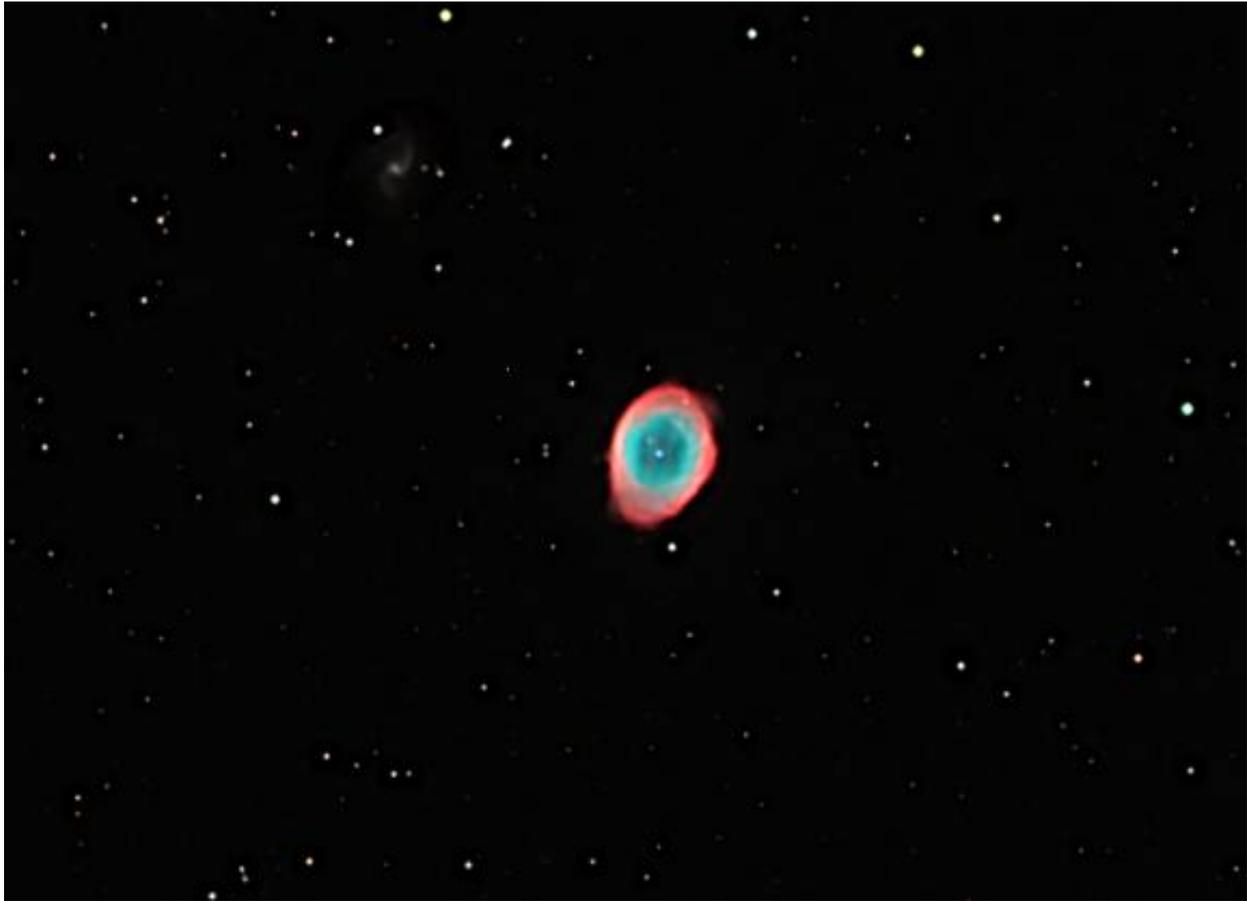


# Sky **WAA** tch

The Monthly Publication of the Westchester Amateur Astronomers

October 2007



## *The Ring and its Distant “Neighbor”*

**Rick Bria and Ted Schimenti** recently took this photo of the Ring Nebula, and the very distant Galaxy IC1296, at the Round Hill Observatory. The image is made of 4-minute stacks as follows: L= 31 stack; R= 15 stack; G= 19 stack and B= 23 stack. The Luminance was layered 3 times with the Red, Green, Blue color data.

**Info. . .** Rick notes: The Ring Nebula (M57) is a planetary nebula; so called because it looks planet-like when viewed in a telescope. It is about 2000 light years away. A planetary nebula forms when a star of 1-5 solar masses runs low on hydrogen. It then starts to burn helium in an unstable manner, and blows off half of its mass to space. The escaping star mass is then recycled into new 'enriched' stars and planets. What remains is a very hot, dense, white dwarf star, which will cool over many billions of years. The center star (from which the Ring Nebula formed) is magnitude 15.

IC 1296 (at approximately 11 o'clock from M57) is a barred spiral galaxy. Editor's note: the NASA/IPAC extragalactic database suggests a distance to IC 1296 of 220 million light years. (See: <http://nedwww.ipac.caltech.edu/>).

# Events for October 2007

## ➤ **Monthly Meetings**

**“A Night with Joe Rao”**

**Friday, October 12, 8:00PM**

**Andrus Planetarium**

**Hudson River Museum, Yonkers**

Joe Rao is the on-air meteorologist for *News 12 Westchester* and a frequent lecturer at New York's Hayden Planetarium. Joe's topic will be eclipses, although he will comment on Sputnik.

## ➤ **Satellite Night**

**Saturday, October 6, 6:30-9:00PM**

**Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River**

Help us commemorate the 50<sup>th</sup> anniversary of Sputnik and the beginning of space exploration. We track the passage of weather and communication satellites and old rocket boosters across the evening sky. Free and open to the public.

## ➤ **“Starway to Heaven”**

**Saturday, October 13, 7:00-10:00PM**

**Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River**

This is our scheduled observing date for October, weather permitting. Free and open to the public. The scheduled rain/cloud date is October 20.

**Call: 1-877-456-5778** (toll free) for announcements, weather cancellations, or questions. Also, don't forget to periodically visit the WAA website at: <http://www.westcheстераstronomers.org/>.

**Editor's Note:** The list of new and renewing members will be updated next month.



Credit: STS-41B, NASA

## ▲ **Out There**

Guided by a Manned Maneuvering Unit (MMU), astronaut Bruce McCandless floats free in space 100 meters from the Space Shuttle.

Westchester Amateur Astronomers, Inc., a 501(c)(3) organization, is open to people of all ages with the desire to learn more about astronomy. The Mailing address is: P.O. Box 44, Valhalla, New York 10595. Phone: 1-877-456-5778. Meetings: Andrus Planetarium, Hudson River Museum of Westchester, 511 Warburton Ave., Yonkers. Observing at Ward Pound Ridge Reservation, Routes 35 and 121 South, Cross River. Annual membership is \$25 per family, and includes discounts on *Sky & Telescope* and *Astronomy* magazine subscriptions. Officers: President: Charlie Gibson; Senior Vice President: Pat Mahon; Secretary: Barbara Moroch; Treasurer: Michael Virsinger; Vice President Membership: Karen Seiter; Vice President Programs: John James; Vice President Field Events: David Butler; Newsletter: Tom Boustead; Webmaster: Robert Davidson.

# Articles

## ***A Missile in Your Eye*** by Patrick L. Barry

Satellite technology designed to catch ballistic missile launches may soon help doctors monitor the health of people's eyes. For the last 15 years, Greg Bearman and his colleagues at JPL have been working on a novel design for a spectrometer, a special kind of camera often used on satellites and spacecraft. Rather than snapping a simple picture, spectrometers measure the spectrum of wavelengths in the light coming from a scene. From that information, scientists can learn things about the physical properties of objects in the photo, be they stars or distant planets or vegetation on Earth's surface.

In this case, however, the challenge was to capture snapshots of short-lived events—like missile launches! The team of JPL scientists designed the new spectrometer, called a computed tomographic imaging spectrometer (CTIS), in collaboration with the Ballistic Missile Defense Organization as a way to detect missiles by the spectral signatures of their exhaust. But now the scientists are pointing CTIS at another fast-moving scene: the retina of an eye.

Blood flowing through the retina has a different spectral signature when it is rich in oxygen than when it is oxygen deprived. So eye doctors can use a spectrometer to look for low oxygen in the retina—an indicator of disease. However, because the eye is constantly moving, images produced by conventional spectrometers would have motion blurring that is difficult to correct.

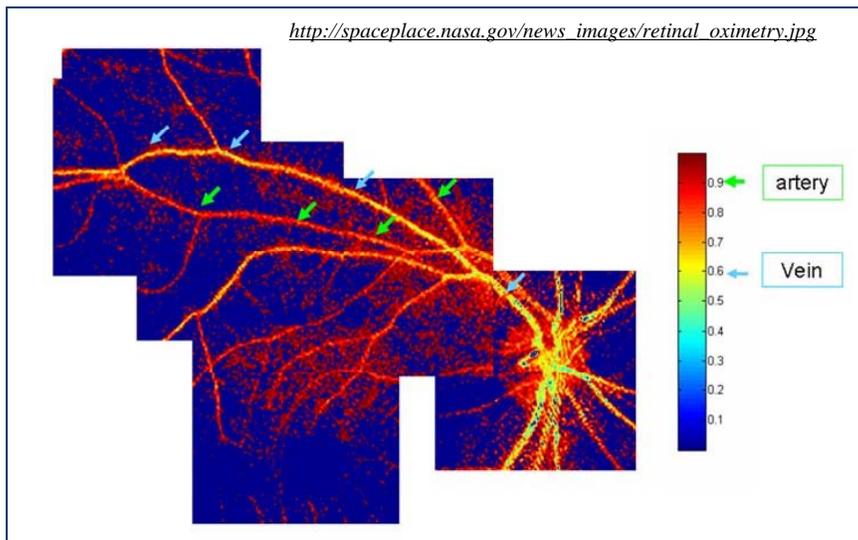
The spectrometer that Bearman helped to develop is different: It can capture the whole retina and its spectral information in a single snapshot as quick as 3 milliseconds. "We needed something fast," says Bearman, and this spectrometer is "missile-quick."

CTIS is even relatively cheap to build, consisting of standard camera lenses and a

custom, etched, transparent sheet called a grating. "With the exception of the grating, we bought everything on Amazon," he says.

The grating was custom-designed at JPL. It has a pattern of microscopic steps on its surface that split incoming light into 25 separate images arranged in a 5 by 5 grid. The center image in the grid shows the scene undistorted, but colors in the surrounding images are slightly "smeared" apart, as if the light had passed through a prism. This separation of colors reveals the light's spectrum for each pixel in the image.

"We're conducting clinical trials now," says Bearman. If all goes well, anti-missile technology may soon be catching eye problems before they have a chance to get off the ground.



This three-color composite image from the computed tomographic imaging spectrometer shows the oxygenation of the blood in the arteries and veins of a human retina. (Arteries appear red; veins appear yellow.) Information about other NASA-developed technologies with spin-off applications can be found at <http://www.sti.nasa.gov/tto>.

The Jet Propulsion Laboratory, California Institute of Technology provided this article under a contract with NASA.

## ***It's The Best Time To Be An Amateur Astronomer***

**by Dave Butler**

The night sky for the September Starway to Heaven at Pound Ridge was very transparent and the Milky Way could be seen easily—its divide a good omen for deep sky observing. A good variety of equipment and three rows of cars graced the Meadow area parking lot: several 90-102mm refractors, a push-to 12-inch Dob; one stargazer had a 13-inch Portaball, hooked to a laptop and imaging the Dumbbell Nebula, Most scopes viewed Jupiter; I had set up in line with a tall tree and didn't start with Jupiter. Uranus and Neptune were viewed in several scopes. Uranus was not a clear disk on a 90mm, but unlike Neptune, did offer a clear disk in an 8-inch glass. Neptune was a clear disk on a 12-inch scope

One of the mistakes beginners make is not making a viewing list or taking star maps with them. The idea that they can randomly point and hope to find something is just not practical. Even a scope with a 1.8-degree FOV sees only 1/10,000<sup>th</sup> of the sky. Even if they find something they might not realize its importance. Doug Towers viewed two such targets, which illustrated the benefits of a little preparation. First, he showed me a wide double in Cassiopeia—V509 Cas, which is visible to the naked eye and is among the most luminous stars in the Milk Way. This star is a hypergiant. At least 7800 light years away, it still has an apparent magnitude of 5.1. Hypergiants are rare; until recently only 7 were known in the Milky Way. A Hypergiant has a mass near the Eddington limit (about 120 solar masses), a point where a star throws off its outer layers. These stars live only 1 to 3 million years before going supernova or hypernova (>100x supernova). The second target was Barnard's Star, a red dwarf that is rapidly approaching our Sun. It's not very bright and you need an up-to-date star map. It's brighter (Mag 8) than the 11<sup>th</sup> order V shaped stars asterism that is used to help find it.

I then checked out some old favorites. The Lagoon Nebula showed a dark center and

brighter outside filling the whole eyepiece. I see why it gets its name. The Trifid Nebula showed less contrast, but there was a dim glow around several stars. The Swan Nebula showed up well.

Most scopes viewed globular cluster M13 in Hercules. I viewed globular clusters M19, M22 M30 because these objects are leaving us for this year. Globular M56 was also viewed; all globular clusters were easily resolved to their stars in an 8-inch scope. The Saturn planetary nebula was viewed; the spokes giving it its 'ring' could be seen on both sides of the nebula. The Ring Nebula, which looks like a puff of smoke with a hole in it, was viewed on most scopes. The Dumbbell Nebula is larger and is sort of dumbbell shaped. Some viewed the Veil Nebula, a supernova that exploded maybe 100,000 years ago and requires an OIII filter or very dark skies or photographs to see. I viewed several open clusters—the Double Cluster a crowd pleaser in Perseus, the Owl Cluster which is Owl shaped with its wings spread and two bright eyes and a Sue French October 2007 *Sky & Telescope* Unsung Marvels in Cygnus target—MeerschaumPipe, which of course looks like a pipe. Blue Yellow double stars Alberio and Almach are both beautiful and easy to find targets. Of course the evening would not be complete with out viewing the Andromeda Galaxy with its companion M32 in the same eyepiece. Transparent skies showed Andromeda's glow diagonal crossing the eyepiece.



Bob Kelly shot this composite of the Moon's phases during Sept 4-7

# Constellation Corner:

by Matt Ganis

Well, here we are in the month of October – the highlight of which (in my opinion) is Halloween. Cool, crisp fall evenings conjure up thoughts of ghouls, ghosts and other scary things that “go bump in the night”. This month I took a look at the October skies in the hopes of finding a few of the “scarier” constellations, and while I didn’t come up with ghosts and goblins, I did find a few lizards, snakes and thoughts of witches.

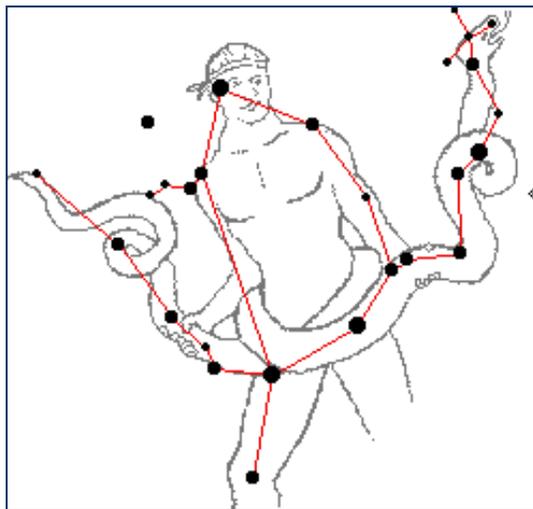
Starting on the western horizon early this month, you’ll find the constellation of Ophiuchus, or the “serpent-holder”. According to legend, Aesculapius, who was the arguably the first doctor of medicine, seems to have begun his career when he saw a snake carrying an herb in its mouth. This snake crawled into a room and gave the herbs to another (dead) snake, which immediately recovered.

It was this herb, which Aesculapius took from the revived snake, that taught him about the powers that certain herbs have over life and death. He traveled far and wide over the land, always learning more about the medicinal use of these herbs, and before long his reputation, as a savior of lives had become widely known. He had become such an expert that Hades, God of the Underworld, complained to his brother Zeus that fewer and fewer souls were being sent down to the Underworld as a result of Aesculapius’ work.

As a result, just as Aesculapius was about to bring the famous hunter, Orion, back to life after he had been accidentally shot with an arrow by his lover, Hades’ patience ran out. He demanded that Zeus stop this restoration of life. Zeus agreed with his brother and hurled a thunderbolt at Aesculapius, killing him on the spot. But Zeus could not help but admire the skills of “the Doctor” and raised him among the stars as Ophiuchus, along with the serpent from which he had learned his skills. Aesculapius, as the God of Medicine, is always shown with a staff with a serpent wound around it (think of the symbol in hospitals and doctors’ offices).

Moving to the south, if you look in the spot between Cygnus, Cepheus, Andromeda and Cassiopeia, you’ll stumble across another slithering member of our heavens: Lacerta the lizard. Lacerta is a modern constellation created by the Polish astronomer Johannes Hevelius in 1687. The constellation is a small northern constellation that lies on the edge of the Milky Way just south of the midpoint of a line drawn from Deneb in Cygnus to

Schedar in Cassiopeia. Its brightest star is Alpha Lac with visual magnitude of only 3.76 located a distance of about 102 light-years from us. So while it may be a bit “spooky” it’s far enough away to be of little to no threat ;-)



Continuing to move to the East we come across the constellation of Perseus as he’s returning home from slaying Medusa en-route to saving the princess Andromeda. The Medusa once had been a beautiful woman with long and glowing hair. She was so proud of her beauty that she dared compare herself with Athena, the Goddess of War. On hearing of the woman’s bragging, Athena turned Medusa into a hideous monster. Where her long beautiful hair had once hung, hissing snakes were now writhing. So hideous was the sight of her that any human or animal, which chanced a gaze upon her, was instantly turned to stone (talk about a punishment for not saying “trick or treat”). I wonder if Medusa was the first Witch?

There are a few other “monsters” up there we could have considered such as Draco (the Dragon) or Cetus the Whale (the monster about to devour Andromeda before Perseus came to the rescue) or Hydra and Hydrus (the water serpent and the lesser serpent). So if you don’t get many trick-or-treaters, have a look into the sky and see which “little monster” happens to be on your doorstep!

# Almanac

For October 2007 by Matt Ganis



Oct 3



Oct  
11



Oct  
19



Oct  
26

Our October skies are relatively quiet this month. It's still a great time to get out in the cool fall evenings for some star gazing, or exploration of some deep sky wonders (or even for hosting your own star party – hint hint).

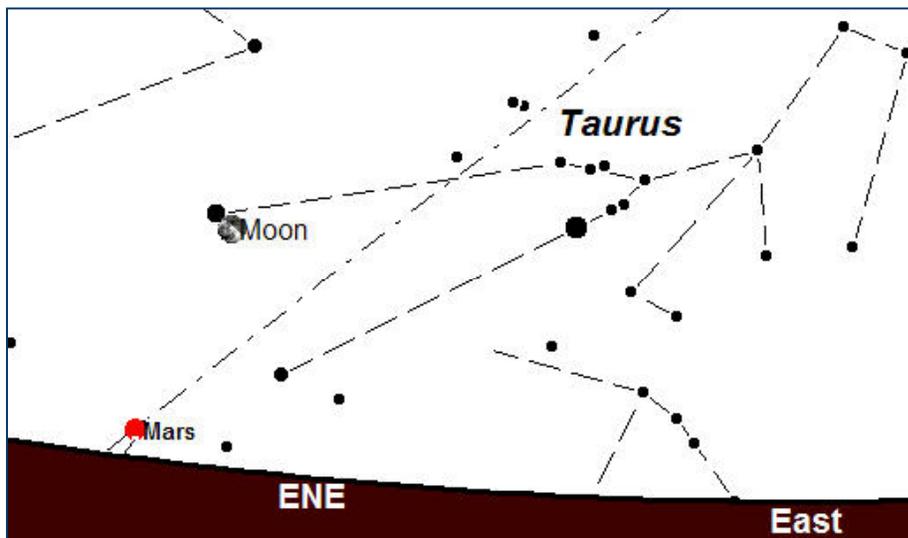
Starting in our Eastern skies, Mars makes its entrance into our fall skies, slowly increasing in brightness as it prepares to reach opposition in December. The “red planet” can be found just above the Eastern horizon at the start of the month, rising at about 10:45pm in the constellation of Taurus. By month's end, the planet will rise by about 8pm, so it's quickly moving “up” from the horizon. Mars is currently shining at about a magnitude of -0.1. By month's end, the planet will brighten by a whole ½ magnitude to -0.6 as it moves into the constellation of Gemini.

As long as we're in the constellation of Taurus, remember to have a look at the Pleiades on the night of the 27<sup>th</sup>. The moon will be very bright, just one day past Full Moon, but if you get a chance, you'll be able to see the Moon occult about half of the cluster over the course of the night. You may be able to see some of the stars reappear from behind the disk of the moon, but again, because the moon will be so bright, this may be difficult (but worth a look nonetheless).

In the wee hours of the month, we're treated to an interesting planetary display as Venus and Saturn go through a wonderful early morning “dance”. At the start of the month, Venus – which is literally blaring at a magnitude of -4.5 (yes, that's not a typo, I said minus 4.5) crests the horizon, moving into our Eastern skies around 3:30am. By about mid-month (around 4am) Venus is joined in the sky by Saturn, which is quickly rising from the eastern horizon. On the 15th of the month, the two planets are separated by only about 3 degrees. However, by month's end, Saturn moves quickly away from Venus, rising about an hour BEFORE its “partner.” The separation between the two planets increases to about 13 degrees.

The Moon adds a little excitement to the month by passing close to M44 (the Beehive cluster) in Cancer on the morning of the 5th. Due to the fact that the Moon will be just 6 days from New Moon, this may be a good binocular event rather than naked eye or telescope event. Also, on the 7th, look for the Moon, Venus, Saturn and Regulus to form a tight little grouping. At this time, the Moon will be about 5 days from New Moon, so it should be a little “sliver” of a disk, making for an interesting display.

The next meteor shower to come our way is the Orionids on October 21st. The gibbous Moon will set by 1-2 a.m., providing several good hours to watch the shower. Some experts predict that the Orionids could be better than average this year, with perhaps a large number of meteors per hour visible at their peak. The best viewing windows are Saturday, Sunday and/or Monday mornings, October 20-22 between 2am - 6am local since the radiant is at it's highest then. Meteors will originate just above Orion, between the feet of Gemini and below the horns of Taurus the Bull.



So while it may not be an exciting planetary sky for October, the cool weather and clear skies should lend itself nicely to some wonderful deep sky observing. Enjoy!