The Prairie Astronomer

May 2018 Volume 59, Issue #5

HCG61

Rick Johnson

Night Sky Network

The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer

NEXT PAC MEETING: May 29, 6:30pm at Dino's

PROGRAM

Club Dinner at Dino's Eastside Grille, 2901 S 84th, 6:30pm.

FUTURE PROGRAMS

June: Solar Star Party
July: To be announced
August: NSP Review
October: Club Viewing Night
November: How to Buy a Telescope
December: To be announced

Buy the book! The Prairie Astronomy Club: Fifty Years of Amateur Astronomy.
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EVENTS

PAC Meeting
Tuesday May 29, 2018, 6:30pm
Club Dinner

PAC Meeting
Tuesday June 26, 2018, 7:30pm
Solar Star Party

PAC meeting
Tuesday July 31, 2018, 7:30pm

Nebraska Star Party
August 5-10, 2018, Merritt Reservoir

PAC meeting
Tuesday August 28, 2018, 7:30pm
Review of Nebraska Star Party

2018 STAR PARTY DATES

Photo by Brian Sivill

	Star Party Date	Star Party Date
January	Jan 12th	**Jan 19th**
February	Feb 9th	**Feb 16th**
March	Mar 9th	**Mar 16th**
April	Apr 6th	**Apr 13th**
May	May 4th	**May 11th**
June	Jun 8th	**Jun 15th**
July	Jul 6th	**Jul 13th**
August	Aug 3rd	**Aug 10th**
NSP	**Aug 5th -10th**	
September	**Sep 7th**	Sep 14th
October	**Oct 5th**	Oct 12th
November	Nov 2nd	**Nov 9th**
December	Nov 30th	**Dec 7th**

Dates in **BOLD** are closest to the New Moon.

PAC E-MAIL:

info@prairieastronomyclub.org

PAC-LIST:

Subscribe through GoogleGroups.
To post messages to the list, send to the address:

pac-list@googlegroups.com

ADDRESS

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WEBSITES

www.prairieastronomyclub.org
https://nightsky.jpl.nasa.gov
www.hydeobservatory.info
www.nebraskastarparty.org
www.OmahaAstro.com
Panhandleastronomyclub.com
www.universetoday.com/
www.planetary.org/home/
http://www.darksky.org/

Night Sky Network

Meeting Minutes

PAC Business Meeting
04/24/2018

President Jim Kvasnicka called the meeting to order at 7:30 p.m.

Jim covered upcoming events:

Star parties, May 4 and 11.

The next club meeting will be our annual dinner at Dino's, May 29. The room is reserved starting at 6:00 p.m. The Hyde Board will not be meeting before the PAC meeting.

ALCON (Astronomical League national convention) is in Minneapolis July 11-14.

NSP (Nebraska Star Party) is at Merritt Reservoir south of Valentine August 5 - 10.

Jim went over the observing programs available from the Astronomical League, of which PAC members are automatically also members. There are observing programs for beginners, intermediate and advanced observers, so there's likely more than one that would be perfect for you. All of the programs, awards and requirements are described at:

https://www.astroleague.org/observing.html

Jim also did a bit of research tracking the awards earned by club members. By decade, awards earned:

1970's – 8
1980's – 5
1990's – 11
2000-2009 – 22
2010 - Present – 25

Ron Veys noted that, in the early years, the 70's and 80's (which he remembers – nobody else is that old), there were just 3 or 4 AL observing programs, while now there are over 50.

The breakdown of awards (4 or more):

Messier – 31
Globular Cluster – 5
Binocular Messier – 5
Double Star – 4
Lunar – 4
Herschel 400 – 4

Jim has been mowing the club observing site near Cortland 8 - 11 times a year, depending on rain/plant growth, for which we have been paying him $300 annually. His brother-in-law, Eugene Busboom, who farms the land, has been allowing the club to use the site for observing (he has never asked to be paid for this); we have been paying him $200 annually in appreciation. Jim asked for a vote on continuing both arrangements for 2018. Motion passed unanimously.

Brian Sivill reported that no progress had been made in getting bids for the club pad at Branched Oak Observatory. They are still working on it.

Jim adjourned the meeting at 7:50 p.m. A program on star parties in the U.S. Followed.

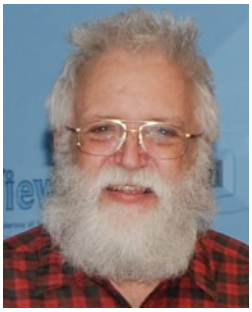
Submitted by Lee Thomas.

Observatory Update: HCG 61

Rick Johnson

The HCG 61 galaxy group is one of Hickson's most photogenic being composed of four bright, NGC galaxies arranged in a rectangle. This has given it its common name of "The Box". It is composed of NGC 4169, NGC 4173, NGC 4174 and NGC 4175. All but NGC 4173 are located about 200 million light-years from us. NGC 4173 is located only about 65 million light-years away by redshift though there's a good agreement that its non-redshift distance is only 30 million light-years. The group is located in northwestern Coma Berenices.

I measure NGC 4169 with a diameter of 135,000 light-years making it the largest of the group. NGC 4174 may be the smallest at only 53,000 light-years while I measure NGC 4175 at 110,000 light-years. While appearing much larger, NGC 4173 is also much closer. I measure it, including the long arm to the southeast as being 84,000 or 39,000 light-years in size. If the closer distance is right it is the smallest of the four.



At the time of Hickson's catalog distances to most of his galaxies was unknown. He was working on appearance, well aware that this isn't going to always equate to distance. Hence his name for them of Compact Groups. He didn't mean they really were compact, only that they appeared that way

from our vantage point. Also, if you look around the annotated image you will find a few other galaxies also with a redshift of about 200 million light-years that are likely true members of the group but don't meet Hickson's requirements so aren't included in the group. What I do find odd is that when I ask NED for HCG 61 it says it has 3 galaxies, not four but then when asked individually about the four it gives them the HCG letters A through D I show in the annotated image. I've found this count difference many times in NED. I suppose I should ask them about it but so far haven't done so.

NGC 7174 is suspected to have a faint polar ring. I saw an image showing a hint of it but the URL has changed to a movie that doesn't begin to go deep enough. I'd hoped to try and bring it out but my weather went bad on me and I never got back to add more data. I suspect I'd need a minimum of 4 times more luminance than I got to have a chance of picking it up.

This image had something go wrong. I still have no idea what but the left side of the image is way out of focus. If this were due to camera tilt (which has happened to me) the stars would elongate but these turned into donuts with a bit of distortion due to being at the edge of the field. All subs showed the same error. It was taken the same night as NGC 2742 and NGC 3686. It was taken between these two yet neither show this problem. I've not looked at all taken since but none I have looked at show this issue. I'm stumped as to what could cause it. Since that put the Abell 1495 galaxy cluster well out of focus I have this one on the reshoot list.

Just off the southwest end of NGC 4174 is ASK 574454.0 which NED lists as a candidate dwarf but if its redshift distance of 1.08 billion light-years is correct I measure it as being the same size as NGC 4174 which is a normal sized S0 galaxy. I suspect it got the possible dwarf label before its distance was known. But why that hangs on I find interesting, inertia?

There's a pair of interacting galaxies near the bottom center of the image, KISSBx 37. I couldn't find them listed separately. NED normally labels distance data as p for photographic, Spec as proven spectroscopic measurements. If likely spectroscopic but not proven it leaves that blank. For this one, however, they use the label ? which I've never seen before. I don't know what they mean by it but included it in the annotation. I can't prove these two are interacting but they sure appear to be interacting.

June Observing: What to View

Jim Kvasnicka

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

Planets

Venus: Shines at magnitude -4.1, setting 2½ hours after the Sun.
Mercury: Becomes visible low in the dusk by mid-month.
Jupiter: Dims to magnitude -2.3 with a disk 41½" wide.
Saturn: At opposition on June 27, its rings are tilted nearly at maximum at 25.7º.
Mars: Brightens to magnitude -2.2 with a disk 20" wide.
Uranus and Neptune: High enough to view in the morning twilight.

Messier List

M58: Oval shaped galaxy in Virgo.
M59/M60: Round galaxies in Virgo that fit in the same FOV.
M84/M86: Galaxies in Virgo that fit in the same FOV.
M87: Round galaxy in Virgo.
M88: Small 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: 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 4565: The Needle Galaxy in Coma Berenices.
NGC 4725: Large oval shaped galaxy in Coma Berenices.
NGC 5248: Oval shaped galaxy in Bootes.
NGC 5986: Class VII globular cluster in Lupus.

Double Star Program List

Sigma Corona Borealis: Yellow pair.
16/17 Draconis: Equal pair of white stars.
Mu Draconis: Close pair of white stars.
Kappa Herculis: Yellow stars.
Alpha Herculis: Orange and greenish colored stars.
Delta Herculis: Bright white primary with a blue-purple secondary.
Rho Herculis: Close white stars.
95 Herculis: Equal yellow and white stars.
Alpha Librae: Wide pair of yellow and white stars.

Challenge Object

NGC 5795 Group: Brightest member of a group of five galaxies in Bootes which includes NGC 5794, NGC 5804, NGC 5805, and NGC 5797.

Hazy Kona skies. April 23, Kailua-Kona, Hawaii. Panasonic Lumix GX8, 8 second exposure, f/2.8, ISO 1600, 12mm focal length. By Mark Dahmke.

Hana, Maui, looking North at 5am, May 1. Cassiopeia is directly above the house on the left side. By Mark Dahmke.

Panasonic Lumix GX8, 30 second exposure at f/5.6, ISO 200, 12mm focal length.

25th Nebraska Star Party - August 5-10, 2018

The early registration deadline is July 15th!

Join us this summer as families from all over the US and around the world gather in the sparsely populated sand hills of North Central Nebraska to spend a good week under a galaxy of stars.

NSP Schedule of Events

Sunday: registration and check-in, optional dinner.

Monday: registration and check-in, field school, optional dinner.

Tuesday: registration and check-in, swap meet, field school, free “Cattle Country” hamburger dinner.

Wednesday: Brewer’s Niobrara Canoe or tube float, optional dinner.

Thursday: (All at Valentine High School) field school, registration, swap meet, speaker program, children’s program, dinner on your own.

Friday: public star party at 9pm.

For more information see the NSP website.

Register online!

What Is the Asteroid Belt?

Linda Hermans-Killiam

This article is provided by NASA Space Place.
With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.
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There are millions of pieces of rocky material left over from the formation of our solar system. These rocky chunks are called asteroids, and they can be found orbiting our Sun. Most asteroids are found between the orbits of Mars and Jupiter. They orbit the Sun in a doughnut-shaped region of space called the asteroid belt.

Asteroids come in many different sizes—from tiny rocks to giant boulders. Some can even be hundreds of miles across! Asteroids are mostly rocky, but some also have metals inside, such as iron and nickel. Almost all asteroids have irregular shapes. However, very large asteroids can have a rounder shape.

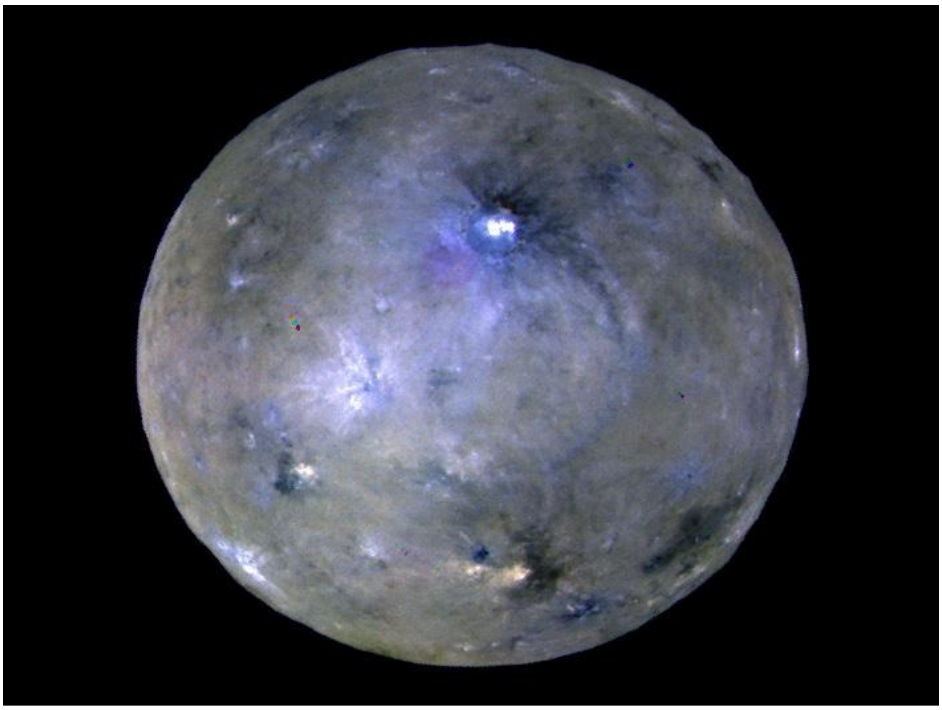
The asteroid belt is about as wide as the distance between Earth and the Sun. It's a big space, so the objects in the asteroid belt aren't very close together. That means there is plenty of room for spacecraft to safely pass through the belt. In fact, NASA has already sent several spacecraft through the asteroid belt!

The total mass of objects in the asteroid belt is only about 4 percent the mass of our Moon. Half of this mass is from the four largest objects in the belt. These objects are named Ceres, Vesta, Pallas and Hygiea.

The dwarf planet Ceres is the largest object in the asteroid belt. However, Ceres is still pretty small. It is only about 587 miles across—only a quarter the diameter of Earth's moon. In 2015, NASA's Dawn mission mapped the surface of Ceres. From Dawn, we learned that the outermost layer of Ceres—called the crust—is made up of a mixture of rock and ice.

The asteroid belt is filled with objects from the dawn of our solar system. Asteroids represent the building blocks of planets and moons, and studying them helps us learn about the early solar system.

For more information about asteroids, visit: https://spaceplace.nasa.gov/asteroid



The Dawn spacecraft also visited the asteroid Vesta. Vesta is the second largest object in the asteroid belt. It is 329 miles across, and it is the brightest asteroid in the sky. Vesta is covered with light and dark patches, and lava once flowed on its surface.

Caption: This image captured by the Dawn spacecraft is an enhanced color view of Ceres, the largest object in the asteroid belt. Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

Focus on Constellations: Libra

Jim Kvasnicka

The word “Zodiac” comes from an ancient Greek phrase meaning “Circle of Animals”. Libra the Scales is the only inanimate object in the Zodiac. Libra is just west and northwest of the Scorpius Milky Way. It lacks such Milky Way objects as open clusters and nebulae. It is fairly rich in galaxies as are most off Milky Way constellations. Libra contains several attractive double stars and a very loose Class XI globular cluster.

Showpiece Objects

Galaxies: NGC 5728, NGC 5792, NGC 5812, NGC 5878, NGC 5898, NGC 5903
Double Stars: N N 28

Mythology

The celestial scales are of very high antiquity. An ancient Mesopotamian carving from about 2200 B.C. shows a priest holding a balance-beam scale over an altar in front of the sun god Shamash who was also the god of justice. Even at this early date scales symbolized the “weighing of justice.” This idea was inherited by the Greeks who in Greek mythology was goddess Astraea, who held the Scales of Justice.

Number of Objects Magnitude 12.0 and Brighter

Galaxies: 14
Globular Clusters: 1
Open Clusters: 0
Planetary Nebulae: 1
Dark Nebulae: 0
Bright Nebulae: 0
SNREM: 0

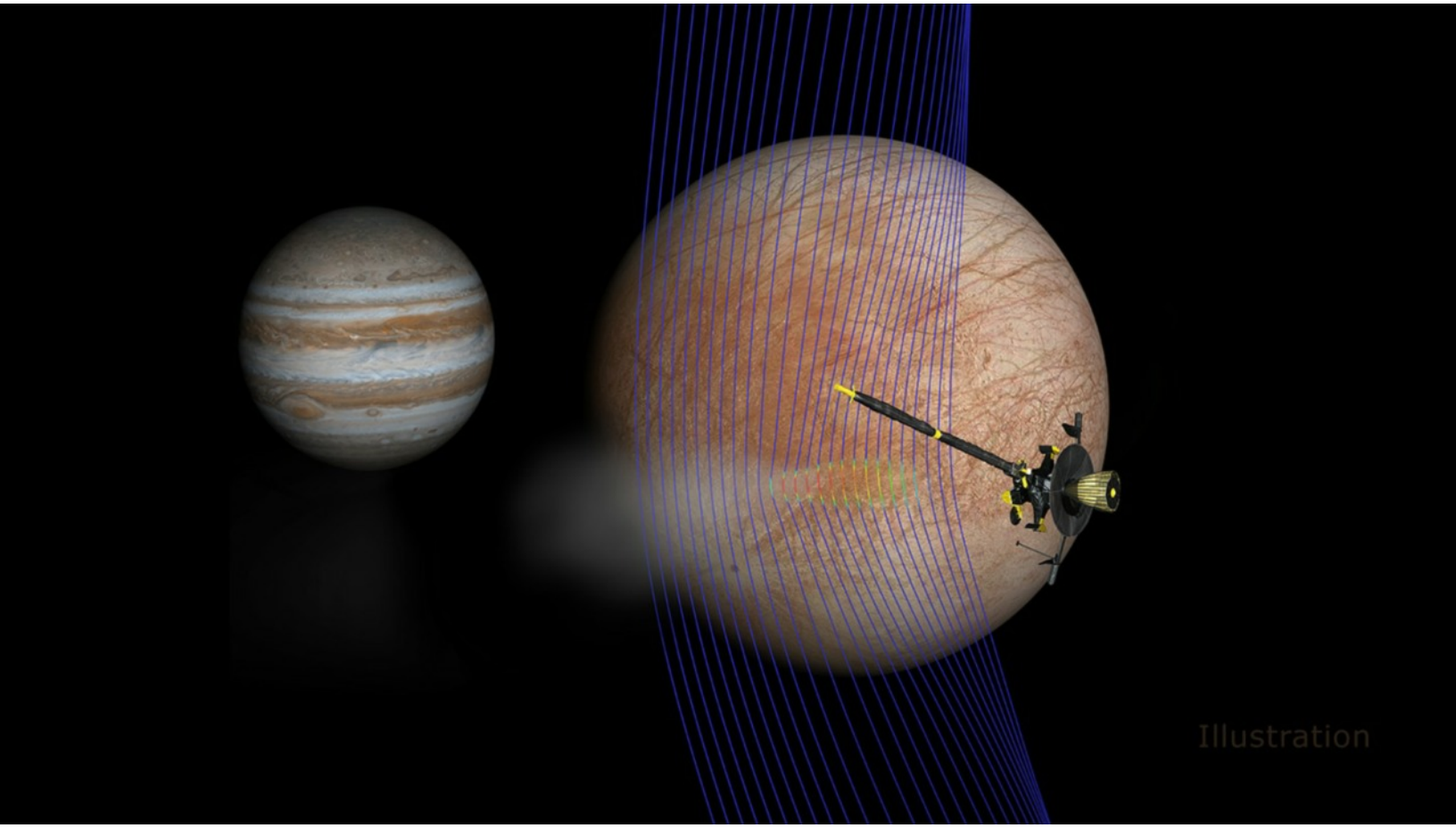
Till Credner - Own work: AlltheSky.com 3.0

Old Data Reveal New Evidence of Europa Plumes

Scientists re-examining data from an old mission bring new insights to the tantalizing question of whether Jupiter's moon Europa has the ingredients to support life. The data provide independent evidence that the moon's subsurface liquid water reservoir may be venting plumes of water vapor above its icy shell.

Data collected by NASA's Galileo spacecraft in 1997 were put through new and advanced computer models to untangle a mystery -- a brief, localized bend in themagnetic field -- that had gone unexplained until now. Previous ultraviolet images from NASA's Hubble Space Telescope in 2012 suggested the presence of plumes, but this new analysis used data collected much closer to the source and is considered strong, corroborating support for plumes. The findings appear in Monday's issue of the journal Nature Astronomy.

The research was led by Xianzhe Jia, a space physicist at the University of Michigan in Ann Arbor and lead author of the journal article. Jia also is co-investigator for two instruments that will travel aboard Europa Clipper, NASA's upcoming mission to explore the moon's potential habitability.



Artist's illustration of Jupiter and Europa (in the foreground) with the Galileo spacecraft after its pass through a plume erupting from Europa's surface.

The data were there, but we needed sophisticated modeling to make sense of the observation," Jia said.

Jia's team was inspired to dive back into the Galileo data by Melissa McGrath of the SETI Institute in Mountain View, California. A member of the Europa Clipper science team, McGrath delivered a presentation to fellow team scientists, highlighting other Hubble observations of Europa.

"One of the locations she mentioned rang a bell. Galileo actually did a flyby of that location, and it was the closest one we ever had. We realized we had to go back," Jia said. "We needed to see whether there was anything in the data that could tell us whether or not there was a plume."

At the time of the 1997 flyby, about 124 miles (200 kilometers) above Europa's surface, the Galileo team didn't suspect the spacecraft might be grazing a plume erupting from the icy moon. Now, Jia and his team believe, its path was fortuitous.

When they examined the information gathered during that flyby 21 years ago, sure enough, high-resolution magnetometer data showed something strange. Drawing on what scientists learned from exploring plumes on Saturn's moon Enceladus -- that material in plumes becomes ionized and leaves a characteristic blip in the magnetic field -- they knew what to look for. And there it was on Europa -- a brief, localized bend in the magnetic field that had never been explained.

Galileo carried a powerful Plasma Wave Spectrometer to measure plasma waves caused by charged particles in gases around Europa's atmosphere. Jia's team pulled that data as well, and it also appeared to back the theory of a plume.

But numbers alone couldn't paint the whole picture. Jia layered the magnetometry and plasma wave signatures into new 3D modeling developed by his team at the University of Michigan, which simulated the interactions of plasma with solar system bodies. The final ingredient was the data from Hubble that suggested dimensions of potential plumes.

The result that emerged, with a simulated plume, was a match to the magnetic field and plasma signatures the team pulled from the Galileo data.

"There now seem to be too many lines of evidence to dismiss plumes at Europa," said Robert Pappalardo, Europa Clipper project scientist at NASA's Jet Propulsion Laboratory in Pasadena, California. "This result makes the plumes seem to be much more real and, for me, is a tipping point. These are no longer uncertain blips on a faraway image."

The findings are good news for the Europa Clipper mission, which may launch as early as June 2022. From its orbit of Jupiter, Europa Clipper will sail close by the moon in rapid, low-altitude flybys. If plumes are indeed spewing vapor from Europa's ocean or subsurface lakes, Europa Clipper could sample the frozen liquid and dust particles. The mission team is gearing up now to look at potential orbital paths, and the new research will play into those discussions.

"If plumes exist, and we can directly sample what's coming from the interior of Europa, then we can more easily get at whether Europa has the ingredients for life," Pappalardo said. "That's what the mission is after. That's the big picture."

JPL manages the Europa Clipper mission for the agency's Science Mission Directorate.

From the Archives: June, 1998

PRESIDENT'S REPORT

By: Dave Knisely

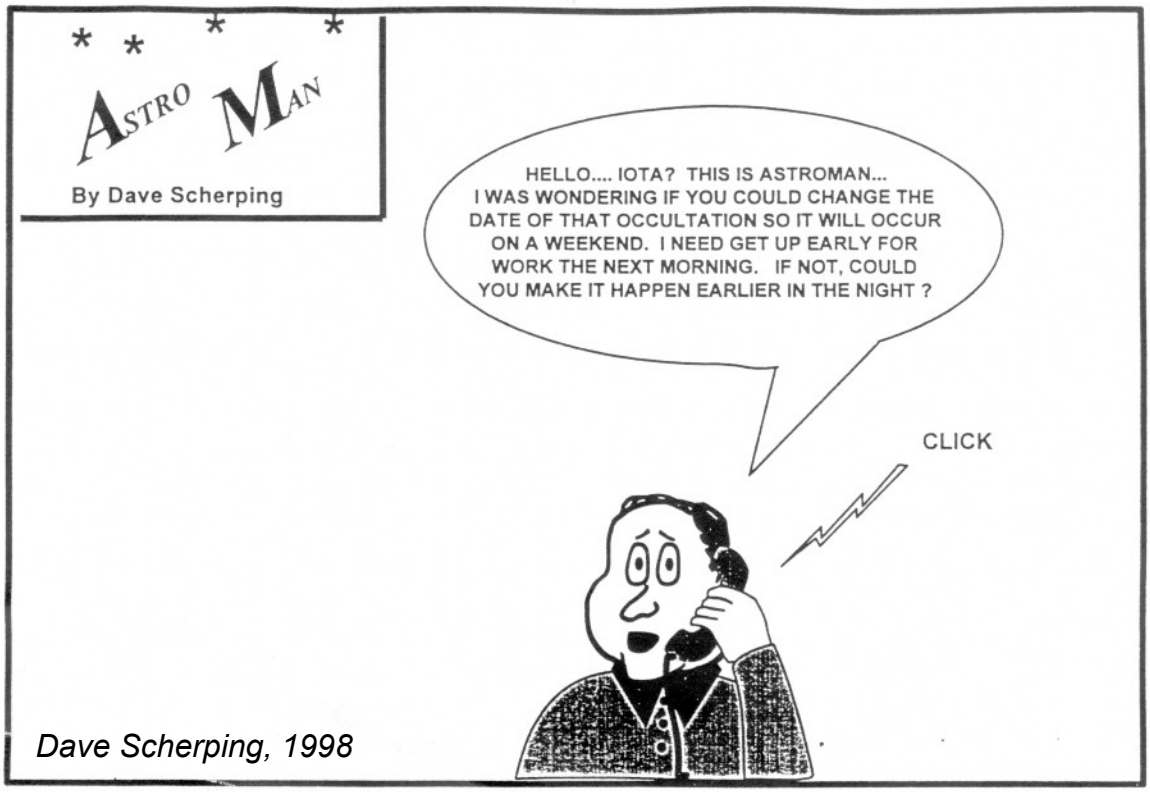
Now that we are into the summer observing season, we need to focus more on one of the goals I set at the beginning of my term, namely, a club observing site. While there are a fair number of places both public and private, which can be used, it would be best if we always had a place where club members were observing consistently. We had this with the Atlas site, but development near that site and the potential for light pollution made it less than satisfactory. At present, club members observe at two major observing locations: Wagontrain Lake, and the Beaver Crossing recreation area. There has also been observing activity at places like Hickory Ridge Wildlife refuge near Crab Orchard, and Rockford Lake east of Beatrice. We need to define what we want for a quality place where we can get together on a regular basis for observing activities. To that end we need to answer the following questions:

1. How far away from Lincoln do we go? From a light-pollution standpoint, it appears that 15 to 20 miles from the center of town is the minimum range, but what about the maximum? Hickory Ridge and Rockford both have very dark skies but are over 40 miles out, so it makes for a long drive for a single night's worth of observing. The closer in a site is, the easier (and probably more used) it will be.

2. Which direction do we go? To the northeast is Omaha, and Lincoln appears to be growing in both east and north, so the northern and northeastern quadrants seem to be off limits. Probably the best directions are southeast, south, and southwest.

3. Do we lease, buy, or just borrow (from a consenting landowner), land for a permanent site? This can have an important financial impact on our club.

I think that the site committee (headed by Liz Bergstrom) has several ideas but again, it could benefit from your input. We need to get the club into both observing and social "cloudy-night" get-togethers, like maybe cookouts at some observing site, even when observing doesn't look too likely. Perhaps all of the star parties (except those in inclement weather or during the winter) need to be also designated as star party get-togethers in general. We also need to set up a "calling-tree" system or use the PAC-list for those who want to go out at times other than regular star party dates. It could also help those of our younger members who need rides to our observing sessions. In any event, we need to get your ideas and opinions, do come to the next club meeting or contact Liz. This club needs to meet the needs of its members, and this is one way it can. See you at the next meeting.



Dave Scherping, 1998

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:

Shop through Amazon Smile to automatically donate to PAC:

CLUB OFFICERS

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