the EYEPIECE

the FORT WAYNE ASTRONOMICAL SOCIETY • PO Box 11093 • Fort Wayne, IN 46855

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GENERAL MEETING

Visitors Welcome

Tuesday Evening, December 20, 6:30 PM

Aboite Township Community Room
11321 Aboite Center Rd. Fort Wayne, IN 46814

Christmas Dinner Party

Members and visitors are welcome. Potluck dinner with hot ham and beverage provided. Bring a favorite dish or desert to share! NOTE We will be starting an hour earlier than our usual meeting time. This is an informal event. Let's talk about your astronomical Christmas list. See you at 6:30.

General Meetings are held the third Tuesday of each month, 7:30pm. Check our web site for location.

Merry Christmas !

Come and join us at the general meeting for fellowship and fun at 6:30 p.m. (an hour earlier than usual). Do you have an astronomical item that you would like to sell or swap? Bring it along with a side dish to share. Serviceware, drinks and ham/turkey will be provided. To aid you in deciding what food item to bring we publish the following list:

FWAS - Place settings; Phil Hudson – Ham, Turkey, drinks; Jon Thomas – Mini-cheese balls & bacon wrapped smokey links; Gene Stringer – Calico beans; Larry Clifford – Rellishes & condiments; Dick Evans – Speghetti pie; Mikal Pulse – Potatoes & egg-roll, Laura Ainslie – Bread & buns.

Please DO bring your own serving utensiles for your side dish. If you have a hot dish please notify Gene at 489-8135 and arrive a little early so we can position it in the serving line and get it on a warming tray or plug in your crock pot. If at the last minute you find you can attend please join us without bringing a dish. There is always more than enough for everyone, and we treasure your fellowship more than your food (except maybe the smoky links in bacon...).

Calendar Events Nov-Dec

Following are scheduled events for the next two months:

December

Saturday Public star gazing at jefferson Township Park has closed for the season. Public observing will resume in April of 2017.

Annual Christmas Party Tuesday, December 20.

No Board Meeting in December.

January 2017

General Meeting Tuesday, January 17.

Board Meeting Tuesday, January 24.

Subscription Updates Due

Those of you who have subscriptions to Astronomy and Sky & Telescope magazines expiring at the end of the year have a last chance to renew now.

The Kalmbach Publishing Company reports that the club subscription rate is $34 for a 1-year subscription. However, they are offering a 2-year option for $60.

The club subscription for Sky & Telescope is $32.95 for a 1-year subscription or 2 years for $64.90. S&T is also allowing you to renew at your present rate without going through the club.

Canadian Handbooks for 2016 will also be available for order at the general meeting. Check with Dave Wilkins for details and pricing.

Make your magazine subscription checks payable to the publishing company and send them to the FWAS P.O. box listed above, or give them to Dave at the general meeting.

Star*Quest Update

By Gene Stringer

Thanks to Greg Jacobs the additional 600 floor tiles have been secured and installed into the east observing wing and the control room. Robert Koors completed installation of baseboard moulding. The building is essentially complete, and Robert has issued us a Certificate of Occupancy and a set of keys.

There is still much to do before the observatory is fully functional, including the following remaining items from our Construction Support Task List:

5. Install Lamps (Alan Pareis). – Current white lights include LED lamps for the control room and dimmable floods for the viewing room and external pads. Two red dimmable lamps are installed in the ceiling of the control room. Alan is researching the current technology for red lighting for improvement over the original design .

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Board Meeting Highlights

- The Board met on 22 Nov in Phil Hudson's office.
- Treas reported current holdings of $3,714 for General operations and $7,587 for S*Q.
- Construction of the S*Q Observatory building is complete. Outfitting is in planning.
- The next board meeting will be on Tuesday, 24 Jan, 2017., at 7:30 p.m. in Phil Hudson's office.

FWAS OFFICERS

President: Larry Clifford 824-2655
Vice-President: Phil Hudson 484-7000
Secretary: Gene Stringer 489-8135
Treasurer: Dave Wilkins 444-3070

APPOINTED POSITIONS

Observatory Director:Mark Anderson 260-387-7913
Star*Quest Project Manager: Gene Stringer 489-8135
Star*Quest Treasurer: Dave Wilkins 444-3070

EDITORIAL STAFF

Eyepiece editor, Gene Stringer, 489-8135
Distribution, Gene Stringer 489-8135 & Phil Hudson 484-7000

Submissions to the Eyepiece are cheerfully accepted by E-mail (preferred) or on CD or other media, or on paper. Submissions may be edited

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7. The HC telescope requires significant rework to place it in service.
• Metal surfaces need to be stripped and repainted.
• Jon Thomas is repairing the fine adjustment control for the declination axis.
• The 12.5" mirror must be installed and the optical train collimated.
• The Sky Wizard must be installed.

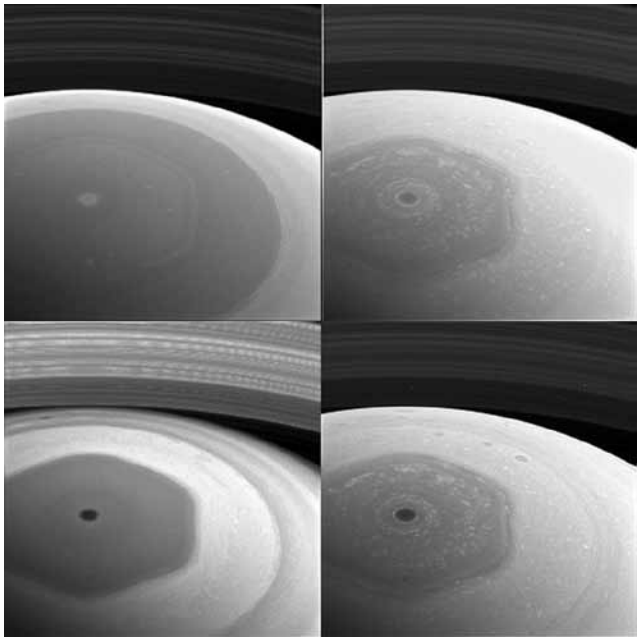
9. Plan & install signs.

10. Landscaping (Laura Ainslie) – The contractor has graded and seeded the site. Laura's plans will create a welcoming garden at the north entrance and other plantings on the site.
• A suitable ramp must be installed at the south door before the public can be allowed to exit it to view telescopes on the external pads.
• The ground level must be raised around the external scope pads to provide stability for step stools and chairs used there.

Planning is under way for acquiring furniture and equipment for the control room.

In addition to the two permanent scopes Phil Hudson, Dave Thackeray and Gene Stringer have placed their portable scopes in the observatory to do some astrophotography this winter.

Members may schedule times on the 16" Richard Johnstone telescope for viewing or photography by calling Gene Stringer at 489-8135, weather permitting (check the clear sky chart on the website).



December 6, 2016

This collage of images from **NASA's Cassini** spacecraft shows Saturn's northern hemisphere and rings as viewed with four different spectral filters. Each filter is sensitive to different wavelengths of light and reveals clouds and hazes at different altitudes.

Clockwise from top left, the filters used are sensitive to violet (420 nanometers), red (648 nanometers), near-infrared (728 nanometers) and infrared (939 nanometers) light.

The image was taken with the Cassini spacecraft wide-angle camera on Dec. 2, 2016, at a distance of about 400,000 miles (640,000 kilometers) from Saturn. Image scale is 95 miles (153 kilometers) per pixel.

The images have been enlarged by a factor of two. The original versions of these images, as sent by the spacecraft, have a size of 256 pixels by 256 pixels. Cassini's images are sometimes planned to be compressed to smaller sizes due to data storage limitations on the spacecraft, or to allow a larger number of images to be taken than would otherwise be possible.

These images were obtained about two days before its first close pass by the outer edges of Saturn's main rings during its penultimate mission phase.

The Cassini mission is a cooperative project of NASA, ESA (the European Space Agency) and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging operations center is based at the Space Science Institute in Boulder, Colorado.

For more information about the Cassini-Huygens mission visit http://saturn.jpl.nasa.gov and http://www.nasa.gov/cassini. The Cassini imaging team homepage is at http://ciclops.org.

Credit: NASA/JPL-Caltech/Space Science Institute

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Dimming stars, erupting plasma, and beautiful nebulae

By Marcus Woo

Boasting intricate patterns and translucent colors, planetary nebulae are among the most beautiful sights in the universe. How they got their shapes is complicated, but astronomers think they've solved part of the mystery—with giant blobs of plasma shooting through space at half a million miles per hour.

Planetary nebulae are shells of gas and dust blown off from a dying, giant star. Most nebulae aren't spherical, but can have multiple lobes extending from opposite sides—possibly generated by powerful jets erupting from the star.

Using the Hubble Space Telescope, astronomers discovered blobs of plasma that could form some of these lobes. "We're quite excited about this," says Raghvendra Sahai, an astronomer at NASA's Jet Propulsion Laboratory. "Nobody has really been able to come up with a good argument for why we have multipolar nebulae."

Sahai and his team discovered blobs launching from a red giant star 1,200 light years away, called V Hydrae. The plasma is 17,000 degrees Fahrenheit and spans 40 astronomical units—roughly the distance between the sun and Pluto. The blobs don't erupt continuously, but once every 8.5 years.

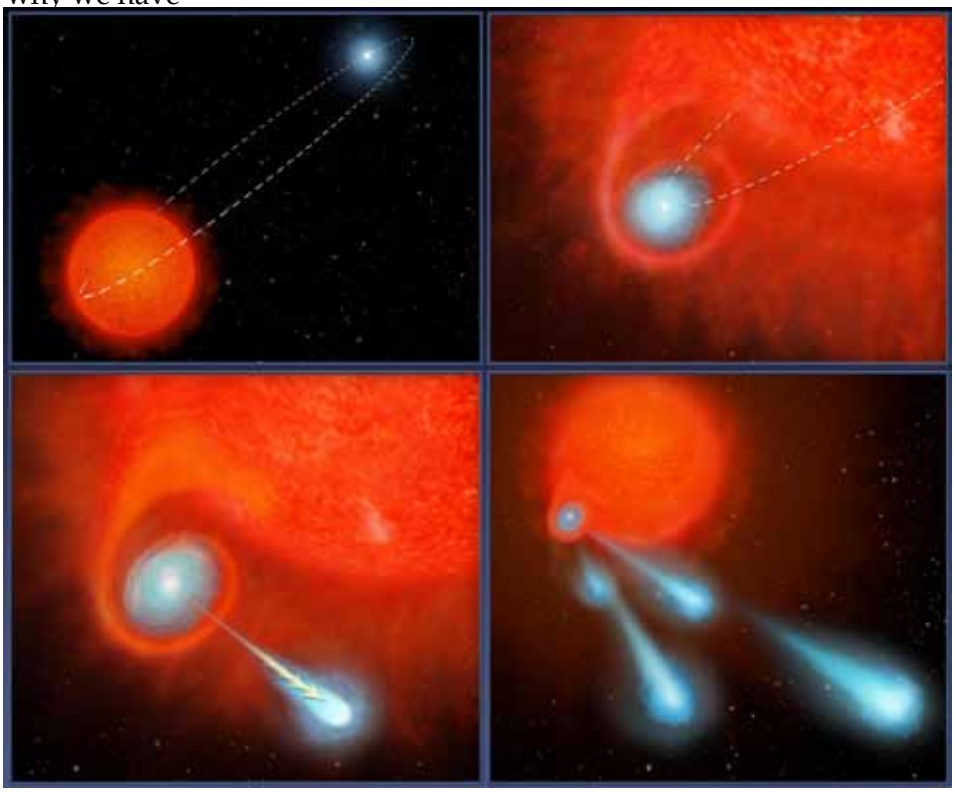
The launching pad of these blobs, the researchers propose, is a smaller, unseen star orbiting V Hydrae. The highly elliptical orbit brings the companion star through the outer layers of the red giant at closest approach. The companion's gravity pulls plasma from the red giant. The material settles into a disk as it spirals into the companion star, whose magnetic field channels the plasma out from its poles, hurling it into space. This happens once per orbit—every 8.5 years—at closest approach.

When the red giant exhausts its fuel, it will shrink and get very hot, producing ultraviolet radiation that will excite the shell of gas blown off from it in the past. This shell, with cavities carved in it by the cannon-balls that continue to be launched every 8.5 years, will thus become visible as a beautiful bipolar or multipolar planetary nebula.

The astronomers also discovered that the companion's disk appears to wobble, flinging the cannonballs in one direction during one orbit, and a slightly different one in the next. As a result, every other orbit, the flying blobs block starlight from the red giant, which explains why V Hydrae dims every 17 years. For decades, amateur astronomers have been monitoring this variability, making V Hydrae one of the most well-studied stars.

Because the star fires plasma in the same few directions repeatedly, the blobs would create multiple lobes in the nebula—and a pretty sight for future astronomers.

If you'd like to teach kids about how our sun compares to other stars, please visit the NASA Space Place:
http://spaceplace.nasa.gov/sun-compare/en/



This four-panel graphic illustrates how the binary-star system V Hydrae is launching balls of plasma into space. Image credit: NASA/ESA/STScI

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This Issue is Available in color on the Web

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FortWayneAstronomicalSociety.com

Next General Meeting:
Tuesday December 20, 6:30 pm
Aboite Township Community Room
11321 Aboite Center Rd. Fort Wayne IN, 46814

ANNUAL POTLUCK CHRISTMAS PARTY

Bring a dish or dessert to share, starts one hour earlier : 6:30 pm

Use parking lot to the right (West) of fire station doors.

December Night Sky: The constellation of Orion is the stand-out feature of our long December nights which are bracketed by the two brightest planets – Venus as a brilliant evening star, and Jupiter in the pre-dawn. Yet another supermoon coincides with the peak of the Geminids meteor shower that runs the 8th to the 17th. Fortunately, a good proportion are bright and the intense moonlight won't hide them all. The young earthlit Moon stands above Venus on the 3rd and close to dimming Mars on the 5th. Full moon the 14th, Winter Solstice the 21st, New Moon the 29th.