

SPECTRUM

Northern Cross Science Foundation Newsletter

January 2016

Looking Up

January 7, Thursday

General Meeting

7:30 p.m. - Main Program

How to use your new telescope

(See page 3 for details)

Business meeting to follow

January 16, Saturday

Candlelight Ski & Hike

6:00 p.m.—9:00 P.M.

Horicon Marsh

January 21, Thursday

Board Meeting

7:30 p.m.

Home of Jeff Setzer

February 4, Thursday

General Meeting

7:00 p.m. - Astronomy 101

7:30 p.m.— Main Program

February 6, Saturday

Candlelight Ski & Hike

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

Harrington Beach

February 13 Saturday

Candlelight Ski & Hike

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

Pike Lake State Forest

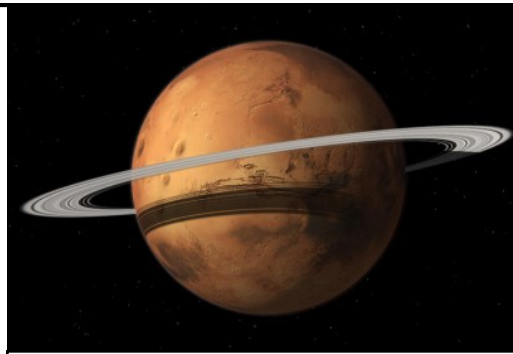
March 3, Thursday

Annual Banquet

Fox & Hounds Restaurant

Hubertus, WI

Mars May Lose a Moon...but gain a Ring By Guy Pirro 11/30/15



Mars could gain a ring in 10 to 40 million years.
Image credit: Tushar Mittal

Mars' largest moon, Phobos, is slowly falling toward the planet. But rather than smash into the surface, it likely will be shredded and the pieces strewn about the planet in a ring like the one encircling Saturn.

Though inevitable, the demise of Phobos is not imminent. It will probably happen in 20 to 40 million years, leaving a ring that will persist for anywhere from one million to 100 million years, according to two scientists at the University of California (UC), Berkeley.

UC Berkeley postdoctoral fellow Benjamin Black and graduate student Tushar Mittal estimate the cohesiveness of Phobos and conclude that it is insufficient to resist the tidal forces that will pull it apart when it gets closer to Mars.

Just as earth's moon pulls on our planet in different directions, raising tides in the oceans, for example, so too Mars tugs differently on different parts of Phobos. As Phobos gets closer to the planet, the tugs will be enough to actually pull the moon apart, the scientists say. This is because Phobos is highly fractured, with lots of pores and rubble. Dismembering it is analogous to pulling apart a granola bar, Black said, scattering crumbs and chunks everywhere.

The resulting rubble from Phobos rocks of various sizes and a lot of dust would continue to orbit Mars and quickly distribute themselves around the planet in a ring.

While the largest chunks will eventually spiral into the planet and collide at a grazing angle to produce egg-shaped craters, the majority of the debris will circle the planet for millions of years until these pieces, too, drop onto the planet in "moon" showers, like meteor showers. In this

scenario, only Mars' other moon, Deimos, will remain.

Different moons, different fates

Black and Mittal, both in UC Berkeley's Department of Earth and Planetary Science, were drawn to the question of what might happen to Phobos because its fate is expected to be so different from that of most other moons in our solar system.

"While our moon is moving away from earth at a few centimeters per year, Phobos is moving toward Mars at a few centimeters per year. So it is almost inevitable that it will either crash into Mars or break apart," Black said. "One of our motivations for studying Phobos was as a test case to develop ideas of what processes a moon might undergo as it moves inward toward a planet."

Only one other moon in the solar system, Neptune's largest moon, Triton, is known to be moving closer to its planet.

Studying such moons is relevant to conditions in our early solar system, Mittal said, when it's likely there were many more moons around the planets that have since disintegrated into rings -- the suspected origins of the rings of the outer planets. Some studies estimate that during planet formation, 20 to 30 percent of planets acquire moons moving inward and destined for destruction, though they would have long since disappeared. Some of Mars' several thousand elliptical craters may even have been formed by remnants of such moonlets crashing to the surface at a grazing angle.

When tidal stresses overcome rock strength

To estimate the strength of Phobos, Black and Mittal looked data from similarly fractured rocks on Earth and from meteorites that struck Earth and have a density and composition similar to Phobos. They also constrained the strength of Phobos based on results from simulations of the 10-kilometer diameter Stickney impact crater, which formed in the past when a rock rammed into Phobos without quite smashing the moon apart. That crater spans about one-sixth the circumference of Phobos and looks as if someone took a scoop out of the moon.

Once they determined when and how they ex
Continued on Pg 4

December 2015 Meeting Minutes

By Kevin Bert

The December Business meeting of the Northern Cross Science Foundation was held at Unitarian Church North. President Jeff Setzer opened the meeting at 7:35pm and welcomed 23 members and guests to the required annual meeting. He then asked for standard reports.

Treasurer Gene DuPree tells the membership that the regular accounts balance is \$8,884.77 and the observatory account balance remains at \$1,042.01. He says that membership dues have started to come in and 2016 calendars are still available for \$8.00.

Secretary Kevin Bert reports that there were no changes in the club roster. A required membership list will be available for the upcoming election of board members. The 2016 Astronomical League North Central Regional Convention dates to save will be April 29 and 30 held at Bloomington Normal IL. This is a welcome development after last year's convention cancellation.

Dan Bert reports that all is well out at the Harrington Beach Observatory. He tells

the membership that the park has a new property Manager. The plan is to have a meeting with him to get acquainted and also highlight a lighting problem that developed recently near the Observatory.

Jeff opened nominations and received answers from last month's nominees. Both Dan Bert and Jaime Hanson said they would run and serve if elected. With no other nominations Joyce Jentges and Kevin Bert rounded out the field of four candidates. Ballots were distributed among the membership who were instructed to vote for three. After the votes were tallied the three top vote getters were Dan Bert, Kevin Bert and Jaime Hanson. A special thanks to Joyce for her many years as a board member as she stepped up to fill this important position.

Jeff Setzer covered upcoming 2016 events. January 16th is a Candlelight Ski & Hike at Horicon Marsh; February 6th is a Candlelight Ski & Hike at Harrington Beach State Park. The 13th is another Candlelight Ski & Hike at Pike Lake State Park. Member's telescopes would be appreciated.

Observatory Director Request

Dan Bert

I have two club loaner-telescopes in my shed that need to find a new home. They are not for sale, I need to make room for yard equipment.

Anyone storing them, also has the option of using them. If there are any new members considering the purchase of a larger telescope these scopes are great to try out. And, can be used as a part of the Loaner-Telescope Program, available to all Club Members. The two scopes are an 8" Meade Starfinder Dobsonian and a home-made 10" reflector that separates at the end of the tube from the square base. Both telescopes include several eye pieces and finders.

Please contact Dan at: dbert64@gmail.com or 262-357-1973. Thank you!



Imagers Report...By Ernie Mastroianni



If it's true that you learn from mistakes, then wow, we had a serious education on Dec. 4 while imaging the Orion Nebula!

Nolan Zadra joined me at the Plunkett Observatory that night, hoping for some hands-on time with the 5-inch refractor and the SBIG astrocamera. He also had perfect tutorial on what NOT to do during an astrophotography session.

But... let me back up a bit. Quite literally as I backed out of my narrow driveway that night, my rear tire snagged the metal lip of our basement window well. The tire flattened instantly. After 29 driveway years, this was a first. But I was undeterred.

Forty minutes later, I was heading to Harrington on a space-saver spare, a fitting metaphor for what was to come.

When Nolan joined me, the roof was open, the stars gleamed, and I had the telescope, camera, and laptop talking to each

other and humming along. So we plugged the guide camera into laptop and slewed the scope to M42 for the best composition.

Mistake One: I neglected to extend the dew shields. And the forecast was for heavy humidity.

The guide camera was generating a lot of digital noise but no real star images. So Nolan and I spent the next 30-45 minutes trying to find a focus point. In millimeter increments. Unsuccessfully.

Mistake Two: I forgot that the guide camera needs an extension tube to reach focus.

So we decided to forgo guiding and shoot M42 in one-minute exposures. Maybe periodic errors would not be apparent in short exposures.

Mistake Three: Periodic errors definitely show up in one-minute exposures.

As we fine-tuned the focus, the stars looked like blobs. Remember Mistake One? We broke out the dew gun, dried out the optics, and made a series of one-minute exposures, which showed a lot of detail.

Mistake Four: Neglected to make a dark frame.

Emboldened by our ability to record stellar images on a CCD, we decided to try a wide field image using the guide scope and SBIG camera. We found focus easily (two

extension tubes, just like the large refractor) and used the 50mm finder as the guide scope. Yes, an Imaging Source camera *can* reach focus with the 50mm finder.

After three hours of tinkering, it seemed the errors were behind us. We began a series of 16 frames at five minutes each of the Orion nebula. The guide camera worked perfectly. Another quick hit with the dew gun and we were on our way. Or so I thought.

Mistake Five: When working with Nebulosity software, the camera will not record pictures in the preview mode. It will just flash a temporary image of your target.

No photos after 80 perfectly-guided minutes. We called it a night. However, I did process the one-minute sub-frames from that session. They're unguided, with no noise reduction, but the final image does show the potential of the camera and scope, if only we can remember our mistakes and not repeat them.

In other news, the imaging committee has created a page on Astrobin, a popular website where astrophotographers from around the world share their pictures. We named ourselves the Harrington Beach Imagers Group. http://www.astrobin.com/users/Harrington_Beach_Imagers_Group/. We uploaded our first, a shot of the Crab Nebula. I expect many more images to follow.

January General Meeting

There will not be a 101 Program this month.

Main Meeting - Jeff Setzer

"How To Use Your New Telescope"

This will be a special program aimed at the general public, as well as new members. It will consist of two parts: first, we'll have a general presentation on tips for using one's first telescope, and then we'll break up to give one-on-one help to people who brought in their telescopes. A few volunteers will be needed to play

the role of "telescope doctor" for the second portion of the program; if you're interested in helping, please contact Jeff Setzer using the contact information on the back of this newsletter. For members who are not involved in the second portion of the program, there will be general fellowship — and snacks, of course!

Upcoming Main Meeting Speakers -

February: Jack Heisler - *Cold War Astronomy*

March: *Banquet Dinner*

April: *Jaime Hanson - SETI*

Christmas Party 2015...by Mickey

The Food and Fun gets better every year! This is always a good time to feast and re-connect. The White Elephant Exchange is great entertainment! I took some photo's, and as they say "A photo is worth a thousand words", so have fun looking.



Bazinga!

Joyce is surprised with her **2016 Big Bang Theory** Calendar!



Can you tell what Chris is thinking?

My guess is..."so much to choose from...I'll just come back for seconds."

Gene wins 1st Prize for best smile, just look at those pearly whites! Delighted with this telescope mirror! But...where's the other mirror???



⇐ I don't know who's more excited here. Rob who was the giver of a box brimming with books or Rick the receiver, who loves books! One of Rick's favorite picks of this treasure trove? **The Celestial Treasury**, now on our coffee table for all to enjoy!



Kevin looks soooo happy with this book, **Soul of the Night**. But then a thought comes to mind. When have we seen Kevin unhappy?

"Hmmm..... Looks very interesting!"...so what is it Rick?



Alan receives a Michael A. Seeds Textbook with CD of **Horizons with Infotrac**, ah yes, back to school!



Dave didn't know he was going to have a Title-change to "Number One" when he removed xmas wrappings to find Captain Jean Luc Picard looking for his new starship!

RELATED INFO

WELCOME NEW MEMBER

Dave Shoofs

Of West Bend, WI

Leaders for Public Viewing

January 16

Horicon Marsh

Gne and Charlotte DuPree

February 6

Harrington Beach

Gene and Charlotte DuPree

February 13

Pike Lake

Gene and Charlotte DuPree



Star Parties!

WOW

June 2nd through 5th

Hartman Creek State Park

www.newstar.org

Registration later February

NORTHWOODS STARFEST 2016

Hobbs Observatory
Beaver Creek Reserve
Fall Creek, Wisconsin
August 5-7, 2016

www.cvastro.org

NCRAL 2016

Bloomington-Normal

April 29 - 30th

Below is the response I received on my inquiry for NCRAL 2016 reservation information. They have our group contact information and will send out e-mails as information is available. *Mickey*

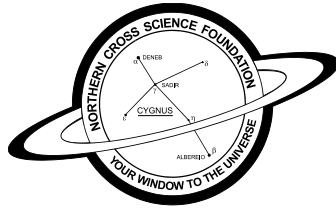
"It will probably be a few weeks before NCRAL 2016 registration opens as we don't have all the detailed expenses worked out yet. I'm anticipating opening registration some time in February. That's at least 2 months before the event.

We do have a web site that we will probably "open" in a couple of weeks.

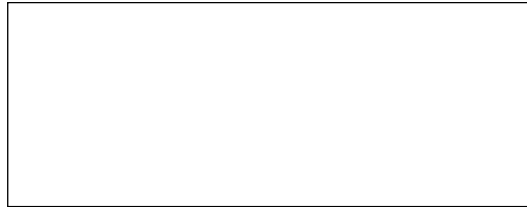
We'll be sending out a detailed announcement around mid January."

- Carl Wenning

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Jim & Gwen Plunkett
OBSERVATORY



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Continued from Pg 1 (Mars)

pected tidal forces to tear Phobos apart, Mittal modeled the evolution of the ring, adapting techniques developed to understand Saturn's rings.

"If the moon broke apart at 1.2 Mars radii (about 680 kilometers above the surface) it would form a really narrow ring comparable in density to that of one of Saturn's most massive rings," Mittal said. "Over time it would spread out and get wider, reaching the top of the Martian atmosphere in a few million years, when it would start losing material because stuff would keep raining down on Mars."

They found that if the moon breaks up farther from Mars, the ring could persist for 100 million years before raining down on Mars.

Mittal said it's not clear whether the dust and debris rings would be visible from earth, since dust does not reflect much sunlight, whereas ice in the rings of the outer planets makes them easily visible. But Mars' ring may reflect enough light to make Mars slightly brighter as seen from Earth, he said, and through a telescope the shadows of the rings might also be visible on the surface.

"Standing on the surface of Mars a few tens of millions of years from now, it would be pretty spectacular to watch," Black said.



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NCSF supports the *International Dark Sky Association*



Spectrum Newsletter

Please send your Questions, Suggestions, Articles, Photo's 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>

SPECTRUM
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Monthly Meeting Information

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