SkyWAAtch

The Monthly Publication of the Westchester Amateur Astronomers *May 2009*

The Silver Coin Redux

Last December, courtesy of Doug Baum and Mike Virsinger, NGC 253 in Sculptor (aka the Silver Coin galaxy) graced the cover of the WAA Newsletter. Since then, with some tutoring from Neil Fleming, Doug has reworked the photo using CCD Stack and Photoshop. Doug's website shows the original image, an intermediate image and the above final image as well as some other interesting astrophotos. See *http://www.scopetrader.com/steppingstone/?page=207*.

As noted in the December issue, NGC 253 is one of Caroline Herschel's discoveries. At a mere 9.8 light years away, it was one of the Local Group's nearest neighbors.

Events for May 2009

➢ Monthly Meetings

"In Search of Time"
Friday, May 1st, 8:00 PM
Andrus Planetarium
Hudson River Museum, Yonkers

What is "time". Science writer Dan Fauk, the author of In Search of Time: The Science of a Curious Dimension, will discuss some of the most intriguing aspects of time: how our ancestors first learned to measure it; how Newton and Leibniz argued over its nature; how Einstein linked time and space; and a brief look at the physics of time travel and the paradoxes it seems to entail. Dan has written about science for the Globe and Mail, the Toronto Star, The Boston Globe, The Walrus, SkyNews, Astronomy, Sky & Telescope, and New Scientist, and has been a regular contributor to the Canadian radio programs Ideas and Quirks & Quarks on the CBC radio network. Free and open to the public.

Upcoming Speakers
Andrus Planetarium
Hudson River Museum, Yonkers

For our June meeting (June 5th) Joe Rao will speak on "The Great Comets of the Last 400 Years." Free and open to the public.

➢ Starway to Heaven

Saturday, May 23rd, 8:30-10:30PM
Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River

This is our scheduled Starway to Heaven observing date for May, weather permitting. Free and open to the public. The scheduled rain/cloud date is May 30th.

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/.

New Members. . .

Curtis Jones, Pleasantville, NY
Leonard Ospina, Briarcliff Manor, NY

Renewing Members. . .

Paul Alimena, Rye, NY
George Angelastro, Harriman, NY
Ramon Bloch, Yonkers, NY
Rick Bria, Greenwich, CT
James Cobb, Tarrytown, NY
Tom Crayns, Brooklyn, NY
Cindy & Tim Dunne, Scarsdale, NY
Ruth Fischer, Pleasantville, NY
Jim Gondek, Jefferson Valley, NY
Patricia & Mike Gondek, Hastings-on-Hudson, NY
Martin Lee, Yonkers, NY
Arumugam Manoharan, Yonkers, NY
Rosalind Mendell, Hartsdale, NY
Richard Romney, Chappaqua, NY
Karen Seiter, Larchmont, NY
George Thomas, Irvington, NY
Lori Wood, Yonkers, NY

NOTE: The WAA election for officers has been postponed while the slate is completed. Volunteers for President and VP Membership are needed. Those interested should contact the Club.

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

The Swiss Army Knife of Weather Satellites

Spotting volcanic eruptions, monitoring the health of crops, pinpointing distress signals for search and rescue teams: It's not what you might expect from a weather satellite. But these are just a few of the abilities of NOAA's newest polar-orbiting weather satellite, launched by NASA on February 6 and turned over to NOAA for full-time operations on February 26.

Formerly called NOAA-N Prime and now renamed NOAA-19, it is the last in its line of weather satellites that stretches back almost 50 years to the dawn of the Space Age. Over the decades, the abilities of these Television Infrared Observation Satellites (TIROS) have gradually improved and expanded, starting from the grainy, black-and-white images of Earth's cloud cover taken by TIROS-1 and culminating in NOAA-19's amazing array of capabilities.

"This TIROS series has become quite the Swiss army knife of weather satellites, and NOAA-19 is the most capable one yet," says Tom Wrublewski, NOAA-19 Satellite Acquisition Manager at NASA's Goddard Space Flight Center in Greenbelt, Maryland.

The evolution of TIROS began in 1998 with NOAA-K. The satellites have carried microwave sensors that can measure temperature variations as small as 1 degree Celsius between Earth's surface and an altitude of 40 kilometers—even through clouds. Other missions have added the ability to track large icebergs for cargo ships, monitor sea surface temperatures to aid climate change research, measure the amount of ozone in Earth's protective ozone layer, and even detect hazardous particles from solar flares that can affect communications and endanger satellites, astronauts in orbit, and city power grids.

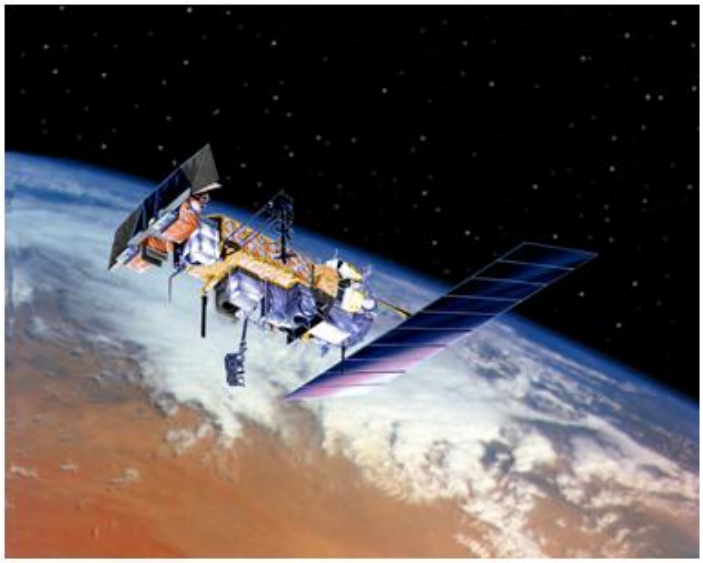
NOAA-19 marks the end of the TIROS line, and for the next four years it will bridge the gap to a new series of satellites called the National Polar-orbiting Operational Environmental Satellite System. NPOESS will merge civilian and military weather satellites into a single system. Like NOAA-19, NPOESS satellites will orbit Earth from pole to pole, circling the planet roughly every 100 minutes and observing every location at least twice each day.

NPOESS will have yet more capabilities drawn from its military heritage. Dim-light sensors will improve observations of the Earth at night, and the satellites will better monitor winds over the ocean — important information for ships at sea and for weather and climate models.

"A lot more capability is going to come out of NPOESS, improving upon the 161 various environmental data products we already produce today," Wrublewski says.

Not even a Swiss army knife can do that many things, he points out. For more on the NPOESS, check out: http://www.npoess.noaa.gov.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with NASA



The new NOAA-19 is the last and most capable in the long line of Television Infrared Observation Satellites (TIROS).

Young Moon

Bob Kelly took this lunar image on April 25th of the 20 hour 50 minute old moon. He used his 8-inch DOB (FL 1200 mm), a 50mm eyepiece and his Canon A40 camera (ISO 100, 3x zoom with a 16 mm FL).

Notes Bob: It turns out that people who do moon sighting for a living (each month in the Islamic calendar starts only when the new moon has been sighted) considered last night's moon to be "easily" visible to the naked eye in the United States, but hard to see if we were just a few hundred miles to the east of our location. I have a new respect for young moon hunters. I found it first in my 8x 25 binoculars, then later we were able to see it without optical aid. Nonetheless, very few people have seen a moon this soon after new moon.

⇦*Mud Volcanoes on Mars?*

Is this a mud volcano on Mars? If so, could it be dredging up Martian microbes? This strange possibility has been suggested recently and seems to fit several recent observations of Mars. First of all, hills like this seem to better resemble mud volcanoes on Earth than lava volcanoes and impact craters on Mars. Next, the pictured dome has an unusually textured surface consistent with fractured ice. Infrared images from space indicate that hills like this cool more quickly than surrounding rock, consistent with a dried mud composition.

Constellation Corner

By Matt Ganis

There has been a tremendous amount of activity within the astronomical community in an effort to discover planets that orbit around other stars in our universe. Since the discovery in 1995 of the first "exoplanet," astronomers have found more than 300 such worlds, almost all of them Jupiter-size "gas giants" which are the easiest to detect with today's technology. So how do astronomers detect these planets ? Let's have a look.

Before we begin, let's review some basics first. The Doppler effect allows astronomers to tell if an object (say a star) is moving towards or away from us by shifts in the spectral lines that originate from the light of a star. When light passes through a prism, it separates into the colors that make it up. White light changes to a swath of colors. This rainbow is called a spectrum. When the light of a star passes through a spectrograph, we get a spectrum of the star which looks like a regular rainbow of colors—except that there are dark lines in it. Every element absorbs light of a particular frequency or rather a particular color. If that element is in the cool atmosphere of the star, those atoms will absorb the light at that color and produce the dark line. What's important is that each element has a specific "signature" or fingerprint that shows itself as a specific line or set of lines in the visible spectrum.

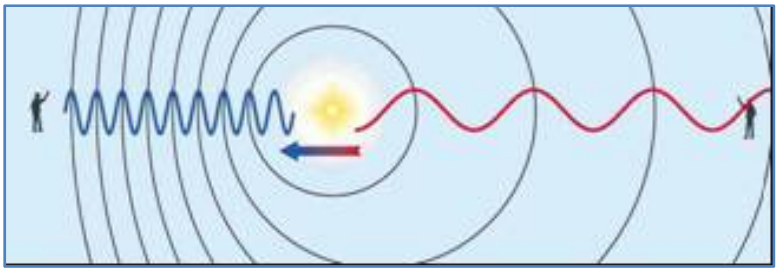
If a spectral line from a star is shifted to longer wavelengths, a red shift, it is moving away from us. If it is shifted to shorter wavelengths, a blue shift, the star is moving towards us. A larger shift tells us the star is moving faster.

If a star's spectrum alternates between red and blue shifts with a regular period, the star is orbiting something. Astronomers can detect some binary systems (two stars orbiting each other) using this effect. By looking at the light from the star, you'll see two sets of spectral lines, one from each star, that alternate between red and blue shifts. So while one of the stars will show a red shift, the other will show a blue shift, so we know that when one star is moving towards us the other is moving away. These binary systems are known as spectroscopic binaries.

Normally we would think about a planet orbiting a star, but actually the planet and star both orbit a point in space, their mutual center of mass. Think about a binary star system. If both stars have the same mass, they will orbit a point half way between them, their center of mass. If one of the stars is more massive, the center of mass will be closer to the more massive star. For example, if one of the stars is twice as massive as the other, the center of mass is one third of the way from the more massive star to the less massive star.

So what about a planet and a star? The star is much more massive than the planet, so the center of mass of the star-planet system is very close to but not exactly at the center of the star. As the planet orbits the star - really the center of mass, the star also orbits the center of mass.

The star's orbit is however very small because it is so much more massive than the planet. So the star's spectral lines have very small alternating red and blue shifts. So the "trick" is to detect the spectral shift in the orbiting planet. Until just recently the instrumentation wasn't good enough. But by the mid-90's astronomical instrumentation improved to the point where high resolution spectroscopy was finally able to detect the small Doppler shifts from extrasolar planets that are orbiting these stars. By analyzing the orbits of these systems we can tell the mass of the unseen object orbiting the star and determine if it is too small to be a star or a brown dwarf and therefore must be a planet.



The first planets detected were massive gas giants that were close to the parent star because those spectral line shifts are easier to detect. As the instrumentation becomes more sensitive, we are able to detect smaller spectral shifts and thus smaller planets.

It's amazing to think that we can learn so much from such a small amount of information (light) that travels to us over vast distances.

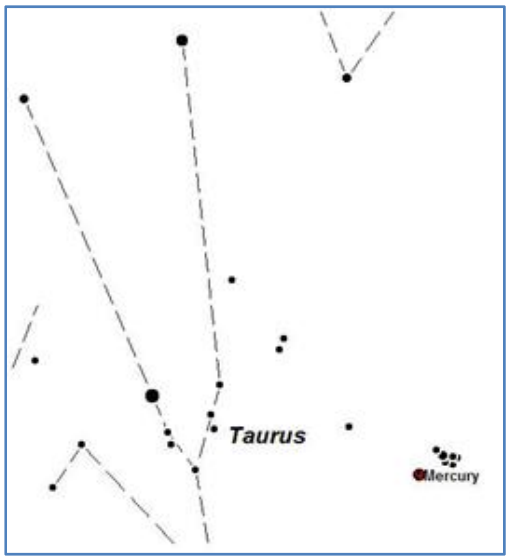
Almanac

For May 2009 by Matt Ganis

May 1 May 9 May 17 May 24

Wow, it's May already. When I start the next column the year will officially be halfway over! I can't believe how fast time is moving. Hopefully you take some time out of your busy schedule this month to catch up with some old friends in our night time sky!

Early this month (around the 2nd or 3rd) see if you can catch a glimpse of Mercury low in our western skies. Mercury spent the latter half of April climbing higher into our skies and now it begins to slowly sink back into the western horizon. But, before it fades from view, have a look at the start of the month for a close conjunction of Mercury and the Pleiades (the two objects will be a little less than 2° apart). Mercury should be shining at about +1.2 magnitude and with a pair of good binoculars should reveal a crescent shaped disk just to the west of the "seven sisters"



Saturn continues to dazzle in the southern evening skies, shining at an impressive +0.8 magnitude. The "ringed beauty" of our Solar System will complete its retrograde motion across the sky on the 17th and will then continue its "normal" eastward trek. By the time Saturn's retrograde motion stops, the rings will have "tipped" a maximum of 4° for 2009 providing a very nice visual appearance (note just for the record, the amount of tilt of the rings is NOT at all related to the planets retrograde motion).

The other bright planet in our May skies is the brilliant Venus. As it nears it's Greatest Enlongation, in the early morning hours, Venus is a spectacular -4.5 magnitude located in the constellation of Pisces. The Greatest Elongation is the position of an inner planet (Mercury or Venus) when it lies farthest from the Sun in its orbit in the sky. On the 21st or 22nd of the month look to see if you catch a slim crescent moon near the planet in the early morning hours.

The Eta Aquarid meteor shower is predicted to reach a peak of about sixty meteors per hour at 8 p.m. EDT on Monday, May 5. Of course, the meteors are not visible until after dark and then for just a couple of hours before dawn. Unfortunately, this shower is very low in the sky and is not easily observed from our area. The radiant or the point in Aquarius the water bearer from which the meteors appear to come, does not rise until about 3 a.m. This year we will have a waxing gibbous moon in the sky which will interfere with observations of fainter meteors until moonset about 4:45 a.m. A waxing gibbous Moon is a very nearly full moon which is illuminated generally from the right side. Of course, twilight begins shortly after 6 a.m. so there is a very short window of potentially dark skies.

While not optimal, you can catch a glimpse of Jupiter in the very early hours of day (perhaps as you're getting ready to have a look at Venus). The planet rises around 2:45am at the start of the month providing a decent view by the time the Sun rises fully into the sky. An interesting conjunction will occur on the morning of the 27th when Jupiter and Neptune come within 0.4° of each other making for a very nice view in the telescope. I know I haven't been able to see Neptune in my 8" Celestron, and this seems like a perfect opportunity to give it a try.

So that's it for this month. Enjoy the warm weather while you put away those snow shovels and pull out that pool floats!!!