



Newsletter of the Pomona Valley Amateur Astronomers

Everybody thought I was a bit of an eccentric for wanting to be out there looking at the stars, but I still do.
Brian May



Volume 42 Number 4

nightwatch

April 2022

President's Message

The next general meeting is this Friday, April 22, at 7:30. Our speaker this month will be Anjani Polit, who leads the OSIRIS-REx Science Planning Team as Mission Implementation Senior System Engineer and served as the Vice-Chair of the OSIRIS-REx Site Selection Board. She holds a BA in Geology from Pomona College and an MS in Geological Engineering

from the University of Nevada Reno. Her talk will be on the OSIRIS-REx mission, which collected a sample of the asteroid Benu which it aims to return to Earth next year. I hope to see you there!

Matt Wedel

Club Events Calendar

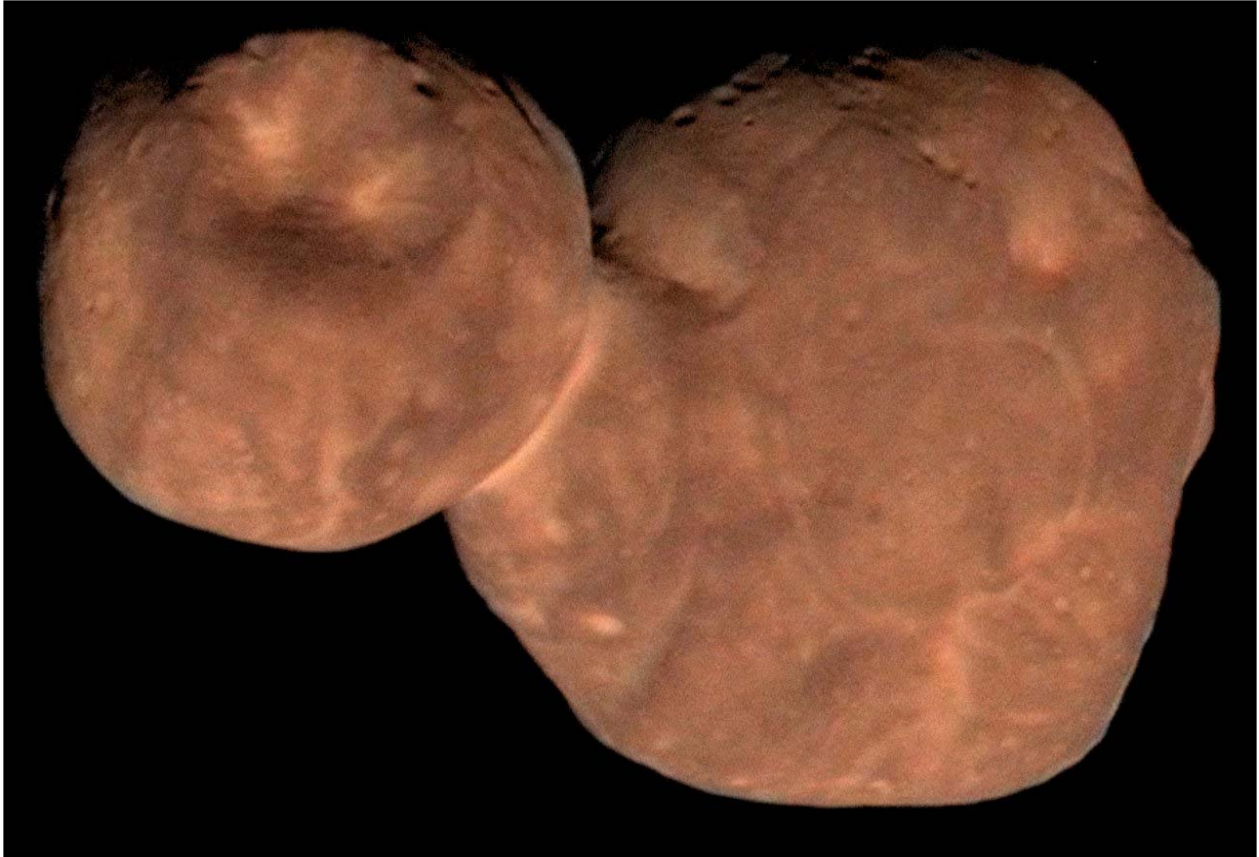
Apr 22	General Meeting – Anjani Polit – “OSIRIS REx Mission”	Aug 27	Star Party – TBD
		Aug 31	Board Meeting
May 4	Board Meeting	Sep 3	Star Party in the Park
May 7	Star Party in the Park - Cahuilla Park 7	Sep 9	General Meeting (presentation: TBD)
:15 PM		Sep 24	Star Party – GMARS
May 13	General Meeting (presentation: TBD)	Sept 28	Board Meeting
May 28	Star Party – GMARS	Oct 7	General Meeting (presentation: TBD)
Jun 8	Board Meeting	Oct 22	Star Party – TBD
Jun 17	General Meeting (presentation: TBD)	Oct 26	Board Meeting
Jun 25	Star Party – White MOUNTAIN	Nov 4	General Meeting (presentation: TBD)
July 2	Star Party in the Park	Nov 26	Star Party – TBD
July 6	Board Meeting	Nov 26	Star Party in the Park
July 15	General Meeting (presentation: TBD)	Nov 30	Board Meeting
July 25-29	Nature at Night – Girl Scout Event	Dec 3	Christmas Party
July 30	Star Party – TBD		
Aug 3	Board Meeting		
Aug 12	General Meeting (presentation: TBD)		

PVAA General Meeting 3/18/22

We had another Zoom meeting for our General Meeting. When the Claremont Colleges opens for live meetings, we will let you know. The next few meetings, until further notice, will be on Zoom.

Our speaker for the night was Briley Lewis. She currently is working on her Ph.D. after getting her B.A. in Astrophysics from Columbia, and her M.S. from UCLA. Her topic for the night was the New Horizons mission to Pluto and MU69 – the most distant object ever explored.

The New Horizons spacecraft also was the first and only spacecraft to explore Pluto up close. It flew by the dwarf planet and its moons on July 14th, 2015 after being launched on January 19th, 2006, on an Atlas V rocket in the 551 configuration. (5-meter fairing, 5 solid rocket boosters, & 1 engine on the Centaur upper stage.) Weighing only 1,054 pounds, it shot passed the Moon's orbit in only 9 hours! It still needed a sling shot from Jupiter to shave 3 years off of its journey.



MU69 nicknamed Ultima Thule. NASA photograph

Here is what we learned from the fly-by: Pluto is interesting and made of ice! Pluto is active (e.g., The materials on its surface move and change.) Vastly different from Earth, it is part of the Kuiper Belt, and more than 3 billion miles away.

Comparing Antarctica on Earth to Pluto: Pluto's surface ice is mostly Nitrogen ice (Frozen Nitrogen) with some methane ice and carbon dioxide ice, on top of a bedrock of water (H₂O) ice. Pluto's atmosphere is 1/100,000 times less than Earth's, and made up of N₂, CO, CH₄ and complex compounds like ethane. It has a surface temperature of ~42K and an atmosphere

temperature of ~90K. (Earth: ~288K surface and ~180-1500K atmosphere) So Antarctica's worst winter day is a blissful summer paradise compared to Pluto's best summer day.

Pluto was demoted from planet status to a 'dwarf planet' in 2006, as the IAU (International Astronomical Union) defined a planet in our solar system is a celestial body that: 1. Is in orbit around the Sun, 2. has sufficient mass to assume hydrostatic equilibrium (a nearly round shape), and 3. has "cleared the neighborhood" around its orbit. Pluto satisfied the first two requirements, but not the third.



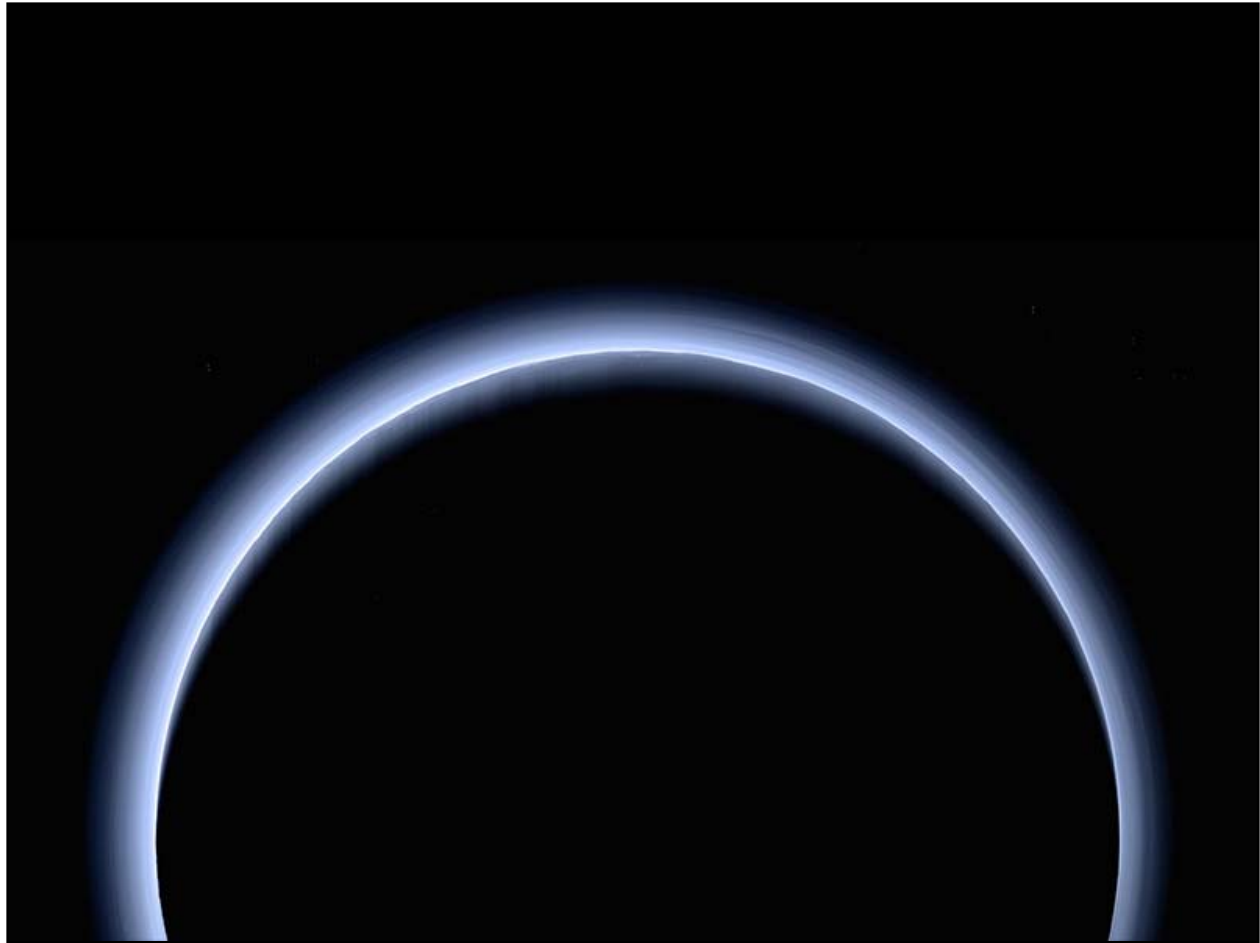
Pluto picture by New Horizon Spacecraft

New Horizons then visited MU69 (nicknamed Ultima Thule) after Pluto. The New Horizons spacecraft flew within 2,200 miles and could see features down to 100 – 200 feet across. This is now the most distant object to be explored up close. MU69 is shaped like a snowman. It looks like it was formed by two large pancake shaped rocks gently colliding after orbiting each other.

The take-away of this mission is that Kuiper Belt objects are not all dead, frozen objects, but can be actively changing objects

full of surprises. The scientists were ‘blown away’ with the diversity of Pluto’s surface and atmosphere. They were also surprised by the shape and formation of Ultima Thule. Currently we can still contact and receive information from the New Horizons spacecraft, but it currently does not have another target, as nothing (that we know of) is currently in its path.

Gary Thompson



Pluto’s atmosphere taken after New Horizon’s fly-by.

PVAA Officers and Board

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M44

It rained here, finally, the week before new moon weekend. Forecast for the weekend was variable; even the same weather site changed day to day. The last forecast before the reservation deadline was for patchy overnight fog. So, the group I go with all agreed it wasn't worth the effort for a second non-astroimaging trip in a row. Before the rain came in, there was a sufficient window for me to take a chance, disassemble my 8 inch Ritchey-Chretien scope, and clean the primary mirror which was looking pretty ugly from pollen. It also meant that I needed to completely re-collimate (align all the optics) once again. I decided to write up my alignment process this time, which was fortunate since it turned out what I did was probably the best and easiest method I've used yet. Truth be told, though, *my* process is really just a compilation of various steps from a number of other methods.

One way to make the process easier is to find a "star-dense" region of sky to work with. Since the process involves examination of stars in the middle of the field of view and in the corners, a target where I don't have to move the telescope as much is preferred. A cluster that fit the requirement is Messier 44, also known as the Praesepe and Beehive Cluster, in Cancer. Being one of the closest open clusters to Earth, it contains a number of fairly bright, magnitude 6 to 7 stars, useful in collimation. While there are over 1,000 stars in the cluster, Galileo who first observed the cluster in a telescope counted only 40 stars. The center of the cluster is estimated to be around 600 light years away and is around 20 light years across the brightest stars. Additionally, at least two planets have been found in the cluster.



M44 Photoshop Version



M44 PixInsight Version

Once I was happy with the alignment of the optics in the scope, I set up to take 20 frames through the red, green, and blue filters. Each green and blue frame was exposed 30 seconds while the red frames were exposed for 60 seconds. Total exposure time was only 1 hour 20 minutes, well below my typical total exposure time. I've attached two images processed through different programs. I usually use Photoshop (PS) with a number of sub-programs added. I recently got a trial version of PixInsight (PI) which many astrophotographers seem to be using. At this point, I still like the PS version for keeping the stars from bloating, but I'm sure there are methods to prevent it

in PI. PI seems a lot more powerful than PS, I probably just need to practice more. Perhaps in the coming months there will be more PI versions.

Well, we're moving into May/June and that means cloudy days and nights here in SoCal. Hopefully some of the new moon nights will be clear enough for a camping trip. We'll see.

Ron Ugolick

<https://www.astrobin.com/users/rucedu/>

YouTube Lectures

JPL has a Von Karman lecture series that is on YouTube, I thought it might be of interest to our members:

<https://www.jpl.nasa.gov/jpl-and-the-community/lecture-series>

Some of their intriguing lecture titles are: Spacecraft Origami, Helicopters in Space, and Galaxy of Horrors: Terrifying Real Planets

Matt Wedel

It's Galaxy Season!

Many of the beautiful nebulae have moved on. The night sky is full of faraway galaxies that are very small in the field of view of a RedCat 51. So what's the amateur wide-field astrophotographer to do? Check out Markarian's Chain!

Markarian's Chain is a group of galaxies in Virgo. It was named after Benjamin E. Markarian, an Armenian astrophysicist who was the first to discover that the galaxies share a common motion through space.



This cropped image is just over 6 hours of integration time captured at GMARS on March 31 and April 1 with the RedCat 51 and ASI2600MC Pro camera mounted on a Rainbow Astro RST-135. The two brightest galaxies at the right are M86 and

M84. According to Messier-Objects.com, NGC 4435 and NGC 4438, the pair of galaxies to the left of M86, are two interacting galaxies that are called the Eyes.

By *Sharol Carter*

PVAA has several telescopes needing a good home.

We have a blue 10-inch Coulter Odyssey with Telrad and Crayton focuser

A Meade 8-inch SCT with tripod and mount

A 6-inch Meade LXD 75 EMC F8 refractor with German equatorial mount, clock drive, tripod, and wood case

A 60mm diameter, 700mm FL Bushnell Sky Chief refractor

A 10-inch Newtonian with German Equatorial mount, 110 AC clock drive and pier

A 1990 RTMC merit award winning 10-inch Dobsonian

And finally, a homemade wood observers chair

These items generously donated to PVAA by long-time Club members Ray and Irene Magdziarz.

If you are interested in seeing and possibly purchasing any of these items, please contact Ron Hoekwater at astro4ron@gmail.com.

NASA Night Sky Notes

April 2022

**This article is distributed by NASA Night Sky Network**

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Springtime Catspotting: Lynx and Leo Minor

David Prosper

Many constellations are bright, big, and fairly easy to spot. Others can be surprisingly small and faint, but with practice even these challenging star patterns become easier to discern. A couple of fun fainter constellations can be found in between the brighter stars of Ursa Major, Leo, and Gemini: **Lynx** and **Leo Minor**, two wild cats hunting among the menagerie of animal-themed northern star patterns!

Lynx, named for the species of wild cat, is seen as a faint zigzag pattern found between Ursa Major, Gemini, and Auriga. Grab a telescope and try to spot the remote starry orb of globular cluster NGC 2419. As it is so distant compared to other globular clusters - 300,000 light years from both our solar system and the center of the Milky Way - it was thought that this cluster may be the remnants of a dwarf galaxy consumed by our own. Additional studies have muddied the waters concerning its possible origins, revealing two distinct populations of stars residing in NGC 2419, which is unusual for normally-homogenous globular clusters and marks it as a fascinating object for further research.

Leo Minor is a faint and diminutive set of stars. Its "triangle" is most noticeable, tucked in between Leo and Ursa Major. Leo Minor is the cub of Leo the Lion, similar to Ursa Minor being the cub to the Great Bear of Ursa Major. While home to some interesting galaxies that can be observed from large amateur scopes under dark skies, perhaps the most intriguing object found within Leo Minor's borders is Hanny's Voorwerp. This unusual deep-space object is thought to be a possible "light echo" of a quasar in neighboring galaxy IC 2497 that has recently "switched off." It was found by Hanny van Arkel, a Dutch schoolteacher, via her participation in the Galaxy Zoo citizen science project. Since then a few more intriguing objects similar to Hanny's discovery have been found, called "Voorwerpjes."

Lynx and Leo Minor are relatively "new" constellations, as they were both created by the legendarily sharp-eyed European astronomer Johannes Hevelius in the late 1600s. A few other constellations originated by Hevelius are still in official use: Canes Venatici, Lacerta, Scutum, Sextans, and Vulpecula. What if your eyes aren't quite as sharp as Johannes Hevelius – or if your weather and light pollution make searching for fainter stars more difficult than enjoyable? See if you can spot the next Voorwerp by participating in one of the many citizen science programs offered by NASA at science.nasa.gov/citizenscience! And of course, you can find the latest updates and observations of even more dim and distant objects at nasa.gov.

NASA Night Sky Notes

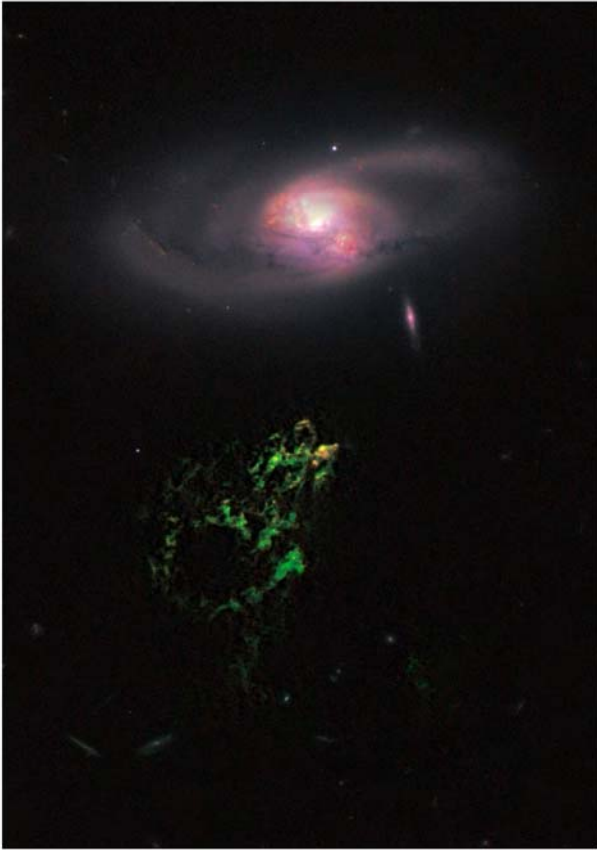
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Map of the sky around Lynx and Leo Minor. Notice the prevalence of animal-themed constellations in this area, making it a sort of celestial menagerie. If you are having difficulty locating the fainter stars of Leo Minor and Lynx, don't fret; they are indeed a challenge. Hevelius even named the constellation as reference to the quality of eyesight one needs in order to discern these faint stars, since supposedly one would need eyes as sharp as a Lynx to see it! Darker skies will indeed make your search easier; light pollution, even a relatively bright Moon, will overwhelm the faint stars for both of these celestial wildcats. While you will be able to see NGC 2419 with a backyard telescope, Hanny's Voorwerp is far too faint, but its location is still marked. A few fainter constellation labels and diagrams in this region have been omitted for clarity. Image created with assistance from Stellarium

NASA Night Sky Notes

April 2022



Hanny's Voorwerp and the neighboring galaxy IC 2497, as imaged by Hubble. Credits: NASA, ESA, W. Keel (University of Alabama), and the Galaxy Zoo Team Source: hubblesite.org/content/news-releases/2011/news-2011-01.html