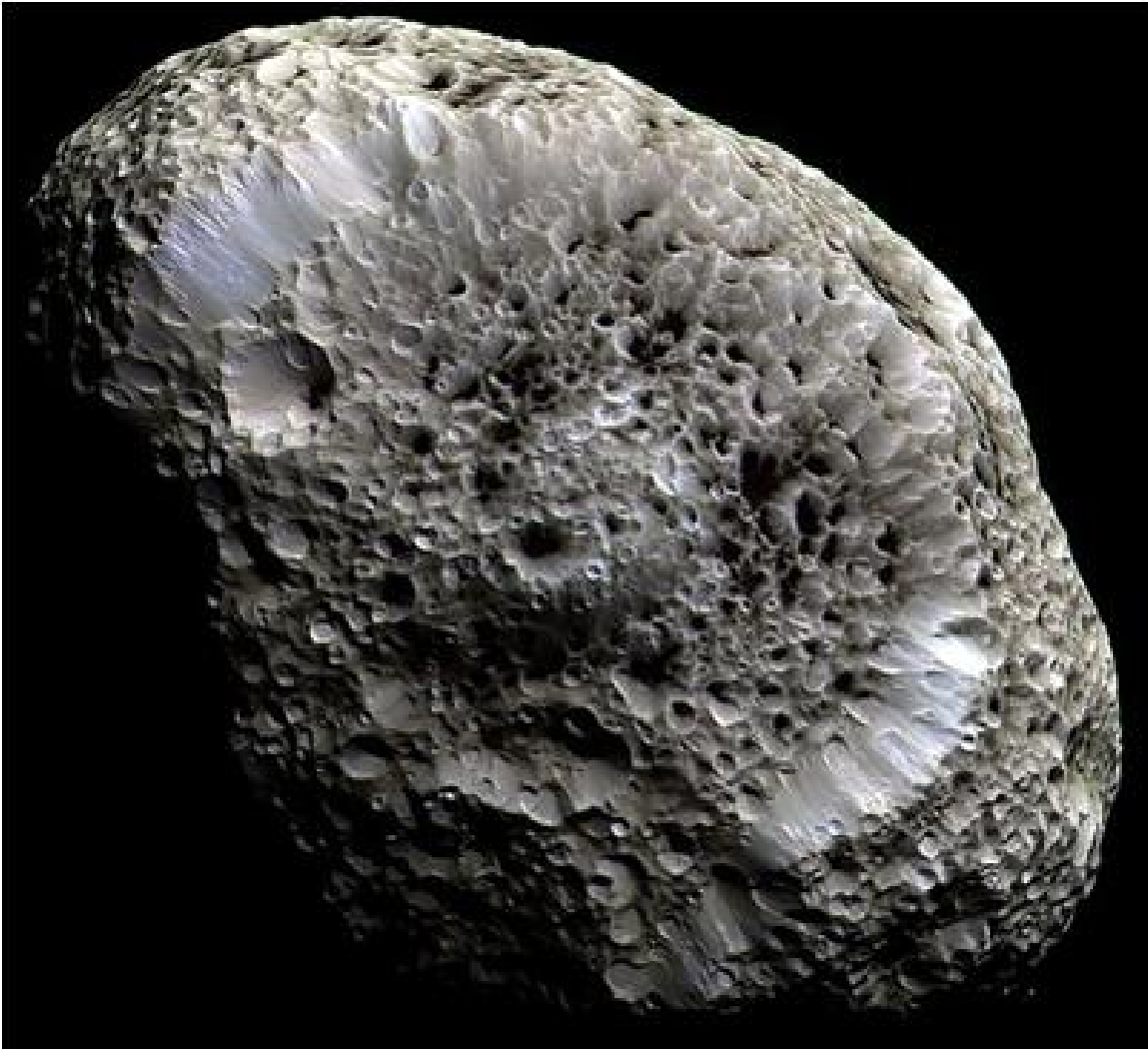


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The Monthly Publication of the Westchester Amateur Astronomers

February 2009



Saturn's Hyperion

What lies at the bottom of Hyperion's strange craters? Nobody knows. To help find out, the robot Cassini spacecraft now orbiting Saturn swooped past the sponge-textured moon in late 2005 and took an image of unprecedented detail. That image, shown above in false color, shows a remarkable world strewn with strange craters and a generally odd surface. The slight differences in color likely show differences in surface composition. At the bottom of most craters lies some type of unknown dark material. Inspection of the image shows bright features indicating that the dark material might be only tens of meters thick in some places. Hyperion is about 250 kilometers across, rotates chaotically, and has a density so low that it might house a vast system of caverns inside.

Credit: [Cassini Imaging Team](#), [SSI](#), [JPL](#), [ESA](#), [NASA](#)

Events for February 2009

➤ Monthly Meetings

WAA at RAC

Friday, February 6th, 7:00 PM

Rye Arts Center

51 Milton Rd, Rye

Rick Bria will be speaking on astrophotography and Hubble. WAA'ers will have an opportunity to visit the galleries at the Rye Arts Center and peruse the Hubble Images at their leisure. Free and open to the public.

Directions: <http://www.ryeartscenter.org/>.

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/>.

“Methane Discovery and Its Implications for Finding Martian Life by Brother Robert Novak”

Friday, March 6th, 8:00 PM

Andrus Planetarium

Hudson River Museum, Yonkers

Brother Novak will discuss the telescopic discovery of methane on Mars and how that affects the likelihood of finding life. Free and open to the public.

➤ Starway to Heaven

Saturday, February 21st, 6:00-9:00PM

Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River

This is our scheduled Starway to Heaven observing date for February, weather permitting. Free and open to the public. The scheduled rain/cloud date is February 28th.

NOTE: The WAA election for officers has been postponed while the slate is completed. Volunteers for President, Webmaster 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

Severe Space Weather

By Dr. Tony Phillips

Did you know a solar flare can make your toilet stop working?

That's the surprising conclusion of a NASA-funded study by the National Academy of Sciences entitled *Severe Space Weather Events—Understanding Societal and Economic Impacts*. In the 132-page report, experts detailed what might happen to our modern, high-tech society in the event of a “super solar flare” followed by an extreme geomagnetic storm. They found that almost nothing is immune from space weather—not even the water in your bathroom.

The problem begins with the electric power grid. Ground currents induced during an extreme geomagnetic storm can melt the copper windings of huge, multi-ton transformers at the heart of power distribution systems. Because modern power grids are interconnected, a cascade of failures could sweep across the country, rapidly cutting power to tens or even hundreds of millions of people. According to the report, this loss of electricity would have a ripple effect with “water distribution affected within several hours; perishable foods and medications lost in 12-24 hours; loss of heating/air conditioning, sewage disposal, phone service, fuel re-supply and so on.”

“The concept of interdependency,” the report notes, “is evident in the unavailability of water due to long-term outage of electric power—and the inability to restart an electric generator without water on site.” It takes a very strong geomagnetic storm to cause problems on this scale—the type of storm that comes along only every century or so. A point of reference is the “Carrington Event” of August-September 1859, named after British amateur astronomer Richard Carrington who witnessed the instigating solar flare with his unaided eye while he was projecting an image of the Sun on a white screen. Geomagnetic storms triggered by the flare electrified telegraph lines, shocking technicians and setting their telegraph papers on fire; Northern Lights spread as far south as Cuba and Hawaii; auroras over the Rocky Mountains were so bright, the glow woke campers who began preparing breakfast because they thought it was morning!

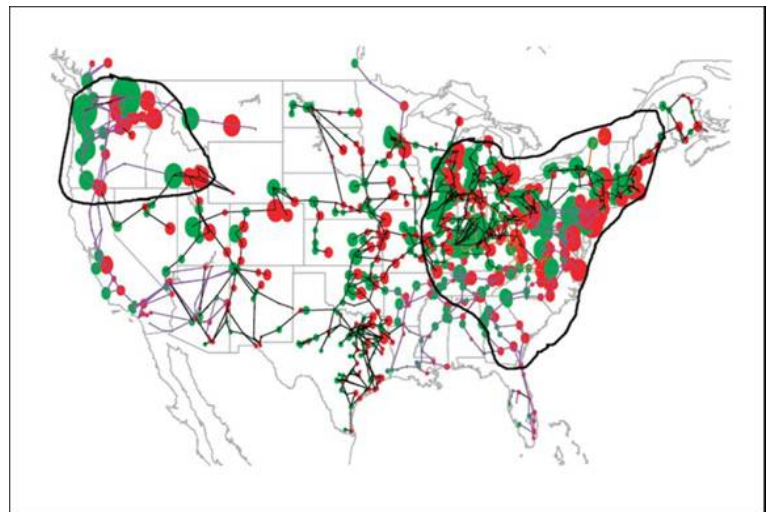
“A contemporary repetition of the Carrington Event would cause ... extensive social and economic disruptions,” the report warns. Widespread failures could include telecommunications, GPS navigation,

banking and finance, and transportation. The total economic impact in the first year alone could reach \$2 trillion (some 20 times greater than the costs of Hurricane Katrina).

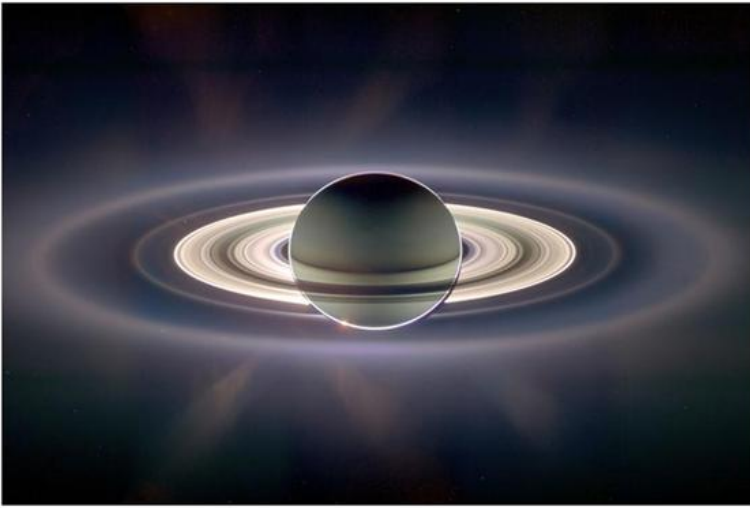
The report concluded with a call for infrastructure designed to better withstand geomagnetic disturbances and improvements in space weather forecasting. Indeed, no one knows when the next super solar storm will erupt. It could be 100 years away or just 100 days. It's something to think about ... the next time you flush.

One of the jobs of the Geostationary Operational Environmental Satellites (GOES) and the Polar-orbiting Operational Environmental Satellites (POES) operated by NOAA is to keep an eye on space weather and provide early warning of solar events that could cause trouble for Earth.

You can keep an eye on space weather yourself at the National Weather Service's Space Weather Prediction Center, www.swpc.noaa.gov. This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with NASA.



On this power-grid map of the United States, the black-circled areas are regions especially vulnerable to collapse during an extreme geomagnetic storm. Inside those boundaries are more than 130 million people. Credit: National Academy of Sciences report on severe space weather.



← Saturn in Shadow

The robotic Cassini spacecraft now orbiting Saturn recently drifted in the giant planet's shadow for about 12 hours and looked back toward the eclipsed Sun. Cassini saw a view unlike any other. First, the night side of Saturn is seen to be partly lit by light reflected from its own majestic ring system. Next, the rings themselves appear dark when silhouetted against Saturn, but quite bright when viewed away from Saturn, slightly scattering sunlight, in this exaggerated color image.

Credit: [Cassini Imaging Team](#), [SSI](#), [JPL](#), [ESA](#), [NASA](#)



← Venus from La Jolla

Bob Kelly took this 15 sec exposure on a portable tripod (slightly tilted!) from the beach at La Jolla, California with my Canon A40, on the evening of January 4th. Venus is to the upper left.

← Mercury and Venus

Bob excerpted the above photo to highlight Jupiter and Mercury, which are difficult to view due to their proximity to the horizon. Notes Bob: "The lighting in the foreground is from local street lights. In the clear sky, I was able to see Venus well before sunset by blocking the Sun with my hand or a small building."

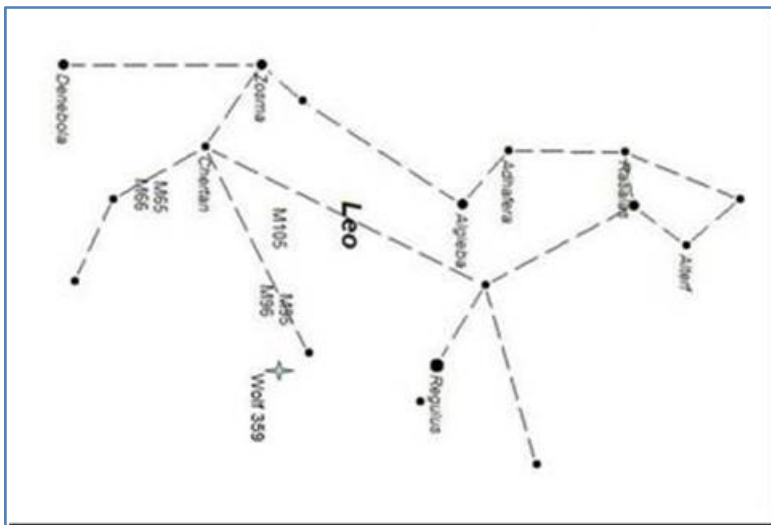


Constellation Corner

By Matt Ganis

This month let's have a look at the constellation of Leo the Lion, located in our eastern skies this time of the year.

Leo, the Lion, has been identified with the Sun since the earliest civilizations looked to the sky. In ancient Mesopotamia and Egypt, over five millennia ago, the Sun's passage at midday through this area of the sky coincided with the midsummer solstice. Leo was therefore the constellation of high summer. As a consequence, during the dry season the lions of the desert came close to the valley of the Nile when the river flooded. Some have interpreted this as the origin of the name of the constellation. We of course associate Leo with the Nemean Lion which was killed by Hercules on one of his great quests. Legend says that the lion had a hide that could not be punctured by iron, bronze or stone. Since he couldn't reason with the ferocious beast, Hercules strangled it to death with his bare hands.



The constellation Leo is known as the Lion; but his head and mane make up one of the most well known asterisms, the sickle or upside-down question mark. One of the brightest spring stars, Regulus, is at the base of the question mark with the rest of Leo's body, legs, and tail extending to the east. The name Regulus is believed to have originated with the astronomer Copernicus and means "the little king." In ancient times, Regulus was known as

the Star of the King as well as "The Flame," or the "Red Fire." It was believed that the star made a contribution towards the heat of summer because around this time (2300BC) the summer solstice was located near Regulus, meaning that around that period, the Sun was located near Regulus. It was thought that the combined heat of the Sun and Regulus produced the excessive heat of that season.

Leo contains several Messier objects within its borders that are worth mentioning here. Located in the "middle" of the Lion's rear leg is "The Leo Triplet" (also known as the M66 Group). This is a small group of galaxies about 35 million light-years away. This galaxy group consists of the spiral galaxies M65 and M66 as well as the very faint NGC 3628.

Of the two spiral galaxies, M66 is considerably larger than its neighbor, M65, and has a well developed but not well defined central bulge. Both are fairly dim (with visual magnitudes of approximately +9.0) making them challenging (but not impossible) telescopic targets.

Located near the belly of the beast, Messier 105 is the brightest elliptical galaxy in the so-called Leo I or M96 group of galaxies. Located approximately 38 million light years from us, this dim galaxy has a rather weak visual magnitude of +9.3 (again, challenging, but possible with decent skies and a telescope). Investigations with the Hubble Space Telescope of the central region of M105 have revealed that this galaxy contains a massive central object of about 50 million solar masses.

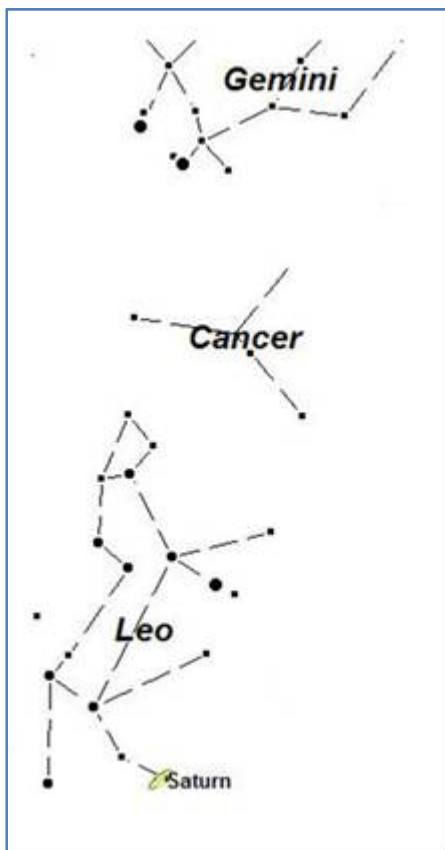
Finally, if you look just "under" M105, you'll find Wolf 359, a star located approximately 2.4 parsecs (or 7.7 light years) from the Earth. This is one of the nearest stars (second only to the Alpha Centauri system and Barnard's star). Wolf 359 is an extremely faint red dwarf and too dim to be visible to the naked eye, with a visual magnitude of only +13.5.

Almanac

For February 2009 by Matt Ganis

These cold winter nights make it a tough choice for observing: do I pull on my winter coat, gloves and hat or do I just “hunker down” inside and wait for the spring thaw? It’s nice to know that when I do decide to go out and brave the elements, I’ll be rewarded with at least a few interesting objects to observe to make the effort worthwhile. This month shouldn’t disappoint.

To start the month off right, keep an eye out for a gibbous Moon passing in front (or slightly North) of the Pleiades star cluster on the evening of February 3rd.



While Mercury, Jupiter and Mars have slipped out of nighttime skies, Venus remains ever vigilant in our February Skies. At sunset on the 1st of the month, Venus rides about 40 degrees above our South-Western skies, shining at a whopping -4.6 magnitude. The planet will be about 40% illuminated and look like a gibbous moon. It stays in our skies until



Feb 2



Feb 9



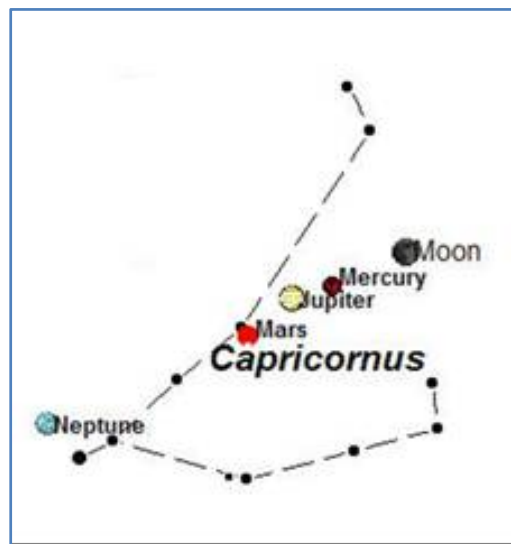
Feb 16



Feb 24

about 9pm every night this month – so it not only makes for an easy target, but one that the young kids can enjoy as well. By the end of the month the planet’s disk will have grown from about 30” in diameter to about 45”, but will only be about 20% illuminated – giving the appearance of a crescent moon in most small/medium sized telescopes. Definitely worth a look!

Just as Venus is setting in the western skies, have a look around 8pm in the east (at the back foot of Leo, the Lion) for a rising Saturn. It’s not overly bright, shining at meager +0.5 magnitude but should make for a fine



observing target this month. The rings appear rather narrow right now, but will widen slightly while the planet remains in retrograde motion; they will then resume narrowing afterward.

Even though Jupiter, Mercury and Mars have slipped from view in our evening skies, you can still catch them (if you want) as early morning objects. As a matter of fact on the morning of February 22nd, just about 40 minutes from Sunrise, if you look to the eastern skies you’ll be able to catch a glimpse the Moon, forming a line with Mercury, Jupiter, and Mars.