid-January, we stand at 148. When we announced the goal in November, we stood at 141. We are off to a good start! We are still working on activities and benefits of membership that we all can enjoy.

The evening following our February general meeting, February 20th, will be the annual Homemade Fest at the McDonnell Planetarium in Forest Park.

The doors open at 6:00, and if officially starts at 7:00. This event is a potluck, so bring your favorite dish to share. If you have made or bought something that enhances your enjoyment of astronomy, bring it to tell us about it and how it helps you enjoy our common hobby.

The society has a current need for several volunteers to fill committee positions (and a board position) that have recently opened up. I've mentioned before that we need a newsletter editor. Jim Small is filling this position on a temporary basis. Aaron, our merchandise chairman has stepped down as his "paying" job requires a lot of travel, and he misses many meetings. I've published elsewhere in this edition that our Vice President has stepped

down. If you're interested in the VP position, it will require a special election (per Article VIII of our constitution), so please contact a current board member, (our names and contact information is also in this newsletter) or email us at board@slasonline.org.

John Solodar, our long-time observing chair has finally admitted that he has far too many time commitments to do justice to the job, so he is also stepping down. Fortunately, Mark Jones has agreed to chair this committee with help from Jim Small as another member of the committee. We CAN have multi-person committees! Thank you both!

None of these jobs is hard, or requires large amounts of time. If you enjoy being a member of the society, please consider volunteering for one of these jobs. They are part of what makes our society special; it takes volunteers to make this all work.

There has been a lot of enthusiasm and new ideas this past year, and 2010 promises to be a very exciting time for the society. Be a part of it! Even if you're a new member, you can be a part of the future of this society.

Looking forward to the May elections, every board position is open for nominations. As I'm writing this, I'm also surveying the board to see who will be running again, and who is stepping down. Personally, I will be stepping down at the end of this term. I've been president for three of the past five years, and my children are increasingly active in after-school activities that demand my participation (and transportation).

Here are the positions that will be up for election in May:

PRESIDENT

"The president shall be the executive officer of the society, shall preside over all meetings of the society and the executive council, and shall be ex-officio member of all standing committees."

Basically, this is running the meetings, and keeping an eye on the happenings of the society. For the meetings (both board and general), I have templates that I use, so things have the same format from month to month. That makes it easy to prepare. Another thing is public speaking.

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If you are reasonably comfortable speaking to an audience, this part is no big deal. If you'd like to improve your public speaking skills, this is a great opportunity. Finally, this job requires keeping a focus on how our society can positively impact the community. Our outreach is a major part of that. How can we increase what we do, bring it to a larger public audience, and increase awareness of the night sky?

VICE-PRESIDENT

"The Vice-President shall, in the absence of the President, preside over all meetings of the society and of the executive council. He shall perform such duties as usually pertain to that, or which may be assigned to him by the President or the executive council."

The main job that the Vice President does is line up speakers for our general meetings. Local universities are a tremendous resource, as are other SLAS members. Also, the VP acts as backup when the president is unavailable.

TREASURER

"The Treasurer shall receive all funds paid to the society and shall deposit same in an official depository as approved by the executive council and shall disburse same on the approval of the President or the executive council. He shall sign all checks. He shall keep the society's financial records and his books shall be open to inspection by the executive council at all times. He shall make a report at the annual election meeting of the society and at such other times as the executive council may require."

The above is a pretty good description. The society does have computer software to assist in keeping the books.

RECORDING SECRETARY

"The Recording Secretary shall keep minutes

of business portions of any regular monthly meetings and minutes of all executive council meetings."

Again, not a hard job. Taking and publishing minutes, and providing counsel and guidance to the board.

MEMBERSHIP AND HOSPITALITY

"The Membership and Hospitality officer shall maintain a program of securing new members for the society and retaining current members. The Membership and Hospitality officer shall plan and coordinate social activities of the society as requested by the executive council or the membership."

Like the refreshments at the meeting? Thank your hospitality board member. This position is to welcome new members, and create a friendly environment at the meetings for both members and guests (and maybe turn some of the guests into members!)

BOARD MEMBER AT LARGE

The constitution does not have a description of this position. The Board Member at Large term is three years. The purpose of these positions is to provide continuity to the board, since all other terms are for one year only.

The bylaws and constitution of the society define all the executive board positions. While the personal pronouns used are "he" and "his", that's just a remnant from how it was originally written back in the 1950's. All adult members in good standing are eligible to run for office.

Even for current board members who will be running again, it is always nice to have multiple candidates to choose from in an election. If you like how the society has been run, nominate yourself to be a part of the leadership team. If you *don't* like how something is being run, nominate yourself to be an "agent of change". Just keep in mind the mission of our society is to share the wonder and science of astronomy.

"How can we increase what we do, bring it to a larger public audience, and increase awareness of the night sky?"

Stellar Asterism Quiz by Mark Jones

See how many you know. Name the constellation (s) and stars contained. Answers elsewhere in this newsletter!

- | | | |
|---------------------|---------------|----------------------|
| 1. Beehive | 2. Big Dipper | 3. Circlet |
| 4. Queen's 'W' | 5. Heavenly G | 6. Hyades |
| 7. Job's Coffin | 8. Keystone | 9. Kids |
| 10. Northern Cross | 11. Pleiades | 12. Sickle |
| 13. Kite | 14. Teapot | 15. House of Cepheus |
| 16. Sail | 17. Teaspoon | 18. Coathanger |
| 19. Winter Triangle | | |

German Equatorial Mounts - A Primer for Astrophotographers Part Two *by Gregg Ruppel*

Special considerations for imaging

The question is sometimes asked, "How accurately does the mount have to track the sky in order to take long exposure images?" The answer depends on many factors, but two that are critical are the focal length of the imaging system and how long an exposure is required. For short focal length systems, such as a DSLR camera with a 100mm lens, the precision with which the mount tracks the sky can be somewhat relaxed because small deviations will not be recorded. This is particularly true if the exposure time is relatively short (i.e. less than 60 seconds). However, as the focal length of the system increases, the apparent movement of the stars is magnified, and slight deviations in the tracking system will cause the stars in the image to be trailed or otherwise misshapen. For long exposures, these deviations add up. Poor polar alignment also becomes evident at longer focal lengths and long exposure times. A long exposure made using a scope that is not well aligned with the pole tends to show *field rotation*. Stars near the center of the field of view look normal but stars near the edge of the field appear to rotate around the center.

If the worm and worm gear (described above) were machined perfectly, tracking the sky would be relatively simple. Unfortunately, even very high quality gearing exhibits some imprecision. These defects usually show up as *periodic error* (PE). PE affects the worm more so than the worm gear because the worm has a rotation rate of a few minutes while the worm gear only rotates once in 24 hours. For example, the gearing on a typical GEM might have a worm that turns once every 4 minutes. During the 4 minute revolution period, slight imperfections will cause the drive to speed up or fall behind the true sidereal rate. If a 4 minute exposure is taken, the star image will reflect the periodic error by being elongated. The larger the periodic error the more elongated the star becomes. Figure 7 shows a graph of the PE of a typical drive. PE can be corrected by recording the necessary movements required to keep a star centered on a CCD chip or in a reticle eyepiece. This process is termed *periodic error correction* or PEC. Many computerized GEMs provide for recording key presses so that a PEC curve can be constructed manually. Software (e.g. PemPro by CCDWare) is commercially available to measure PE, compute the PE curve and then program the PEC into the mount. When properly implemented, PEC can turn a marginal mount into one that works well for imaging.

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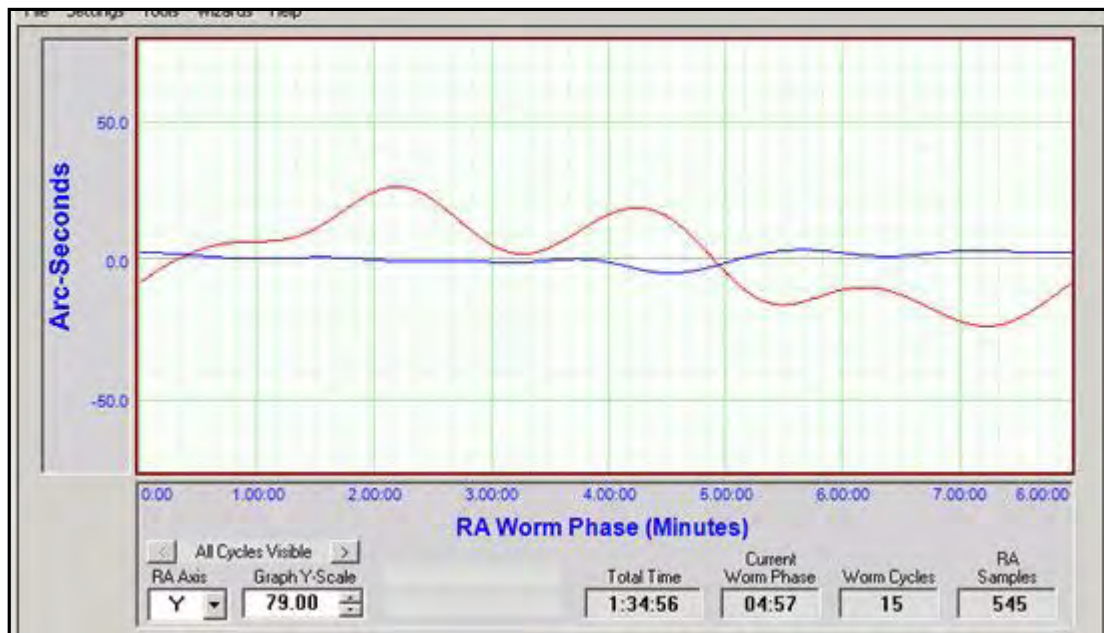


Figure 7. Graph of PE before (red) and after periodic error correction (PEC, blue).

(© PemPro – CCDWare <http://www.ccdware.com/products/pempro/>)

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Even a very accurate, well-aligned GEM (with PEC enabled) cannot track the sky perfectly, particularly at longer focal lengths and for long exposures. In order to make long exposure photographs, most modern imaging systems employ a guiding mechanism, sometimes called an autoguider. Before about 1994, guiding for long exposure photography was performed by the imager observing a star near the object being imaged and guiding the mount manually. A small CCD chip with software that could control relay switches was introduced by Santa Barbara Instrument Group (SBIG) as the ST-4 autoguider, and quickly became the de facto standard for controlling the mount during long exposure photographs. Because the guider does all the work this technique is often referred to as *autoguiding*.

Guiding is usually done with a separate guide scope (see Figure 8) or by using a pick-off prism that sits at the edge of the optical path to the film or imaging CCD (see Figure 9). The guider camera is usually a small, dedicated CCD camera, but inexpensive web cameras can be used as well. The guider camera is pointed at a star near the object being imaged. If the guide star drifts or changes position, a signal is sent to the mount to move the guide star back to its starting position. This feedback loop can be implemented by means of opto-mechanical relays or by issuing software commands by computer. A third method of autoguiding is proprietary to cameras manufactured by SBIG. These cameras incorporate two CCD chips – a large chip for imaging and a smaller chip for guiding. The guider chip is placed immediately adjacent to the main chip and shares the field of view of the imaging system.

GEMs are widely used for long exposure astrophotography, but have a few idiosyncrasies that deserve mention. GEMs are usually categorized by the weight of the equipment they can carry and still track the sky accurately. With a few exceptions, the carrying capacity of the mount when used for long exposure imaging is typically less than what might be suitable for visual use only. Many astrophotographers use the “50% rule” which suggests that a mount designed to carry a certain weight will function best for imaging if the load is reduced to approximately half of its capacity. The exception to this rule is the high-end GEM designed specifically for imaging. In practice, if the telescope/camera is well balanced, many GEMs can function acceptably up to their stated capacity. A second limitation exhibited by the German equatorial mount is that the typical telescope will bump into the mount (tripod or pier) as the mount tracks past the meridian. In order to track an object across a wide swath of sky from East to West, the mount needs to do what is termed a “meridian flip”. The meridian flip involves reversing the position of the telescope and counterweights in order to continue tracking. When imaging an object east of the meridian the

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Figure 8. Guide scope and guider mounted on top of a larger imaging telescope.



Figure 9. Off-axis guider mounted in front of a DSLR camera. A small prism reflects a star image near the edge of the field of view to the autoguider.

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telescope is on the West side of the mount; after the object crosses the meridian, the mount moves the telescope to the East side of the mount, rotating the DEC axis by 180°. Once this is done, the mount can continue tracking the object across the western half of the sky.

Computerized GoTo type GEMs often have the capacity to perform a meridian flip automatically. By setting specified limits, the user can make sure that the mount does not run into the pier or tripod, but flips when the object of interest has crossed the meridian. Depending on the length of the telescope tube (and other factors), most GEMs allow tracking past the meridian if it can be done safely.

The German equatorial mount has evolved as the workhorse of astro-imaging. Modern high precision mounts, under computer control, allow amateur astrophotographers to make long exposure images, limited only by the amount of time they wish to devote to a particular object.

Gregg Ruppel, Ellisville, MO

Glossary of GEM (German Equatorial Mount) Terms	
DEC axis	Mounted at right angles to the polar axis; carries the scope at one end and counterweights at the other end
Drift align	The process of adjusting the altitude and azimuth of the GEM by monitoring stars at the meridian or near the horizon. When drift is eliminated the mount is considered polar aligned.
DSC	Digital setting circles; encoders attached to a mount to monitor its position; allows the scope to be accurately pointed to a specific point in the sky
encoders	Device attached to the shaft of the mount or motor to measure it's relative position; used for digital setting circles
GoTo	Describing a mount that can point the telescope using a micro-processor and pointing software
meridian flip	The maneuver in which the telescope is moved to the opposite side of the mount when tracking across the local meridian
PAS	Polar alignment scope; a small telescope mounted in the bore of the RA axis. It contains a reticle for aligning the mount to the north or south celestial pole.
PE	Periodic error; the mechanical error in the worm of a worm-worm wheel combination
PEC	Periodic error correction; recording of the periodic error for playback of corrective actions
polar alignment	The process of aligning the RA axis to the earth's axis using a polar alignment scope, drift aligning, or software
RA axis	The polar axis that is aligned with the earth's axis
saddle plate	The attachment point for the telescope on the DEC axis
Servo	Drive motor with an encoder that monitors the position of the motor with a feedback loop
Setting circle	A calibrated ring attached to the axes of a GEM that allows accurate pointing once the circles have been calibrated on a known object
Stepper	Drive motor that can adjust its position by a discrete number of steps
worm	A round shaft geared to rotate with a fixed period against the worm wheel to produce the sidereal rate
worm wheel	A large gear attached to the axis of the mount; with appropriate gearing the worm wheel rotates exactly once each sidereal day

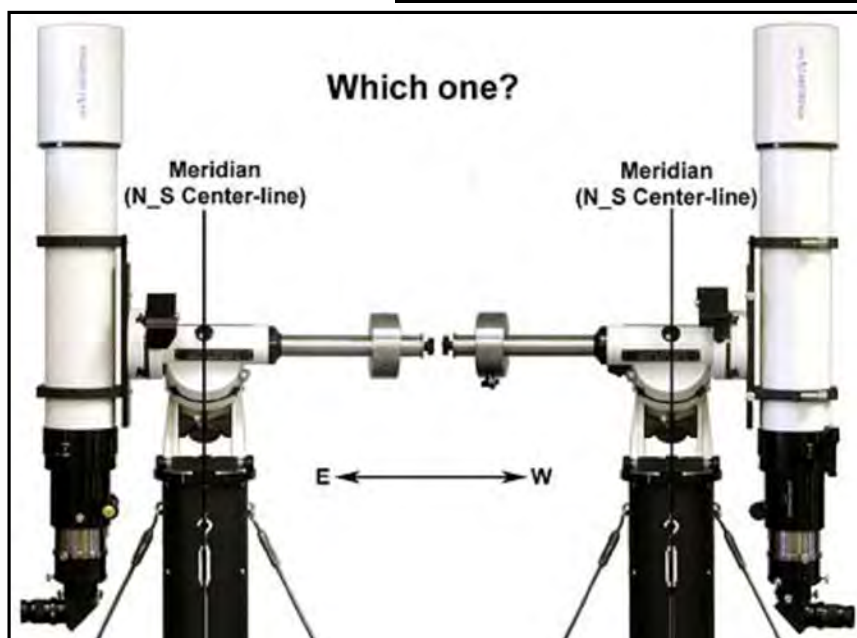


Figure 10. Meridian flip; viewed from the North, the scope on the right will bump into its pier if it continues to track past the meridian. By flipping to the configuration on the left it can continue to track the sky (© Astro-Physics, Inc.).

Moon Madness by John Newcomer

The annual Moon Madness event was held at the Center for Creative Learning in Ellisville on January 29, 2010. More often than not, the weather is cloudy for this event. This year reinforced that idea. The temperature was in the teens, and during the event it started to snow. Because this was accurately forecast by our fine local meteorologists, I put the word out that I could handle this event by myself. Technically, though, that wasn't true. I had two assistants in my youngest daughter, and her friend.

We arrived at about 6:30pm to set up our supplies and props. I brought my small travel-scope, several slide shows to choose from, my globe and Moon-surrogates, and my model Saturn V rocket. While we were setting up, I discovered that the main speaker for the evening was Greg Marnyiak, the current director of the McDonnell Planetarium. He is a good speaker.

I had three sessions following the keynote. For the first and third sessions, I explained the relative size and distance of the Earth and Moon with my props, and described the various parts of the Saturn V stack and how/when they are used during an Apollo mission. In the first session, I must have been talking fast because I had time remaining to cover lunar and solar eclipses as well. For the middle session, I reprised the Astro 101 that Rich Heuermann did last July for the 40th anniversary of the Apollo 11 landing.

This event was on Jan 29. The following weekend, Jan 31, marks the 39th anniversary of the Apollo 14 liftoff. I also quoted, not Neil Armstrong's famous words, but the first words from the Apollo 12 mission, when Pete Conrad not so famously said, "Whoopie! That may have been one small step for Neil, but that's a long one for me!"

My very able assistants manned the telescope in the hall, held up the Moon-surrogates while I was demonstrating the sizes, and also took photographs of the event. I provide two here for your enjoyment.

Several people throughout the evening had very good questions about using telescopes they already have, and when our public telescope viewing session occur. I gave out several brochures, and pointed many people to our website.



Afocal Moon Photograph



A Note From the President by John Newcomer

Paul Baldwin has resigned his position as Vice-President of the SLAS. In his farewell message, he made a vague but scary comment on SLASdialogs that he feared for his personal safety. I think it is important for everyone to understand that this comment was an unfortunate phrase to describe what he was feeling at the time.

I spoke at length with Paul about leaving and how he came to that decision. The situation would better be described as a personality conflict with another member, and he was uncomfortable with continuing in his position. I specifically asked him, and he replied that at no time was any threat of physical violence offered by any member, or by anyone at any SLAS event.

I want everyone to know that safety is one of the fundamental priorities of our society. Our meetings and outreach activities are open to everyone, are family-friendly, and offer all an opportunity to share in the wonder and science of the night sky.

Homemade Fest



2010



will be held at the
**PLANETARIUM IN FOREST PARK
MISSION CONTROL ROOM**

Saturday Evening, February 20, 2010

Doors Open at 5:00 p.m.



Use the main entrance, continue walking straight ahead, then enter the Mission Control room (the large glass doors on the right).
Temporary parking is available at the main entrance for unloading and loading your projects if needed.




Please arrive early.
We will begin eating as soon as the food is ready.

The formal opening and presentations will begin
at approximately 7:00 p.m.



This is our winter get-together --
A combination event of a potluck dinner followed by entertaining talks
by those members who want to show off anything of astronomical interest that they have, or have done.
The cleverness, creativity and talent of our members is truly impressive.
So bring a favorite dish, have a great meal, then sit back and enjoy some fun presentations.



Since dinner is potluck, everyone is asked to bring a dish. 
The club will furnish the beverages, bread, paper plates, utensils, etc.

Please call **BILL DAVIS (636-789-4929)** for more information.

**This event is free for SLAS members and their families
and \$5.00 for non-members and their families**

Flyer Design donated by *BK Graphics*, Brenda King, 636-789-2098 baodraft@sbcglobal.net

NOTICE: Due to a scheduling conflict at the McDonnell Planetarium, the annual SLAS Homemade Fest will be located upstairs in the Star Chamber this year. The time is the same, and there will be an elevator available for our use. The Planetarium staff has agreed to post signs to direct us to the new location. See you there!

Public Outreach - Who is Entertaining Whom? by Cook Feldman

As many of the members of SLAS are aware, we do a significant amount of public outreach events during the year. All you have to do is go out to the Night Sky Network and look on the Society's calendar and take a head count. I would, but I can't count that high. A number of these events are scheduled, such as the Public Telescope View at the Science Center (which I have been doing since 1994) and Francis Park; repeat every month on the first Friday and the Wednesday closest to the First Quarter Moon.

A few of us, years ago, started doing what I would consider pure sidewalk astronomy, emulating the ideals of John Dobson and the San Francisco Sidewalk Astronomers. Since the name "Sidewalk Astronomers" was already taken, the name "Urban Guerilla Astronomers" was chosen. It is a fitting name since the astronomy is done with in a somewhat urban environment and people on the street are "hijacked" to look through the scopes. There are no special requirements to be part of this group. Anyone who has as desire to share the sky, look up or having a good time meeting the public are already a member.

Personally, I think these impromptu activities are more fun than the scheduled and somewhat structured outreach in which we normally participate. These sidewalk activities can often produce some of the best and enduring memories.

Let me relay to you one evening that stands out as one of the most memorable. Randy Gibb, a fellow member of SLAS, and I were setting up at one of our usual locations by Vintage Vinyl in the Delmar Loop. This is a good location since it is between Cicero's and Blueberry Hill and there is a lot of foot traffic. This provided a large number of "victims" to choose from for the evenings' activities.

From our vantage point, we had unobstructed views of

both the first quarter Moon and Saturn. It really seemed that the pedestrians displayed a limited vocabulary that evening. I had noticed that a lot of sentences started off with the word "WOW." Not being one to openly criticize a person's syntax or choice of words, I decided to let this repetition pass unnoticed. Lo and behold, there was at least one individual who had a much broader and descriptive vocabulary regarding what he was seeing through the telescopes.

Later that evening, one individual had actually inquired about what the cost would be to look through the scope. When he was told that to take a look was absolutely free, he seemed to have difficulty dealing with that concept. He stated that no one is altruistic and that there had to be a hidden cost somewhere. Finally, I had capitulated. I confessed that there would be a nominal cost and a slight investment. I could tell by the expression on his face "Okay, here it comes."

Of course, me being the type of person that would never under any circumstance, pull anyone's chain, proceeded to tell him what the cost and investment would be. I told him the cost would be to venture into the unknown and that the investment would be no more than the amount of time it would take for him to approach and look through the eyepiece.

He couldn't believe what he was seeing through the telescopes and was totally astonished. In all, he spent the better part of an hour at our location talking with us and asking some excellent questions. He even went as far as to stop other pedestrians as they walked past our location to stop and take a look.

You go out with your equipment with a certain level of expectations and something totally different and sometimes unexpected happens that really strikes a chord. So, you can easily ask in situations such as this, who was being entertained and who was doing the entertaining?

When the weather breaks and it gets a little warmer, I urge you to gather your equipment and hit the sidewalks. It will be an evening of cheap entertainment, you just have to decide for whom. Cook

ANSWERS to quiz

- 1. Beehive** Located in the constellation Cancer. The Beehive is an open star cluster, and is also called Praesepe or M44 and faintly visible to the naked eye. With the stars gamma Can and delta Can, it forms another asterisms called "the Asses and the Manger".
- 2. Big Dipper** The most famous asterism. Formed by the following Stars of the Great Bear alpha UMa, beta UMa, gamma UMa, delta UMa, epsilon UMa, zeta UMa and eta UMa, it is often called "Wain" (Wagon) or "Charles's Wain" because of its resemblance with it when the Dipper handle is thought to be the wagon tongue.
- 3. Circlet** Aka. western fish; the circlet is formed by gamma Psc, b Psc, theta Psc, iota Psc, 19 Psc, lambda Psc and kappa Psc.
- 4. Queen's 'W'** Alpha; Beta; Gamma; Delta and Epsilon Cassiopeiae form a 'W' or 'M' shape; most of the throne of the Queen
- 5. Heavenly G** Nine bright stars forming a G-shaped group. Seven of these stars are of 1st magnitude. In order they are: Aldebaran (alpha Tau), Capella (alpha Aur), Castor (alpha Gem), Pollux (beta Gem), Procyon (alpha CMi), Sirius (alpha CMa), Rigel (beta Ori), Bellatrix (gamma Ori) and Betelgeuse (alpha Ori)
- 6. Hyades** An open cluster; V-shaped group superposed on alpha Tau, gamma Tau, delta Tau and epsilon Tau
- 7. Job's Coffin** Formed by the four stars alpha Del, beta Del, gamma Del and delta Del
- 8. Keystone** The Keystone is formed by the epsilon Her, zeta Her, eta Her and pi Her
- 9. Kids** The Kids are: epsilon Aur, zeta Aur and eta Aur
- 10. Northern Cross** Formed by the leading stars of the constellation Cygnus: alpha Cyg, beta Cyg, gamma Cyg, delta Cyg and epsilon Cyg
- 11. Pleiades** Located in the constellation Taurus. This open star cluster is one of the Messier objects, M45. It also known as Seven Sisters or, in Latin America the Seven Little Goats
- 12. Sickle** Formed by alpha Leo, eta Leo, gamma Leo, zeta Leo, mu Leo and epsilon Leo
- 13. Kite** A Kite-shaped figure enclosed by Alpha; Beta; Gamma; Delta; Epsilon and Rho Bootis
- 14. Teapot** Handle of Teapot to the east and Spout to the west with 'steam' of Milky Way coming out of the Spout; Handle is also Milk Dipper
- 15. House of Cepheus** Alpha; Beta; Gamma; Iota and Lambda Cephei for 5 sided figure with the 'roof' facing toward Polaris
- 16. Sail** Beta; Gamma; Delta and Epsilon Corvi form a sail shaped grouping south of Virgo
- 17. Teaspoon** Nu; Rho1; 43; Pi; Omega; Xi1 and Xi2 Sagittarii form a curved 'spoon' shape NE of Teapot; Beautiful binocular scanning including lovely chain
- 18. Coathanger** Collinder 399; Brocchi's Cluster; he used it for photometer calibration
- 19. Winter Triangle** Procyon; Sirius and Betelgeuse form conspicuous triangle during northern Winter

Upcoming Star Parties and Other Events

Geoff Marcy, Ph.D., popular “planet hunter” and professor of astronomy at the University of California, Berkeley, will deliver the Ferguson Lecture for the Assembly Series

Date: 2/17/2010

Time: 11 a.m.

Location: Graham Chapel, Washington University
The lecture is free and open to the public.

Fulton School - St. Albans Telescope Viewing

Date: Thursday, 2/18/2010 **Time:** 7:00PM -8:00PM

Location: The Fulton School - St. Albans

SLAS Regular Meeting

Date: Friday, 2/19/2010 **Time:** 7:30 PM - 9:00 PM

Location: Room 162 McDonnell Hall, Washington University, Saint Louis, MO

SLAS Homemade Fest - Members and Guests

Date: Saturday, 2/20/2010 **Time:** 5:00PM -10:00PM

Location: McDonnell Planetarium - Forest Park

Francis Park Stargazing

Date: Wed, 2/24/2010 **Time:** 7:00PM-10:00PM

Location: Francis Park, Tamm Ave, St Louis, MO

Incarnate Word Science Olympiad

Date: Thursday, 2/25/2010 **Time:** 6:30PM - 8:30PM

Location: Incarnate Word, Chesterfield, MO

SLSC Public Telescope Viewing

Date: Friday, March 5, 2010 **Time:** 7:00PM-10:00PM

Location: McDonnell Planetarium, Forest Park

SLAS Board Meeting

Date: 3/11/2010 **Time:** 7:00PM-9:00PM

Location: Wired Coffee, Sunset Hills

SLAS Regular Meeting

Date: Friday, 3/19/2010 **Time:** 7:30 PM - 9:00 PM

Location: Room 162 McDonnell Hall, Washington University, Saint Louis, MO

For details on these and other upcoming events, check out the Night Sky Network Calendar linked on the Home Page for SLAS at

<http://www.slasonline.org>

Observing 2010

It's February 2010, time to get ready for this year's observing season. The SLAS dark sky events are

scheduled for Saturday nights nearest New Moon. We will plan to use Danville Wildlife Area unless otherwise announced at a later date. Check SLASDialogs and the SLAS calendar for details.

Dark Sky Observing Dates (all are Saturdays)

Mar 20 Apr 10 May 15 Jun 12 Jul 10

Aug 7 (Star-B-Q Babler State Park)

Aug 14 Sep 4 Oct 9 Nov 6

2010 is a fairly bland year for astronomical events. Besides the usual planetary oppositions and meteor showers, only a few rare events occur. Of particular note will be the Partial Lunar eclipse on June 26 and the Total Lunar eclipse on Dec 21. One cool event this month is the asteroid Vesta passing through Leo. On the night of Feb 16-17. Vesta will pass between Gamma and 40 Leonis. It should be very easy to identify the 6 magnitude Vesta on this night.

Below is a list of detailed events for February through April, plus a two lunar eclipses.

Feb-Dec 2010

February 14 - New Moon

February 16 - Jupiter 0.5 deg upper right of Venus

February 21 - Pleiades 0.09degN of Moon

February 28 - Full Moon

March 6 - 34km asteroid Anastasia occults 2.5mag star Nevada Baja CA

March 15 - New Moon

March 20 - The Vernal Equinox occurs in the northern hemisphere at 17:32 UT.

March 21 - Pleiades 0.32degN of Moon

March 22 - Saturn at Opposition.

March 30 - Full Moon

April 3 - Mercury 3 deg right of Venus

April 8 - Mercury greatest E elongation

April 14 - New Moon

April 21, 22 - Lyrids Meteor Shower.

April 28 - Full Moon

June 26 - Partial Lunar Eclipse.

Start=4:20AM Alt=2deg

Moonset=4:31AM

December 21 - Total Lunar Eclipse.

start=12:34AM Alt=72deg

Totality Start=1:41AM Alt=63deg

Totality end=2:52AM Alt=50deg

Eclipse End=3:59AM Alt=37deg



LET US KNOW YOU ARE COMING!

To RSVP for any of these events log in to the Night Sky Network and submit your RSVP. If the event is canceled, you will be notified immediately according to the preferences you have selected. For more information about events, such as Moon phase, clear sky clock, weather report or a map of what's up, see the calendar online.

SLAS MEMBERSHIP APPLICATION



Name: Last _____

First, Middle Initial _____

Address _____

City, State, Zip Code _____

email address _____

Youth @ \$10.00 / 1 year (18 yrs or younger) \$ _____

Individual @ \$25.00 / 1 year \$ _____

Family @ \$40.00/1 year \$ _____

Publications with discount available with your SLAS membership:

Sky and Telescope @ \$32.95 / 1 year \$ _____

(S&T may also be renewed at their website: www.skyandtelescope.com)

Astronomy @ \$34.00 / 1 year \$ _____

TOTAL ENCLOSED \$ _____

Please send completed form with check (no cash please) made payable to

St Louis Astronomical Society

Don Ficken, Treasurer

13024 Barrett Crossing Court

St. Louis, MO 63122-4900

e-mail: treasurer@slasonline.org

Check all that apply:

Renewal

Address Change Only

Please send my newsletter by email

New Member!

SLAS OFFICERS

President *John Newcomer* 314-496-4636
president at slasonline.org

Vice President *Vacant* vicepresident at slasonline.org

Secretary *Rich Heuermann* 314-962-9231
secretary at slasonline.org

Treasurer *Don Ficken* (636) 225-0269
treasurer at slasonline.org

Hospitality *Annette Rolls* hospitality at slasonline.org

Board Members at Large:

Jim Trull board10 at slasonline.org

Cook Feldman board11 at slasonline.org

Bill Breeden board12 at slasonline.org

ALCOR Astronomical League Representative *Don Ficken*

COMMITTEE CHAIRS

Telescope Making *Bill Davis, Jim Melka* 314-469-3061
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Publicity—*Rich Heuermann* 314-962-9231
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Dark Site Coordinator *Mark Jones* 636-394-2342
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Observing Programs *Mark Jones*
observing at slasonline.org

Club Librarian *Jim Small* 314-909-7211
librarian at slasonline.org

Loaner Scopes *Linda and John Follis* 636-583-3485
loaner at slasonline.org

Merchandise *WE NEED A NEW MERCHANDISE CHAIR*
merchandise at slasonline.org

SLASdialogs Moderator *John Beaury* 314-965-9094
dialogsmoderator at yahoo.com

Star Party Coordinator *Mike Malolepszy* 314-781-4701
vicepresident at slasonline.org

Webmaster *Jim Small* 314-909-7211
webmaster at slasonline.org

Newsletter Editor *WE NEED A NEW EDITOR!!*
newsletter at slasonline.org

ST. LOUIS ASTRONOMICAL SOCIETY

We're on the Web!

<http://www.slasonline.org>



Who We Are and What We Do

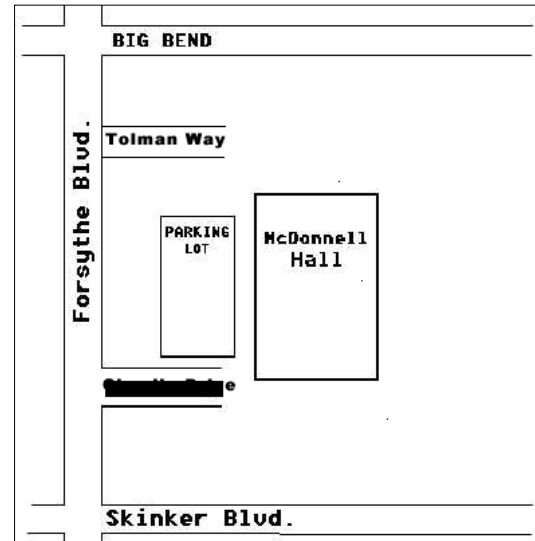
St. Louis Astronomical Society is a not-for-profit organization established in 1936. SLAS is devoted to the interest and advancement of the science of astronomy. Our mission is to promote an understanding of the science of astronomy to our members and to the public. Membership is open to anyone with an interest in astronomy.

For more information contact any SLAS officer or visit our website listed above. SLAS is affiliated with the Astronomical League, Night Sky Network and the Mid-States Region of the Astronomical League.

SLAS conducts star parties, presentations, holds public monthly lectures frequently with guest speakers and hosts social events for members.

Member benefits include outreach opportunities, loaner telescopes, a library, an online forum and social events such as star-b-q's and dark sky parties. Support for members wishing to further observing or other skills is also available.

Meetings are held the 3rd Friday of each month at McDonnell Hall at Washington University. See the map to the right for directions.



St. Louis Astronomical Society

Jim Small
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