

Sky **WAA** tch

The Monthly Publication of the Westchester Amateur Astronomers

December 2008



The Silver Coin

Doug Baum teamed up with Mike Virsinger out at New Mexico Skies Astronomy Village to capture this image of NGC 253—the Sculptor Galaxy. They used a Takahashi FRC-300 telescope with a SBIG STL-11000M camera on a Paramount ME Mount (The image is 4x15 minutes Luminance, 2 x 15 minutes in each channel R, G and B).

Facts on NGC 253: Sometimes called the Silver Coin galaxy, NGC 253 (aka Caldwell 65) was discovered by Caroline Herschel in 1783. Estimated distance to this spiral galaxy is 9.8 million light years, making it a near neighbor to the Milky Way local group. At 54,000 light years in diameter, NGC 253 is roughly one-half the size of our Milky Way.

Events for December 2008

➤ *Monthly Meetings*

“The NEAR Shoemaker Mission to Asteroid Eros”

Friday, December 5th, 8:00 PM

Andrus Planetarium

Hudson River Museum, Yonkers

David High, a designated NASA Solar System Ambassador, will be giving a lecture on the NEAR Shoemaker Mission to the asteroid Eros. Free and open to the public.

“Energy Technologies Updated”

Friday, January 9th, 8:00 PM

Andrus Planetarium

Hudson River Museum, Yonkers

Launch the New Year with Prof. Steve Greenbaum of Hunter College/CUNY as he updates his talk on Energy Technologies for Earth and other planets, as related to the exploration of Mars as well as other planetary programs. Free and open to the public.

➤ *Starway to Heaven*

Saturday, December 20th, 7:00-9:00PM

Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River

This is our scheduled Starway to Heaven observing date for December, weather permitting. Free and open to the public. The scheduled rain/cloud date is December 27th.

Renewing Members. . .

Paul Andrews, Patterson, NY

Harry Butcher, Mahopac, NY

Larry & Elyse Faltz, Larchmont, NY

Bob Kelly, Ardsley, NY

Hans Minnich, Bronx, NY

Scott Namacher, White Plains, NY

Daniel Poccia, Cortlandt Manor, NY

Robert Rehrey, Yonkers, NY

Anthony Sarro, Scarsdale, NY

James Steck, Mahopac, NY

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.westcheasterastronomers.org/>.



Bob Kelly took this image of Orion from the backyard of his house—a 15 sec exposure using a Canon A40 on tripod.

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; Vice President: Michael Virsinger Vice President Programs (lectures): Pat Mahon; Treasurer: Doug Baum; Vice President Membership: Karen Seiter; Vice President Field Events: David Butler; Newsletter: Tom Boustead.

Articles and Photos Gallery

What Happened to Comet Holmes?

By Dr. Tony Phillips

One year after Comet 17P/Holmes shocked onlookers by exploding in the night sky, researchers are beginning to understand what happened.

“We believe that a cavern full of ice, located as much as 100 meters beneath the crust of the comet’s nucleus, underwent a change of phase,” says Bill Reach of NASA’s Spitzer Science Center at the California Institute of Technology. “Amorphous ice turned into crystalline ice” and, in the transition, released enough heat to cause Holmes to blow its top.

Anyone watching the sky in October 2007 will remember how the comet brightened a million-fold to naked-eye visibility. It looked more like a planet than a comet—strangely spherical and utterly lacking a tail. By November 2007, the expanding dust cloud was larger than Jupiter itself, and people were noticing it from brightly-lit cities. Knowing that infrared telescopes are particularly sensitive to the warm glow of comet dust, Reach and colleague Jeremie Vaubaillon, also of Caltech, applied for observing time on the Spitzer Space Telescope—and they got it. “We used Spitzer to observe Comet Holmes in November and again in February and March 2008,” says Reach.

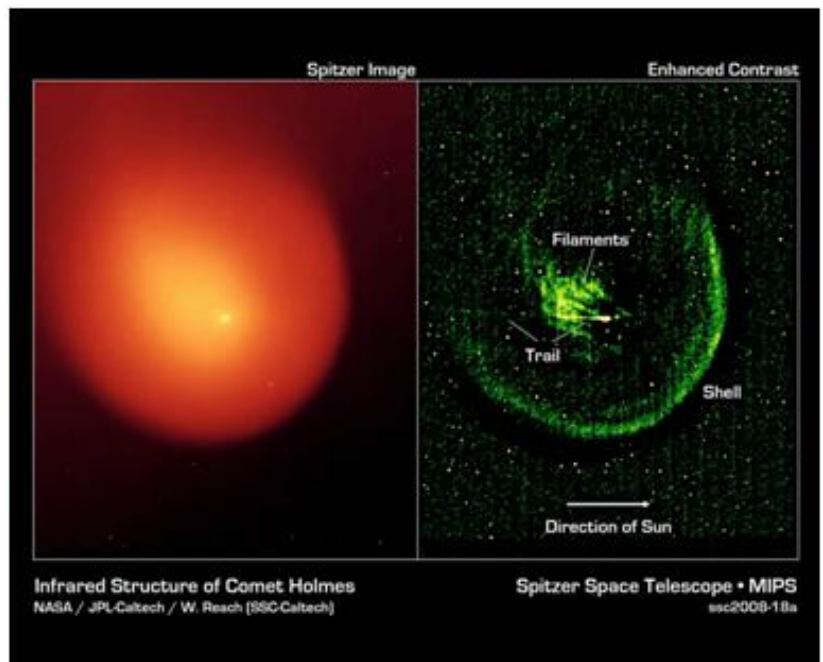
The infrared glow of the expanding dust cloud told the investigators how much mass was involved and how fast the material was moving. “The energy of the blast was about 10^{14} joules and the total mass was of order 10^{10} kg.” In other words, Holmes exploded like 24 kilotons of TNT and ejected 10 million metric tons of dust and gas into space.

These astonishing numbers are best explained by a subterranean cavern of phase-changing ice, Reach believes. “The mass and energy are in the right ballpark,” he says, and it also

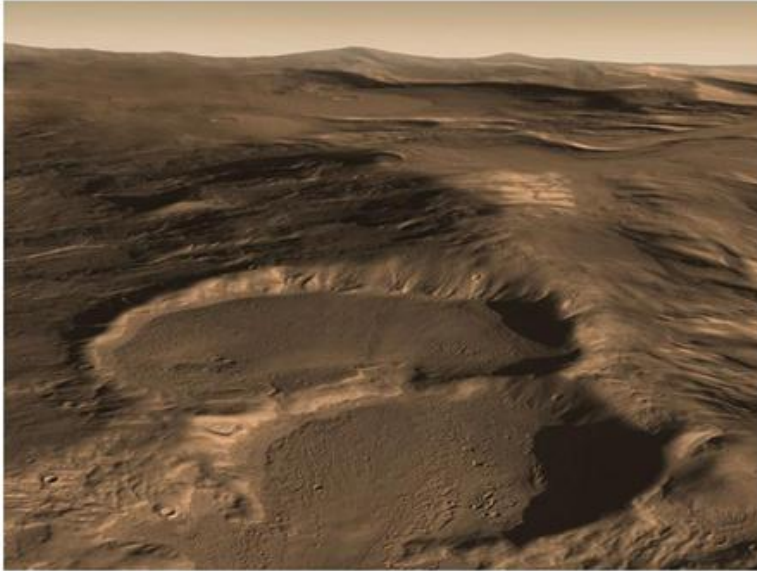
explains why Comet Holmes is a “repeat exploder.”

Another explosion was observed in 1892. It was a lesser blast than the 2007 event, but enough to attract the attention of American astronomer Edwin Holmes, who discovered the comet when it suddenly brightened. Two explosions (1892, 2007) would require two caverns. That’s no problem because comets are notoriously porous and lumpy. In fact, there are probably more than two caverns, which would mean Comet Holmes is poised to explode again. When? “The astronomer who can answer that question will be famous!” laughs Vaubaillon.

“No one knows what triggered the phase change,” says Reach. He speculates that maybe a comet-quake sent seismic waves echoing through the comet’s caverns, compressing the ice and changing its form. Or a meteoroid might have penetrated the comet’s crust and set events in motion that way. “It’s still a mystery.”



Comet Holmes as imaged by the multiband imaging photometer (MIPS) on the Spitzer Space Telescope. The enhanced contrast image at the right shows the comet’s outer shell and mysterious filaments of dust.



Martian Underground Glaciers

What created this unusual terrain on Mars? The floors of several mid-latitude craters in the Hellas Basin on Mars appear unusually grooved, flat, and shallow. New radar images from the Mars Reconnaissance Orbiter bolster an exciting hypothesis: huge glaciers of buried ice.

Credit:

*NASA/JPL-Caltech/UTA/UA/MSSS/ESA/DLR/JPL
Solar System Visualization Pro*



Soul Nebula

Here, Doug Baum images IC 1848—the Soul Nebula in Perseus. The image was taken with a 14nm band-pass H-alpha filter on 9-23-08 in Pound Ridge, NY using a Takahashi FSQ-106 EDXII with QSI 532wsg CCD camera on Takahashi EM-200 Temma 2 mount; 2 Exposures of 300 seconds stacked.



Pinwheel Galaxy

Here's another collaboration by Doug Baum and Mike Virsinger from the Mexico Skies Astronomy Village—this time M33, the Pinwheel Galaxy in Triangulum. The exposure is 3 x 15 minutes Luminance, 1 x 15 minutes in each channel R, G and B, again using a QSI 532wsg CCD camera on a Takahashi EM-200 scope.

Constellation Corner

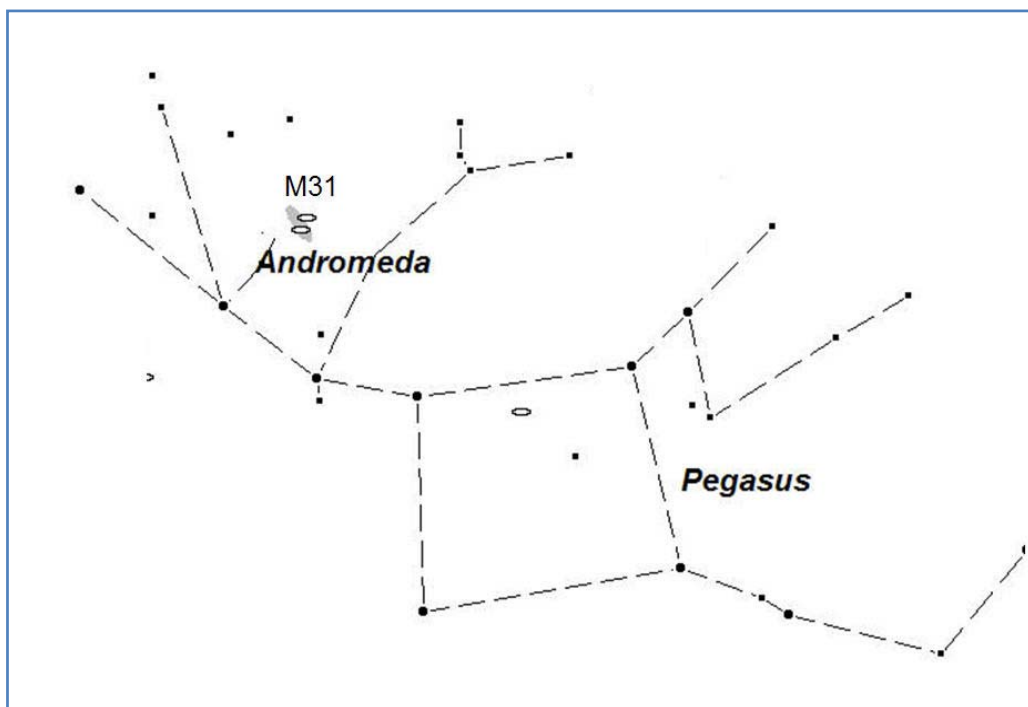
By Matt Ganis

This month if you look high in our zenith skies you'll get a glimpse of the great square of Pegasus accompanied by the gentle arc of Andromeda, the princess. Andromeda contains one corner of the Great Square of Pegasus (the star Alpheratz – which means the navel of the horse). Andromeda's dress flows outward from the corner along three pairs of stars, with each pair slightly farther apart than the previous pair. Perhaps she is petting Pegasus, who bore the hero Perseus across the ocean on his mighty wings to save her from the sea monster Cetus.

Andromeda does have an interesting object within its boundaries, the Messier object 31 or the Andromeda Galaxy. The large galaxy is located around 2.5 million light years away, and is the most distant

of Milky Way). M31 is so large it is accompanied by at least 10 satellite galaxies, including M32 and M110 (both visible through binoculars).

M31 is part of "our" group of galaxies, the so-called Local Group. It was first recognized by Hubble, in the time of the first distance determinations and redshift measurements. Other members of the Local Group (over 30 in all) include our Milky Way Galaxy, the Large and the Small Magellanic Cloud (LMC and SMC), which were known before the invention of the telescope, as well as several smaller galaxies which were discovered more recently. These galaxies are spread in a volume of nearly 10 million light years diameter, centered somewhere between the Milky Way and M31.



The Hubble Space Telescope has revealed the appearance of a double nucleus in Andromeda. It may be that there really are two bright nuclei, perhaps because a smaller galaxy was cannibalized in the past, or that there is a single core partly obscured by dust.

object visible to the naked eye. Recent estimates suggest that M31 is bigger but less massive than the Milky Way Galaxy (even though some consider the Andromeda galaxy to be the sister galaxy

Almanac

For December 2008 by Matt Ganis



Dec 5



Dec 12



Dec 19



Dec 27

Our December skies open with the familiar constellations of Taurus, Gemini and Orion rising up from our eastern horizon just as the Sun sets. There isn't much planetary activity this month, but since it's the season of Thanksgiving, let's be thankful for what we have.

At the start of the month, the always bright Jupiter can found near the western horizon, making its exit from our skies – falling below our horizon by December 10th. If you get a chance, have a look on December 1st where Jupiter, Venus and the Moon form an interesting conjunction low in the western skies.

The planet Venus is literally glowing at a magnitude of -4.0 while Jupiter is holding its own, shining at an impressive magnitude -2.0. So while Jupiter is rapidly moving to the West, Venus is quickly moving in the opposite direction rising higher above western horizon, well into March, making it nice a early evening object.

Later in the evening (around midnight at the start of the month) look for a rising Saturn just under the foot of Leo the Lion. If you're like me, midnight is too late, however the ringed planet will start to rise around 10:30pm by the end of the month (making for great viewing in those new telescopes that you got for the holidays).

The annual Geminid meteor shower is expected to peak on December 13th. The Geminids usually rank as one of the best meteor showers for the year, but this year the nearly full moon will wash out all but the brightest Geminid meteors from view—so don't expect too much from this shower.

As the Earth travels around the Sun in its orbit, the north-south position of the Sun changes over the course of the year due to the changing orientation of the Earth's tilted rotation axes with respect to the Sun. The dates of maximum tilt of the Earth's equator correspond to the summer solstice and winter solstice, and the dates of zero tilt correspond to the vernal equinox and autumnal equinox. In

the northern hemisphere, the Winter solstice is day of the year (near December 22) when the Sun is farthest south. This point the shortest day of the year in the sense that the length of time elapsed between sunrise and sunset on this day is a minimum for the year. For us the Winter Solstice occurs on December 21, 2008 at 7:04 AM EST.

