



ASTRAL PROJECTIONS

October 2014

Volume 25 Issue 9

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Upcoming Events

Monthly Meeting on Friday, October 10th

The next meeting will be held at the [Robert J. Novins Planetarium](#) located on the Ocean County College campus (Bldg. 13 next to parking lot 2) from 7pm to 10pm.

Planetarium Show will begin at 7pm. Please arrive early before the doors close.

There will also be a premier of the new show "Life Cycle of Stars" at 5:30pm

Star Party on Saturday, October 18th

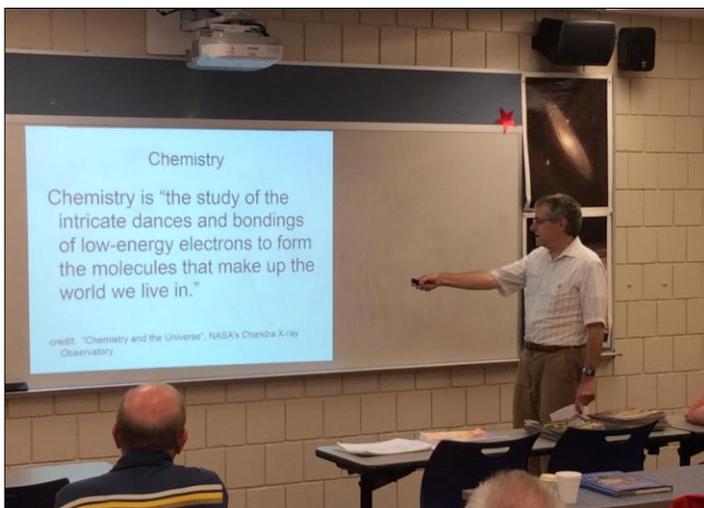
Join us as we set up our telescopes and observe the universe from 5:30pm to 8:30pm at [Jakes Branch County Park, 1054 Sunset Road, Beachwood NJ](#)

A.S.T.R.A.
Robert J. Novins Planetarium
Ocean County College
P.O. Box 2001
Toms River NJ 08754-2001

EVENT CANCELLATIONS

Two hours before the event start time please check out the ASTRA Message Board at <http://forum.astra-nj.org/viewforum.php?f=4> or call the ASTRA Hotline: 609-971-3331

Recap



Matthew McCue gave a presentation on the "Chemistry of the Universe" at September's Meeting



The club received a donation of an Orion Skyview Deluxe EQ Tripod. It is a manual mount with flexible cable slow motion controls. We plan on mounting a 6 inch Newtonian telescope on it for ASTRA members to use. We will post in a future news letter when it's ready to loan

CLUB TELESCOPES:

- A.S.T.R.A. owns seven small telescopes
- 6-inch Dobsonian (needs repairs)
 - 8-inch Dobsonian
 - 80mm Celestron Refractor
 - 120mm EQ AstroView Refractor.
 - Lunt 35mm H-Alpha solar scope
 - 8-inch Celestron NexStar 8i SE
 - 60mm Meade EQ refractor

These telescopes are available for club members to borrow and use for a month or two at a time. Contact John Endreson at Telescope_Loan@astra-nj.org to borrow a telescope

CELESTIAL EVENTS FOR OCTOBER 2014

October 7 - Uranus at Opposition

October 8 - Full Moon

October 8 - Total Lunar Eclipse

October 8, 9 - Draconids Meteor Shower

October 22, 23 - Orionids Meteor Shower

October 23 - New Moon

October 23 - Partial Solar Eclipse

Source: <http://www.seasky.org/>

Ocean County College Thursday, October 16th

Story Musgrave, a physician and retired NASA astronaut, will be at the Ocean County College to present "Design a Life for Yourself: One Step at a Time"

The presentation for the general public will be at the main theater at 8:00pm.

Ticket Prices: General \$25 Senior \$20 Student \$10

ASTRA LIBRARY OF BOOKS AND DVDS:

Many books and DVDs are available for loan from the ASTRA Library for a one month period. A list of these items is available on the ASTRA website. Request for these items must be made prior to our regular meeting and returned by the following meeting. Please e-mail your request for these items to our Librarian Barbara Novick at Library_Loan@astra-nj.org or call her at 732-840-3111.

ASTRONOMICAL LEAGUE MEMBER SOCIETY

Astronomical League National Headquarters, 9201 Ward Parkway; Suite 100, Kansas City, MO 64114

1-816-333-7759 or www.astroleague.org

The REFLECTOR is published in March, June, September and December. If you do not receive your copy of the REFLECTOR magazine, contact Astronomical League Coordinator (Alcor) Ro Spedaliere (Treasurer@astra-nj.org)



Twinkle, twinkle, variable star

By Dr. Ethan Siegel

As bright and steady as they appear, the stars in our sky won't shine forever. The steady brilliance of these sources of light is powered by a tumultuous interior, where nuclear processes fuse light elements and isotopes into heavier ones. Because the heavier nuclei up to iron (Fe), have a greater binding energies-per-nucleon, each reaction results in a slight reduction of the star's mass, converting it into energy via Einstein's famous equation relating changes in mass and energy output, $E = mc^2$. Over timescales of tens of thousands of years, that energy migrates to the star's photosphere, where it's emitted out into the universe as starlight.

There's only a finite amount of fuel in there, and when stars run out, the interior contracts and heats up, often enabling heavier elements to burn at even higher temperatures, and causing sun-like stars to grow into red giants. Even though the cores of both hydrogen-burning and helium-burning stars have consistent, steady energy outputs, our sun's overall brightness varies by just ~0.1%, while red giants can have their brightness's vary by factors of thousands or more over the course of a single year! In fact, the first periodic or pulsating variable star ever discovered—Mira (omicron Ceti)—behaves exactly in this way.

There are many types of variable stars, including Cepheids, RR Lyrae, cataclysmic variables and more, but it's the Mira-type variables that give us a glimpse into our Sun's likely future. In general, the cores of stars burn through their fuel in a very consistent fashion, but in the case of pulsating variable stars the outer layers of stellar atmospheres vary. Initially heating up and expanding, they overshoot equilibrium, reach a maximum size, cool, then often forming neutral molecules that behave as light-blocking dust, with the dust then falling back to the star, ionizing and starting the whole process over again. This temporarily neutral dust absorbs the visible light from the star and re-emits it, but as infrared radiation, which is invisible to our eyes. In the case of Mira (and many red giants), it's Titanium Monoxide (TiO) that causes it to dim so severely, from a maximum magnitude of +2 or +3 (clearly visible to the naked eye) to a minimum of +9 or +10, requiring a telescope (and an experienced observer) to find!

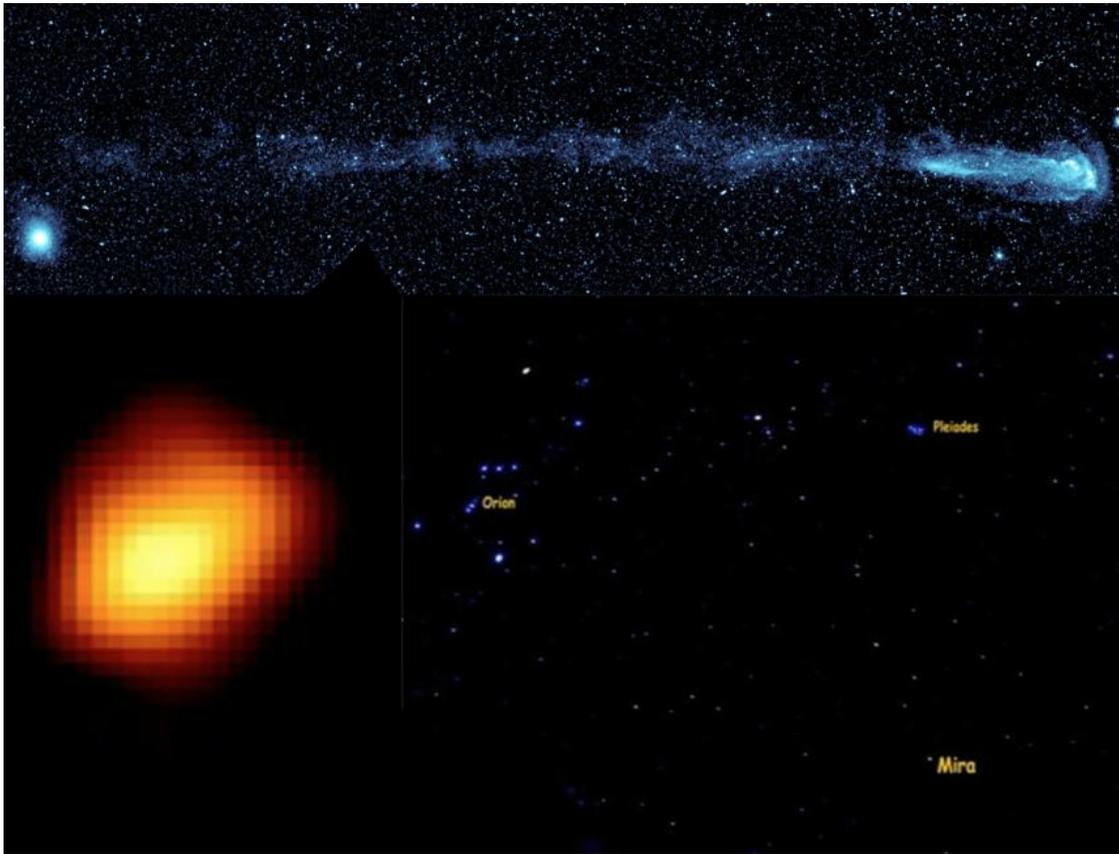
Visible in the constellation of Cetus during the fall-and-winter from the Northern Hemisphere, Mira is presently at magnitude +7 and headed towards its minimum, but will reach its maximum brightness again in May of next year and every 332 days thereafter. Shockingly, Mira contains a huge, 13 light-year-long tail -- visible only in the UV -- that it leaves as it rockets through the interstellar medium at 130 km/sec! Look for it in your skies all winter long, and contribute your results to the AAVSO (American Association of Variable Star Observers) International Database to help study its long-term behavior!

Check out some cool images and simulated animations of Mira here:

http://www.nasa.gov/mission_pages/galex/20070815/v.html

Kids can learn all about Mira at NASA's Space Place: <http://spaceplace.nasa.gov/mira/en/>

Images of Mira



Images credit: NASA's Galaxy Evolution Explorer (GALEX) spacecraft, of Mira and its tail in UV light (top); Margarita Karovska (Harvard-Smithsonian CfA) / NASA's Hubble Space Telescope image of Mira, with the distortions revealing the presence of a binary companion (lower left); public domain image of Orion, the Pleiades and Mira (near maximum brightness) by Brocken Inaglory of Wikimedia Commons under CC-BY-SA-3.0 (lower right).

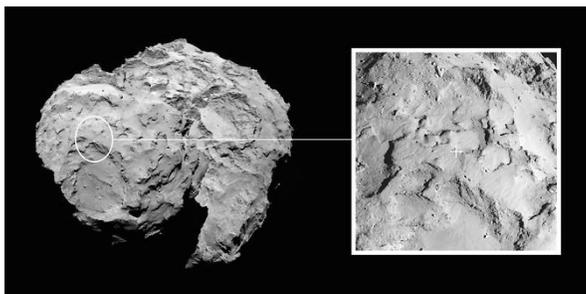
NASA Highlights
Information from www.nasa.gov/



Celebration: MAVEN Arrives at Mars

NASA's Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft successfully entered Mars' orbit at 10:24 p.m. EDT Sunday, Sept. 21, where it now will prepare to study the Red Planet's upper atmosphere as never done before. MAVEN is the first spacecraft dedicated to exploring the tenuous upper atmosphere of Mars.

Image Credit: Lockheed Martin



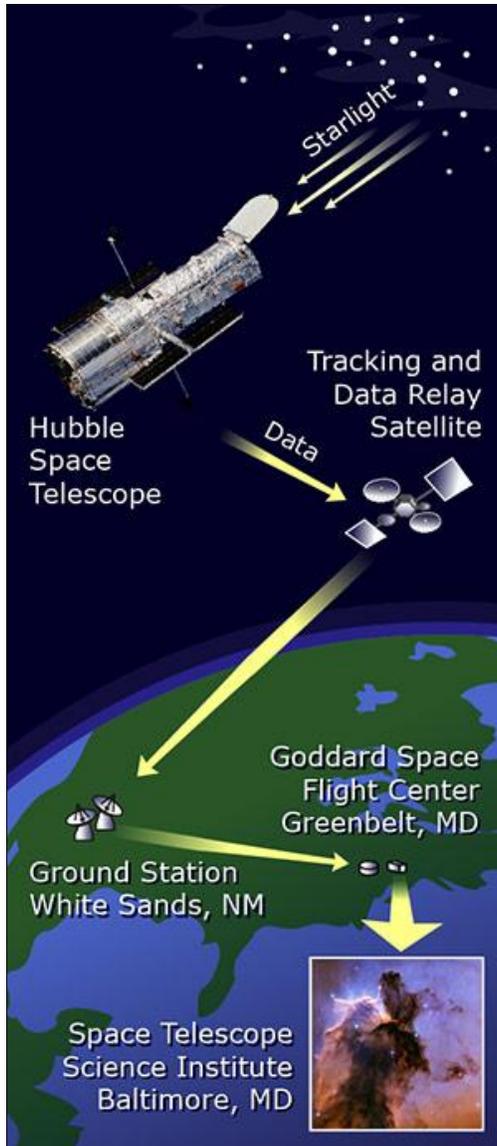
'J' Marks the Spot for Rosetta's Lander

The European Space Agency's Rosetta is scheduled to reach the surface at target Site J of the comet 67P/Churyumov-Gerasimenko on November 11, where it will perform in-depth measurements to characterize the nucleus.

Image Credit:
ESA/Rosetta/MPS for OSIRIS Team

Did you know?

Data from the Hubble Space Telescope must travel through a path before becoming an image.



ASTRONOMICAL ITEMS FOR SALE

If you have an astronomical item to sell, or need help with an astronomical problem (a question, or telescope setup) contact the President President@astra-nj.org to announce it at a meeting. To advertise in our monthly newsletter please send all information to astra.newsletter@gmail.com

2014 Calendar

- Oct 10 ASTRA Meeting (7pm – 10pm)
Planetarium Show
- Oct 18 Star Party (5:30pm – 8:30pm)
Public star party at Jakes Branch
- Nov 14 ASTRA Meeting (7pm – 10pm)
“Solar Update” by Bill Edelen
- Nov 29 Winter Star Watch (7pm -11pm)
Public star party at OCC
(Moon 1st Qtr)
Star Party (5pm – 8pm)
Public star party at Jakes Branch
- Dec 12 ASTRA Meeting (7pm – 10pm)
Awards, Open Meeting, Elections
- Dec 27 Star Party (5pm – 8pm)
Public star party at Jakes Branch



ASTRA-WEAR – Embroidered and/or Printed items with the ASTRA Logo

You can see some samples at ASTRA meetings. To order by mail: Shelter Cove Embroidery Co. 1333 Bay Ave Toms River, NJ 08753 call 732-506-7700 or E-mail astra-wear@estitches.com. Order form is on the ASTRA website.

**NOVEMBER NEWSLETTER DEADLINE:
OCTOBER 24, 2014**