

Pegasus The BCAAS Newsletter

Berks County Amateur Astronomical Society



President's Message

This will be my last Presidents message. My term as President is over at the end of 2008, and after 3 years in this post, someone else will take my place for 2009. I have and will continue to enjoy all the friendships made at BCAAS, and look forward to being part of future activities.

We will be celebrating those accomplishments and friendships at the December meeting, as we will be treating all of you to a 35th Anniversary party, complete with old photos and archival footage of happenings over the last 35 years since BCAAS' inception. A buffet will be provided, so there is no need to bring your own food as we normally do at our annual Christmas party. No cover charge - just show up!

Next year, we are going to do some "joint" programs with The Reading Museum. For 3 meetings, as part of the Museum's "Friday Nights at the Museum", our program will be opened up to the public.

These nights will be promoted in newspapers and on the radio, with corporate help to defray advertising costs.

These Friday night events will serve several purposes for us; they will spread out to the public what we do and teach them about the science of astronomy, we will enjoy 3 very special presentations during the year, and by bringing folks to the Museum, we will offset or maybe eliminate our monetary obligation to meet there during the year.

Since 2009 has been designated "The International Year of Astronomy" by the United Nations, it is a great year to try this! You will be receiving more info on this as it becomes reality.

Thanks to all of you for allowing me to be your President, and may your skies always be clear!

Dave Brown

Autumn 2008

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2008 Slate of Officers & Board Members

President—Dave Brown
Vice President—Bret Cadmus
Secretary—Barb Geigle
Treasurer—Linda Sensenig
Public Relations—Barry Shupp
Hotline Coordinator—Paul Becker
Pegasus Editor—Melody Gardner
Webmaster—Mike Bashore

Death of A Red Giant by JPL personnel

By all outward appearances, the red supergiant appeared normal. But below the surface, hidden from probing eyes, its core had already collapsed into an ultra-dense neutron star, sending a shock wave racing outward from the star's center at around 50 million kilometers per hour.

The shock wave superheated the plasma in its path to almost a million degrees Kelvin, causing the star to emit high-energy ultraviolet (UV) radiation. About six hours later, the shock wave reached the star's surface, causing it to explode in a Type IIP supernova named SNLS-04D2dc.

Long before the explosion's visible light was detected by telescopes on Earth, NASA's Galaxy Evolution Explorer (GALEX) space telescope captured the earlier pulse of UV light — scientists' first glimpse of a star entering its death throes.

"This UV light has traveled through the star at the moment of its death but before it was blown apart," explains Kevin Schawinski, the University of Oxford astrophysicist who led the observation. "So this light encodes some information about the state of the star the moment it died."

And that's exactly why astronomers are so excited. Observing the beautiful nebula left behind by a supernova doesn't reveal much about what the star was like before it exploded; most of the evidence has been obliterated.

Information encoded in these UV "pre-flashes" could offer scientists an unprecedented window into the innards of stars on the verge of exploding.

In this case, Schawinski and his colleagues calculated that just before its death, the star was 500 to 1000 times larger in diameter than our sun, confirming that the star was in fact a red supergiant. "We've been able to tell you the size of a star that died in a galaxy several billion light-years away," Schawinski marvels.

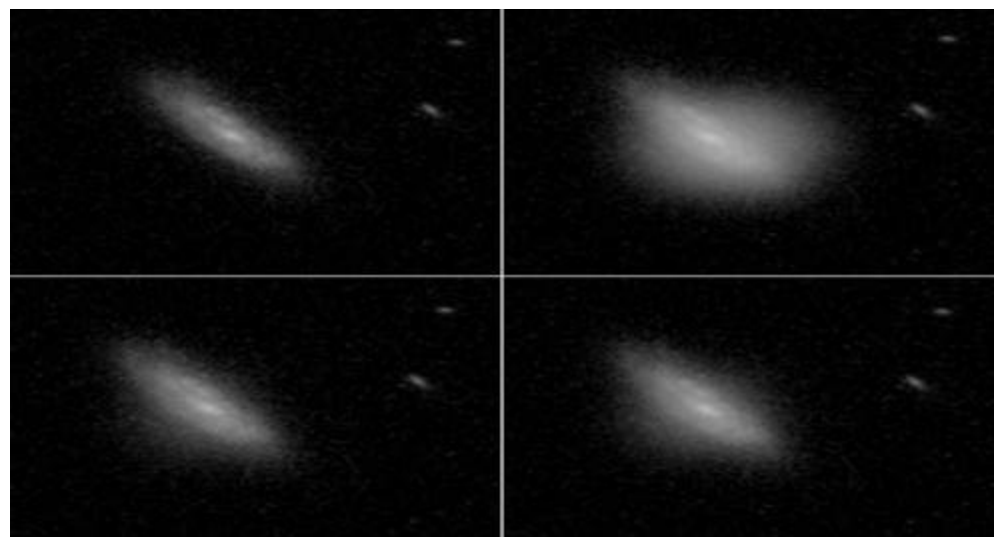
"GALEX has played a very important role in actually seeing this for a few reasons," Schawinski says. First, GALEX is a space telescope, so it can see far-UV light that's blocked by Earth's atmosphere.

Also, GALEX is designed to take a broad view of the sky. Its relatively small 20-inch primary mirror gives it a wide, 1.2-degree field of view, making it more likely to catch the UV flash preceding a supernova.

With these advantages, GALEX is uniquely equipped to catch a supernova before it explodes. "Just when we like to see it," Schawinski says.

For more information, visit www.galex.caltech.edu, "Ultraviolet Gives View Inside Real 'Death Star'." Kids can check out how to make a mobile of glittering galaxies at spaceplace.nasa.gov/en/kids/galex_make1.shtml.

Sequence of images shows supernova start to finish. The top left image shows the galaxy before the supernova. At top right, the bright UV flash called the shock breakout indicates a red supergiant has collapsed. At bottom left, moments later, the flash is mostly gone. As the debris expands, it heats up again and becomes brighter (bottom right). The supernova became 10 times the size of the original over the following few days, thus becoming visible to supernova hunters.



Night Sky Network News

Teleconference Scheduled For November 18th: **Itty-Bitty Radio Telescope November Telecon**

Sue Ann Heatherly from the National Radio Astronomy Observatory (NRAO) in Green Bank, West Virginia, will share her love of astronomy by showing us how to make an Itty Bitty Telescope [radio, that is] on Tuesday, November 18th at 6 pm PT and 9 pm ET.

Sue Ann's down home delivery is sure to please. Don't miss tuning in to our fun and informative telecon.

Contact Barb Geigle
for more information!

There is a wonderful new activity on the Space Place web site!



NASA's latest plans to return to the Moon are a lot more ambitious in many ways than was the Apollo Program in the '60s and '70s. This time, we plan to stay a while. NASA wants to learn how to keep the astronauts alive in a hostile environment for months at a time, so we will someday be able to send humans to Mars and beyond!

Designing a lunar habitat is part of the challenge. Kids can help to create a lunar outpost by building their own Moon Habitat, or even a whole village of them! This fun activity that can involve the whole family can be found at NASA's website for kids, The Space Place, at <http://spaceplace.nasa.gov/en/kids/exploration/habitat>.

Find answers to hard questions at the SciJinks Weather Laboratory

The SciJinks Weather Laboratory at <http://scijinks.gov> is a website for middle school-age children, sponsored by both NASA and NOAA. SciJinks presents weather and other Earth science topics via games, stories, and fun facts, as well as simple, concise answer to often-asked "how and why" questions. For example, answers will be found to "Why is the sky blue?", "How does a hurricane form?" and "Why do we have seasons?"

Two new "how & whys" have recently been added:
* How did earth's atmosphere form?
* Why doesn't the atmosphere just float off into space?

Other how and why topics are listed at scijinks.gov/weather/howwhy.

Help design the new lunar habitat on
NASA's website for kids, Space Place,
with your children today!

International Year of Astronomy Article: The Lives of Stars

Back in 1054 AD, Chinese and Arab astronomers recorded seeing a "new star" that was bright enough to be visible even during the day. 450 years later, Galileo also saw a bright "star" appear, just a few years before he made his telescope. But for both of those events, no one knew what they were seeing. We have learned now that ancient astronomers saw a special event called a supernova – the flashy end to a giant star's life. Stars spend most of their lives shining brightly without much change. But the sight of their birth and death can be spectacular.

Every star begins its life in a stellar nursery of gas and dust. As enough of this star-building material falls together it becomes hot and dense enough to form a star. Because the dense clouds where stars form block visible light, it is often easier to study them using infrared light which can pass right through the clouds. NASA's Spitzer Space Telescope and Hubble Space Telescope have both used infrared light to study star formation in our own galaxy and in distant ones. You can see a stellar nursery where stars are being born if you look at the December IYA Discovery Guide, which features the Orion Nebula.

At the end of their lives, very large stars will go supernova. This huge explosion blows off the outer layers of the star in a bright display. It releases oxygen, iron, and other heavier elements into the surrounding space. These contribute to making a new stellar nursery and eventually get recycled into new stars. Many of the elements that make up the Earth and even us came from many supernovae that occurred billions of years ago.

The supernova that was observed in 1054 faded after about a year. Now, when we look at the same place in the sky we see a supernova remnant called the Crab Nebula (below). Giant stars also leave something else behind. In the Crab nebula, there is a neutron star that is so dense that a teaspoon would weigh as much as a train of boxcars loaded to maximum capacity that stretched all the way from Canada to Mexico! And the very biggest stars leave behind a black hole, which is even denser and more mysterious, and also invisible.

NASA is studying black holes and other high-energy x-ray and gamma-ray sources with the Suzaku and XMM-Newton Missions. The Swift and Fermi missions are orbiting Earth to study the dramatic deaths of very large stars.

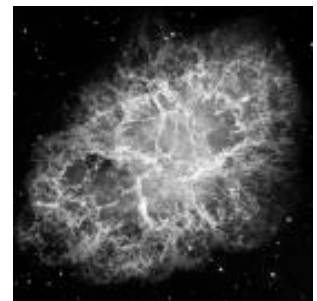


Photo Corner — Photos Taken By BCAAS Members



Sunset at Middlecreek—Barry Shupp



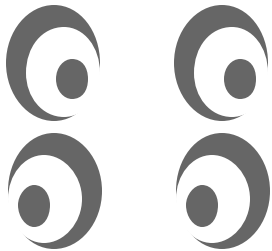
Moon Over Happy Valley—Barry Shupp

Berks County Amateur Astronomical Society

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Hotline: 610-921-0173
Call us for all the
latest event details!

Visit us today at
www.berksastronomy.org



2008 Events Calendar

Thursday, November 13th at 7:30pm:

General Meeting at the Reading Museum.
Speaker and topic TBA. We are also gathering nominations for next month's BCAAS Board of Elected Officers elections.



Thursday December 11th at 7:30pm:

General Meeting at the Reading Museum.
Tonight we will celebrate the 35th Anniversary of BCAAS and the festivities will include our annual Holiday Party and feast. The Club will also be electing Officers for the 2009 BCAAS Board. Everyone is invited and reminded that food and drink will be provided for you! If anyone has old photos of Club events, please bring them along—thank you!