

# SPECTRUM

Northern Cross Science Foundation Newsletter

February 2015

## Looking Up

**February 5, Thursday**

**General Meeting**

7:00 p.m. - Astronomy 101

7:30 p.m. - Main Program

**Speaker:** Jean Creighton

**February 7, Saturday**

**Candlelight Ski & Hike**

6:00 p.m. - 9:00 p.m.

Harrington Beach

**February 8, Sunday**

**Celebrate Families**

11:00 a.m. - 3:00 p.m.

West Bend High School

**February 12, Sunday**

**An Evening with Nature**

7:00 p.m.

Stargazing at the Ice Age  
Visitors Center

**February 14, Saturday**

**Candlelight Ski & Hike**

6:00 p.m. - 9:00 p.m.

Pike Lake State Forest

**February 19, Thursday**

**Board Meeting**

7:30 p.m.

Home of Jeff Setzer

**“NCSF Annual Banquet”**

(In lieu of the March Meeting)

**Thursday - March 5, 2015**

**Social hr 6 p.m. Dinner at 7 p.m.**

**Fox and Hounds Restaurant**

**1298 Friess Lake Rd.**

**Hubertus, WI**

Menu selection & registration forms are being mailed with the Spectrum Newsletter and e-mailed to club members!

Bring your significant others! Food is fabulous, deserts divine and the company...outstanding!!!

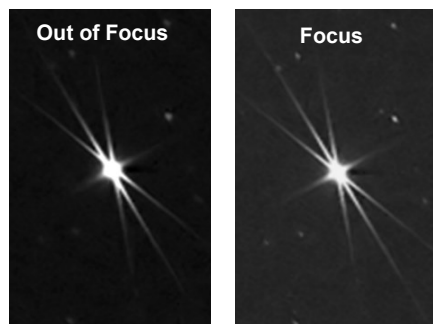
## How to Make a Simple Bahtinov Mask *adapted from Michael Viasor Article*

The Focusing Mask which was invented by Pavel Bahtinov is considered to be the easiest, the fastest, and a very accurate tool for manual focusing. You can Google Astrojargon Mask Generator for their free and simple mask generating software and additional information.



### How It Works

During focusing procedure the mask is placed in front of telescope's aperture. The telescope then should be pointed to a bright star. Bahtinov mask produces 3 diffraction spikes. Two of them form an "X" shape, and another spike crosses it, forming a "Ж" shape. The central spike moves left or right (relative to the side X spikes) according to focus position. When precise focus is achieved - the pattern becomes



symmetrical.

This method is very sensitive, as the displacement of diffraction spikes is apparent even with slightest focus shift. Bahtinov mask takes guessing out of the equation, and it can be used also on "regular" camera lenses for astrophotography. In my opinion, this method is superior to using focusing software. This is

because the human brain interprets geometrical shape much faster than a numerical value, and is capable of evaluating its "average" position (sort of noise filtering) much easier. Also Bahtinov mask is highly superior to Hartmann focusing mask (its older cousin), however it is more complicated to make.

The most elegant way of making it is laser cutting, CNC or even 3D printing. I've also read reports on printing the mask with a laser printer and transferring it to a glass with hot iron. However, I've been able to make a Bahtinov mask using materials commonly available in an office supply store.

### Making a Bahtinov Mask

Required tools and materials:

- Binder made from hard and thin plastic
- Stanley knife and scissors
- Contact glue
- Ruler and a marker pen
- Printer

First step was to generate a mask using this [www.astrojargon.net/mask generator](http://www.astrojargon.net/mask_generator), and then print it. Since I printed the mask with an 8 1/2 X 11 inch printer, it didn't fit on one page and I had to make two halves on two pages.

Then I cut one half of the plastic binder, and attached to it my printed mask. I used a masking tape, making sure it's smooth and held firmly in place. It is important to keep the lines straight and parallel (while it won't affect the focusing accuracy, it will make the spikes thinner and easier to "read").



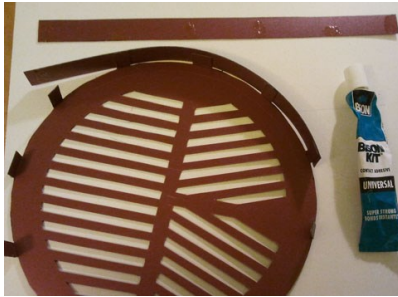
Then the annoying task - cutting the plastic. I did it by placing a ruler over each slot, and sliced with a knife, without too much pressure, several times over each cut.

Next step was to measure the telescope outer diameter, and to draw a circle on plastic. Then I cut the plastic with scissors around, while leaving 12 small sections around the circle, for attaching the mask to OTA.

*Continued on Pg 2*

Continued from Pg 1

These sections should be bent 90° inside after cutting:



Then I cut a few strips of plastic, to fit the 12 cutouts on the mask (2.5cm in my case). I glued the strips to bent sections using a strong contact glue:

#### The final result



In a similar way - a daylight solar filter can be made, by gluing a sheet of astrosolar film between two circles of plastic. If you wish - you can make the inner diameter of the mask slightly larger than required (3-4mm) and stick some thick soft tape inside - this will make the mask hold tighter and easier to put on.

## January Meeting Minutes

By Secretary Kevin Bert

The January NCSF General Meeting was cancelled due to inclement weather. The main speaker, Jean Creighton is rescheduled to speak at the February Meeting.

## Jupiter Triple Transit by Rick Kazmierski

I hope those of you how took the time to observe the triple moon transit of Jupiter had better luck than I did. On January 22nd Skies cleared up beautifully around 7:00pm after being cloudy all day. I set up my equipment on the driveway and anxiously awaited the first transit at 9:11pm. At 9:00pm there were some clouds to the West, but I still wasn't worried. Even some clouds should allow a view of bright Jupiter and it's satellites.

Well, those of you that were out there know the rest. By first transit, the sky was a blanket of thick clouds and not even Jupiter could peek through.

Maybe better luck in 2032, when the next triple transit will occur!!!!

## Things to See in the February 2015 Night Sky By Don Miles

**Neptune, Venus, Mars, & Uranus:** All four planets are up at sunset, but Neptune (8.0 mag) is the first to set, and does by about (7:15/sunset). It's followed closely by Venus (-3.9 mag), and orange colored Mars (1.2 mag), which sets by about 8pm. All follow the recently set Sun, but Venus and Mars will be easily viewable this month. If you can, make a special point of observing a couple of close pairings on the 20th and 21st this month. On the 20th, Venus & Mars will be joined by a two day old Moon, making a seldom experienced grouping. Venus will be the brighter of the two planets, and will be about 1-1/2 degrees to the left of a thin sliver of a Moon, and Mars floats above Venus by about a 1/2 degree. This group is the closest at about 7:30pm on the evening of the 20th. The next night, Venus and Mars are even closer (less than half a degree), but the Moon won't join the party this time. These last two planets start the month in the constellation Aquarius, and drift eastward to end the month in the constellation Pisces. Neptune stays stationary in the constellation Aquarius, but drifts closer and closer to the setting sun until the end of the month when they both set together. Uranus (5.9 mag) sets around (10:30/8:30pm), and remains pretty stationary in the constellation Pisces.

**Jupiter:** Is the Crown Jewel this month as it is already up at sunset, and stays up all night as it is at opposition on the 6th. It transits about (12:30am/10:30pm), and sets around sunrise. It's now at (-2.6 mag),

and the views will keep getting better as it keeps rising earlier and earlier throughout spring. If you're itching to get that scope out after a long stretch of cloudy nights, one peak of Jupiter on a clear/steady night makes them much easier to take. **Saturn:** Rises around (2:30/12:30am) and is at (0.5 mag). This month, Saturn remains almost stationary in the constellation Scorpius. As mentioned above, if you happen to get a break in the Wisconsin weather, a clear view of Saturn is unforgettable, and worth the wait.

**Pluto & Mercury:** By mid-month, Pluto will again be viewable (not easy, but viewable). It's still in the constellation Sagittarius, still low in the sky, and still faint (14.2 mag)... but now it's in the morning sky rising about (6:15/5am). It will never be easy especially if you're star-hopping, but if you're up to it... Pluto is again a viable object. Mercury (mag 0.4) is now also a morning object, and rises about (6:30/5:30am). It will be at its Greatest Western Elongation the morning of the 25th (meaning it will be as far to the West [ahead of the Sun] from the Sun as it will get before it slips back towards the Sun again). It remains a morning object until early April when Mercury will pass around the back side of the Sun and once again become an evening object. And so, the cycle continues...

#### Moon:

February 3rd: Full Moon

February 11th: Last Quarter

February 18th: New Moon

February 25th: First Quarter

#### Special Events/Objects:

**Meteor Showers:** There is only one meteor shower to speak of this month, and those are the Delta Leonids. They "peak" the evening of the 25th, with a whopping 5/hr. The moon will set by 2:30am, so your darkest times to view will be from 3-6am. The ones you do see will be slower than most other showers as these are traveling at about 15 miles/sec. The debris trail is fairly wide, so you may notice *sub-peak bursts* of activity a week before the 25th, but will drop off soon after.

**Comet c2014 Q2 Lovejoy:** If you haven't had a chance to see it yet, it's not too late. It will still be fairly high overhead this month, but is on the move, and will get progressively harder to see. It won't be as bright as it was in January, but still easily visible with a pair of binoculars. Early in the month, look on the north-eastern edge of Andromeda where the constellation Triangulum and Andromeda meet. Thru February, Lovejoy will continue westward thru Andromeda, and by the end the month will be just inside the border of Cassiopeia. For a more detailed location, check on-line for its current position. For the darkest skies, mid-month will be best as the moon won't be an issue, but take anything you can get if you get a break in the clouds. Good Luck.



## February General Meeting

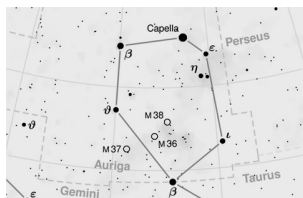
101 Class...By Kevin Bert

### Telescope Workshop

Did you get a new or existing telescope and find the instructions lacking or confusing? Bring your telescope to the January meeting and one of our knowledgeable members will get you going in the right direction. You will be observing planets and nebula in no time.

Backup program is **Micrometeorites**.

### Constellation of the Month Auriga



## Main Program Guest Speaker

Jean Creighton

Flying at 45,000 Feet:

### Adventures in the Stratosphere

Jean Creighton, director of the Manfred Olson Planetarium at UWM, was selected by NASA to be an Airborne Astronomy Ambassador on the largest moving astronomical observatory in the world, the Stratospheric Observatory for Infrared Astronomy (SOFIA). She will talk about her adventures in the stratosphere and about the joys working for NASA.

## RELATED INFO

### Leaders for Public Viewing

#### February 7

Harrington Beach

Charlotte & Gene DuPree

#### February 8

West Bend High School

Mickey Kazmierski

#### February 12

Ice Age Visitors Center

Charlotte and Gene DuPree

#### February 14

Pike Lake

Charlotte and Gene DuPree

## February Public Events

### Harrington Beach, January 17th

Horicon Marsh...By Charlotte DuPree

January 17, Horicon Marsh, Ski and Hike. The night was cloudy and we set-up a display inside. The attendance was over 2000, based on the number of parked cars.

## THE NCSF IMAGING REPORT

By Ernie Mastroianni

### First Light for Nolan Zadra

As Comet Lovejoy glowed at naked-eye visibility over Harrington Beach in late January, a little bit of club history was made when Nolan Zadra attached his Canon EOS 7D to the Explore Scientific 5-inch refractor, adjusted the focus, and carefully slewed the telescope to compose the comet in the viewfinder. Setting the camera on self-timer, he made a 30-second exposure.

When the shutter closed and the screen lit up, the small group with him peered over his shoulder and saw the glowing green comet with a faint tail among the tack-sharp background stars. It was Zadra's first light with the refractor. The comet seemed like a cosmic gift, timed perfectly to reward the person who led a long effort to bring an imaging scope to the Jim and Gwen Plunkett Observatory.

Exactly two years and one week before Lovejoy's appearance, he hosted the first meeting to explore the feasibility of an observatory dedicated to astrophotography. The committee studied many options for domes, telescopes, mounts, cameras and construction. To the surprise of no one, prices skyrocketed and the expense of an

ideal imaging system grew out of reach for the club's resources.

Like many Northern Cross Science Foundation members, Zadra has viewed the night sky for decades, but he has taken his hobby on some serious road trips. He has photographed Halley's Comet from Hawaii with a barn door mount and hypered film. He has photographed solar eclipses from Aruba, Europe and Illinois. He saw the space shuttle launch twice.

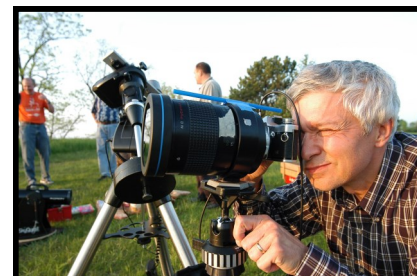


His motivation and significant monetary contributions for an astrophotography system kept the idea alive, especially when the committee began studying the option of placing the telescope under the current roll-off roof. The idea proved feasible, and in September, Zadra drove to Cincinnati to pick up the used but immaculate telescope that sits in the observatory today.

"I really look forward to the camaraderie of members sharing their experiences with the imaging scope," he said. "To have several members participating together on any particular night makes it all the more enjoyable. I would like to see us achieve some stunning galaxy, nebula and other deep sky photos that could be blown up to 12 x 18 inch prints," he added. "That "wow" factor will create interest for visitors at public viewing

events and in members who have might have wondered about astrophotography."

Zadra was not alone in his efforts. Among the committee members who attended meetings, researched equipment, and studied all options are Chad Andrist, Kevin and Dan Bert, Wally Gersmehl, Paul Gruener, Jaime Hanson, Rick Kazmierski, Teddy Kroll, Ernie Mastroianni, Robert Powell, Jeff Setzer, Harvey Sherman, Tom Schmidtunz, and Brian Wollner.



Nolan Zadra photographs the Venus transit in June 2004 from the bluff at Mequon's Concordia University. He's using an Olympus film camera and a Russian Catadioptric lens.

## Observing Summary for 2014

The volunteer participation forms completed at each public viewing event have now been totaled. Looking back at this past year, a total of 27 viewing nights were held at the Jim & Gwen Plunkett Observatory. All together 18 different members logged a combined total of 403 volunteer hours towards public outreach at the park.

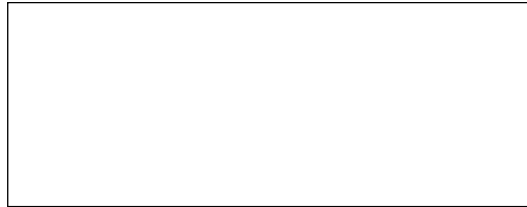
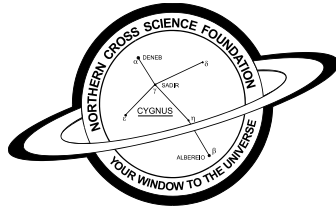
A big thank you to everyone who gave of their time to help provide a window to the universe for others. Looking forward to the 2015 viewing season, clear skies.

Reported by

Dan Bert

Observatory Director NCSF

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## Astrophotography Setups From the Ground Up! *By Chad Andrist*

I came across a great video from the guys over at The Astro Imaging Channel that I think will be useful for anyone considering getting into astrophotography. It covers peripherals, cameras, scopes, mounts, and more. Examples include complete setups ranging across varying budgets, targeted objects, and imaging locations. VERY in-depth! They share their unbiased opinion from an amateur point of view and also serve pointers and tips based upon years of experience and trial and error. <https://www.youtube.com/watch?v=sZykAYI5NPK>

I can get this content on DVD for those who can't stream or who would rather watch on a television set with a DVD player if there is interest. It is a little over 2 hours.

## Celebrate Families - February 8, 2015

11:00 a.m. to 3:00 p.m. - West Bend High School

NCSF will be in the Fieldhouse at Table 1

Parking and access will be on the West side of the HS

This is an amazing event, for the entire family!

Live Music, Activities, Games, Scavenger Hunt, Food , Rock climbing wall, train display, petting zoo, Air Rifle and Archery Range, and much, much more!!!

<http://www.celebratefamilieswashco.org/event-schedule.html>

## Sheboygan Astronomical Society

### Annual Swap-and-Sell

Saturday, March 28th 9:00 am to 2:00 pm

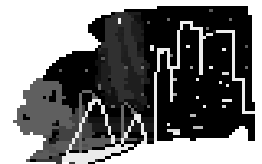
Speaker line-up to be announced

## SPECTRUM

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The NCSF supports the International Dark sky association.



**Send inquiries to:**  
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This Issue, along with back Issues of SPECTRUM, can be found on the NCSF Web Site.

<http://www.ncsf.info>

### Monthly Meeting Information

7:00 p.m. Astronomy 101  
7:30 Main Program  
Unitarian Church North  
13800 N. Port Wash. Rd.  
Mequon, WI 53097