



A.S.E.M. Newsletter

March 2014



**PHOTO BY GREGG RUPPEL
THE FLAME AND HORSEHEAD NEBULAE**

LENZINMANOTH

Old German name for March, “The Month of Spring”

MARCH CALENDARS

Social

March 6 - 7pm Beginner Meeting @ Weldon Springs Interpretive Center, 7295 HWY 94 South, St. Charles, MO 63304

March 8 – 6pm Monthly Pot Luck & 7pm General Meeting, at Weldon Springs. Carl & Helen Turek will be bringing fried chicken.

March 18 – 7pm DigitalSIG. Astrophoto group meeting Weldon Spring, 7295 Highway 94 South, St. Charles, MO 63304.

March 26 - 7PM DIY-ATMSIG For the telescope maker to display his wares or those who wish to see what folks have been doing in their workshops. Weldon Spring, 7295 Highway 94 South, St. Charles, MO 63304

March 7, 14, 21, 28 – 7 pm start times Broemmelsiek Park Public Viewing, weather permitting.

Astronomical

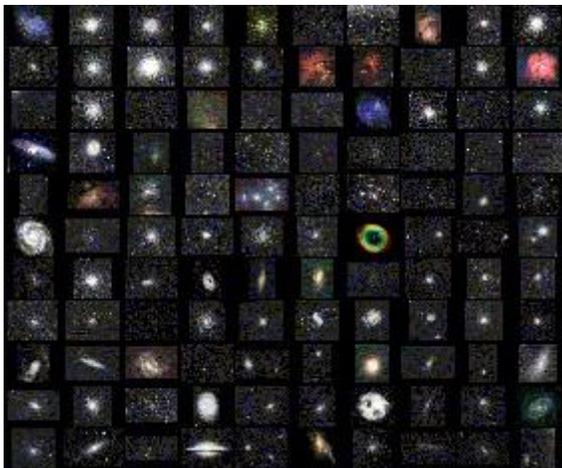
Jupiter – High overhead at the end of twilight Jove will never be better positioned after dinner this year than now in March.

M82 Supernova – At the end of February this supernova is still telescopic.

Messier Marathon 2014

Submitted by Steve Boerner

(I'm reprinting this as a reminder, JC)



ASEM and SLAS are sponsoring the first of what we hope will become an Annual Greater St. Louis Messier Marathon the night of March 29, 2014.

What's a Messier Marathon?

The idea behind a Messier Marathon is to see as many of the 110 Messier objects a possible in one night.

Based on the position of the sun and the moon you should be able to view about 105 of the 110 that night.

Where will the event be held?

You may choose to participate at either Broemmelsiek Park or

Danville Conservation Area.

How long will it take?

It will take all night. The Messier objects are spread out all over the sky. Some need to be seen just after dark and others just before light. With about 11 ½ hours of darkness and 110 objects you'll have about 6 ½ minutes to find and view each object.

Is there any cost?

There is no cost at all beyond equipment, snacks and what it takes to get to the event.

Where can you find more information?

The ASEM website has a page that covers who, what, where, when, how, and why of it all. You can find a link in the "Latest News" section of the home page or go to:

<http://tinyurl.com/lvgxgox>

Where can you ask questions about the event?

Send email to admin@asemonline.org for questions not answered by the event's webpage.

See you there!

Other upcoming events to plan for/consider Submitted by Jim Twellman

Mar 22, 2014 Sat 9am to 1pm TRAIL WORK DAY at Broemmelsiek Park

<http://www.calameo.com/link?id=80025574>. Consider helping our Parks department improve our favorite park.

Mar 29-30 Messier Marathon (B-siek and Danville)

April 8 - Mars Opposition and

April 14 - Mars closest approach

At this time only considering extra emphasis on Mars at the April FNOH's. Other ideas?

April 11 YURI'S Night - FNOH (Broemmelsiek Park)

Visit <http://yurisnight.net/> and find a description of this event that celebrates the exploration of space. (We are a day early.)

April 15 - Total LUNAR eclipse - Broemmelsiek Park. Totality runs from 12:46 to 3:02AM, so this is early the morning of the 15th. Perhaps (if desired) we could offer scopes on Mars late on the 14th, as we near the lunar eclipse? Folks can see this event from their homes, so I doubt there will be much need to do this at B-siek, but it is open for consideration of our membership. Local neighborhoods have trees and buildings that block the view for some.

May 3 Sat 9am-1pm TRAIL WORK DAY at Broemmelsiek Park

<http://www.calameo.com/link?id=80025577>

Consider helping our Parks department improve our favorite park. That's all I got. I can't wait for some milder and clearer weather!

Jim T.

FEBRUARY DANVILLE OBSERVATIONS

DAN CROWSON

Danville – Wednesday, February 26th – It was cold and very windy. Two of us ventured out. Views were ok but the wind was terrible. It took me three and a half hours to get two hours of imaging data at the start of the night. Jeff was nice enough to share a view of SN 2014J in M82 the only time I left my warm vehicle. It is still very bright and easy to see. The winds really picked up while preparing to tear down in the morning but Comet C/2012 X1 LINEAR was nice to ‘see’ through the camera near the bright globular cluster NGC 6760.

Use caution when driving in and out because it looks like they’re still cutting trees down and the road is littered with pieces that have been cut and others that have just fallen by themselves.

BEGINNER GROUP SUBMITTED BY AMY WHITE

Beginner’s Meeting for March 2014
By Amy White

The next ASEM Beginner Meeting will be held Thursday, March 6, 2014. The location is the Weldon Springs Interpretive Center classroom, 7295 Highway 94 South, St. Charles, MO 63304. The event starts at 7:00pm and runs until 9:00pm. This is a free service of ASEM for members and the general public.

Come with any questions you might have about observing the sky. You do not have to be an ASEM member to attend and participate. If you are not sure how to use your telescope, please bring it to a Beginner’s Meeting so we can help you. Nothing is sadder than a telescope in a closet. If you do not have a telescope, you can get advice on what to look for in optics. Binoculars are great for getting started. Even \$20 binoculars will show you amazing things in the sky.

One topic for discussion will be observing Mars. The opposition and close approach dates for Mars will occur during the second week of April. When the Red Planet’s orbit brings it nearer to Earth, its angular size in the sky becomes larger. Mars noticeably brightens over the next 6 weeks.

Mars is an easy naked eye planet to watch. It has a distinct rusty color, and it is very bright. The normal motion of planets, as viewed from Northern Latitude observers on Earth, is from right to left among the stars, meaning west to east. There are stretches of time when planets “go the wrong way,” or travel from east to west in the sky. This is called retrograde motion. We can watch Mars move backwards in the sky from March 1st to May 20th.

Mars travels through the constellation Virgo during the 2014 opposition. This image from http://www.alpo-astronomy.org/jbeish/2014_MARS.htm shows the dramatic changes in the size of Mars over the next few months. If you miss this opposition and close approach, the next opportunity will occur at the end of May, 2016, when Mars will occupy over 18” of sky.



This link has some good information on the motion of Mars

<http://www.universetoday.com/109010/enter-the-red-planet-a-guide-to-the-upcoming-mars-2014-opposition-season/>

Mars is such an interesting planet. It will probably be the next Solar System object, after the Moon, where humans will walk. It may, or may not, have had living organisms on it in the past.

Mars' geology is fascinating. The tallest volcano in the entire Solar System is Mars' Olympus Mons. If you have an old National Geographic Mars map, that feature is called Nix Olympus. A rift canyon system as long as the US is wide stretches across Mars.

DIY-ATM GROUP SUBMITTED BY TOM RICHARDS

We had no completed projects or modifications shown at this meeting, but we did discuss some interest ideas, needs, and travel tips (read on).

Steve presented the idea of building a sun projector for the park, to use for those early visitors who want to look at something when the sun is still up. Such a device would be stored in the observatory, and brought out by a club volunteer/staffer for use before sunset. Another goal is to initiate a "group" build project by interested members of the DIY-ATM SIG. Steve discussed several types of designs that can be seen off the internet, including a few manufactured models, and of those presented he made a recommendation for building a folded refractor design that he found on www.clearskyobserver.com, that offered several benefits of portability, ease of use, and protection. Everyone that attended the meeting agreed to the recommendation and to begin more detail/design discussions and to find beat the drum on finding parts. Steve had an objective lens to donate and John Duchek offered a first surface mirror. Please see Steve's post on the DIY-ATM Yahoo forum for more details.

A couple of questions also came up on:

Dew heaters, especially for a Paracorr. First recommendations to this need was to check out Dewbusters.com and Scopestuff.com, in addition to consider making a custom solution. Several recounted success stories of homemade solutions that have worked very well too.

Solar filter material for an existing dob or reflector. Recommendations were to check out thousandsoptical.com solar filter webpage that has a lot of information and size selections for both sheet stock and manufactured scope filters. It was also recommend that look into Astro-Solar film made by www.baader-planetarium.com, which is available at www.astro-

physics.com. Grant noted that this film worked extremely well for high-magnification viewing or photography, versus that from thousandoaks which seemed to produce "soft" results in viewing. Also, if there is interest in a custom solution for mounting solar film material on a SkyWatcher dob, be sure to contact Steve, since he has already cooked up an adaptation using an extra cover plate that he found for his dob.

Finally, somewhere in the discussions of observing and scope use, the skies (and the warmer temperatures compared to what we have living with) of New Mexico came up, and everyone wanted to know more (from John Duchek and Bill Sheehy) of their travel and living experiences there.

Yes, it sounded wonderful, despite the creepy critters that one must put up with. Ahhh, what a dream we all had, at the moment, of being out there with our scopes under clear dark skies, comfortable temperatures, and low humidity. It was nice warm thought, considering the winter we are seeing this year in St. Louis.

A link to our webpage for projects:

<https://sites.google.com/a/asemonline.org/asem-intranet/Home/asem-s-sigs/atm-sig>

Catch ya next month,
Tom

FEBRUARY DIGITAL SIG MEETING NOTES SUBMITTED BY DAN CROWSON

The theme of February's Digital SIG meeting was DSLRs and sky tracking platforms. Gregg Ruppel demonstrated his iOptron Sky Tracker to the eight people in attendance. Gregg pointed out some of the good and bad qualities as well as showing images he's taken. The main issue appeared to be the ball head. If you use one that is short, there's a chance that the camera could hit the Sky Tracker. At least three members have these now. I'm hoping we see some images from them soon.

The next meeting will be Tuesday, March 18th, 2014 at 7 PM at the Weldon Spring Interpretive Center. John Duchek will be the featured speaker. John will be talking about all things lunar including Astronomy League programs that can be completed with imaging. There should be time for other questions.

I'd really like to see more images coming in. A couple of targets were suggested at the January meeting but it looks like Gregg Ruppel and I were the only people that made it out to take pictures. An honorable mention goes out to Steve Boerner who ran into issues with the C-14 while trying. Every month I select an image for the newsletter and I'd love to select something from someone else in the group. With spring coming, I'm hoping we'll get more favorable conditions leading to more participation.

Changing up the conclusion, if the weather is good and the moon is out of the way, I'll probably be at Danville imaging. Visit the STLAstronomy Yahoo Group for more up to date information.

The latest news can always be found in the [ASEM Digital SIG Yahoo Group](#).

Alt/Az Alignment

Submitted by Steve Boerner

Mel Bartels is one of the pioneers of GoTo telescope systems. For nearly two decades, he has provided a DOS and Windows based computer control program and electronics plans/boards for self build drive systems. He also has a commercial program that controls servo motors

Mel recently started a thread on SiTechservo@yahoogroups.com, a Yahoo group for Sidereal Technology controllers. I monitor the group because there is a SiTech controller at the heart of the C14 in the observatory at Broemmelsiek.

I've heard various "directives" about how to go about aligning an Alt/Az mount... what to do or not to do, what stars to use and not use, how far apart and what locations, etc. Mel's post deals with determining which method of Alt/Az alignment is the "best" based on actual experimentation/data collection. If you use a GoTo Alt/Az mount you might find the results both interesting and helpful.

Think You Know Which Initialization Is Most Accurate?

Sat Feb 15, 2014 9:16 am (PST) Posted by: Mel Bartels

Think you know which initialization is most accurate?

An altazimuth telescope needs to be aligned or initialized in order to track and find objects. Initialization between the telescope's azimuth and altitude axes and the sky's Right Ascension and Declination coordinates requires synchronizing on two different points in the sky. Each point is described by its equatorial coordinates (RA, Dec), the telescope's coordinates at the moment the synchronization occurred (the telescope's azimuth and altitude readings) and the sidereal time of the synchronization.

Some believe that the initialization points should avoid the equatorial pole (e.g. the star Polaris for the northern hemisphere). But is this true? Some say that the initialization points should never be at the same telescope's altitude. Some say that the init points should be 90 degrees apart. Just how accurate do the initializations need to be?

Think of the ideal and actual telescope to sky coordinate frames containing longitude and latitude lines like Earth. With real life errors, the ideal and actual frames are translated side to side (azimuth), translated up and down (altitude) and rotated or twisted with respect to each other. I used the matrix transformations with directional cosines as developed by Taki.

I chose seven initializations.

1. First point at the equatorial pole in the north and the second point on the meridian 90 degrees away facing south (Declination = 0).
2. First point at the telescope's zenith or azimuth's pole and the second point on the southern horizon.
3. First point on the northern horizon and second point on the southern horizon, both up one degree in altitude.
4. Two points that are as distantly separated as possible in all four coordinates: RA, Dec, azimuth and altitude.
5. Two points widely separated but at exactly the same telescope's altitude.
6. Two points separated by 135 degrees.
7. Two points close in together, about 30 degrees apart, with some change in both azimuth and altitude.

I introduced errors into the initializations just like occurs at the eyepiece when aligning the telescope as the evening begins. I choose random errors varying from zero to one degree. These random errors are in both the telescope's azimuth and altitude coordinates. Each initialization was evaluate for accuracy using 30 points across the sky, roughly separated by 30 degrees, from horizon to zenith, in all cardinal directions. I ran each initialization 100 times so as to build up a solid picture of the resulting telescope pointing errors.

Here are the results:

| Style of initialization | Telescope pointing error in degrees |
|-------------------------------------|-------------------------------------|
| Equat Pole And Meridian 90 Deg Away | 0.7 |
| Zenith South Horizon | 0.6 |
| North South Horizon | 7.9 |
| Farthest Apart | 0.7 |
| Same Alt | 0.7 |
| init Altaz 135 Apart | 0.8 |
| 30 deg Apart | 1.2 |

Comments:

1. The beginning random initialization errors were 0.7 degrees (0.5 degrees in each axis results in 0.7 degree angular error). The ending simulated telescope pointing errors for the best initialization strategies were the same. So, garbage in, garbage out.
2. Initializing using the equatorial pole is fine; not a bugaboo to be avoided.
3. Ditto for initializations at the same telescope altitude but separated in azimuth.
4. Using the horizon with initialization points essentially 180 degrees apart resulted in astonishing errors.
5. Telescope pointing error increases when the initialization points are close to each other.

Since telescope pointing errors increase with small and large initialization distances, is there a best distance?

I created a second study where I varied the initialization distance from 10 degrees to 170 degrees. Here are the results.

In table form (all in degrees):

| | | | | | | | | | | | | | | | | | |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| separation | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 |
| error | 1.7 | 1.0 | 0.8 | 0.7 | 0.6 | 0.9 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.7 | 0.8 | 1.2 | 2.4 |

The idea that the initialization points should be 90 degrees apart is not false. However, initialization distances from 40 to 140 degrees separation performed equally well. As the separation approaches zero or 180 degrees, the error increases sharply. By the way, that small bump at the 55 degree separation point is an artifact of initializing near the telescope's azimuth pole aimed at the zenith.

Conclusions:

1. Garbage in, garbage out. The single most important thing you can do is to initialize as accurately as possible, preferably with a cross haired eyepiece at high power. It may be necessary to first obtain a rough initialization to get rudimentary tracking operating before a final quality initialization.
2. Strive for initialization points that are separated by at least 40 degrees.
3. Don't worry if the points coincide with poles or are at the same RA, Dec, azimuth or altitude.

Background data:

My data, code and details are incorporated in my QUnit unit tests available at <http://bbastrodesigns.com/lib/coordLib%20unitTests.htm>. See the test named, “investigate different init points for accuracy given real world errors: compare various inits for random errors”.

The actual thread is at:

<https://groups.yahoo.com/neo/groups/SiTechservo/conversations/messages/22888> The SiTechservo group is a restricted Yahoo group, but simply mention that you use a StTech controller when you apply and you will be approved.

CLUB CONTACTS

Membership

Membership issues can be addressed through our executive director Stacey Thater (pronounced “totter”) at these addresses:

Email: stthater@stchas.edu

Snail mail:

Alliance for Astronomy (ASEM)
PO Box 141
New Melle MO 63365

Committees

Comments, questions, suggestions and money (just kidding) may be sent to the following addresses:

program@asemonline.org

Use this address to communicate with the program committee. If you have something to present at a meeting or wish to contribute and let someone else perform, send it here. Questions and/or suggestions about programming etc. Remember, they are here to help you. This is a user friendly society and we like to see members get up and share.

equipment@asemonline.org

This address is used to find out about ASEM loaner equipment. If you find something amiss at BPark by all means report it here. If you are curious about borrowing an item, put in a request via this address.

hospitality@asemonline.org

Got a main dish you’d like to bring to the potluck? We sure could use it AND you will be reimbursed for your expenses.

newsletter@asemonline.org

Primary contact for the newsletter. Got an article or notice you’d like to see published? Send it here and be famous!

Outreach@asemonline.org

Special requests for groups at Broemmelsiek Park including:

- Notice of large party (more than groups of twenty)
- Request for specific requirements needed (school assignment, merit badge requirements, etc.)
- Requests for Star Party / Telescope event at another location

steve.boerner@asemonline.org

Web page and all other communications not covered above

ENTERTAINMENT

Late breaking news and member adventures (or shenanigans as the case may be) can usually be found at STLAstronomy in yahoo groups. If you aren't a member, you should join. Go to

<http://tech.groups.yahoo.com/group/STLAstronomy/>

and click "Join"

Think Clear, dark skies