

# Sky **WAA** tch

The Monthly Publication of the Westchester Amateur Astronomers

January 2007



## ◀ A Winter Wonder

Rick Bria took this wide-angle shot of the Orion nebula (M42) back in 2004, at the Round Hill Observatory. He used a Tak FSQ 106mm refractor. It's a single 300-second exposure through a red filter.

Visible to the unaided eye as a 'fuzzy star', M42 can be found below the three belt stars of Orion. The Orion nebula is 1500 light-years away, about 40 light years across, and like most nebulae, is a star-birth region, with a potential of producing thousands of stars.

## Another Orion Wonder ▶

Rick used the TAK FSQ-106mm refractor to capture this view (a single 5 minute image) of the Horsehead and Flame nebulae complex.

The Horsehead Nebula is about 1500 light years away. Also, just left of center is the bright star Alnitak. It's the leftmost belt star in Orion's belt. Alnitak is interesting enough all on its own. It's a hot blue super-giant star, 800 light years away, 10,000 times brighter, and 20 times more massive than our star.

Rick notes: If Earth were orbiting Alnitak, it would have to be more than 30 billion miles away (more than 8 Pluto distances) so as not to boil our oceans away. But, the saying 'those that burn twice as bright burn half as long' applies to Alnitak, because even though it is only about 6 million years old (our sun is 5 billion) it is soon to go supernova.



# Events for January 2007

## ➤ **Monthly Meetings**

**“Current and Future Measurements of Water in Mars’ Atmosphere”**

**Friday, January 5, 8:00PM**

**Hudson River Museum, Yonkers**

Life “as we know it” requires the presence of water. Brother Robert Novak from Iona College will discuss the measurement of water in the Martian atmosphere. He works with the Goddard Space Flight Center’s Infrared Spectroscopy Group and uses NASA’s 3-meter Infrared Telescope atop Mauna Kea.

**“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.

## ➤ **“Starway to Heaven”**

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

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

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

## ➤ **Upcoming Events**

**Vernal Equinox Star party**

Wednesday, March 22 Quaker Ridge Elementary School 125 Weaver St Scarsdale (Exits 20, SB or Exit 21, NB Hutch & route 125), 7PM. Rain date: Thursday, March 23.

**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/>.

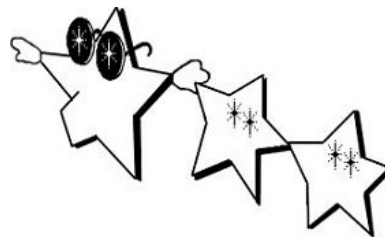
## **Club Bits**

### **Renewing Members...**

David Butler, Mohegan Lake, New York  
William Sawicki, Bronx, New York  
Neil Schreffler, Bedford Hills, New York

### **Calendars...**

The WAA is selling, while supplies last, a limited number of Guy Ottewell’s astronomical calendar for \$20 (~\$5 savings). For each month the “Astronomical Calendar” shows a large map of the evening sky, a diary of evening events, planets orbits and telescopic tours. We also have the “2007 Deep Space Mysteries Calendar” for \$6.50 (~1/2 price). E-mail the club with your request. Members who have already placed an order can pick up their calendars at the January monthly meeting, or contact us if you are unable to make the meeting.



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

## Space Weather for Air Travelers

By Dr. Tony Phillips

At a time when much of the airline industry is struggling, one type of air travel is doing remarkably well: polar flights. In 1999, United Airlines made just twelve trips over the Arctic. By 2005, the number of flights had grown to 1,402. Other airlines report similar growth.

The reason for the increase is commerce. Business is booming along Asia's Pacific Rim, and business travel is booming with it. On our spherical Earth, the shortest distance from Chicago to Beijing or New York to Tokyo is over the North Pole. Suddenly, business travelers are spending a lot of time in the Arctic. With these new routes, however, comes a new concern: space weather.

"Solar storms have a big effect on polar regions of our planet," explains Steve Hill of NOAA's Space Weather Prediction Center in Boulder, Colorado. Everyone knows about the Northern Lights, but there's more to it than that: "When airplanes fly over the poles during solar storms, they can experience radio blackouts, navigation errors and computer reboots—all caused by space radiation."

In 2005, United Airlines reported dozens of flights diverted from polar routes by nasty space weather. Delays ranged from 8 minutes to nearly 4 hours, and each unplanned detour burned expensive fuel. Money isn't the only concern: Pilots and flight attendants who fly too often over the poles could absorb more radiation than is healthy. "This is an area of active research—figuring out how much exposure is safe for flight crews," says Hill. "Clearly, less is better."

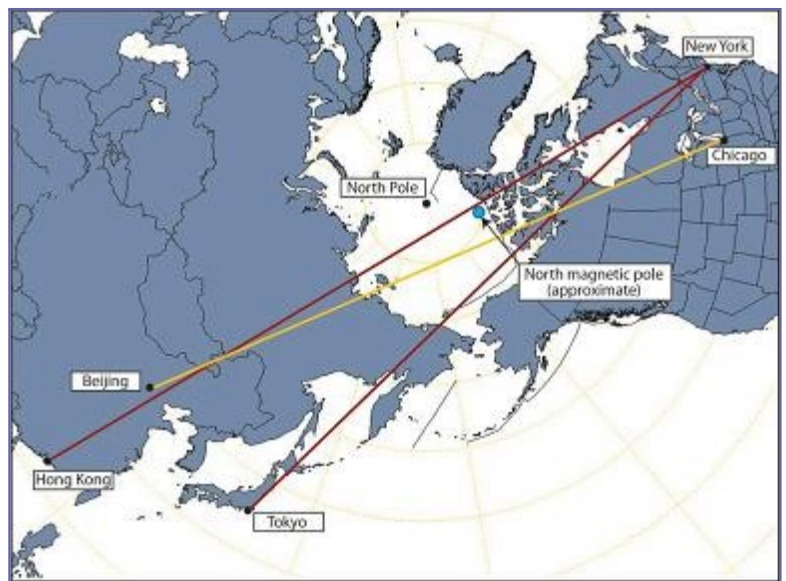
To help airlines avoid bad space weather, NOAA has begun equipping its GOES weather satellites with improved instruments to monitor the Sun. Recent additions to the fleet, GOES 12 and 13, carry X-ray telescopes that take spectacular pictures of sunspots, solar flares, and coronal holes spewing streams of solar wind in our direction. Other GOES sensors detect solar protons

swarming around our planet, raising alarms when radiation levels become dangerous.

"Our next-generation satellite will be even better," says Hill. Slated for launch in 2014, GOES-R will be able to photograph the Sun through several different X-ray and ultra-violet filters. Each filter reveals a somewhat different layer of the Sun's explosive atmosphere—a boon to forecasters. Also, advanced sensors will alert ground controllers to a variety of dangerous particles near Earth, including solar protons, heavy ions and galactic cosmic rays.

"GOES-R should substantially improve our space weather forecasts," says Hill. That means friendlier skies on your future trips to Tokyo.

The Jet Propulsion Laboratory, California Institute of Technology provided this article, under a contract with the National Aeronautics and Space Administration.



The shortest airline routes from the Eastern U.S. to popular destinations in Asia go very near the magnetic North Pole, where space weather is of greatest concern.

This image may be downloaded from [http://spaceplace.nasa.gov/news\\_images/polar\\_routes\\_map.jpg](http://spaceplace.nasa.gov/news_images/polar_routes_map.jpg)

For the latest space weather report, visit the website of the Space Weather Prediction Center at <http://www.sec.noaa.gov/>. For more about the GOES-R series spacecraft, see: [http://goespoes.gsfc.nasa.gov/goes/spacecraft/r\\_spacecraft.html](http://goespoes.gsfc.nasa.gov/goes/spacecraft/r_spacecraft.html).

# Photo Gallery



## ◀ The Pleiades

John Paladini took this impressive photo of part of the Pleiades cluster (M45) in Taurus with a 6-inch Schmidt-Newtonian, using Meade's Deep Sky Imager II.

The Pleiades is tailor-made for the wide fields of view offered by small telescopes. For more details, see the **Constellation Corner** on page 5.

## Iowa Aurora ▶

Bob Davidson, the WAA webmaster, has done yeoman's work providing WAA'ers with real-time notice of night-sky happenings. Last December 13<sup>th</sup> the WAA website alerted members of a powerful solar flare and the possibility of intense auroral activity.

This photo, from the NASA website, shows an aurora in Iowa on December 14<sup>th</sup>. It makes cool wallpaper for your computer.



At: <http://antwrp.gsfc.nasa.gov/apod/ap061218.html>

# Constellation Corner:

By Matt Ganis

Since it's the beginning of the New Year, I thought I'd try to introduce you to a new set of "friends". In a previous column, I discussed the Pleiades and the various stars in this famous open cluster. This time around, I want to take a closer look at some interesting objects within this cluster.

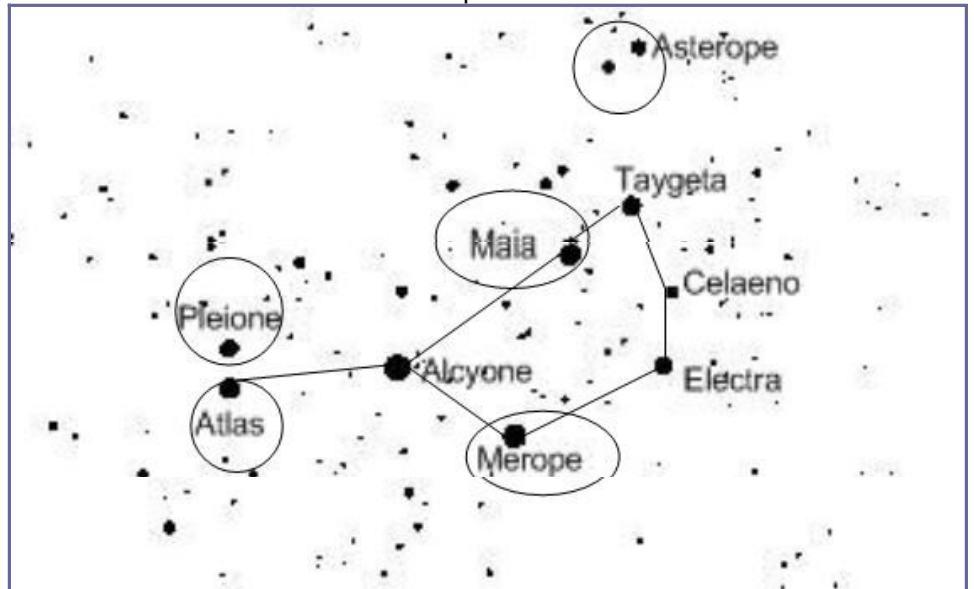
Let's start off by getting reacquainted with this wonderful cluster first. When people first look at the Pleiades, most will remark that it looks just like the "Little Dipper" (as a matter of fact, in my introductory astronomy class, many of my students point to the "seven sisters" when trying to identify Ursa Minor). I must admit it does bear a striking resemblance to the bowl of the dippers with the five brightest stars (Merope, Alcyone, Maia, Taygeta, Celaeno and Electra) tracing out a "bowl-like" pattern. The two stars at the end of the pattern, Atlas and Pleione represent the parents of the sisters.

Use low power when first observing the Pleiades to fit the entire cluster into a single field of view and to gain an appreciation for all the stars. The brightest stars of the Pleiades are bluish-white because they are young and extremely hot. All of the stars in the Pleiades are hot class B stars. B-type stars do not live very long, so the cluster must be young, only 100 or so million years old. Atlas, which is 425 light years away (as is the rest of the cluster), is a bit on the cooler side with a temperature around 12,300 Kelvin (or about 21,680 degrees Fahrenheit). Like the other naked-eye Pleiades Atlas is brilliant, radiating 940 times as much light as the Sun, much of it in the invisible ultraviolet wavelength. Its luminosity and temperature tell us it's a star with a mass about 5 times that of the Sun.

Sterope I and Sterope II, less correctly called Asterope, are a double star system at the upper edge of the rising cluster, and faintly visible only by reason of their combined light. 21 Tau (Asterope or Sterope I) and 22 Tau (Sterope II) appear as a pair of widely spaced bluish colored stars within the Pleiades star cluster.

Several stars of the Pleiades show nebulosity, but this nebulosity is not the birth cloud that created the

cluster. It is only a lucky coincidence that the cloud is passing through the cluster at a time when it can be appreciated. The nebula is brightest, largest and most easily seen around the bright star, Merope, where it spreads most noticeably to the south like a blue mist, reflecting Merope's light. Here it is known as the Merope Nebula or NGC1435. Look for



nebulosity surrounding Maia also; where it is appropriately called the Maia Nebula or NGC1432.

The oddest star of all is Pleione. It spins so rapidly that it is squashed into a shape resembling an egg, or an oblate spheroid. This causes it to throw off a plume of gas causing it to brighten and then dim before returning to its usual magnitude. From 1972 to 1987 it ranged from magnitude +4.8 to +5.5. Many cultures have stories regarding the lost Pleiad, and the variability of Pleione may have led to only six of the brightest stars of the Pleiades to appear visible most of the time with the unaided eye.

So if you get a chance this winter, get out and have a look at an old friend. See if you can locate some of the doubles in this cluster, or if you're into photography, see if you can capture some of the nebulosity. It's worth the effort, and you know, friends never let you down.

# Almanac

For January 2007 by Matt Ganis

Can you believe it's 2007 already? Honestly, it feels like just yesterday I was writing last year's January Almanac column – I'm sorry to say, I failed in my 2006 resolution to attend more WAA meetings, but this year I resolve to make at least four or five observing nights – what about you?

Our year opens with some interesting planetary conjunctions/meetings in the early evening skies. If you find a location with a clear view of the western horizon, you'll be able to see the bright planet Venus shining at nearly -4.0 magnitude. In early



Jan 3



Jan 11

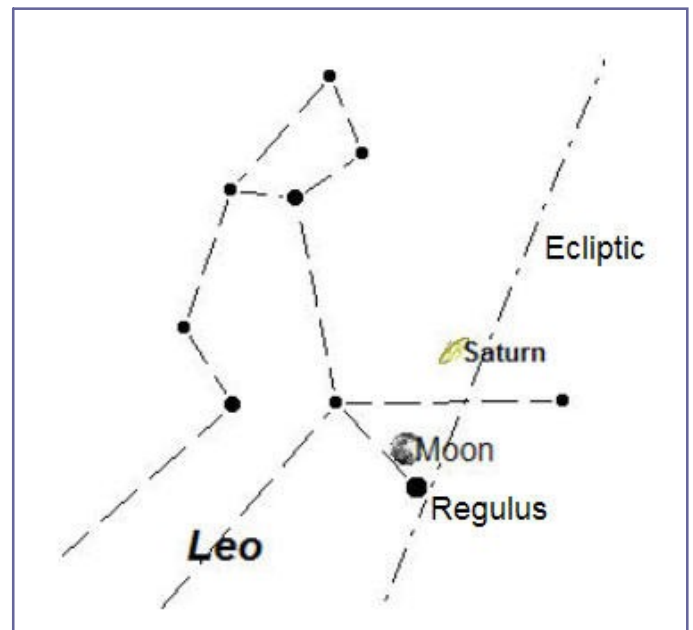


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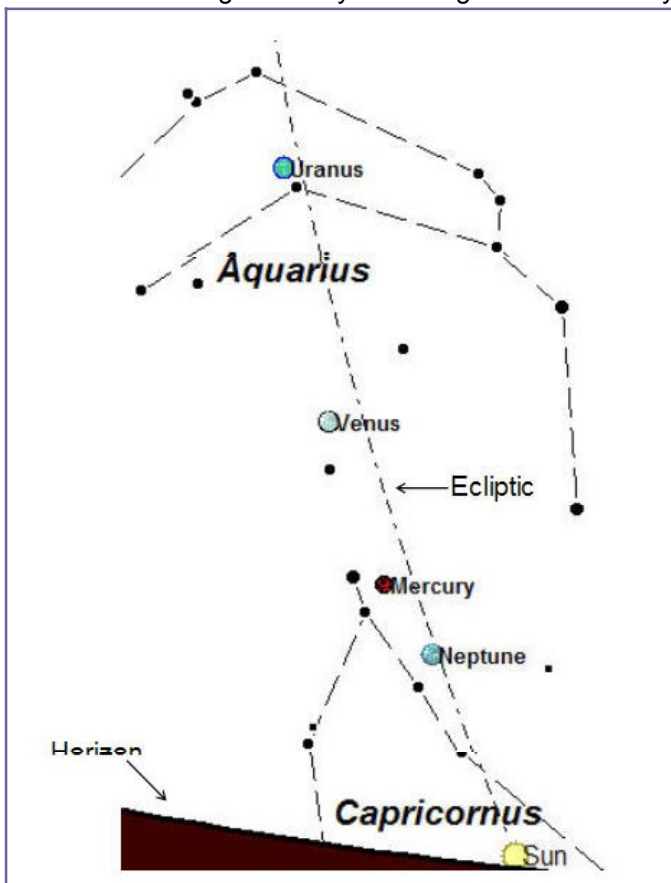


Jan 25

For your evening viewing pleasure, be on the lookout for Saturn when it rises in the eastern skies by 8pm at the start of the month. You can find the ringed planet just at the feet of Leo the Lion. This jewel of our solar system is shining at magnitude of about +0.10 on the first of the month and by month's end it will rise by 6pm and will have increased in brightness to a magnitude -0.10 (quite a change). If you're having trouble locating Saturn in your skies, look for the Moon on the evening of January 6th when it will be about 4 degrees to the east (or lower to the horizon) than Saturn. Don't confuse Saturn with the bright star Regulus (the heart of the Lion). On this night the Moon will be closer to Regulus than to Saturn, but it makes for a great "signpost".



Where 'o where has Jupiter gone? Look for the giant gas planet in the early morning skies. The large planet will be shining at a magnitude of about -1.8 and should be easy to see just before dawn. For a challenge, see if you can find Mars about 20 degrees to the east of Jupiter. It might be tough to see since it's a dim +1.4 magnitude, but if you're able to see it (and you catch the conjunction of Uranus, Neptune, Venus and Mercury) you can then brag to all your friends you were able to observe all of the planets in solar system this month. Kinda cool, huh?



January, the planet will set below the horizon by 6pm, but as the month progresses the planet climbs higher and higher into the evening sky. Throughout the month, as Venus climbs higher into the sky, the speedy planet Mercury "tags" along and the two planets settle between the distant worlds of Uranus and Neptune. By month's end (just at sunset) the four planets will line up along the ecliptic "anchored" by the Sun in a wonderful display. Be sure to check this out – this is a perfect visual example of what the ecliptic represents.