starry nights

WEHR ASTRONOMICAL SOCIETY

July, August, September 2004 Volume 24, Issue 3

In this Issue

Observatory Repairs

We are in need of doing some repairs and enhancements on the observatory at Froemming Park. If you can help out or donate materials, please contact Tim Grunewald (our observatory director), Todd Weiler or Adam Machajewski.

The follow is a list of repairs and enhancements that the club should consider for its observatory at Froemming Park:

1) Locate replacement motors. The wheels and motors that rotate the dome have shrunk/worn down to the point where the dome is binding on the motor casings. Either the wheel needs replacing or the whole assembly will need replacement. Adam Machajewski has the info on the existing motors. To complete the project we will need a scissors jack to lift the dome, and possibly rewire to the motors. Wedges such as 4x4's diagonally cut to hold the dome up while the motor or wheels are swapped out. The nylon L-clip that holds the dome on in a 50 mph wind may need to be lengthened.

2) Schedule maintenance day. These items are less labor intensive and may involve others with less carpentry skills.

a. Patch holes outside walls and stoop- Small holes in the walls and stoop are allowing mice to enter and nest in the observatory. We need Bondo (auto body filler) and sanders, and paint to fix these holes.

b. Replace exterior trim- Using a miter saw and a router with a 1/2” roundover bit we need some 3/4" boards cut to match the profile of those around the base of the dome.

c. Rebuild 3 x 5 door- The main entry door is damaged and should be rebuilt. However, since the dome has shifted, it is NOT square and may need a custom fit. One or two sheets of 3/4" exterior grade plywood, glued together and trimmed in 1/8 x 1 1/2 angle iron should frame the door and jamb. Need about 16 ft of steel for door and 13 feet for jamb.

d. Add dead bolt locks and remove latches- We could add key locks (one dead bolt-existing) and replace it with top and bottom deadbolts.

e. Clean out old signs and materials. Get rid of or permanently mount the wood signs somewhere. Add lights to the portable signs. Build smaller illuminated "red arrow" signs to show the route to the observatory.

f. Update posters and info inside observatory. (Example-add the current moon count for all the planets. Add some list of interesting trivia under the red lights to enlighten those waiting to look in the scope. i.e., light times from various planets, how big, how far, etc. Anyone could add their favorite space oddity to the list.

g. Post sign or schedule on observatory building. We could mount the observatory schedule and at a minimum paint the web site address on the outside of the observatory. (I'd like to see it looped around the dome.) Mount the schedule by the drinking fountains and/or under the shelter.

h. Add a hanger sign on road park sign. This goes under the Milwaukee County Park Sign. Add lights or flashers to the portable sign saying we are OPEN TONIGHT!

3) Other suggestions-Discussions on 16ft observatory?

Baader Astrosolar Film

So you missed the transit of Venus across the sun because you didn't have a solar filter for your telescope? The club has purchased a large sheet (19.7" x 39.4") of Baader Astrosolar film for $70 and is selling quantities of it at $0.10 a square inch. If you have ever thought of using your telescope or binoculars for solar observing, this is the least costly way to do it. Along with the film, instructions for how to make a cell to fit your telescope and how to mount the film will be provided. Contact our Observatory Director, Tim Grunewald, if you would like to purchase some.

Pick'n Save We Care Program

The Pick'n Save stores in Wisconsin run a We Care program which donates a percentage of the total amount of your purchase to the non-profit organization of your choice when you use your

Advantage Plus Savers Card. To sign up for this program, go to the Service Desk and ask for an application and enter **923500** for the charity code. There is no cost to you and it can bring in extra money for the club. **To date, we only have 6 members who have signed up since we signed up for the program a year and a half ago.** Only 6 out of 80 total member households isn't much. We need to sign up more people for this easy, free fundraiser.

There is one new rule, which started this year—you can only select one non-profit organization to donate to. So for those of you who already donate in this way to your child's school, this may not be an option for you. Previously, you could have up to three organizations. If you have more than one organization on your card, they will still allow you to switch.

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*** Signifies the position is available and the name represents the acting volunteer. Contact a board member if you are interested in the position.**

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Lenspen

I'm sure this has happened to you. You are using your telescope, either out at the observatory or when showing the wonders of space to family members. Someone points at the eyepiece and asks "Do I look in here?" and touches the lens of the eyepiece. Or maybe you tend to get a bunch of eyelash oil on your eyepiece lenses. A great tool that I have found to easily remove the grime off of a coated lens is a Lenspen.

The Lenspen comes in two sizes—Normal and Mini-Pro. The normal Lenspen has a 14mm diameter pad, while the Mini-Pro has a 7mm diameter pad. Both models have a brush on one end to swipe away any dust and the other contains a pad with a special cleaner. I find that the normal Lenspen works fine on larger lenses like binoculars and the primary lens on a refractor telescope, but due to its curvature doesn't quite clean an eyepiece. And on some of the smaller lenses for the higher power eyepieces it just doesn't fit. This is where the Mini-Pro comes in. With its smaller size it easily cleans the smaller lens of eyepieces and digital cameras.

We are going to place an order for the Mini-Pro Lenspen. Unfortunately, only the normal Lenspen can be found locally. So, we will be placing an Internet order. Please contact Tim Grunewald, our Observatory Director, if you would be interested in purchasing one. The order will be placed at the end of July. The expected cost will be around $8.

Homemade Dew Heater

How many times have you been out on one of those beautiful summer nights and had to pack up early because your corrector plate or primary lens dewed up? Hopefully this article can assist you in building your own dew heater. Dew heaters from companies like Kendrick can cost anywhere from $50 to more than $100. The heater that you will be able to build will cost you about $20 to $40 and is applicable to any size telescope or accessory you wish to remove dew from. This project will require some basic electrical knowledge like soldering, and require a soldering iron, wire stripper, hot glue, a few drill bits, a drill and preferably an electrical circuit tester with ohms, and ampere test. I will try to explain everything thoroughly so even the most inexperienced person can construct the dew heater.

Switch Box Construction

The switch box is basically a glorified switch. The reason I include such an elaborate switch is so the system can be fuse protected and include an indicator lamp. Also, it will make for a cleaner, more professional look, and allow for further expansion for other equipment to remain dew free all night.

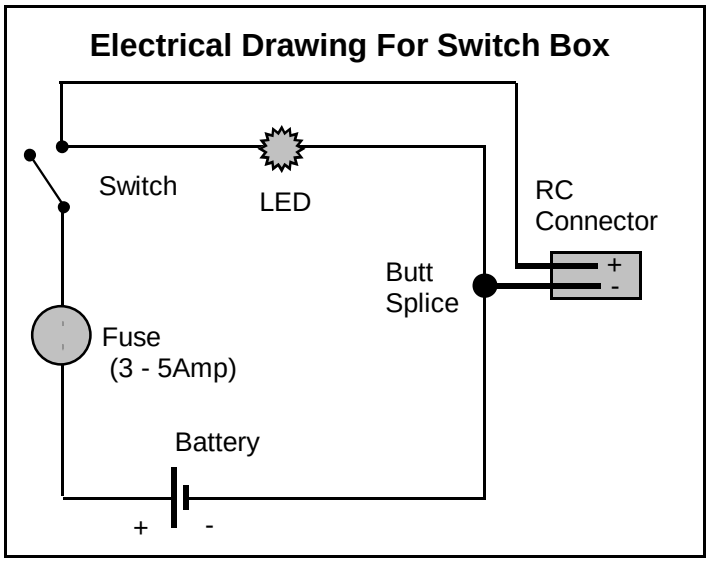
Parts List

(All parts are from Radio Shack and will be about $20)

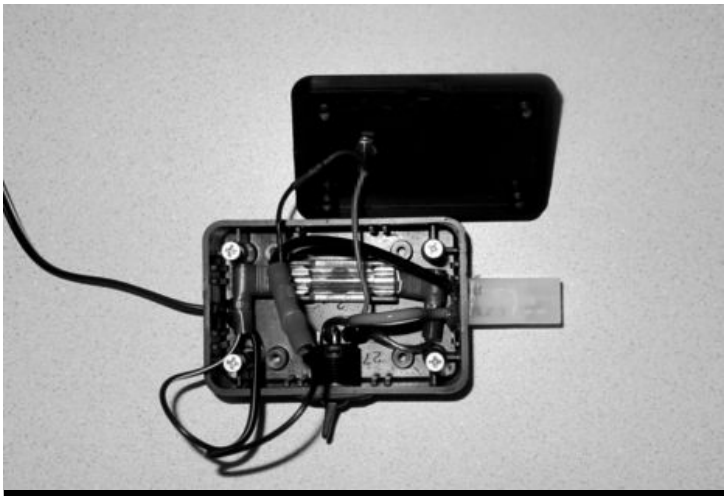
2780857 35' wire
2781627 Shrink Tubing
2300444 RC connector
2701801 3x2x1 project box
2700739 Fuse Holder (2 pk)
2750648 Paddle Switch
2760084 Red 12V DC LED
2701533 12VDC Power Cord

The switch box contains most of the items listed in the parts list. The parts are just my suggestion, but the parts can be substituted with others to suit your taste and application. If you wish to have other equipment attached to the dew heater a larger project box will be required. Start by inspecting the electric diagram. The box is a very simple circuit, it is just a switch for the light and the wires which will run out the box for the heating element.

Start this section of the project by drilling the appropriate holes in the box for the voltage in, out, the switch and the LED. The holes for the wire only need to be large enough to just fit the wires and may be a really tight fit for best results. I drilled a 13/64" hole for the LED in the cover of the box, and a large 9/16" hole for the switch (the hole for the switch is a really tight fit). A somewhat unorthodox method can be used to make the hole a little large if need be. The hole can be reamed out slightly by wiggling the drill around to resize the hole. Also, insure that the internal circular part of the switch is low enough so the cover will be able to close tightly, otherwise a small notch will have to be cut into the lip of the cover.



After all the holes have been drilled, pull the wires into the box and install the switch. I always find it easiest to connect the circuit in the order that the electricity will flow through the circuit, which is always positive to negative. So, start with the positive side, wire with white line on it wire coming into the box. Strip the insulation back about 3/8 of an inch and crimp a terminal on to the wire and connect it to the fuse holder. Do not attach the fuse holder to the box until after the whole electrical circuit has been wired. It will give a little more room in the box for later steps. Cut a short wire and strip and crimp another terminal to one side and simply strip the other side to be soldered to the switch. Slide a short piece of shrink tubing over the wire. The shrink tubing helps prevent short circuits but is not absolutely necessary. The wire will be soldered onto the center prong of the switch. Before soldering the wire to the switch, make sure the shrink tubing is as far from the end to be soldered as possible. This is because it shrinks at a relatively low temperature and once it is shrunk it is nearly impossible to move because there is a heat sensitive adhesive inside the tubing.



Here is how my switch box looked before I packed everything inside. You can also see all the components and where I put them.

The LED and power wires for the heating element will be wired in parallel, which means they both will be twisted together and soldered to the switch at the same point. It is wired like this because of the relatively high amperage that the heating elements will draw could cause the LED to burn out prematurely. Now, cut the butt splice off the red wire of the female plug wire (part #) and strip the wire. Also strip the red wire of the LED back about the same length and twist the wires together. This will be wired to one of the side terminals of the switch. It does not matter which one the wire is attached to, the only difference will be which way the switch is flipped to turn the unit on. Again slip a piece of shrink tubing over both the wires after they are twisted together and soldier it to the terminal.

Make sure there are no loose wires touching between the terminals of the switch and push the shrink tubing over the soldered terminal and hold a lit match about an inch from the shrink tubing for a few seconds to allow the tubing to shrink tightly around the connection.

Next, cut the butt splice off the black wire of the

exiting power wire and strip the insulation back. Also, strip the black wire of the LED back about the same length and twist them together. These two wires should be crimped into one end of a butt splice. The negative end of the input power wire should be stripped and crimped into the other end of the butt splice.

Now that the wiring of the switch box is complete, use some hot glue to attach the fuse holder to the inside of the box, and also put some hot glue on the spots where the wires enter or exit the box to retain them. Attach the cover to the box, and that should complete the construction of the switch box.

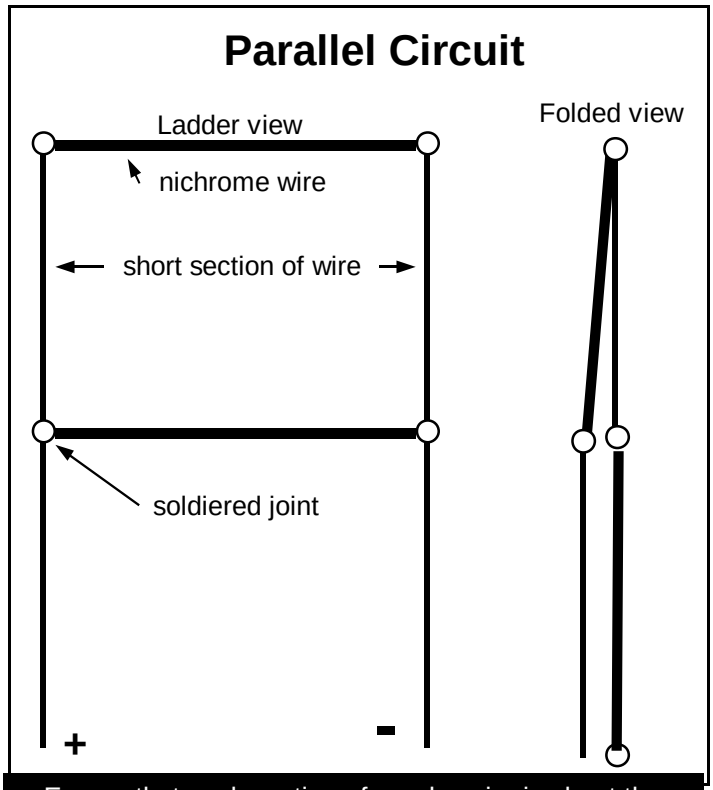
The Heating Element

This section of the project will vary slightly for each type of telescope or application. What I mean by this is, you will not want to have too much heat, which will cause some heat distortions in the image. The only way to make less heat is to make a longer section of the nichrome wire (this will be explained more later) or have it on for less time. The wire is designed for 120-volt household electricity, but it can be modified for this application. The wire I bought from American Science and Surplus on 69th and Oklahoma or online (www.sciplus.com, item number 1490), for $1.95 each.

The wire is a fiberglass cord tightly wrapped with a thin high resistance nichrome wire, which is again wrapped with another fiberglass sheath. To start this section the outside sheath needs to be removed to expose the wire wrapped cord. The only way to approach this is by trial and error.
The amount of heat and amperage drawn by the system are the two major factors that should be considered. This is where an electrical tester is required and also some knowledge of electrical circuitry. I will try to explain the process thoroughly.

The full length of the heat tape will be made up of a few short, 5 to 8 inch sections of heat tape depending on the application. To test how long you will need for your application, attach one end of the nichrome wire to the positive side of a twelve volt power source, and attach a jumper wire to the negative terminal and strip the other end of the wire. With the nichrome wire, with the fiberglass outer sheath removed and stretched out laying on a piece of wood or some other non-conducting material, place the bare end of the jumper wire on the nichrome wire. Make sure that the distance from the end of the nichrome wire with the positive attached is not less then 2 inches, this will cause the wire to get extremely hot. Any thing less than about 2 inches will cause the wire to glow and start to burn. Start with the wire far from the positive side and slowly drag it along the wire and test it with your finger until you begin to feel some warmth. The desired temperature will depend on the application. A larger telescope will require a little bit warmer temperature than a small one. The temperature of the wire should be warm enough that you can feel some heat with your finger for a small telescope (5 inches); any more is probably too much. I would suggest playing around with it a little bit. There really is no wrong length, except if it will start your telescope on fire.

Once you find a temperature that you feel is appropriate for your application, cut as many sections of the wire as required to wrap it around your tube. The sections will all be wired in parallel (see picture) so this will require the most wire. Construct the entire system like a ladder, as



Ensure that each section of regular wire is about the same lenght as the nichrome wire so the whole system can be folded into a long rope

shown, soldering all the ends of the wire to each section of the parallel circuit until all sections are connected, and placing a small piece of shrink tubing over each soldered joint. Also, it does not matter which end of the nichrome wire is positive or negative. Once everything is in order, crimp the male end of the electrical plug to the each end of the wires. Once again it makes no difference which is positive or negative.

After the electrical sections are complete and tested for functionality, make a sheath for the whole length of the dew heater with felt. The felt should be sewn around the heat tape but can be glued if necessary. A little piece of Velcro should be attached to each end so it will hold tight to you telescope.

That should complete your dew heater. I hope this project will help you observe longer and with less frustration and for less money. If you have any questions about the procedure or anything else about this project I can be e-mailed at adrmach@netscape.net.

-Adam Machajewski

Aquarids and More Aquarids...

The summer sky is full of Aquarid meteors! In July we have 3 different Aquarid showers - the northern and southern delta Aquarids, and the southern iota Aquarids.

The southern delta Aquarids (SDA) reach a maximum on July 27th, with a radiant at 339 degrees, i.e. RA 22h 36m, Dec -16, about 5 degrees to the right of the star delta Aquarius. These are average velocity meteors, at about 41 km/sec, and can be seen from about July 12th to August 19th. At the peak on the 27th, ZHR rates are about 20 meteors per hour.

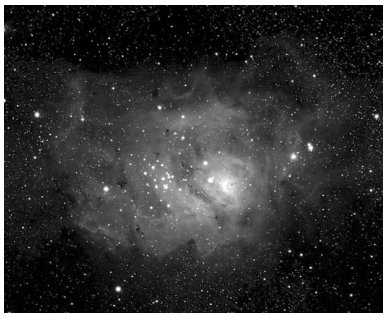
What is ZHR? This is Zenithal Hourly Rate, and is the number of meteors, on the average, that an observer would expect to see in an hour if the radiant, the area in the sky where the meteors seem to come from, is directly overhead - and if the observer is out under dark country skies. If the radiant is not overhead, you will see fewer. If your sky is not really dark, you will see fewer. So to see the most, get away from city lights, and observe when the shower radiant is high in the sky. The southern iota Aquarids (SIA) reach a peak on August 4th, but can be seen from about July 25th to August 15th. These are slower than the delta's, with a velocity of about 34 km/sec, but still classed as 'average' velocity. At maximum on August 4th, their ZHR will be about 2 meteors per hour. Rates in July will be less. On July 25th, their radiant will be at 322 degrees, ie. RA 21h 28.2m, Dec -17. Where is this in the sky? Remember our set of 4 NAMN charts? Now would be a good time to print them off, and see where this radiant is in the sky.

The northern delta Aquarids (NDA) reach a peak on August 8th, but again, can be seen starting in July, as they run from about July 15th to August 25th. These are average velocity meteors at 42 km/sec, very similar to the southern delta's. At their peak on August 8th, they will reach a ZHR of about 4 meteors per hour, but rates in July will be lower. On July 25th, their radiant will be at 323 degrees, ie. RA 21h 31.8m, Dec -9.

Do we have a nice map that will show how the radiants of each of these 3 showers move over the summer? Yes. On the website of the IMO, the International Meteor Organization, there is a map showing all this. Check out http://www.imo.net/calendar/cal04.html#Aquarids. There is an easy way to keep track of these 3 showers - and the northern iota Aquarids coming in August. If you look at these 4 radiants on any given night, they (roughly) form a sort of parallelogram shape in the sky. Mark the radiants on your NAMN charts, and you'll see what we mean. This helps to remember them!

Exerpt from July 2004 NAMN Notes written by Cathy Hall & edited by Mark Davis

Observers Corner:
The Lagoon Nebula (M8)



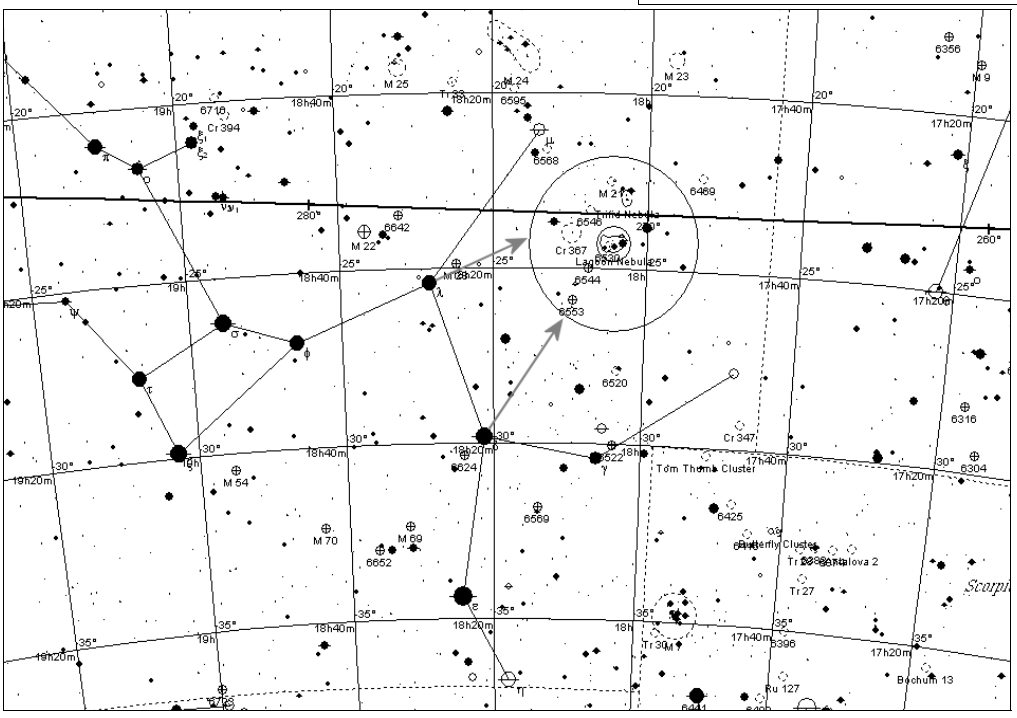
If you point binoculars above Sagittarius and wander around, you will notice several dim, fuzzy objects. One of the more interesting objects is the Lagoon Nebula or M8. In binoculars it is an easy target and with a telescope you see a nebula next to an open star cluster.

To start our journey to this showpiece object, locate the teapot shaped constellation Sagittarius. Locate delta (δ) Sagittarii, which is the star that joins the top of the spout to the teapot. Locate two 4.5 magnitude stars above the teapot (the star closest to the teapot will have two 6th magnitude stars "pointing" at it). Draw a line from delta Sagittarii to in between the two 4th magnitude stars. Since the Lagoon Nebula is easily visible in binoculars, you should see a fuzzy patch of light within a line of three stars.

As an alternative route, you can also use the line formed by phi (ϕ) and lambda (λ) Sagittarii. These stars form the left side of the top of the teapot. Travel along this line out away from the top of the teapot until you come to a 5th magnitude star. Travel a little to the right and you will see another 5th magnitude star. The Lagoon Nebula will be below and between these two stars.

It is 90 x 40 arc minutes (3 x 1 1/3 the apparent diameter of the moon), which is about 140 x 60 light years given an estimated distance of 5200 light years away from us. One of the more interesting features of this nebula is that it contains dark nebulae or globules. Within the brightest part of the nebula an hourglass shape can be seen.

-Tim Grunewald



Lunar Phases

July 2	Full
July 9	Last Quarter
July 17	New
July 24	First Quarter
July 31	Full
August 7	Last Quarter
August 15	New
August 23	First Quarter
August 29	Full
September 6	Last Quarter
September 14	New
September 21	First Quarter
September 28	Full

SCHEDULED ACTIVITIES

FOR

The Wehr Astronomical Society

http://www.wehrastro.org

Regular Meetings

(Free and Open to the Public)

July 13, 2004
Froemming Park
Members Only annual picnic at Froemming Park from 6-8 pm. The society will furnish the burgers, brats and buns. Members should bring a dish to pass and their own table service and silverware. Bring your telescope and get in some solar viewing before we eat

August 10, 2004
No meeting scheduled.

September 14, 2004
Wehr Nature Center
Dr. Joe Otu from UW-Waukesha will be presenting a program on Dark Matter.

Observatory Activities

(Free and Open to the Public)

July 9	9:30	Deep Sky Observing. Locate Albireo - a blue and yellow double star
July 23	9:30	Observing the Moon and deep sky objects. See a 1st quarter moon and the brighter deep sky objects.
August 13	9:00	Deep Sky Observing. The Perseid meteor shower.
August 20	8:30	Obseving the Moon and deep sky objects. See a crecent moon and the brighter deep sky objects.
September 10	8:00	Deep sky observing. **Novice Night.** Bring your telescope or binoculars and let show you what you can see.
September 24	7:30	Observing the Moon and deep sky objects. See a gibbous moon and the brighter deep sky objects

Note: All observatory dates fall on a Friday, and are held at Froemming Park, on 51st Street between Ryan Rd. and Puetz Rd.