

Sky **WAA** tch

The Monthly Publication of the Westchester Amateur Astronomers

December 2007



Alone in a Crowd

Rick Bria and Ted Schimenti took this photo of NGC 7331 (aka Caldwell 30) in Pegasus at the Round Hill Observatory. It is a luminance layered (LL-RGB) image from 46 stacked luminance images, and 30 stacks each of RGB. The 14.5" RC telescope was used to automatically acquire the data through the automation program ACP.

Rick notes: At 50 million light years away, NGC 7331 seems to be in a close group of galaxies. In reality, the background galaxies (NGC 7335, 7336, and 7337) are 10 times farther away, and just happen to be in the same line of sight.

Some facts on NGC 7331: At 100,000 L.yrs in diameter, NGC 7331 is a near twin of our Milky Way. About ½-degree to the Southwest resides the well-known Stephan's Quintet of galaxies. For those lacking the telescopic aperture to hunt up the Quintet, try Jimmy Stewart's Holiday classic, *It's a Wonderful Life* for Hollywood's take.

Events for December 2007

➤ **Monthly Meetings**

"The Life and Accomplishments of Henry Draper"

Friday, December 7, 8:00PM

Andrus Planetarium

Hudson River Museum, Yonkers

Francis J. O'Reilly, past WAA President, will speak on the accomplishments of Henry Draper, a pioneer of astrophotography. Free and open to the public.

"Advances in Collimation Techniques"

Friday January 4, 8:00PM

Andrus Planetarium

Hudson River Museum, Yonkers

Howie Glatter will discuss recent advances in collimating telescopes. Free and open to the public.

➤ **Starway to Heaven**

Saturday, December 8, 7:00-10:00PM

Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River

This is our scheduled observing date for December, weather permitting. Free and open to the public. The scheduled rain/cloud date is December 15.

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.westchesterastronomers.org/>.

New Members. . .

Tom & Lisa Cohn, Bedford Corners, NY
Michael DiLorenzo, Yonkers, NY

Renewing Members. . .

Harry Butcher, Mahopac, NY
James Cobb, Tarrytown, NY
Gregory DiNome, Hawthorne, NY
Larry Faltz, Larchmont, NY
Ted Keltz, New Rochelle, NY
Patrick McGuire, Tuckahoe, NY
Scott Nammacher, White Plains, NY
Daniel Poccia, Cortlandt Manor, NY
Robert Rehrey, Yonkers, NY
Anthony Sarro, Scarsdale, NY
Doug & Vivian Towers, Yonkers



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 and Photos

Going My Way?

by Diane K. Fisher

Not many endeavors require that you plan the mode of transportation before you even know what it is you are transporting. But weighing the physics and economics of getting any sort of cargo to space is a major part of designing a space mission.

It's one of the first issues that NASA's New Millennium Program (NMP) considers when planning a new mission. NMP has the forward-looking job to identify promising new technologies for space exploration. It then helps to mature the technology so it will be available to space missions of the future. If the technology cannot be tested adequately on Earth, the last part of this process is to actually send the technology into space. With carefully documented test results, future mission planners can confidently incorporate the new technology into their designs.

But where to begin? On call from the start, Linda Herrell is the New Millennium Program Architect. Given a list of proposed technologies, she has the job of figuring out the feasibility of wrapping a mission around them.

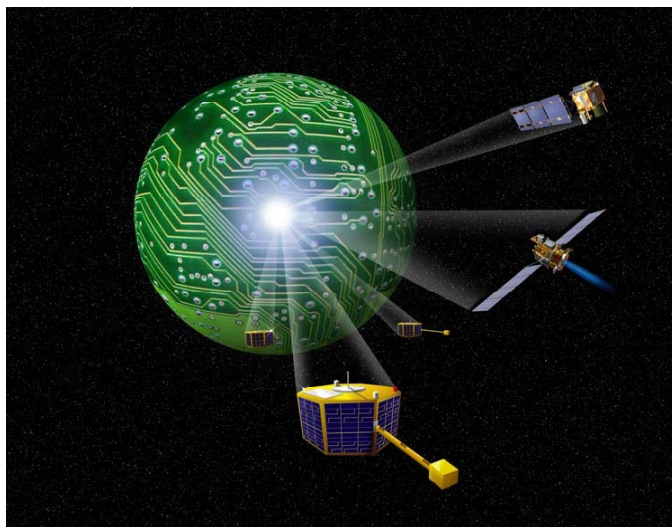
"We might be considering six or more technologies, anything from solar panels to imagers to masts for solar sails to more intelligent software. Of those, we may choose four. My job is to answer the question—can the selected technology be transported to and operated in space within the constraints of a low-cost technology validation project?"

Along with the list of possible mission payloads (the technologies), Linda also has a list of spacecraft to put them on, as well as a list of launch vehicle parameters. All she has to do is try them out in every possible combination (of which there are thousands) and see what might work.

"Fortunately, we have a software tool to help with this analysis," says Linda. When it comes down to it, her job is primarily to figure out how to get the technologies into space. "Sometimes, it's like figuring out how to get across town when you don't have your own car. You have to get creative."

She keeps a database of all possible options, including riding piggyback on another spacecraft, hitching a ride on a launch vehicle as a secondary payload, or sharing a launch vehicle with other NASA, Department of Defense, or even commercial payloads.

Her assessment is but one of a gazillion factors to be considered in planning a mission, but it is indeed one of the very first "details" that forms the foundation for the rest of the mission. *The Jet Propulsion Laboratory, California Institute of Technology, provided this article under a contract with NASA.*



NASA's New Millennium Program selects breakthrough technologies that will be of the greatest use to future space and Earth science missions and that are perceived to be risky to the first user.

Find out some of the technologies that NMP has already validated or is considering at:
<http://nmp.nasa.gov/TECHNOLOGY/innovative-tech.html> .



▲ **Comet 17P Holmes**

Jimmy Gondek took this image of Comet 17P Holmes on Nov. 9th from WPRR through a 14" Dob which was mounted on an equatorial platform. He used a Canon 30D set at ISO 800. The image is a stack of nine 10-second exposures with dark frames subtracted to eliminate noise and hot pixels. Processing involved a mid-point realignment in Levels using CS2 in 16-bit mode. The image was then reduced to 1/4 original size and then changed to 8-bit mode for JPG formatting. Jimmy notes: I wasn't expecting such a bright and powerful view...truly incredible—a nearly stellar nucleus with a strong off-center condensation deep within the coma. A few faint background stars showed through the glow, and a slight and diffuse elongation of the almost perfectly circular comet.



▲ **A Few Days Later**

Rick Bria and Ted Schimenti imaged the Comet on Nov 13th—stacks of 8, 60-second exposures from a FSQ106mm refractor were combined into an RGB image.

Editor's note: The Comet's core looks less pronounced, with perhaps the hint of a tail. What did you see?

Starway to Heaven, Ward Pound Ridge, November 10th **By Dave Butler**

Despite the cold weather Comet Holmes caused the turnout to be good. As an added bonus a club member in our group pointed out that Algol was near its minimum magnitude. Comet Holmes was big, I started with a 28 minute FOV eyepiece, but it was easier to switch to a 32mm eyepiece that had a 45-minute FOV. After the entire group had seen the Comet, I switched to my widest lens, a 36mm 2 inch eyepiece with AFOV of 70 degrees. This gave the brightest image that showed some of the tail. It was also used for Double Cluster, Pleiades, and the Andromeda galaxy with its companion galaxy M32. The spiral arm appeared as a faint streak across the eyepiece passing near M32. At 9PM Mars was low on the horizon. My wife said, she now knows why they call it the red planet. Other targets included the Saturn, Ring and Dumbbell planetary nebulas, globular clusters M2 M15 and M56, open clusters M39 and blue yellow doubles Cygni 61 and Almach.

A busload of Fordham University came and stayed with Bill Newell and the clubs 20 inch Dob for the whole evening. Bill as usual gave them detailed information about the night sky. In our group Jimmy pointed out all the nights constellations and the Milky Way. His vision is somewhat better than mine. I always learn something new. I have trouble saying where one constellation is in relationship to another even if I know both—may be the result of a "goto" telescope.

Constellation Corner:

by Matt Ganis

As you know for this column, I typically like to highlight some of the constellations in our current month's sky and discuss the various mythologies around them. Of course, if it's a holiday season, I like to look at the constellations and see if I can somehow relate the season to the constellations.

Try as I might, I could not find any Christmas or Chanukah symbols "up there". But as I thought about what I'd write, I remembered a story I typically tell my class when we're discussing constellations. As rumor would have it, there was once a 2nd or 3rd grade teacher that was trying to teach her students about the "patterns in the sky". They were interested, but to make it just a little more entertaining, she had them create their own constellation out of an existing star pattern. She started with the stars of Cassiopeia and asked "now, what pattern or picture do you see?" - of course, given their ages they didn't see a Queen's throne or some exotic animal - they saw the Golden Arches (an "M") of McDonalds. So if they can do it, I can

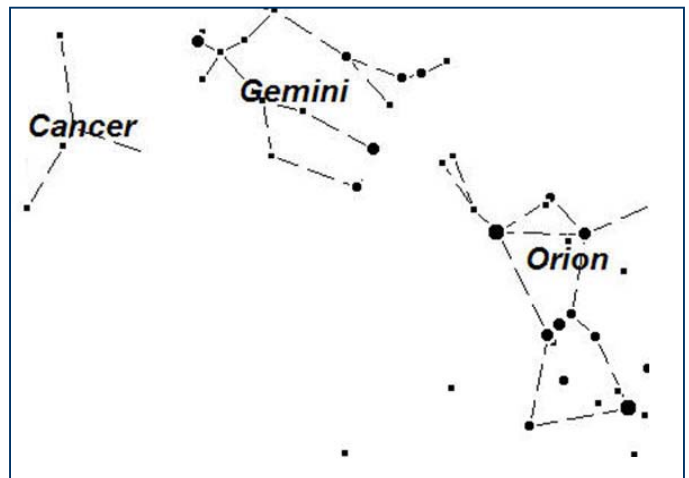
Looking to our West this month, we watch as Cygnus the swan sinks below the horizon. Originally known simply as the "Bird" in ancient times, it later became the constellation Cygnus, the Swan. But the brightest six stars of Cygnus compose an asterism more popularly called the Northern Cross.

The bright star Deneb decorates the top of the Cross with Alberio representing the foot. While usually regarded as a summertime pattern, the Cross is best oriented for viewing now, appearing to stand majestically upright on the northwest horizon at around 8:30 p.m. local time, forming a perfect looking Christmas tree!

Looking to the Southeast, we come to (arguably) the most famous wintertime constellation: Orion. The French astronomer Nicolas Camille Flammarion referred to the three belt stars of Orion as "The Three Kings." And if we were to consider these three stars as representing the Magi, then not too far away,

to the east, within the faint zodiacal constellation of Cancer, is the star cluster known as Beehive cluster or the Praesepe, which is Latin for "manger".

A manger is defined as a trough or open box in which feed for horses or cattle is placed. But the Book of St. Luke also tells us that the baby Jesus, wrapped in swaddling clothes, was set down in a manger because there was no room at the Inn. The Praesepe represents this manger where Christ was born. The two brighter stars flanking M44 to the north and south, Gamma and Delta Cancer, were known to ancient mariners as Aselli (or Ass's) which were seen to be gathered around the glimmering manger (the star cluster) representing the scene of the Nativity.



M44 is an easy naked eye object, which is more than twice the size across of the full Moon, and has been observed since prehistoric times. It was one of the first objects on which Galileo trained his newly acquired telescope. M44 is also one of the nearest open clusters - only about 600 light-years away. For those of you that received a Holiday gift of binoculars, give a quick look: you won't be disappointed.

So I hope you all have a wonderful holiday - and enjoy all of those astronomy presents that I'm SURE Santa brought to you!

Almanac

For December 2007 by Matt Ganis



Dec 1



Dec 9



Dec
17



Dec
23

Can you believe we're at the end of the year already? It seems like only yesterday I was writing about the constellations of springtime. But like Santa's sleigh, the month of December brings a slew of presents with it (in the form of planetary observations of course).

The festivities start right away: on the 1st of the month our early morning skies are graced with a close conjunction of Saturn and a last quarter Moon. The ringed planet rises in our skies around 11pm at the start of the month, but will rise into skies by about 9:30pm to begin the New Year. Saturn, which can be found at the feet of Leo the Lion, is shining at about a magnitude of about +0.6 but will only brighten by about a tenth of a magnitude at month's end. It should still make for some nice early evening viewing.

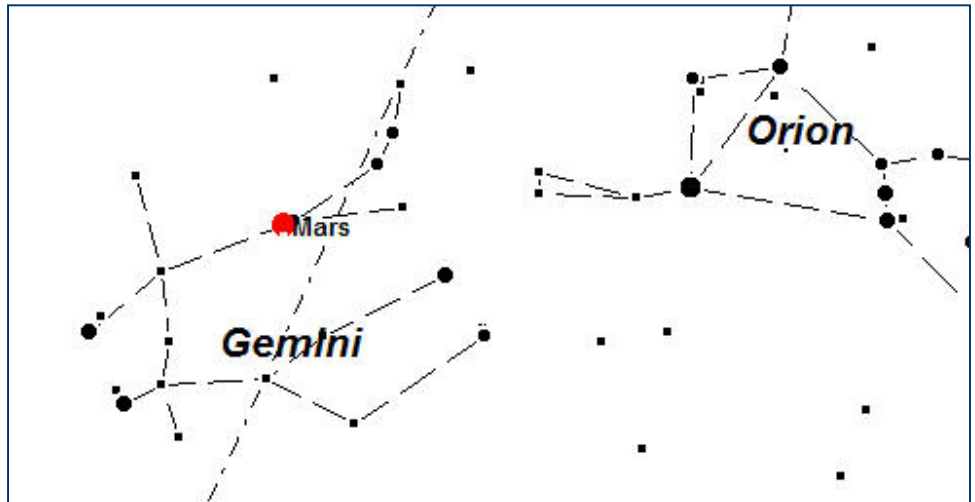
Venus is another of those early morning risers, cresting the eastern horizon around 3:30am on December 1st. In the past I've often commented how "you won't be able to miss it" because it's so bright. This month, I think you'll truly be astounded by the brightness of this planet as it shines at a magnitude -4.2 in your sky.

In our evening skies, Mars takes center stage. The tiny, red planet reaches opposition on December 24th. Remember, a superior planet (those planets whose orbit is farther from the Sun than the Earth's) are said to be "in opposition" when it is directly on the opposite side of the Earth from the Sun. This is generally the closest it comes to the Earth and the time at which it is most easily visible. At its opposition, Mars will rise at Sunset and set in the Northwest at Sunrise. The planet is in retrograde in the constellation of Gemini for most of December, finally moving into Taurus for the start of the New Year.

The Geminids return again in December on the night of December 13th -14th. Meteor enthusiasts are keenly awaiting the Geminids in 2007 because their progenitor, the defunct comet Phaethon, precedes them in a flyby of Earth on December 10th. The Best viewing windows should be Friday morning, December 14 around the last few hours

before morning twilight and the entire night of Thursday evening/Friday morning, December 13/14 after about 8pm local time.

The Geminids are medium-speed meteors. Most don't leave a glowing train, but the brighter ones are often colored (yellow, green and blue are most common). The proportion of bright meteors is higher during and after maximum than on pre-maximum nights. The Geminids are worth watching for one or two mornings before the peak; there will be slightly less moonlight interference (New Moon is December 9th), and some locations will get a short moonless period before morning twilight.



The mid December solstice marks the beginning of winter in the Northern Hemisphere and summer in the Southern Hemisphere. In the Northern Hemisphere, the Winter Solstice occurs on December 22, 2007 at 1:08 AM EST. This marks the shortest day and the longest night of the year. The Sun appears at its lowest point in the sky, and its noontime elevation appears to be the same for several days before and after the solstice. Hence the origin of the word solstice, which comes from Latin solstitium, from sol, "sun" and -stitium, "a stoppage." Following the winter solstice, the days begin to grow longer and the nights shorter.

So that's it for this month. I wish each and every one of you a wonderful Holiday, and peaceful New Year!