

# The Prairie Astronomer

May 2016 Volume 57, Issue #5

Cover Photo:

## Quadruple Conjunction

May 21/22

Michael Sibbernsen

**May Program:**  
Calibration of "Alice" on  
New Horizons – Nathaniel  
Cunningham, NWU



**Night Sky Network**



The Newsletter of the Prairie Astronomy Club

# ***The Prairie Astronomer***

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**NEXT PAC MEETING: May 31, 7:30pm**  
at Hyde Observatory

## **PROGRAM**

**The Calibration effort for “Alice” aboard NASA’s New Horizons Mission** - Nathaniel Cunningham, Nebraska Wesleyan University

New Horizons flew by Pluto in July of 2015, carrying out a first (and last for a long time!) close-up exploration of this distant, richly-varied world. I’ll introduce the New Horizons mission, and Alice, an ultraviolet-sensing instrument aboard New Horizons. I will discuss my work with the Alice instrument team, characterizing and calibrating the instrument, and will show Alice’s results and discoveries about Pluto’s atmosphere. Along the way, I’ll highlight unexpected challenges that arose for Alice during flight, and the in-flight problem solving we carried out to understand and deal with those challenges.

## **FUTURE PROGRAMS**

June: Solar Star Party  
August: NSP Review

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**Buy the book! The Prairie Astronomy Club: Fifty Years of Amateur Astronomy.**  
Order online from [Amazon](https://www.amazon.com) or [lulu.com](https://www.lulu.com).

# EVENTS



Tuesday May 31st, 2016, 7:30pm  
Hyde Observatory  
Program: New Horizons and Pluto

PAC Meeting  
Tuesday June 28th, 2016, 7:30pm  
Hyde Observatory  
Solar Star Party

PAC Meeting  
Tuesday July 26th, 2016, 7:30pm  
Hyde Observatory

Newsletter submission deadline June 16

## 2016 STAR PARTY DATES



Photo by Brian Sivill

	Star Party Date	Star Party Date	Lunar Party Date
January	Jan 1st	<b>Jan 8th</b>	
February	Jan 29th	<b>Feb 5th</b>	
March	Mar 4th	<b>Mar 11th</b>	
April	Apr 1st	<b>Apr 8th</b>	Apr 15th
May	Apr 29th	<b>May 6th</b>	May 13th
June	May 27th	<b>Jun 3rd</b>	
July	<b>Jul 1st</b>	Jul 8th	
<b>NSP</b>	<b>July 31st</b>		
	<b>- Aug 5th</b>		
August	Jul 29th	<b>Aug 5th</b>	Aug 12th
August	Aug 26th	<b>Sep 2nd</b>	Sep 9th
September	Sep 23rd	<b>Sep 30th</b>	
October	Oct 21st	<b>Oct 28th</b>	
November	Nov 25th	<b>Dec 2nd</b>	
December	Dec 23rd	<b>Dec 30th</b>	



### PAC E-MAIL:

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### WEBSITES

- [www.prairieastronomyclub.org](http://www.prairieastronomyclub.org)
- <https://nightsky.jpl.nasa.gov>
- [www.hydeobservatory.info](http://www.hydeobservatory.info)
- [www.nebraskastarparty.org](http://www.nebraskastarparty.org)
- [www.OmahaAstro.com](http://www.OmahaAstro.com)
- [Panhandleastronomyclub.com](http://Panhandleastronomyclub.com)
- [www.universetoday.com/](http://www.universetoday.com/)
- [www.planetary.org/home/](http://www.planetary.org/home/)
- <http://www.darksky.org/>



**Night Sky Network**

## **PAC Meeting Minutes**

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Minutes for the meeting of April 26, 2016

President Jim Kvasnicka called the meeting to order.

Welcome to our members, guests and speakers, Elsbeth Maglition and Professor Frans Von der Dunk.

Jim reviewed some upcoming events and club dues, and benefits.

Jim provided his May observing report.

Jim presented two observing

awards. Bob Kacvinsky has completed the Two In The View award, the first PAC member to complete this program and 12th AL member to receive this. Also, Jim completed the Herchel 400 list, the fourth PAC member for this award. This is Jim's tenth observing award.

Congratulations, Bob and Jim!

Club business

Brian mentioned some discussions about lighting

standards with LED lighting from the city of Lincoln. The use of LED lighting seems excessively bright and are a concern for light pollution. Hyde has established a committee and Brian would like PAC members to join him.

Adjourn to our program on Space Law.

Respectfully submitted by,

Lee Taylor

## **Hyde Volunteer of the Year Award**

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Leonard Mertz received the Hyde Volunteer of the Year award for 2015. Unfortunately Leonard was not able to attend. The dinner was hosted by Zach Thompson at Mueller Planetarium. Zach also ran the fulldome show *Solar Superstorms*.



# Boller-Sivill Observatory

Brian Sivill and Brett Boller

The Boller-Sivill roll-off observatory at Branched Oak Observatory is officially underway!

On Saturday, May 7, Brett and I embarked on an overly ambitious plan to get concrete footings poured for Brett's 12 foot by 24 foot structure design. Delays set in from the start, having to go to the South Home Depot for some rental equipment, then discovering they only had the two-man auger, not the drill bit.... say what?

When we called, we presumed you would have told us THAT PART.

Nearly every step of our initial day was delayed or interfered with. Fortunately, Matt Anderson with Branched Oak Observatory recommended we call a nice guy down the road who has really cool equipment. One phone call later, we had Sunday scheduled with a very generous Doug Buhrman and his tractor-mounted hole auger.

On Sunday, Doug and I got the six foundation holes dug along with two holes for telescope piers!

Sketchy weather was playing havoc with our ability to work at the now muddy site. A few days with some volunteer help I had rounded-up produced very little further progress - until Brett and his dad, Bill, came out Wednesday (today).

Brett and Bill finished setting the forms in place, and mixed and poured all of the primary structure footings.

Progress is very tangible now! Our mission: To build an observatory where we can perform astrophotography, and eventually, do it remotely.

We intend to partner with PAC – providing members support a shared investment concept.

In any case, the Boller-Sivill observatory will have several telescopes, plus a tracking platform intended to permit astrophotography for any club member with a DSLR.

We have big plans and ideas, and we now have real, tangible progress.



## Mercury Transit at Hyde Observatory

*John Reinert*

PAC members Brian Sivill and Rick Brown were among the early risers Monday May 9th as we gathered at the Hyde Observatory for Mercury's transit of the Sun. A significant rain shower had preceded us by mere minutes and we nervously anticipated rolling the roof closed in a hurry if unfavorable weather conditions were to overtake, but we and our equipment endured partly cloudy skies to enjoy doughnuts and light breakfast fare before Mercury dashed across the Sun's face in a nearly seven hour local event. Upwards of 50 people would drift through the observatory hoping for a glimpse on their ways to school and work though out the day. Ed Schmidt, Lee Thomas, Kevin Dowd, and Mark Dahmke all made appearances as filters and various helioscopes were brought to bear. Lacey clouds did yield to several minutes of bright sun for uncommon viewing of the sun's surface with Mercury racing along dodging sunspots here and there. Lunt and Coronado H-alpha scopes competed with metalized mylar and glass filters for the CPC 11 and 9.25 inch Hyde telescopes. Brian and Rick both brought additional optical gear to further test photometric limits. By early afternoon the better moments had passed and we ended at 1:42pm as predicted. Several fun photographs were captured on cell phones and other DSLRs. Hopefully club members will share their own thoughts and images.



*Top: Mercury Transit, handheld iPhone 6s view through Celestron 9.25 inch CPC scope on the deck at Hyde with Orion glass sun filter (Lee Thomas's) taken at 11:18 am.*

*Bottom: Kevin Dowd and Coronado.*



*Ed Schmidt and patron*



*Brian Sivill*



*Ed Schmidt and Lee Thomas*



*Rick Brown*

# Observatory Update: Ghosts in Orion? IC 423-424

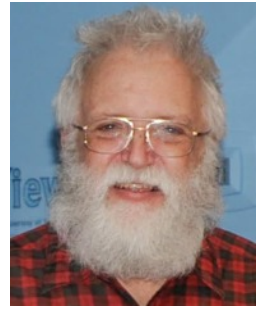
Rick Johnson

IC 423 and IC 424 are a pair of reflection nebula in the region of Orion's belt two thirds of the way from Alnilam (middle star) and Mintaka (western belt star). I found no distances for these. Both seem to have tails pointing to Mintaka and heads pointing to more distant by angular measurement Alnilam. I'm going to go out on a limb and say that since their heads are toward Alnilam that it is the illuminating star. It is a B0Ia star at 1342 light-years per The Sky's database. Mintaka is a O9.5II star about 900 light-years

distant. That puts it in front of most of the nebulae in the area with known distances.

IC 423 is sometimes called "The Teardrop Nebula". Considering how bad my imaging weather has been for months that seems appropriate. An interesting description of IC 423 going back to an image taken with the Crossley reflector and published in 1918 reads: "A very peculiar and interesting mass of diffuse nebulosity, 6' x 4'. The central part is vacant, giving the object the general appearance of a

pear-shaped ring, rounded at the southern end and pointed at the northern end, which is directed approximately toward  $\delta$  Orionis, 27' distant. There are flame-like protuberances on each side at the north. Quite faint." By today's imaging standards it isn't all that faint and certainly not "vacant" in the center. That region is much redder and





somewhat dimmer but not empty. I couldn't find the Crossley image itself unfortunately.

IC 424 has two stars in it. To my pareidolia challenged brain they look like slightly red and blue eyes. I turned the cropped image to south up. Is it a three eared cat or a ghost? The Crossley description reads: "A smaller mass of diffuse nebulosity, somewhat resembling I 423; 2.5' x 1'; the sharper western end points to {delta} Orionis, 24' distant." Delta is Mintaka. To me that's

backwards. The Delta end is fuzzier not sharper and fades away. Like IC423 it has a reddish darker core that sort of makes the nose of the cat or ghost.

Both were discovered by Williamina Fleming on June 27, 1888. A short bio of her reads: "Scottish-American astronomer. Abandoned by her husband, she was reduced to working as a maid. Her employer, a professor of astronomy at Harvard, was so dissatisfied with the work of his assistants that he claimed "My maid could do a better job." And

she did, becoming one of the most famous female astronomers of the 19th century, and an honorary member of the Royal Astronomical Society."

Conditions went down while this was taken. They were pretty good for the luminance data but transparency went bad on me for the color data. This meant I picked up nothing but noise for the faint nebulosity in the background. I didn't realize this until I went to process it too late to take more color data.

## Annotated Cover Photo



Cover photo: quadruple conjunction on May 21/22, by Michael Sibbersen. Nikon 18mm f/4.5 10sec. Best viewed "live," as something like this is oddly difficult to photograph. Had to find a balance of settings to capture the stars, planets and landscape without completely blowing out the scene from the bright full Moon.

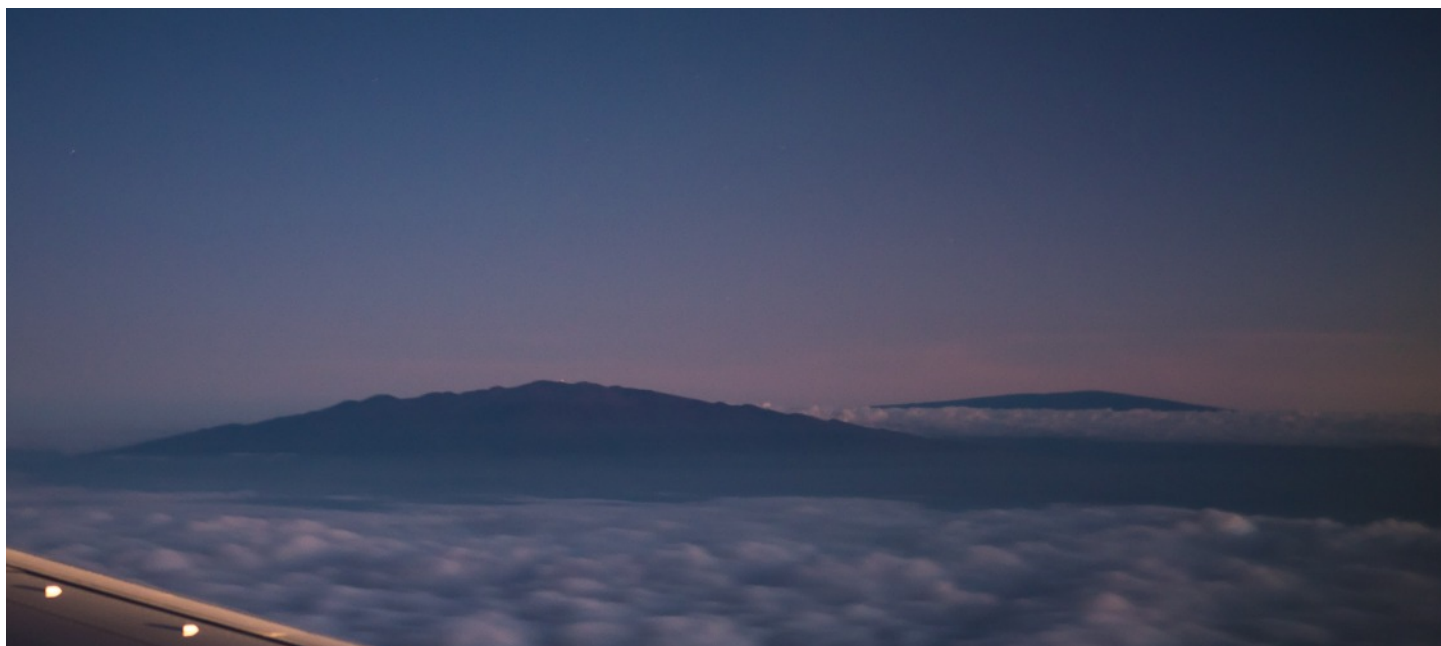
## **Astro (and Aerial) Photography - Mark Dahmke**

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*Left: A stack of two images processed with Lightroom's HDR (high dynamic range) utility. I used a Panasonic Lumix GX8 with Nikon 28-300 VR lens at 300mm, which on the GX8 is an effective 600mm focal length. April 25, 5am HT. ISO 400, 1/800 sec, Kona, Hawaii.*

*Below: Mauna Kea and Mauna Loa, April 19 at 8pm HT. An observatory dome is visible at the summit of Mauna Kea.*



# June Observing: What to View

Jim Kvasnicka

This is a partial list of objects visible for the upcoming month.

## Planets

**Jupiter:** Shines at magnitude -1.9 with a disk 34" wide in the southwest.

**Mars:** Dims to magnitude -1.5 with a disk 16.5".

**Saturn:** Reaches opposition on June 3<sup>rd</sup> at magnitude 0.0 in Ophiuchus with the rings open 26° from edge on.

**Mercury:** Very low in the dawn sky a half hour before sunrise.

**Venus / Uranus / Neptune:** Not visible in June.

## Messier List

**M58:** Oval shaped galaxy in Virgo.

**M59/M60:** Two galaxies in Virgo that fit in the same FOV.

**M84/M86:** Galaxies in Virgo that fit in the same FOV, start of Markarian's Chain.

**M87:** Round galaxy in Virgo.

**M88:** Oval shaped galaxy in Coma Berenices.

**M89/M90:** Galaxies in Virgo that fit in the same FOV.

**M91:** Oval shaped galaxy in Coma Berenices.

**M98:** Thin elongated galaxy in Coma Berenices.

**M99:** Round galaxy in Coma Berenices.

**M100:** Round galaxy in Coma Berenices.

**Last Month:** M49, M51, M61, M63, M64, M85, M94, M101, M102, M104

**Next Month:** M3, M4, M5, M53, M68, M80, M83

## NGC and other Deep Sky Objects

**NGC 4754/4762:** Galaxy pair in Virgo.

**NGC 4866:** Edge on galaxy in Virgo.

**NGC 5248:** Galaxy in Bootes.

**NGC 5676:** Oval shaped galaxy in Bootes.

**NGC 5689:** Spindle shaped galaxy in Bootes.

**NGC 5746:** Thin edge on galaxy in Virgo.

**NGC 5838:** Oval shaped galaxy in Virgo.

## Double Star Program List

**Sigma Corona Borealis:** Yellow pair.

**16/17 Draconis:** Equal pair of white stars.

**Mu Draconis:** Pair of close white stars.

**Kappa Herculis:** Yellow pair.

**Alpha Herculis:** Orange primary with a greenish secondary.

**Delta Herculis:** Bright white star with a blue-purple secondary.

**Rho Herculis:** Close pair of white stars.

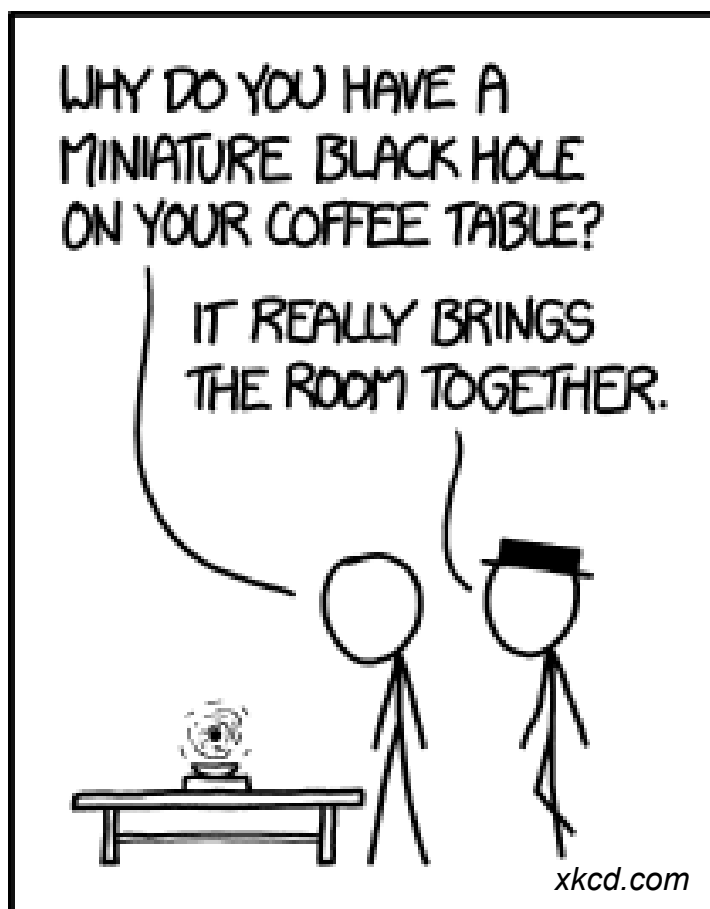
**95 Herculis:** Light yellow and white stars.

**Alpha Librae:** Wide pair of yellow and white stars.



## Challenge Object

**NGC 5576 Group:** A trio of galaxies in Virgo. NGC 5576 is the brightest along with NGC 5574 and NGC 5577.



# Focus on Constellations: Hercules

Jim Kvasnicka

Hercules, the Strongman is the fifth largest constellation covering 1,225 square degrees. It's best known by its Keystone asterism making it easy to spot. On the western side of the Keystone is the constellations finest object, the Great Hercules Cluster M13, the best globular cluster in the northern hemisphere. Hercules contains a second outstanding globular cluster in M92 which is often overlooked. The constellation has a number of colorful double stars, planetary nebulae, and a number of galaxies. The constellation Hercules is best seen in June.

## Showpiece Objects

**Globular Clusters:** M13, M92

**Multiple Stars:** Alpha Herculis (Ras Algethi), Delta Herculis, Mu Herculis

## Mythology

Hercules was the son of Zeus by a mortal woman and hated by Zeus's wife Hera. He began his life of heroic violence by strangling two serpents in his crib as an infant. The serpents were sent by Hera to kill Hercules. As a man Hera made Hercules insane by burning down his house and killing his wife and children. When he recovered his sanity he sought the help from the oracle of Delphi. The oracle told Hercules he must serve his cousin Eurystheus, King of Argos. Hoping to kill Hercules, Eurystheus gave him 12 supposedly impossible tasks to do. These were the 12 labors

of Hercules and included strangling the Nemean Lion and striking off the many heads of the Hydra. After he completed the 12 labors Hercules took part in the voyage of Jason and the Argonauts to find the Golden Fleece. Hercules died when his second wife accidentally poisoned him. Zeus honored his son by making him a god and placing him in the sky forever.

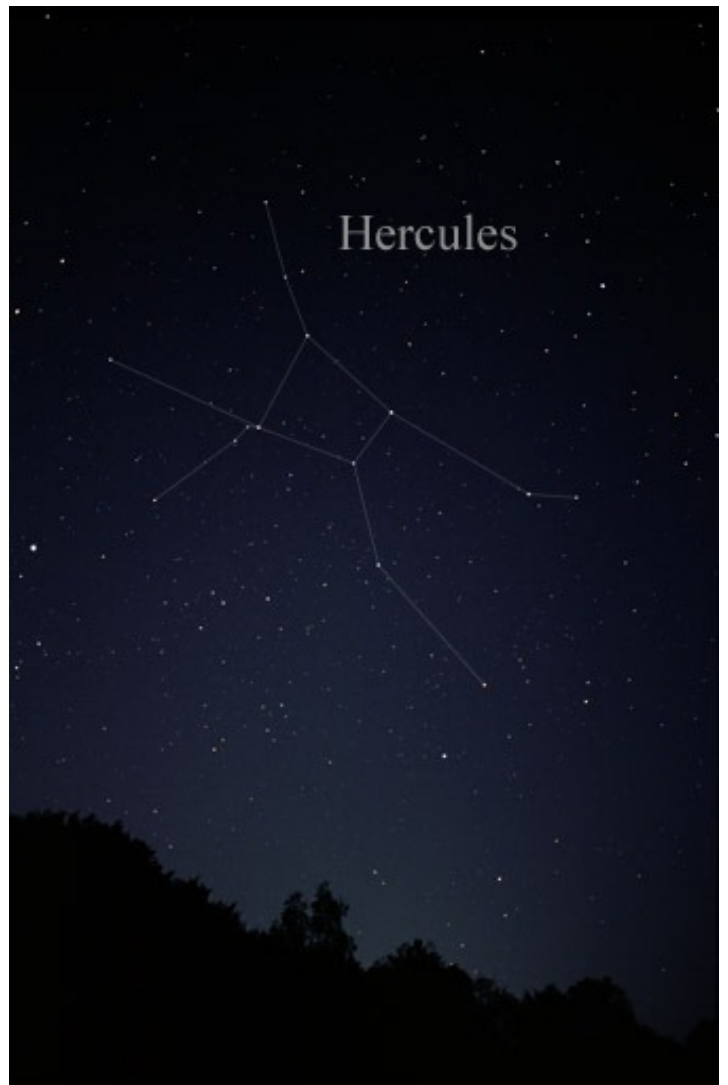
## Number of Objects Magnitude 12.0 and Brighter

**Galaxies:** 8

**Globular Clusters:** 3

**Planetary Nebulae:** 4

*Photo: Till Credner - Own work: AlltheSky.com*



# Enceladus Jets: Surprises in Starlight



*The gravitational pull of Saturn changes the amount of particles spraying from the south pole of Saturn's active moon Enceladus at different points in its orbit. More particles make the plume appear much brighter in the infrared image at left. Credit: NASA/JPL-Caltech/University of Arizona/Cornell/SSI*

During a recent stargazing session, NASA's Cassini spacecraft watched a bright star pass behind the plume of gas and dust that spews from Saturn's icy moon Enceladus. At first, the data from that observation had scientists scratching their heads. What they saw didn't fit their predictions.

The observation has led to a surprising new clue about the remarkable geologic activity on Enceladus: It appears that at least some of the narrow jets that erupt from the moon's surface blast with increased fury when the moon is farther from Saturn in its orbit.

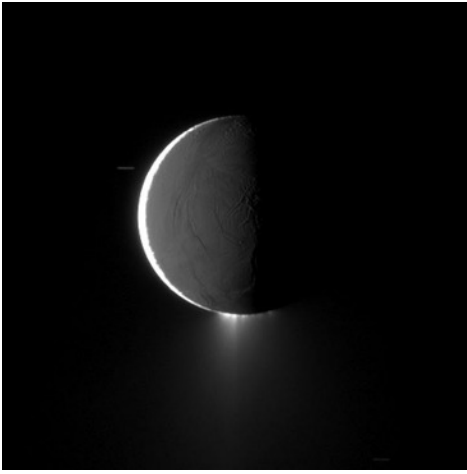
Exactly how or why that's happening is far from clear, but the observation gives theorists new possibilities to ponder about the twists and turns in the "plumbing" under the moon's frozen surface. Scientists are eager for such clues because, beneath its frozen shell of ice, Enceladus is an ocean world that might have the ingredients for life.

## It's a Gas, Man

During its first few years after arriving at Saturn in 2004, Cassini discovered that Enceladus continuously spews a broad plume of gas and dust-sized ice grains from the region around its south pole. This

plume extends hundreds of miles into space, and is several times the width of the small moon itself. Scores of narrow jets burst from the surface along great fractures known as "tiger stripes" and contribute to the plume. The activity is understood to originate from the moon's subsurface ocean of salty liquid water, which is venting into space.

Cassini has shown that more than 90 percent of the material in the plume is water vapor. This gas lofts dust grains into space where sunlight scatters off them, making them visible to the spacecraft's cameras. Cassini



has even collected some of the particles being blasted off Enceladus and analyzed their composition.

### Not the Obvious Explanation

Previous Cassini observations saw the eruptions spraying three times as much icy dust into space when Enceladus neared the farthest point in its elliptical orbit around Saturn. But until now, scientists hadn't had an opportunity to see if the gas part of the eruptions -- which makes up the majority of the plume's mass -- also increased at this time.

So on March 11, 2016, during a carefully planned observing run, Cassini set its gaze on Epsilon Orionis, the central star in Orion's belt. At the appointed time, Enceladus and its erupting plume glided in front of the star. Cassini's ultraviolet imaging spectrometer (or UVIS) measured how water vapor in the plume dimmed the star's ultraviolet light, revealing how much gas the plume contained. Since lots of extra dust appears at this point in the moon's orbit, scientists expected to measure a lot more gas in the plume, pushing the dust into space.

But instead of the expected huge increase in water vapor output, the UVIS instrument only saw a slight bump -- just a 20 percent increase in the total amount of gas.

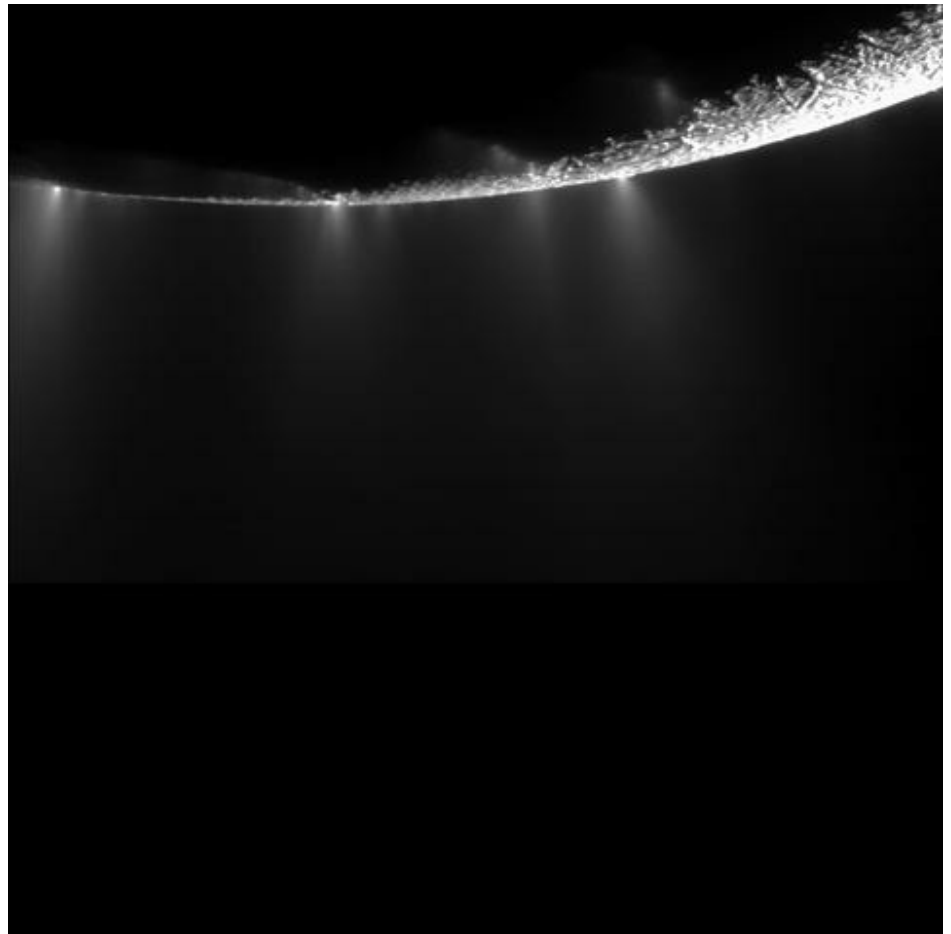
Cassini scientist Candy Hansen quickly set to work trying to figure out what might be going on. Hansen, a UVIS team member at the Planetary Science Institute in Tucson, led the planning of the observation. "We went after the most obvious explanation first, but the data told us we needed to look deeper," she said. As it turned out, looking deeper meant paying attention to what was happening closer to the moon's surface.

Hansen and her colleagues focused their attention on one jet known informally as "Baghdad

I." The researchers found that while the amount of gas in the overall plume didn't change much, this particular jet was four times more active than at other times in Enceladus' orbit. Instead of supplying just 2 percent of the plume's total water vapor, as Cassini previously observed, it was now supplying 8 percent of the plume's gas.

### Call a Plumber

This insight revealed something subtle, but important, according to Larry Esposito, UVIS team lead at the University of Colorado at Boulder. "We had thought the amount of water vapor in the overall plume, across the whole south polar area, was being strongly affected by tidal forces from Saturn.



Instead we find that the small-scale jets are what's changing." This increase in the jets' activity is what causes more icy dust grains to be lofted into space, where Cassini's cameras can see them, Esposito said.

The new observations provide helpful constraints on what could be going on with the underground plumbing -- cracks and fissures through which water from the moon's

potentially habitable subsurface ocean is making its way into space.

With the new Cassini data, Hansen is ready to toss the ball to the theoreticians. "Since we can only see what's going on above the surface, at the end of the day, it's up to the modelers to take this data and figure out what's going on underground."

The Cassini-Huygens mission is a cooperative project of NASA,

ESA (European Space Agency) and the Italian Space Agency. JPL, a division of Caltech in Pasadena, manages the mission for NASA's Science Mission Directorate in Washington. The ultraviolet imaging spectrograph was designed and built at the University of Colorado, Boulder, where the team is based.

## HubNOAA's Joint Polar Satellite System (JPSS) to revolutionize Earth-watching

*This article is provided by NASA Space Place.*

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Ethan Siegel



If you want to collect data with a variety of instruments over an entire planet as quickly as possible, there are two trade-offs you have to consider: how far away you are from the world in question, and what orientation and direction you choose to orbit it. For a single satellite, the best of all worlds comes from a low-Earth polar orbit, which does all of the following:

- orbits the Earth very quickly: once every 101 minutes,
- is close enough at 824 km high to take incredibly high-resolution imagery,
- has five separate instruments each probing

various weather and climate phenomena,

- and is capable of obtaining full-planet coverage every 12 hours.

The type of data this new satellite – the Joint Polar Satellite System-1 (JPSS-1) -- will take will be essential to extreme weather prediction and in early warning systems, which could have severely mitigated the impact of natural disasters like Hurricane Katrina. Each of the five instruments on board are fundamentally different and complementary to one another. They are:

1. The Cross-track Infrared Sounder (CrIS), which will

measure the 3D structure of the atmosphere, water vapor and temperature in over 1,000 infrared spectral channels. This instrument is vital for weather forecasting up to seven days in advance of major weather events.

2. The Advanced Technology Microwave Sounder (ATMS), which assists CrIS by adding 22 microwave channels to improve temperature and moisture readings down to 1 Kelvin accuracy for tropospheric layers.

3. The Visible Infrared Imaging Radiometer Suite (VIIRS) instrument, which takes visible and infrared pictures at a

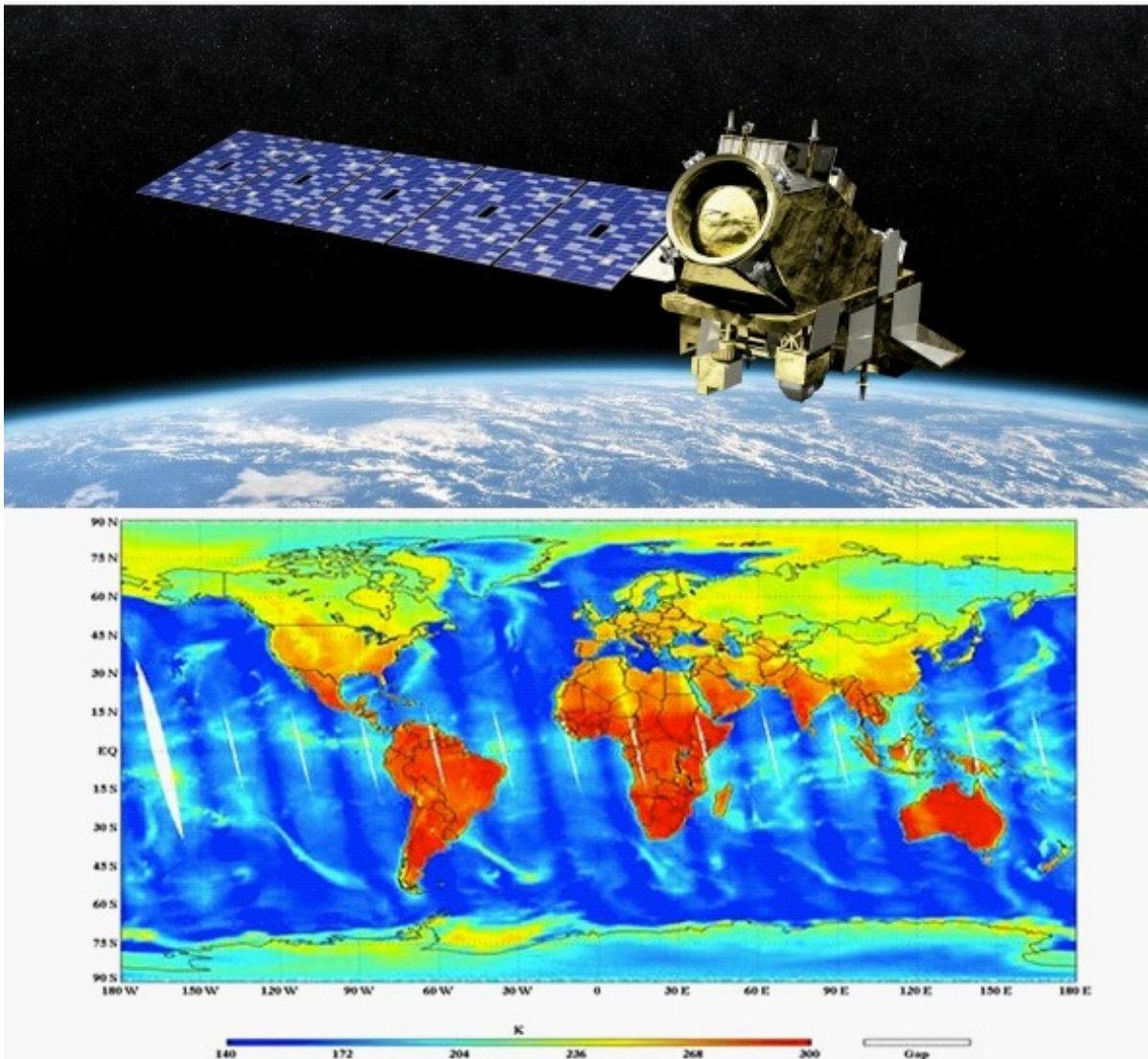
resolution of just 400 meters (1312 feet), enables us to track not just weather patterns but fires, sea temperatures, nighttime light pollution as well as ocean-color observations.

4. The Ozone Mapping and Profiler Suite (OMPS), which measures how the ozone concentration varies with altitude and in time over every location on Earth's surface. This instrument is a vital tool for understanding how effectively ultraviolet light penetrates the atmosphere.

5. Finally, the Clouds and the Earth's Radiant System (CERES) will help understand the effect of clouds on Earth's energy balance, presently one of the largest sources of uncertainty in climate modeling.

The JPSS-1 satellite is a sophisticated weather monitoring tool, and paves the way for its' sister satellites JPSS-2, 3 and 4. It promises to not only provide early and detailed warnings for disasters like hurricanes, volcanoes and

storms, but for longer-term effects like droughts and climate changes. Emergency responders, airline pilots, cargo ships, farmers and coastal residents all rely on NOAA and the National Weather Service for informative short-and-long-term data. The JPSS constellation of satellites will extend and enhance our monitoring capabilities far into the future.



*Images credit: an artist's concept of the JPSS-2 Satellite for NOAA and NASA by Orbital ATK (top); complete temperature map of the world from NOAA's National Weather Service (bottom).*



# Messier 14 (M14) – the NGC 6402 Globular Cluster

Tammy Plotner, [Universe Today](#)

*Welcome back to Messier Monday! Today, in our ongoing tribute to Tammy Plotner, we take a look at the M14 globular cluster!*

In the 18th century, French astronomer Charles Messier began cataloging all the “nebulous objects” he had come to find while searching the night sky. Having originally mistook these for comets, he compiled a list these objects in the hopes of preventing future astronomers from making the same mistake. In time, the list would include 100 objects, and would come to be known as the Messier Catalog to posterity.

One of these objects was the globular cluster which he would designate as M14. Located in the southern constellation Ophiuchus, this slightly elliptically-shaped stellar swarm contains several hundred thousand stars, a surprising number of which are variables. Despite these stars not being densely concentrated in the central region, this object is not hard to spot for amateur astronomers that are dedicated to their craft!

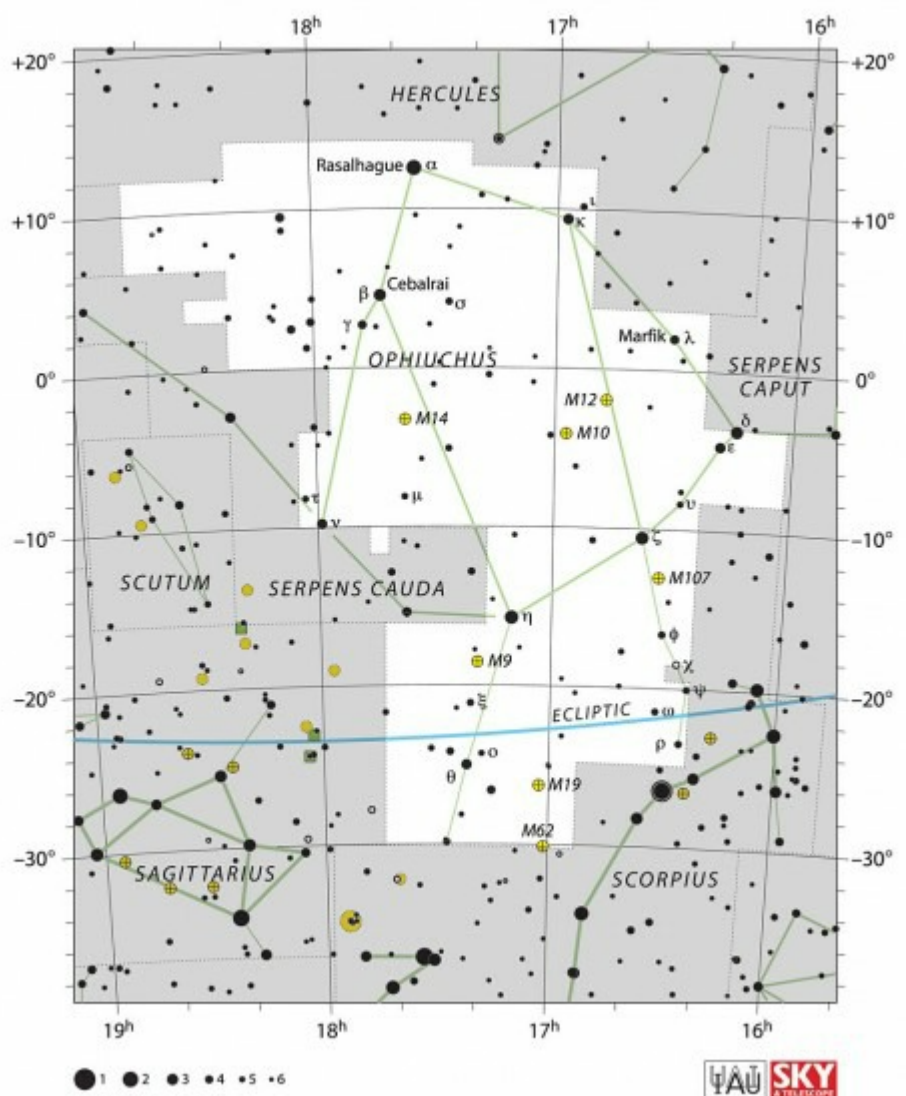
## Description:

Located some 30,000 light years from Earth and measuring 100 light years in diameter, this globular cluster can be found in the southern Ophiuchus constellation, along with several other Messier Objects. Although

it began its life some 13.5 billion years ago, it is far from being done changing. It is still shaking intracluster dust from its shoes. What this means is that M14, like many globular clusters, contains a good deal of matter that it picked up during its many times orbiting the center of our Galaxy. According to studies done by N. Matsunaga (et al):

“Our goal is to search for emission from the cold dust

within clusters. We detect diffuse emissions toward NGC 6402 and 2808, but the IRAS 100-micron maps show the presence of strong background radiation. They are likely emitted from the galactic cirrus, while we cannot rule out the possible association of a bump of emission with the cluster in the case of NGC 6402. Such short lifetime indicates some mechanism(s) are at work to



remove the intracluster dust... (and) its impact on the chemical evolution of globular clusters.”

Another thing that makes Messier 14 unusual is the presence of CH stars, such as the one that was discovered in 1997. CH stars are a very specific type of Population II carbon stars that can be identified by CH absorption bands in the spectra. Middle aged and metal poor, these underluminous suns are known to be binaries. Patrick Cote, the chief author of the research team that discovered the star,

wrote in their research report to the American Astronomical Society:

“We report the discovery of a probable CH star in the core of the Galactic globular cluster M14 (=NGC 6402 = C1735-032), identified from an integrated-light spectrum of the cluster obtained with the MOS spectrograph on the Canada-France-Hawaii telescope. Both the star’s location near the tip of the red giant branch in the cluster color-magnitude diagram and its radial velocity therefore argue for membership in M14. Since the

intermediate-resolution MOS spectrum shows not only enhanced CH absorption but also strong Swan bands of C2, M14 joins Centaurus as the only globular clusters known to contain “classical” CH stars. Although evidence for its duplicity must await additional radial velocity measurements, the CH star in M14 is probably, like all field CH stars, a spectroscopic binary with a degenerate (white dwarf) secondary.”



## ***From the Archives: May 30, 1978***

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May brought the bane of Amateur astronomers, Daylight Saving Time. At least it was tempered by some fine viewing nights.

Unfortunately, the skies were cloudy for the trip to Mead. Even with the cloudy skies we managed to view Mars as it has never been viewed before! While not listed in an ephemeris, May 5, 1978, was the closest conjunction we have ever had with Mars--about 200 feet across an open field filled with many distorting heat cells. We were asked to draw what we saw. What I saw was a very good facsimile of the real Mars. There was much fine detail but only fleetingly due to the blasted heat cells. Many familiar "landmarks" were easily seen. Thanks to the heat cells I never had a chance to "see" what I was seeing in that fine detail.

The artificial Mars was a one-inch transparency with a muted flashlight shining through it. The drawing on the transparency consisted of many fine "details" which, due to the unsettled "seeing" conditions, came out as the familiar landmarks we were seeing. These fine "details" consisted of drawings of telescopes, rockets, the big dipper, comets, flying saucers,

cartoon wisecracks, etc! After it was all over, everyone was saying they did see some of the detail, but refused to draw it. Being honest, I did see a Saturn which I refused to draw. The only problem is that what I saw as Saturn was really a galaxy! Let's just say it was a very educational experiment. It also illustrated the effects of telescope aperture. Those of 6-inches or less were too small to see much of the fine detail. Those 8-inches in size saw by far the most detail, while my 10-inch was so affected by the seeing that only fleeting glimpses of the detail were seen, and then at far less contrast than in the 8-inch scopes. I wish someone had brought a 12.5-inch scope, because I bet that would have seen even less.

Awards were given for optical and mechanical excellence as well as for drawing ability. While Larry Stepp couldn't be there, his 4-inch refractor took mechanical excellence, and Dr. Manthey's Questar took optical excellence. They did take pity on my poor optical alignment and gave me a second place award in that category. Next year I'll keep it in alignment all the way to Mead! Steve Myatt won for his drawing of Mars.

Thus, we took the first four prizes.

To be fair, many of the Omaha Club attending to the signing of the deed for their new observatory. Their site consists of several acres on which they plan to build two observatories. Also there will be several sites available to members for construction of their own facilities. Bob Allen, the president, tells me it is 56 miles to the site from his home in Council Bluffs. Well, see you at the meeting.

Rick Johnson

[Note from Rick: Don Taylor provided the Mars image for this observing experiment.]

## CLUB MEMBERSHIP INFO

REGULAR MEMBER - \$30.00 per year. Includes club newsletter, and 1 vote at club meetings, plus all other standard club privileges.

FAMILY MEMBER - \$35.00 per year. Same as regular member except gets 2 votes at club meetings.

STUDENT MEMBER - \$10.00 per year with volunteer requirement.

If you renew your membership prior to your annual renewal date, you will receive a 10% discount.

Club members are also eligible for special subscription discounts on Sky & Telescope Magazine.

## CLUB TELESCOPES

*To check out one of the club telescopes, please contact a club officer. Scopes can be checked out at a regular club meeting and kept for one month. Checkout can be extended for another month if there are no other requests for the telescope, but you must notify a club officer in advance.*

100mm Orion refractor: David Pennington  
10 inch Meade Dobsonian: Lee Taylor  
13 inch Truss Dobsonian: Available

## CLUB APPAREL



Order club apparel from [cafepress.com](http://cafepress.com):



Shop through Amazon Smile to automatically donate to PAC:



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