

# Sky **WAA** tch

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

**March 2007**



## **Whirlpool Galaxy**

**Rick Bria and Ted Schimenti** took this image of the Whirlpool galaxy (M51) last year at the Round Hill Observatory. It is only the luminance pane--a 93 stack of 4 and 6-minute images, with a total exposure time of over 7 hours.

### **Some Facts...**

The Whirlpool Galaxy is located in the constellation Canes Venatici and is 30 million light-years distant. It is made up of two Galaxies in a cosmic collision. The galaxy on the left is an edge-on spiral, seen vertical. The Whirlpool spans about 65,000 light-years, and has the shape of a logarithmic spiral. Observes Rick: Other Logarithmic spirals in nature are the arrangement of sunflower seeds, the shape of a nautilus shell, and even hurricanes.

# Events for March 2007

## ➤ **Monthly Meetings**

### **“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

### **“Energy Technologies for Earth And Other Planets”**

**Friday April 6, 8:00PM**

**Hudson River Museum, Yonkers**

Professor Steve Greenbaum will speak on energy technologies. Professor Greenbaum is from Hunter College and his research concerns the evaluation of materials being developed for fuel cells and lithium batteries—two technologies undergoing rapid growth.

## ➤ **“Total Lunar Eclipse”**

**Saturday, March, 3, 6:00-8:00PM**

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

Bundle up and join us, weather and sky conditions permitting, at the Meadow Picnic Area to watch a total lunar eclipse—which will already be in progress when the Moon rises at 5:42 p.m. By mid-eclipse the coppery-red Moon should be floating just above the treetops and make for a nice sight in the sky.

## ➤ **“Starway to Heaven”**

**Saturday, March, 17, 7-10:00PM**

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

This is our scheduled observing date for March, weather permitting. Free and open to the public. The scheduled rain-snow/cloud date is March 24th.

## ➤ **Upcoming Events**

**Family Stargazers’ Night**

**Tuesday, March 20, 7:00PM. (Rain date: Wednesday, March 21). George Washington Elementary School 3634 Lexington Avenue,**

**Mohegan Lake.** Our annual stargazers' night for the children and parents of George Washington Elementary School is one of our best-attended and fun events of the year. Stop by with your telescope so we can show off a hair-thin crescent Moon, Venus and beautiful Saturn. We will set up our telescopes behind the left side of the school building.

**Vernal Equinox Star party**

**Thursday, March 22, 7:00PM (Rain date: Friday, March 23.) Quaker Ridge Elementary School, 125 Weaver Street, Scarsdale (Exits 20 southbound or Exit 21 northbound Hutch & Rt. 125).** A large group of students will be waiting for us to show them the Moon, planets and spring constellations. Meet and set up telescopes at the back parking lot.

## **Club Bits**

### **New Members...**

Byron Collie, Croton on Hudson, NY  
Dunne Family, Scarsdale, NY  
Patrick McGuire, Tuckahoe, NY  
Glauce Postatni, Sleepy Hollow, NY  
Anthony Sarro, Scarsdale, NY

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

Warren Lindholm, Cortlandt Manor, NY  
Simmonds Family, Scarsdale, 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: 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

## *Even Solar Sails Need a Mast*

*By Patrick L. Barry*

Like the explorers of centuries past who set sail for new lands, humans may someday sail across deep space to visit other stars. Only it won't be wind pushing their sails, but the slight pressure of sunlight.

Solar sails, as they're called, hold great promise for providing propulsion in space without the need for heavy propellant. But building a solar sail will be hard; to make the most of sunlight's tiny push, the sail must be as large as several football fields, yet weigh next to nothing. Creating a super-lightweight material for the sail itself is tricky enough, but how do you build a "mast" for that sail that's equally light and strong?

Enter SAILMAST, a program to build and test-fly a mast light enough for future solar sails. With support from NASA's In-Space Propulsion Program to mature the technology and perform ground demonstrator tests, SAILMAST's engineers were ready to produce a truss suitable for validation in space that's 40 meters (about 130 feet) long, yet weighs only 1.4 kilograms (about 3 pounds)!

In spite of its lightweight, this truss is surprisingly rigid. "It's a revelation when people come in and actually play with one of the demo versions—it's like, whoa, this is really strong!" says Michael McEachen, principal investigator for SAILMAST at ATK Space Systems in Goleta, California.

SAILMAST will fly aboard NASA's Space Technology 8 (ST8) mission, scheduled to launch in February 2009. The mission is part of NASA's New Millennium Program, which flight-tests cutting-edge technologies so that they can be used reliably for future space exploration. While actually flying to nearby stars is probably decades away, solar sails may come in handy close to home. Engineers are eyeing this technology for "solar sentinels," spacecraft that orbit the Sun to provide early warning of solar flares.

Once in space, ST8 will slowly deploy SAILMAST by uncoiling it. The truss consists of three very thin, 40-meter-long rods connected by short cross-members. The engineers used high-strength

graphite for these structural members so that they could make them very thin and light.

The key question is how straight SAILMAST will be after it deploys in space. The smaller the curve of the mast the more load it can support. "That's really why we need to fly it in space, to see how straight it is when it's floating weightlessly," McEachen says--It's an important step toward building a sail for the space-mariners of the future.



SAILMAST is the thin triangular truss in front of the picture. It is attached to a section of a silver foil solar sail section shown here in a laboratory test. The mast in the picture is 2m (6 ft) long. The Space Technology 8 mission will test the SAILMAST, which is 20 times longer.

This image may be downloaded at:  
[http://spaceplace.nasa.gov/news\\_images/sailmast.jpg](http://spaceplace.nasa.gov/news_images/sailmast.jpg).

The Find out more about SAILMAST at:  
<http://nmp.nasa.gov/st8/>

# *Observing Reports*

## *Saturn First Viewing: January 31, 2007*

*By Dave Butler*

At 8PM the temperature was 23 degrees, some light clouds covering sky, the moon 98% full and 24 degrees from Saturn. Saturn was smaller than I had remembered. It was 22 degrees above the horizon, just clearing the trees. ClearDarkSky.com said that transparency and seeing were just above poor. Detail was disappointing, only Titan and the Cassini divide in the rings could be seen. Having come from a 70-degree house, my Cassegrain scope hadn't adapted to the temperature. I decided to look at Castor and Rigel ... splitting those stars means that the focus was good. I also viewed R Lupus a very red (class N) variable star that was almost washed out by the Moon. The light clouds and the full Moon blocked out most stars. Polaris and Orion's belt could be seen with some difficulty.

Returning to Saturn I first saw two moons, then three, then four moons: Rhea and Dione on the left, Tethys, and further out, Titan. If I had known where Enceladus was, I would have had a better chance of picking it up. Its position was possible to pick up given better conditions. The rings, shadow and a narrow band in the lower half of Saturn were clear. I viewed Saturn at 63X, [83X, 100X, 125X, 168X, 200X, 222X and 250X], the advantage of a zoom lens. It took 100X to pick up all the moons, all the moons could be seen at 250 power. The lower band was best viewed at 125X and 168X but could be seen at 250X. The Cassini division was best from 168X to 220X. The rings were less tilted than last year. The division could not be seen all the way around as it could last year. Saturn appeared brighter and whiter than it was last year. This year the tilt started at -12.6 degrees and will vary (climb) only to -15.4 (in May) and drop to 6.7 degrees (in December) and we won't see much of the rings for many years to come. The tilt will become edge on sometime in 2009 and the rings may seem to disappear. The rings are only 50 meters wide! Saturn orbits every 29.5 years. In 2003 Saturn's tilt maximized at -27 degree. It won't be until 2018 when it reaches it next maximum. Read about Saturn's tilt at <http://soc.jpl.nasa.gov/viewing.cfm>. A couple, who had seen Saturn last year, dropped by to view. They described the view as many others had -- surreal. Viewing ended at 9:30PM. Other objects included M31, the Double Cluster and NGC 188, maybe the oldest open cluster at 7 billion years, far off the spiral plane ... all too washed out by the Moon for a good view.

## *My Annual February Getaway*

*By Charlie Gibson*

February 10, 2007: I am in Aruba, first in the Divi Golf and Beach Resort, and later, at the Caribbean Palm Village. The weather has been great -- between 72 and 85 degrees. The beaches are to die for, and service and restaurants are first rate -- no wonder why people come back here year after year. On the astronomical side, there's some cloudiness at night, along with a late-rising Moon, which has hindered my picture taking efforts. (I have my Nikon 8 megapixel digital point-and-shoot, 35mm Nikon and a pocket tripod.) I will go out again Sunday evening to catch Crux, Centaurus and Scorpius in the Aruban dark skies. At about 12 degrees north latitude, and only 18 miles off the Venezuelan coast, Orion is directly overhead and Leo is more comfortably viewed upside down.

February 15, 2007: The weather has been great down here, but I'll be back in the chilly northeast by this weekend. I met up with Marcos Bislip, who runs the Aruba Astro Research group here, and confirms what I had suspected -- a weeklong series of partly cloudy nights has hampered viewing efforts by his observers too. It's a strange situation down here, as almost every night, high overhead is remarkably clear -- Orion is like a jeweled hunter on velvet, and the two brightest stars in the sky, Sirius and Canopus are like lighthouses. But as your eyes scan the horizon, especially the southern sky, murky clouds are sitting right above the waterline, extending about 20 degrees upward, blocking out all the great southern stuff. Because this is carnival month, no observations or meetings are held in February. Aruba (16 miles long and 8 miles wide) is almost banana shaped and sits in the Caribbean Sea NW to SE. The best viewing from the island is on the SE tip. Unfortunately, it is the poorest and least developed part. The "high end" hotels, like the Marriott and Westin are on the northernmost end. San Nicolas is the "ghetto" town on the SE, and Baby Beach, is at the southernmost point. There is where the best viewing takes place. This is also where illegal immigrants from Venezuela and Colombia try to sneak in under the cover of darkness to hide in the country. Therefore the Coast Guard and police patrol the area at night looking for illegal immigrants. Marcos warns me that I should not go down there alone and that should I come back again, he will call his contacts in the government to give us an area to observe from. Well you live and learn. See you all soon.

# Constellation Corner:

*By Matt Ganis*

This month, let's return to our discussion and exploration of various constellations in our skies. This month if you look straight up, in your zenith you'll find the constellation of Gemini. It's not the most recognizable constellation, but its brightest stars: Castor and Pollux are quite unmistakable.

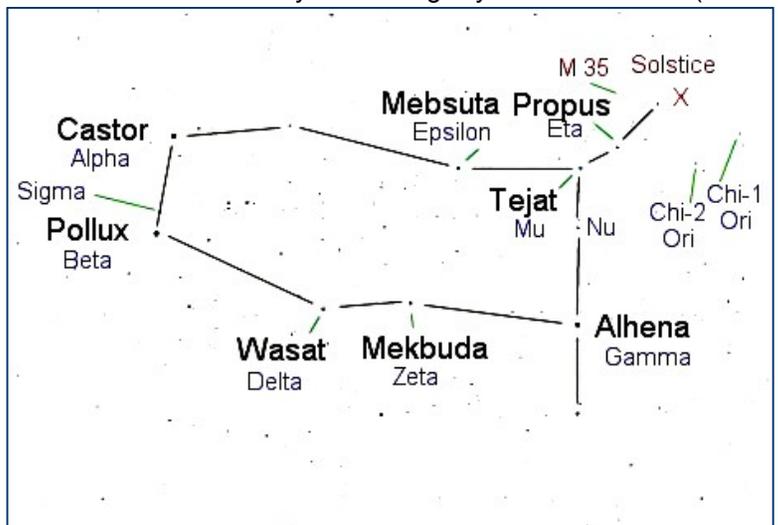
Gemini, the Twins, are really half-brothers. They share the same mother (Leda) and different fathers. The two were born from an egg laid by Leda after she was seduced by Zeus in the disguise of a swan. Yet it was said that Pollux was the son of Zeus, and Castor was the son of Tyndareus.

Castor and Pollux, the world's most famous twins were raised by the centaur Chiron (now the constellation Sagittarius) and later joined Jason and the Argonauts in search of the Golden Fleece. Eventually the pair decided to take wives and selected the two beautiful daughters of the king of Sparta. Unfortunately these two women were already married to Idas and Lynceus, who just happened to be cousins of the twins. Amazingly, this seems to have made little difference to the two brothers as they simply carried the two girls off and settled down with them. Idas and Lynceus for some reason, didn't seem to be bothered by this. A few years later, the cousins, who were friendly with both Castor and Pollux, made a joint raid on some cattle. As the story goes, trouble between the two pairs of thieves began when they tried to divide the cattle among themselves. Idas had an interesting solution. He hacked one of the cows into four equal pieces and said that whichever two individuals completely finished eating their quarters first would divide the cattle. This took the Twins off guard and they watched helplessly as their two cousins wolfed down their quarters of the cow. As a result, Idas and Lynceus then drove off the entire herd revealing in their victory.

Feeling tricked, Castor and Pollux vowed to get even with their cousins. Within a few days they set out after the two cousins to recover their share of the cattle. During the fight that followed, Idas killed Castor with a spear. Infuriated over the loss of his twin brother, Pollux chased his cousins and killed Lynceus with a single blow. Just as Idas was about to kill Pollux with a tombstone, Zeus came to Pollux's aid and hurled a thunderbolt at Idas, killing him on the spot. Pollux, the immortal son of Zeus, begged to die so that he would not be separated from his brother. Not even the mighty Zeus could

do such a thing so he placed them together in the sky as the constellation Gemini, the Twins.

Castor (alpha Geminorum) is the slightly dimmer star. It has a visual magnitude of 1.93 and is located 52 light years from the Earth. It isn't a particularly large star, only about twice the Sun's diameter. Pollux is the brighter of the two stars with a visual magnitude of 1.16 and a distance of 33.7 light years. It is also considerably larger, with an estimated diameter of about ten Suns. Epsilon Gem is a supergiant which checks-in at about 30 Sun diameters. Current measurements have this star as far away as 950 light years. Zeta Gem (a



cepheid variable) is the most distant of the bright stars in this constellation located at over 1200 light years.

There are several interesting nebula in the constellation as well. One of the more interesting in the Eskimo Nebula. This planetary nebula began forming about 10,000 years ago, when the dying star began flinging material into space. The nebula is composed of two elliptically shaped lobes of matter streaming above and below the dying star. Scientists believe that a ring of dense material around the star's equator, ejected during its red giant phase, created the nebula's shape. This dense "waist" of material is traveling in space at a speed of about 72,000 miles per hour preventing the high-velocity stellar winds from pushing matter along the nebula's equator. Instead, these 900,000 mile-per-hour winds are sweeping the material above and below the star, creating elongated bubbles in the nebula (I said it was the most interesting, didn't I).

# Almanac

For March 2007 by Matt Ganis

Well, we almost had a snow-less winter. I have to admit; I don't think I ever set up my telescope on a sheet of ice before. I spend more time thinking about my telescope slipping down the hill than I do thinking about the cold (and with this year's cold temperatures, that's really saying something).

This month brings us a special treat: a total lunar eclipse. This one has all the makings of a decent event: It happens on a Saturday night and at a decent time (especially for the kids). Soon after sunset on Saturday evening, March 3, those of us in eastern North America will be able to watch the rising full Moon undergoing its first total eclipse in nearly 2-½ years. The Moon will track across the northern portion of the Earth's shadow, and will be completely immersed for one-hour and 14 minutes, making this a somewhat longer than normal totality. It's a good thing it lasts so long, since for those of us on the east coast, the eclipse will be underway as the moon rises. Officially, the eclipse begins at 4:29pm (P1) and reaches totality at 5:42pm (U2). According to my sky charting software, the moon will rise at 5:44pm (2 minutes into totality). Totality ends at just about 7pm (U3) with the whole event ending by about 9:25pm (P4)

Because some of the sunlight that strikes our Earth is diffused and scattered by our atmosphere, its shadow is not completely dark; enough of this light reaches the Moon to give it an eerie coppery glow even when it's totally eclipsed. It is anticipated that during the upcoming total eclipse the Moon will glow brightest across its upper portion, while its lower part (closest to the center of the shadow) will appear a darker shade of brown or chocolate color.

This month's eclipse is the first of two total lunar eclipses in 2007, the other occurring on August 27th, but it will favor those in western North America and the Pacific Rim.

The nighttime skies this month offer just two planets for your observing pleasure. The first is Venus, which is shining at an incredible magnitude -4.0! You should be able to find it easily in the western skies about 30 degrees above the horizon. It will remain visible in the sky for at least 2 hours surrendering to the western horizon. A view of the planet in even the smallest telescope should easily



Mar 2



Mar 12



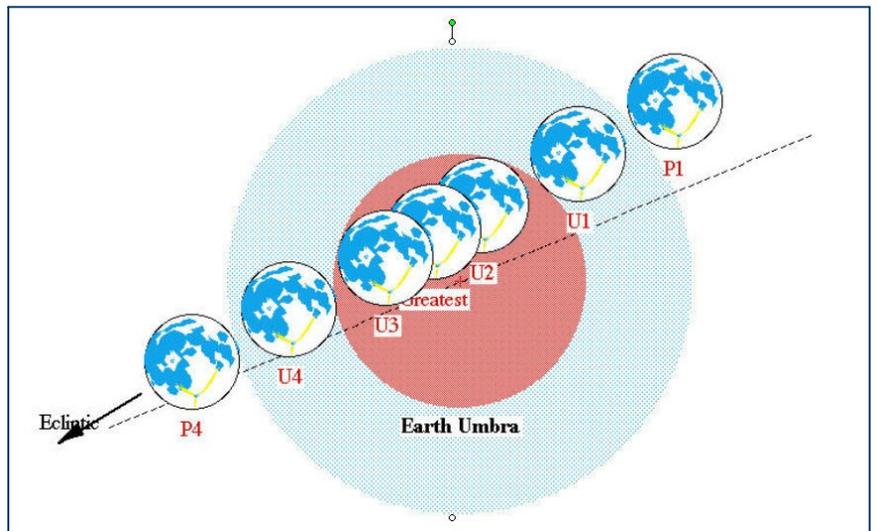
Mar 19



Mar 24

resolve the gibbous shape of the planet. You won't see any detail on the planet's surface, but it does make an interesting sight showing a disk that is more than half but less than fully illuminated.

Saturn is nice and high in the Eastern/Southeastern skies and it shines at a respectable magnitude zero. Look for the planet in the between the constellations of Leo and Cancer. Interestingly, see if you can catch a glimpse of the globe's



shadow falling on the rings. It should give the planet a distinctively three-dimensional "feel" to it.

Saturn has a few "close encounters" with the Moon this month that might be worth a quick look. On March 1st the nearly full moon will be a scant ½ degree to North of Saturn and then on the 28th the two bodies will be about 1½ degrees apart (this time the moon will be in its Gibbous phase).

So enjoy the eclipse this month, and remember if you miss it (or we have rain) you can get another chance on August 28th (of course, you may have to travel to the west coast to see it!). One other interesting point: On March 20, 2007, at precisely 8:07 P.M. EDT the Sun will cross directly over the Earth's equator. This moment is known as the vernal equinox in the Northern Hemisphere. For the Southern Hemisphere, this is the moment of the autumnal equinox.