SkyWAAtch

The Monthly Publication of the Westchester Amateur Astronomers **February 2007**

Double Cluster

Rick Bria and Ted Schimenti took this color image of the Double Cluster in Perseus at the Round Hill Observatory. Observes Rick: Note the subtle colors of stars throughout the image, especially a sprinkling of orange stars (red giants), which look just like I've seen them in the 12.5" Bowman Observatory reflector. We try to achieve 'true color' by assembling calibrated (from G2v stars) RGB (Red, Green, Blue) panes. This of course means 3 times the work than for a black and white image, but the result agrees well with nature. The image was taken with the FSQ106mm refractor, during perfect weather in September 2005, while the big 14.5" scope had an electronic control problem.

Some Facts...

The Double Cluster (NGC884 and NGC869) are what their name implies, a double cluster of stars. 7000 light years distant in the constellation of Perseus, and each 80 light years across, they formed from one huge gas cloud. The Double Cluster can be seen from a dark location naked eye, and their discovery predates written history, but the Greek astronomer Hipparcos first cataloged them in 130 BC.

Events for February 2007

➢ Monthly Meetings

"**The Space Program We Never Had**"
Friday February 2, 8:00PM
Hudson River Museum, Yonkers
Patrick Di Justo speaks on the US space program. Patrick, a former WAA president, is a contributing editor to Wired, The New York Times, The Atlantic Monthly, Salon.com and Popular Science. He also reports for WFUV and has been a technology commentator for CNN.

"Lunar Geology"
Friday March 2, 8:00PM
Hudson River Museum, Yonkers
Alan Witzgall will speak on the geology of the Moon. Alan is a well-known astronomy lecturer who works on precision optical components and is active in many New Jersey astronomical organizations

➢ "Starway to Heaven"

Saturday, February, 17, 7-10:00PM
Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River
This is our scheduled observing date for February, weather permitting. Free and open to the public. The scheduled rain-snow/cloud date is February 24th.

➢ Upcoming Events

Family Stargazers' Night
March 20--George Washington Elementary School 3634 Lexington Avenue, Mohegan Lake, 7 p.m. Rain date: March 21.

Vernal Equinox Star party
March 22--Quaker Ridge Elementary School125 Weaver St Scarsdale (Exits 20, SB or Exit 21, NB Hutch & route 125), 7PM. Rain date: Thursday, March 23.

ANNUAL ELECTIONS

Election of officers will be conducted at the February meeting. Please bring your completed ballot with you to the meeting.

Club Bits

New Members…

Gregory DiNome, Hawthorne, NY
Jacob Richards, Harrison, NY

Renewing Members…

James Cobb, Tarrytown, NY
Margot Dilmaghani, Purchase, NY
Jay Friedman, Katonah, NY
Ted Keltz, New Rochelle, NY
Gary Miller, Pleasantville, NY
George Thomas, Irvington, 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.westchesterastronomers.org/.

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: Mike Cefola, President; Robert Davidson, Senior Vice Pres.; Mike Virsinger, Treasurer; Karen Seiter, Secretary; Charles Gibson; Vice Pres. Programs; Barbara Moroch, Vice Pres. Communications; Newsletter: Tom Boustead; Webmaster: Robert Davidson.

Articles

A Great Big Wreck

By Dr. Tony Phillips

People worry about asteroids. Being hit by a space rock can really ruin your day. But that's nothing. How would you like to be hit by a whole galaxy?

It could happen. Astronomers have long known that the Andromeda Galaxy is on a collision course with the Milky Way. In about 3 billion years, the two great star systems will crash together. Earth will be in the middle of the biggest wreck in our part of the Universe.

Astronomer John Hibbard isn't worried. "Galaxy collisions aren't so bad," he says. A typical spiral galaxy contains a hundred billion stars, yet when two such behemoths run into each other "very few stars collide. The stars are like pinpricks with lots of space between them. The chance of a direct hit, star vs. star, is very low."

Hibbard knows because he studies colliding galaxies, particularly a nearby pair called the Antennae. "The two galaxies of the Antennae system are about the same size and type as Andromeda and the Milky Way." He believes that the Antennae are giving us a preview of what's going to happen to our own galaxy.

The Antennae get their name from two vast streamers of stars that resemble the feelers on top of an insect's head. These streamers, called "tidal tails," are created by gravitational forces—one galaxy pulling stars from the other. The tails appear to be scenes of incredible violence.

But looks can be deceiving: "Actually, the tails are quiet places," says Hibbard. "They're the peaceful suburbs of the Antennae." He came to this conclusion using data from GALEX, an ultraviolet space telescope launched by NASA in 2003.

The true violence of colliding galaxies is star formation. While individual stars rarely collide, vast interstellar clouds of gas do smash together. These clouds collapse. Gravity pulls the in-falling gas into denser knots until, finally, new stars are born. Young stars are difficult to be around. They emit intensely unpleasant radiation and tend to "go supernova."

GALEX can pinpoint hot young stars by the UV radiation they emit and, in combination with other data, measure the rate of star birth. "Surprisingly," Hibbard says, "star formation rates are low in the tidal tails, several times lower than what we experience here in the Milky Way." The merging cores of the Antennae, on the other hand, are sizzling with new stars, ready to explode.

So what should you do when your galaxy collides? A tip from GALEX: head for the tails. To see more GALEX images, visit www.galex.caltech.edu.

This GALEX UV image of the colliding Antennae Galaxies shows areas of active star formation, which is not in the tidal tails as one might expect.

This image may be downloaded from http://spaceplace.nasa.gov/news_images/antennae_galaxies.jpg.

Photo Gallery

Comet Swan

Last October 27th Rick Bria and Ted Schimenti took this photo of Comet Swan at Round Hill Observatory through the 14.5" RCOS Scope. It's a stack of 19, 1-minute images, statistically combined to eliminate distracting background stars. This image was taken just three days after Comet Swan (C/2006 M4) made its closest approach to Earth.

Notes Rick: Comet Swan's ghostly tail is made of ionized gas (carbon monoxide). As far as I know, it did not have a dust tail. The actual tail was much longer than shown in this image, but I had a limited field of view, and wanted a close look at the coma. It almost looks like an old primitive painting of comets that you might see in textbooks.

Sunset at 32,000 Feet

Karen Seiter recently took this photo flying home from Barbados. Says Karen; I was on a cruise in the southern Caribbean last week. The skies on the open ocean under a moonless sky were incredible as usual.

Earth/Venus Pairing

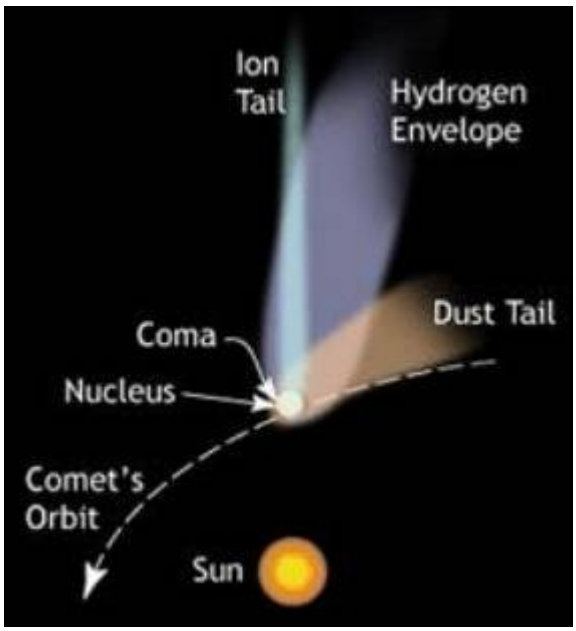
Jimmy Gondek decided to brave the cold and wind on January 22nd and take his "new camera out for a spin and try to catch a decent picture of the Moon/Venus pairing that was decorating our sky. The image was taken at around 6 p.m. from a parking lot overlooking some woods in Mahopac. The camera was a Canon 30D using a 75-300mm zoom set at 125mm, f/7.1 with a 1-second exposure at ISO1600. The image was shot in RAW mode and converted to JPG in PS Elements, a slight adjustment was done using the Levels controls to bring up the exposure brightness."

Constellation Corner:

By Matt Ganis

I don't know how many of you had a chance to see Comet McNaught last month. It really was pretty impressive. Some estimates had it as bright as magnitude -5.0 – I'm not sure I saw it when it was THAT bright, but it was pretty noticeable in the sky. While observing the comet, I thought it might make sense to look a little closer at where these things come from and what they're all about.

The current theory on the composition of comets came from Fred Whipple in 1950. It is called the dirty snowball theory. At the center of the comet's head is the nucleus, typically several kilometers in diameter. This nucleus is composed of ices of water, ammonia, carbon dioxide and methane with dust mixed in. These dust particles are smaller than the particles in cigarette smoke. The gases expand to form a cloud-like structure known as the coma. As the comet gets closer, these gases are illuminated by sunlight, making them visible to us if the comet is either especially large or especially close to the Earth.



When people talk about comets, they typically think of the tail being generated by the speed of the "iceball" racing through space. Interestingly the word comet means "long haired" in reference to the streaming tails of some comets, which may extend tens of millions of miles from the nucleus. The tails are simply extensions of gas and dust pushed back from the nucleus and coma by the solar wind. Many comets have two tails, a gas tail and a dust tail. The dust tail is caused by dust particles released from the gasses being vaporized, and usually curves slightly behind the comet. The gas, or ion tail (which is usually brighter than the dust tail) is composed of ionized gasses excited by the ultraviolet radiation from the Sun. It's usually a wispy bluish color and is blown straight back.

Comets are actually collections of materials left over from the formation of the solar system. This makes them especially interesting to astronomers because the solar system formed around 4,600 million years ago! Studying the composition of comets can tell us something about the history of the solar system. Comets have their origin in a region well beyond the orbit of Pluto, and perhaps half way to the nearest stars. This region is at the outer limits of our solar system and is called the Oort Cloud. There are possibly hundreds of millions of comets in waiting here. Occasionally, a passing star or even a comet already in orbit around the Sun will nudge one of these dirty snowballs. If it's jostled toward the Sun, it will eventually have an orbit all of its own. Comets that arrive from the Oort Cloud are called long period comets. Sometimes these comets can be influenced by the gravity of one of the planets as they travel around the Sun. Jupiter is large enough to alter the orbit of a comet if it ventures too near.

Without the Sun, we wouldn't be able to see comets very easily or maybe even at all! This is because they reflect the light from the Sun, rather than having their own source of light. This makes the sun vital to the observation of comets. Remember, as the comet approaches the Sun, the radiation evaporates the ice creating the tails. That then poses the question: How long do comets last? That depends on the comet's orbit. A comet loses some of its ice and gases every time it goes by the Sun. After about 500 passes, most of the ice and gas is lost, and the comet turns into something close to an asteroid – and eventually they won't reappear. So the amount of time it takes a comet to orbit the Sun determines how long the comet will last.

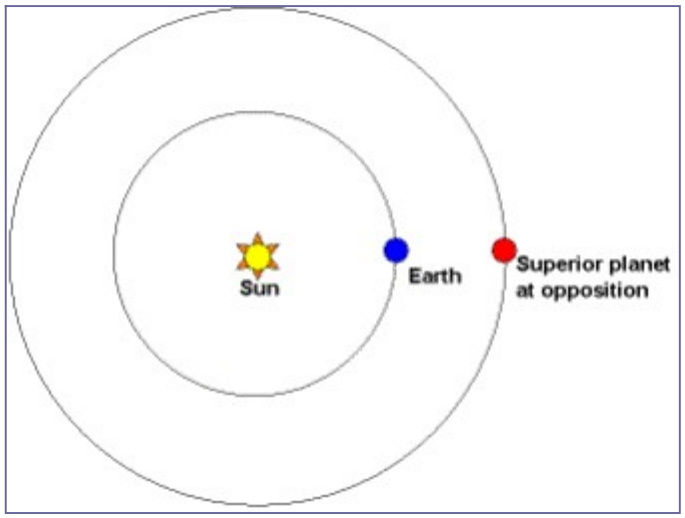
Before they were understood, comets caused quite a stir throughout history. People have blamed them for all sorts of tragedies, from the start of wars, to plagues, illnesses, and deaths of leaders. In recent times there has been a lot of hype about "doomsday" comets, which are comets that people believe will hit the Earth. The United States even set up the Near Earth Asteroid Tracking (NEAT) program specifically to guard us from these cosmic catastrophes. However, although they were once regarded as omens of disaster, and messengers of the god(s), today a scientific approach has helped put those concerns to rest.

Almanac

For February 2007 by Matt Ganis

Isn't it great to be outside at your telescope at night and not have to stand in 6 inches of snow; your feet freezing from the cold? I know I shouldn't mock Mother Nature - she always seems to get the last laugh.

Clearly the highlight of this month's sky is the beautiful planet Saturn. On February 10, Saturn reaches opposition, making it an ideal time to observe the ringed world. Opposition is a point in time when the Earth lies between a planet and the Sun, making the Sun and planet appear in opposite directions as viewed from the Earth. Oppositions are the best opportunities for observing superior planets because they are well away from the glare of the Sun, and closer to the Earth than usual.



Saturn starts the month by rising at about 5:30pm and setting by 7:30am (I think you should be able to find some time to catch a quick glimpse). The ringed planet is located at the feet of Leo the Lion, and will continue to shine at a magnitude of -0.16 throughout the month. See if you can see the planet on the night of February 2nd when a Full moon is about 1.5 degrees to the East of the planet.

No other planets are really visible in our evening skies. Jupiter is beginning to move from our early morning sky into the night sky, but it will take a few more months until it's observable by those of us that need our beauty rest. Jupiter is nearly 6 times as bright as Saturn, shining at a magnitude of -1.9 – unfortunately it doesn't rise high enough in the sky to be visible until about 3am at the start of the month. It gets a little better at the end of the month when the "Big Guy" rises a few minutes before 2am.

Mars is doing a similar "dance". The red planet starts the month rising at about 5:25am – only an hour and half ahead of the Sun. It doesn't get much better by month's end, rising at 5am. Keep the faith though, things will get better as we move into the summer months.

Venus is quite a sight in our early evening skies. If you tried to see the comet last month, I'm sure you got a good view of the planet. It's still VERY bright, checking in at a magnitude of almost -4.0! The planet is actually getting a little higher in our skies as the month progresses, reaching about 19 degrees above the horizon, making it very observable. On the nights of February 6th and 7th look for Uranus to be about 1 degree North of Venus. If you've never had the chance to see Uranus, don't pass up this chance. With Venus so bright you won't be able to miss it in the sky, it's a perfect "pointer" to this dim, distant world.