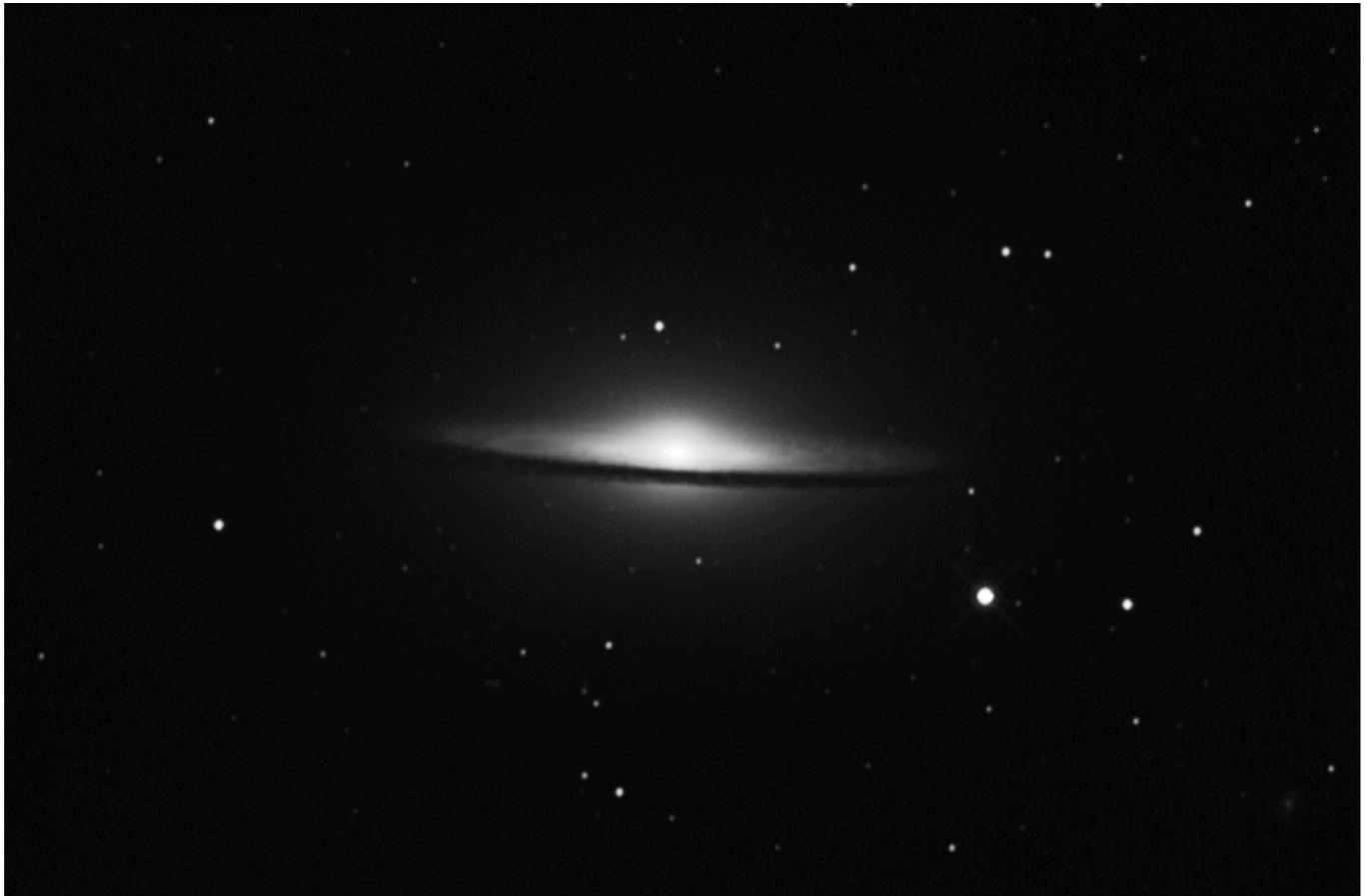


SKY **WAA** TCH

The Monthly Publication of the Westchester Amateur Astronomers

August 2006



M-104 Continuing the galaxy sweep—here is an image of the Sombrero Galaxy, M-104 (NGC4594). This image was taken at the Round Hill Observatory by Ted Schimenti and Rick Bria, and is a stack of 17, 6-minute exposures. The Sombrero does not rise high in our skies, so new images with more exposures are planned.

Sombrero Facts: Our Milky Way view is from six degrees south of its equatorial plane. It is 41 million light-years from us and moving away at 1,000 km/sec. It is circled by a thick dark rim of dust, and has a one-billion-solar-mass black hole at its center. The Sombrero Galaxy contains 1,100 or more globular clusters (ten times that of the Milky Way), forming a large central bulge around its core.

Events for August, 2006

Please Note: There will be no WAA meeting in August at the Andrus Planetarium.

Annual Telescope Workshop

**Saturday, August 19, 2006, 7-11:30PM
Meadow Picnic Area, Ward Pound
Ridge Reservation, Cross River, NY**

The WAA will host our annual workshop to benefit the public and our own club members who might need assistance with setting up, collimating and using their telescopes. Pack a picnic dinner and arrive early to enjoy the sunset from the park. Don't forget to bring your telescope's instruction manual. When it gets dark we will observe Jupiter and show you how to find some well-known deep sky objects. Dust off your telescope — we know that it has been sitting in your closet too long. Bring the entire family to enjoy this workshop and our scheduled observing date for August, weather permitting.

The Rain/Cloud date will be August 26, 2006.

Free and open to the public.

Reminder: September's meeting at the Andrus Planetarium will be our annual "Amateur Night". Bring your astrophotos, videos, homemade telescope equipment, or share an observing story, poem or music with your friends. Please e-mail the club with a brief idea of what you will be presenting. Meeting date will be announced in the September newsletter.

Renewing Members...

Armen Balemian, Cortlandt Manor, NY
Lloyd Buchanan, Bronxville, NY
Tom Boustead, White Plains, NY
Jose Castillo, Pelham Manor, NY
Peter Cetinski, Chappaqua, NY
Donne Cincotta, Yonkers, NY
Charles Ekholm, Lake Peekskill, NY
Robert Fath, Scarsdale, NY
Robie Burke, Katonah, NY
Matthew Fiorillo, White Plains, NY
Matt Ganis, Carmel, NY
Joe Geller, Hartsdale, NY
Charlie Gibson, Scarsdale, NY
Gerhardt Grosse, Mahopac, NY
John James, Sunnyside, NY
Tony Kim, South Salem, NY
David Klaus, Yorktown Heights, NY
Amelia Lawrence, Millwood, NY
John Le Var, Briarcliff Manor, NY
Barbara Moroch, Tarrytown, NY
John Paladini, Mahopac, NY
Mario Palmieri, Cortlandt Manor, NY
Lydia Maria Petrosino, Bronxville, NY
Michael Rinaldi, Scarsdale, NY
Anthony Torres, Patterson, NY



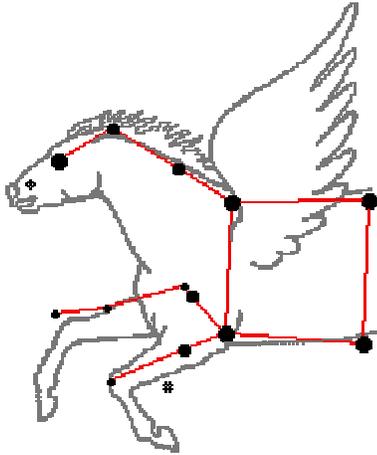
Bob Kelly took this shot of the International Space Station passing over a fluttering U.S. flag at the Ardsley Middle School on the 4th of July. Bob used a Canon A40 on tripod, ISO 200, 5-second exposure.

Westchester Amateur Astronomers, Inc., a 501(c)(3) organization, 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: 1-877-456-57578. Meetings: Andrus Planetarium, Hudson River Museum of Westchester, 511 Warburton Ave., Yonkers. Observing at Ward Pound Ridge Reservation, Routes 121 and 35, Cross River, NY.

Annual membership: \$25 per family, and includes discounts on *Sky & Telescope* and *Astronomy* magazine subscriptions. Officers: Mike Cefola, President; Bob Davidson, Senior Vice Pres.; Mike Virsinger, Treasurer; Karen Seiter, Secretary; George Klaus, Vice-Pres. Field Events; Charles Gibson; Vice Pres. Programs; Barbara Moroch, Vice Pres. Communications; Newsletter: Dick Shaw; Webmaster: Robert Davidson

Constellation Corner: by Matt Ganis

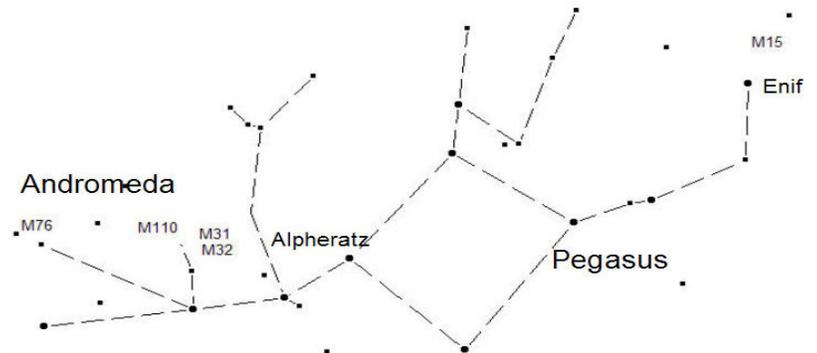
This month let's take a look at the constellation of Pegasus. This month the winged horse will have completely risen over the eastern horizon by about 11pm. In the mythology of the skies, the constellation is closely associated with its neighbors Andromeda, Cepheus and Cassiopeia.



After Perseus' victory over the Medusa, he took to the air (with winged shoes that were lent by Hermes) to present his prize to Athena. On the way some of the blood from the Medusa's severed head dripped out of the sack and fell into the sea. Poseidon had been in love with the Medusa since she was a beautiful maiden, and he raised her drops of blood from the sea. Then he mixed them with white foam of the waves and with white sand of the beach and out of them he created the Winged Horse, Pegasus. The best way I've found to learn (and teach) about constellations is to understand the mythological stories that tie groups of constellations together. The constellations of Perseus, Andromeda, Pegasus, Cassiopeia, Cepheus and Cetus are high in the sky on fall/winter evenings. They are all related to the famous story of Perseus coming back victorious with the head of Medusa and responding to the cries of help from Andromeda who was chained to a rock near the sea to appease the sea monster Cetus. Perseus slays the sea monster and flies off with Andromeda on the back of Pegasus the horse.

Pegasus is home to the globular cluster, M15; a great object to view with a telescope because it is one of the brightest in the sky. M15 lies slightly northwest of the head of Pegasus, which is marked by the star, Enif. The globular lies at a distance of about 33,600 light years from the Earth and had a total visual brightness

of 6.2 magnitude, making it visible using binoculars (under dark skies). M15's core has undergone a process of contraction called "core collapse" which is



driven by the intense gravitational pull of so many stars in such a small volume of space. Half the mass of this cluster is concentrated in its innermost radius. It is still unclear if the central core of M15 is packed so dense simply because of the mutual gravitational interaction of the stars it is made of, or if it houses a dense, supermassive object which many scientists believe is a strong candidate for a "Black Hole".

"Attached" to Pegasus is the constellation of Andromeda. The two constellations are tied together at the star Alpheratz (which is 'officially' part of Andromeda not Pegasus). The name of Alpheratz was from Arabic, meaning "horse's navel". This is because in former times this star has been associated with the constellation of Pegasus, next to Andromeda. Nowadays it marks the head of the royal daughter.

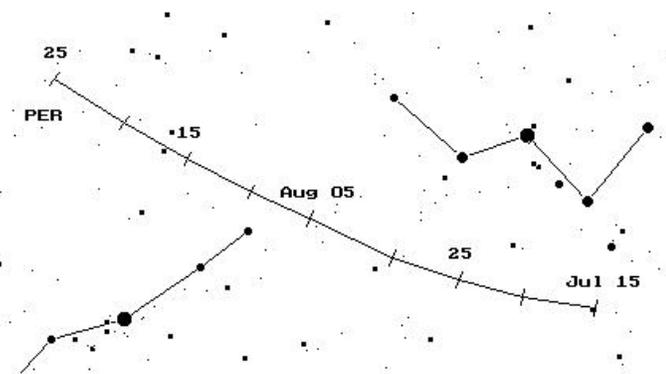
By far the most famous landmark in this constellation is M31, the famous Andromeda galaxy (our nearest large neighbor galaxy) forming the Local Group of galaxies together with its companions (including M32 and M110, two bright dwarf elliptical galaxies), our Milky Way, M33, and others. It's located at a distance of approximately 2.9 million light years away and has a mass of about 1.5 times that of the Milky Way. Even though it's so far away, the galaxy is visible to the naked eye under moderate conditions. Projections indicate that the Andromeda Galaxy is on a collision course with the Milky Way, approaching it at a speed of about 140 kilometers per second. An impact is predicted in about 3 billion years when the two galaxies will merge to form a giant elliptical. (You had me worried before Matt. I thought that you had told me one billion years. Editor)

Almanac

For August, 2006, by Matthew Ganis

I hope you're all surviving these sweltering days of summer. I can't remember a July that's been this hot in a long time. While the warm weather is nice – it wrecks havoc with our nighttime skies. Hopefully August brings us a little relief.

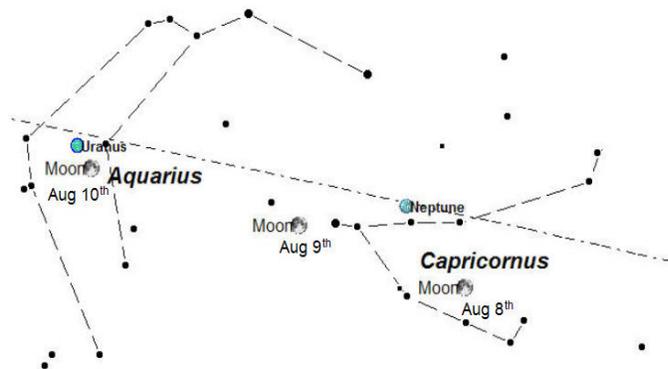
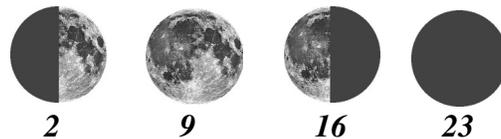
The best time for viewing meteors during the summer months is during the Perseid meteor shower. This shower is active the second half of July and throughout most of August. It is most active near August 12, when the Earth passes near the core of the Perseid material. The shower is most interesting around its peak on August 12 or 13.



This year, the waning gibbous Moon will be a big nuisance, riding high in the sky during the morning hours when the Perseid radiant is high.

Because meteor shower particles are all traveling in parallel paths, and at the same velocity, they will all appear to radiate from a single point in the sky (called the radiant) to an observer on the Earth. This year the shower's normal peak will occur during daylight for North American observers (August 12 at 23h UT which is 7pm EDT). The radiant is above the horizon the entire night for observers north of latitude 32N, but it is fairly low at the end of evening twilight. The evening rates will be low but there are usually enough meteors to be interesting and should provide at least some show. The Moon is also low in the evening this year, and hopefully the rates will not have fallen too far from their peak. While the 2006 Perseid shower will be somewhat compromised, meteor observers can look forward to 2007 when the moon will be at its new phase and completely out of the way for the time of Perseid maximum (so I guess it's "better luck next year").

Planetary viewing this month is going to be a challenge. Saturn isn't visible this month since it's in conjunction with the Sun on August 7th. Remember, when two celestial



bodies appear near one another in the sky, they are in conjunction with each other. Saturn, appears in the same place as the Sun – making it impossible to see.

On the other hand, Neptune reaches opposition on August 11th this month. Opposition occurs when a planet farther from the Sun than Earth appears opposite the Sun in the sky. It is the best time to observe a planet. The planet is still rather dim, shining at a mere +7.83 magnitude. You'll find it in the constellation of Capricornus in your southeastern skies. If you have trouble finding Neptune, you can use the Moon as your guide over the course of three nights starting on August 8th. On the 8th, look for the Moon 7 degrees to the south of Neptune, then less than 2 degrees to the south of Uranus on the 10th.

The best planetary viewing this month comes from the planet Jupiter. The bright planet is in your western skies this month – but catch it early – the big "guy" will set by about 11:30pm this month. It's shining at a magnitude of about -2.0 so I don't think you'll have a problem finding it. The early morning skies get a little interesting around mid-month. On the 15th look for Mercury and Venus; separated by only 3 degrees. The planets are moving toward the Eastern horizon, with Mercury "falling" faster than Venus. On the 20th, Saturn rises to join Mercury when the two are just 1 degree apart.

Enjoy your summer and try to stay cool. Before you know it, fall will be here, and we will worry about winter (smirk).

Postscript – I'd like to take a few lines to thank Dick for fantastic leadership on the newsletter. He was a pleasure to "work for" and though we only met in person once, I feel I have a friend for life. Thanks Dick. We'll miss you.

Celebrating 40 Years of Intent Listening

By Diane K. Fisher

In nature, adjacent animals on the food chain tend to evolve together. As coyotes get sneakier, rabbits get bigger ears. Hearing impaired rabbits die young. Clumsy coyotes starve. So each species pushes the other to “improve.”

The technologies pushing robotic space exploration have been like that. Improvements in the supporting communications and data processing infrastructure on the ground (the “ears” of the scientists) have allowed spacecraft to go farther, be smaller and smarter, and send increasingly faint signals back to Earth—and with a fire hose instead of a squirt gun.

Since 1960, improvements in NASA’s Deep Space Network (DSN) of radio wave antennas have made possible the improvements and advances in the robotic spacecraft they support.

“In 1964, when Mariner IV flew past Mars and took a few photographs, the limitation of the communication link meant that it took eight hours to return to Earth a single photograph from the Red Planet. By 1989, when Voyager observed Neptune, the DSN capability had increased so much that almost real-time video could be received from the much more distant Planet, Neptune,” writes William H. Pickering, Director of JPL from 1954 to 1976, in his Foreword to the book, *Uplink-Downlink: A History of the Deep Space Network, 1957-1997*, by Douglas J. Mudgway.

Mudgway, an engineer from Australia, was involved in the planning and construction of the first 64-m DSN antenna, which began operating in the Mojave Desert in Goldstone, California, in 1966. This antenna, dubbed “Mars,” was so successful from the start, that identical 64-m antennas were constructed at the other two DSN complexes in Canberra, Australia, and Madrid, Spain.

As Mudgway noted in remarks made during the recent observance of the Mars antenna’s 40 years of service, “In no time at all, the flight projects were competing with radio astronomy, radio science, radar astronomy, SETI [Search for Extra-terrestrial Intelligence], geodynamics, and VLBI [Very Long Baseline Interferometry] for time on the antenna . . .

It was like a scientific gold rush.”

In 1986 began an ambitious upgrade program to improve the antenna’s performance even further. Engineering studies had shown that if the antenna’s diameter were increased to 70 m and other improvements were made, the antenna’s performance could be improved by a factor of 1.6. Thus it was that all three 64-m DSN antennas around the world became 70-m antennas. Improvements have continued throughout the years.

“This antenna has played a key role in almost every United States planetary mission since 1966 and quite a few international space missions as well. Together with its twins in Spain and Australia, it has been a key element in asserting America’s pre-eminence in the scientific exploration of the solar system,” remarks Mudgway.

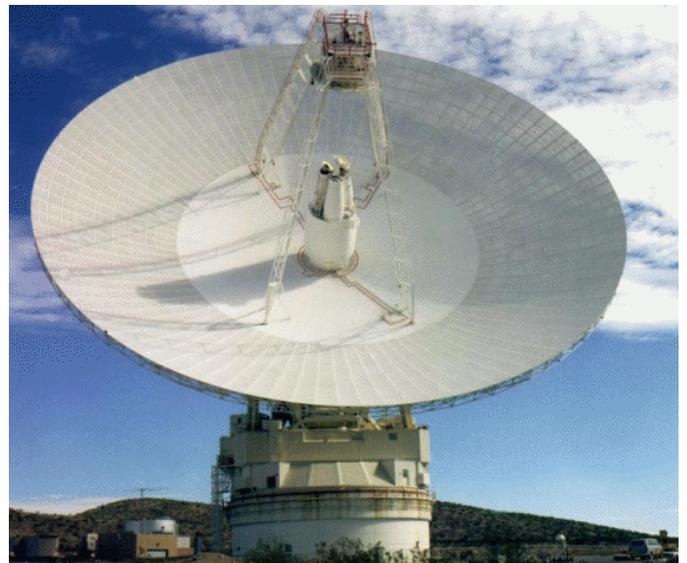
Find out more about the DSN and the history of the Mars antenna at:

deepspace.jpl.nasa.gov/dsn/features/40years.html.

Kids (and grownups) can learn how pictures are sent through space at:

spaceplace.nasa.gov/en/kids/phonedrmarc/2003_august.shtml

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



For over 40 years, the “Mars” 70-m Deep Space Network antenna at Goldstone, California, has vigilantly listened for tiny signals from spacecraft that are billions of miles away.