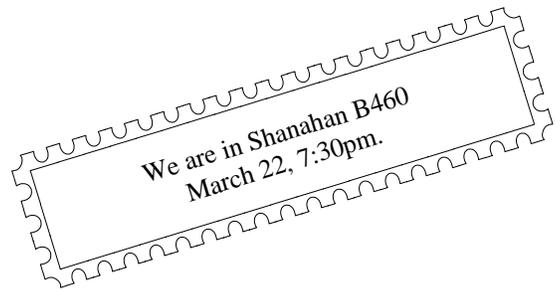




Newsletter of the Pomona Valley Amateur Astronomers

If you think you're going nowhere and you stop,
then you're not going nowhere anymore.
Harrison Ford



Volume 39 Number3

nightwatch

March 2019

Farewell to Iridium Flares

As I'm sure many of you have found, the bright flash of an Iridium Flare has been an exciting part of our night time observing experiences for many years – since 1997 in fact, when the Iridium SSC Company began to launch 66 communications satellites along with a few spares. All were up by 2002. This array of devices provided complete cell and pager coverage around the world and was state of the art for a time. Due to the placement of their solar panels and their reliably predictable positions in the sky, prediction websites were soon available telling us where to look and when from any spot on the ground. Then, barring cloudy skies, we could look up to see a 5-20 second long very bright flash in the sky, often reaching magnitudes of -4 to -8. Some of the most fun with these flares were enjoyed at public events where one of us with a loud voice would let everyone know which direction to look so the whole group could see the reflection of sunlight off the satellite as it went by overhead.

But progress marches on and technologies are updated, including that of what is now called Iridium Communications Inc. In January 2019, they finished the deployment of 75 Iridium-NEXT satellites, 66 operational ones and 9 spares. Their design does not include the 3 reflecting panels of the old satellites so unfortunately flares will not be produced by this new array. Not only are the old satellites being allowed to re-enter Earth's atmosphere, the orbits of those still up are no longer carefully controlled as they are no longer needed for their original communications purpose. As their attitude is no longer tightly controlled, flare predictions have become increasingly unreliable.

One side benefit of the new NEXT array though, was that many of us throughout California had a chance to observe some of the launches as the satellites were sent into space in groups of 10 on Falcon 9 rockets launched by SpaceX from Vandenberg Air Force Base.

Fun fact: the original plan was for a 77 satellite array. 77 is the atomic number of Iridium. As it turned out, complete coverage of the Earth was obtained using 6 planes of 11 satellites each, with each plane orbiting 30 degrees apart from its neighbors. The name from the original configuration stuck – hence Iridium Satellites and Flares. Thank goodness, I might add – the element with atomic number 66 is Dysprosium (Dy). It is a rare earth element with a metallic silver shine which is not found in nature as a free element. It is found in various minerals, such as xenotime. Sorry – it just doesn't roll off the tongue like good ol' 66!

Details on satellite de-orbits with many flare photos from Iridium Communications Inc:

<https://www.iridium.com/flarewell/>

Heavens Above is a popular viewing prediction site for flares, other satellites, as well as the ISS. An update from them on viewing predictions:

<https://www.heavens-above.com/IridiumDemise.aspx>

A nice 2017 BBC Sky at Night article:

<http://www.skyatnightmagazine.com/news/iridium-flares-cease-end-2018>

2019 Earth Sky article:

<https://earthsky.org/space/i-saw-a-flash-in-the-night-sky-what-is-it>

Wikipedia Article:

https://en.wikipedia.org/wiki/Iridium_satellite_constellation

Claire Stover

Club Events Calendar

Our March speaker is Tim Thompson. His talk is about the interstellar asteroid Oumuamua that was discovered in 2017 and is titled "Oumuamua - Interstellar Asteroid or Interstellar Spacecraft?" Tim's talk discusses astronomer, Abraham "Avi" Loeb at Harvard, who has been in the news lately because of his ideas about Oumuamua. Before Oumuamua, Loeb had done a lot of research on the first stars & galaxies after the bang. Tim says, "He has a point, and I will talk about it."

Mar 22 General Meeting

Apr 6 Star Party – Messier Marathon – Mecca Beach

Apr 10 Board Meeting

Apr 19 General Meeting

May 4 Star Party – Mt Baldy

May 8 Board Meeting

May 17 General Meeting - Apollo 10 and "Getting Your Hands on Real Astronomy Data" Lisa Rebull

Jun 1 Star Party – White Mountain

Jun 5 Board Meeting

Jun 14 General Meeting Apollo 11 Ken Elchert

Jul 10 Board Meeting

Jul 19 General Meeting

Jul 27 Star Party – Tejon Ranch

Aug 3 Nature at Night GS Camp - Nawakwa

Aug 7 Board Meeting

Aug 16 General Meeting

Aug 31 Star Party – TBD

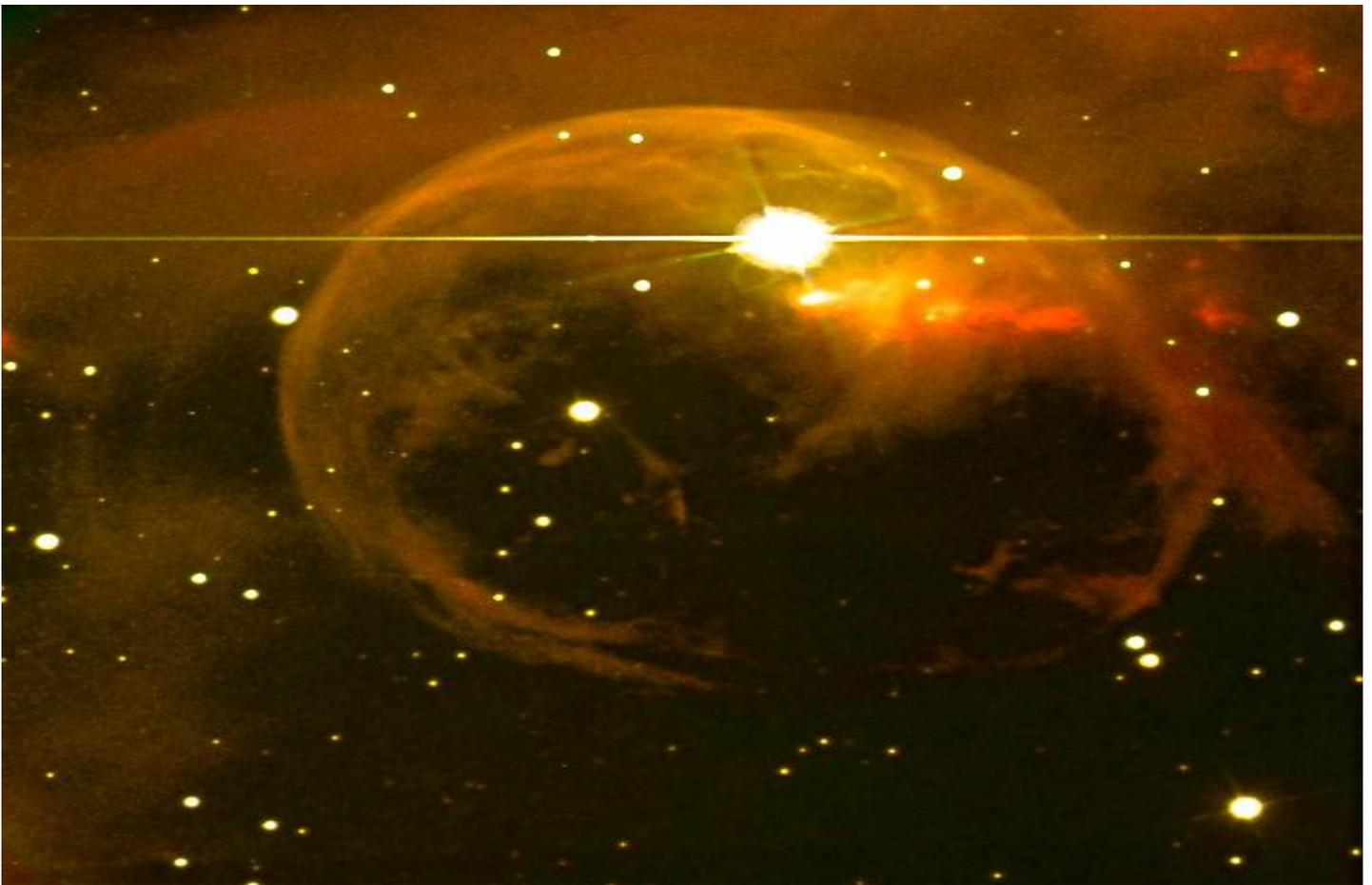
Sept 4 Board Meeting

Sept 13 General Meeting

Sept 28 Star Party – TBD

Oct 2 Board Meeting

Oct 11 General Meeting



I find it very interesting to browse through some of my Sky and Telescope magazines from the 1940s. In the fourth issue of February 1942 the lead article is by noted astronomer Otto Struve and is a history up to that date of the Poulkovo Observatory just outside St. Petersburg Russia that was founded by his greatgrandfather, the noted F.G.W. Struve a century earlier.

Illustrating the article is a snapshot of the observatory director, Boris P. Gerasimovich, taken by American astronomer Donald Menzel during a visit to Russia in 1936 for the Siberian solar eclipse that year. The sentence in the caption that caught my attention was this: “No word has been received about Dr. Gerasimovich since 1937.”

What could be the story here?

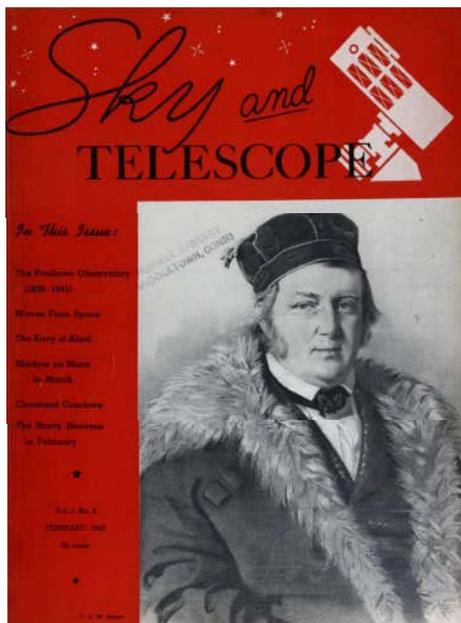
The short answer, as it turned out, was that Gerasimovich was caught up in the Stalin purges of the late 1930s, along with an estimated 30 percent of the astronomical talent in the Soviet Union at the time. By the end of 1937 Gerasimovich had been executed.

The story was told in a 1991 article by Robert A. McCutcheon in Slavic Review, after the KGB files had been opened following the collapse of the Soviet Union, and follows in condensed form.

Gerasimovich became director of Poulkovo in 1933 after more than a dozen years during which Poulkovo’s reputation and output had declined due to politicization and chaos caused by the Bolsheviks. He began to “clean house” of deadwood, making more than a few enemies along the way, and to establish an observing and cataloguing program for the observatory to pursue with its 30-inch Alvan Clark refractor and other instruments. Further, the fact that many of the papers emanating from Gerasimovich’s observatory were published in foreign (i.e., non-Russian) journals attracted much negative comment in Stalinist Russia in the late 1930s.

By 1936 Gerasimovich was the target of anonymous denunciations in the local Pravda personally, scientifically, and administratively. There was a all-purpose accusation of “corrupt wrecking” of the Soviet project which was directed at him. Further, he was accused of making “counterrevolutionary statements during a discussion on the use of Marxist-Leninist methodology in the natural sciences.” Late in 1936, Harlow Shapley, pre-eminent American astronomer, invited Gerasimovich to Harvard for the Spring semester 1937. Gerasimovich demurred at that moment, citing heavy administrative duties. It’s an invitation he should have accepted. As more and more charges and accusations piled on in March 1937 Gerasimovich tersely telegraphed Shapley (probably the last contact he had with the American): “Regretting thanking cannot go.”

Gerasimovich was arrested in June 28, 1937. On November 30, 1937, he was tried by the authorities on charges of “having been a member of a fascist, terrorist, spying and wrecking organization...” and other crimes running an entire paragraph. He was sentenced to be shot and the sentence was carried out that day.



General Meeting 02/22/19

The main speaker for the night was our own PVAA member Gary Thompson. The topic was Apollo 9, as the 50th anniversary was upon us. While Apollo 8 orbited the moon in December of 1968, Apollo 9 stayed in Earth orbit. The primary objectives of Apollo 9 were:

- to demonstrate crew, space vehicle, and mission support facilities performance during a manned Saturn V mission with command and service modules and lunar module
- to demonstrate lunar module crew performance
- to demonstrate performance of nominal and selected backup lunar orbit rendezvous mission activities
- to assess command and service module and lunar module consumables

The crew consisted of two Gemini Astronaut veterans Colonel James Alton McDivitt (USAF), commander, and Colonel David Randolph Scott (USAF), command module pilot; and one rookie Russell Louis “Rusty” Schweickart, lunar module pilot. Rusty was with the USAF, but left the Air Force to graduate from MIT and joined NASA as a civilian.

- Apollo 9 had several space firsts:
 - First undocking and docking of two manned space vehicles
 - First flight of the Lunar Module
 - First use of the completely self-contained space suit in space. (PLSS = Portable Life Support System)
 - First time a planet (Jupiter) was used for inertial measurement unit alignment
 - First time humans were in a spacecraft that could not safely return to Earth

The Lunar Module got as far as 113 miles away from the Command Module during the tests. Both the Command Module and the Lunar Module made several orbital changes to test the engines and guidance of each spacecraft. This was the only flight that the Command Module was open to the vacuum of space. The spacesuits designed for the lunar surface with their Portable Life Support Systems were also checked out in the space environment.

The mission was deemed a complete success. Rusty’s bout of space sickness and the need for additional lighting during docking of the two spacecraft were the only two major concerns. The mission was delayed 1 day due to crew sickness, and was extended by one orbit due to weather at the recovery site.

Selected Videos:

Apollo 9 Overview (no video for 1st 12 seconds) Length: 33:43

<https://www.youtube.com/watch?v=GNfulJIXta8>

2008 Schweickart Interview Length: 30:47

<https://www.youtube.com/watch?v=2E8j2GakRk0>

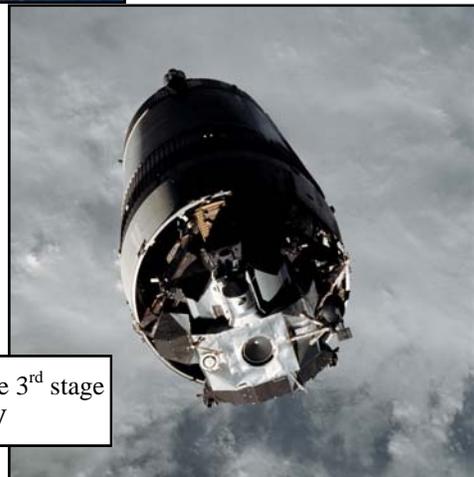
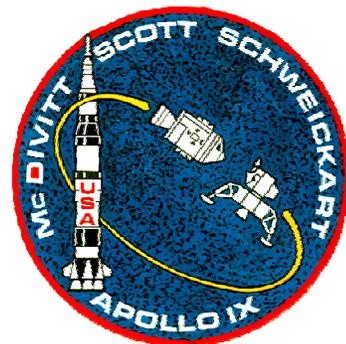
Apollo 9 Overview Length: 17:14

<https://www.youtube.com/watch?v=31OF2-1JTpY>

All photos from NASA & Wikipedia.



James McDivitt, Dave Scott & Rusty Schweickart



Lunar Module inside 3rd stage of Saturn V



Picture of Dave Scott taken by Rusty Schweickart while Rusty was outside of the Lunar Module



Rusty outside of the Lunar Module.



The ascent stage of the Lunar Module



The Lunar Module below the Command Module



The Lunar Module "Spider"



Command Module "Gumdrop" and Service Module as seen from the Lunar Module



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.org to find local clubs, events, and more!

Mars the Wanderer

April's skies find Mars traveling between star clusters after sunset, and a great gathering of planets just before sunrise.

Mars shows stargazers exactly what the term "planet" originally meant with its rapid movement across the evening sky this month. The ancient Greeks used the term *planete*, meaning *wanderer*, to label the bright star-like objects that travelled between the constellations of the zodiac year after year.

You can watch Mars as it wanders through the sky throughout April, visible in the west for several hours after sunset. Mars travels past two of the most famous star clusters in our night sky: the **Pleiades** and **Hyades**. Look for the red planet next to the tiny but bright Pleiades on April 1st. By the second week in April, it has moved eastward in Taurus towards the larger V-shaped Hyades. Red Mars appears to the right of the slightly brighter red-orange star **Aldebaran** on April 11th. We see only the brightest stars in these clusters with our unaided eyes; how many additional stars can you observe through binoculars?

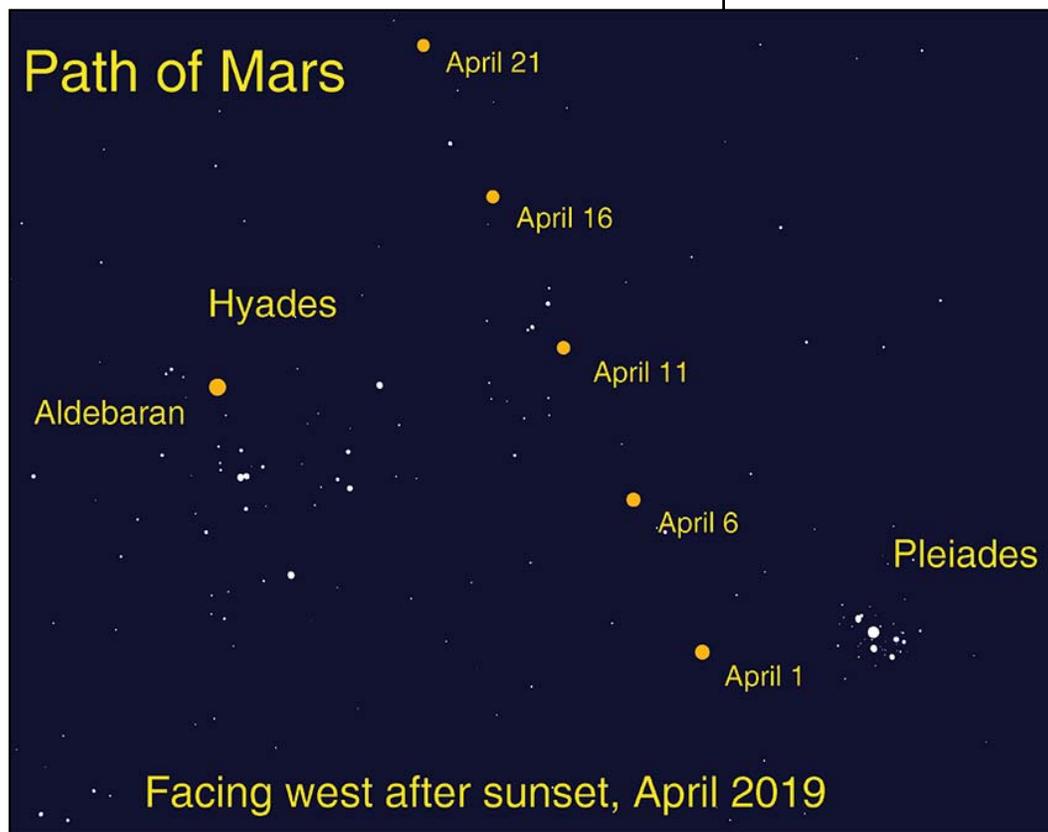
Open clusters are made up of young stars born from the same "star nursery" of gas and dust. These two open clusters are roughly similar in size. The Pleiades appears much smaller as they are 444 light years away, roughly 3 times the distance of the Hyades, at 151 light years distant. Aldebaran is in the same line of sight as the Hyades, but is actually not a member of the cluster; it actually shines just 65 light years away! By comparison, Mars is practically next door to us, this month just a mere 18 light minutes from Earth - that's about almost 200 million miles. Think of the difference between how long it takes the light to travel from these bodies: 18 minutes vs. 65 years!

The rest of the bright planets rise before dawn, in a loose lineup starting from just above the eastern horizon to high above the south: **Mercury**, **Venus**, **Saturn**, and **Jupiter**. Watch this month as the apparent gap widens considerably between the gas giants and terrestrial planets. Mercury hugs the horizon all month, with Venus racing down morning after morning to join its dimmer inner solar system companion right before sunrise. In

contrast, the giants Jupiter and Saturn move away from the horizon and rise earlier all month long, with Jupiter rising before midnight by the end of April.

The **Lyrids** meteor shower peaks on April 22nd, but sadly all but the brightest meteors will be washed out by the light of a bright gibbous Moon.

By David Prosper



Caption: The path of Mars between the Pleiades and Hyades in April.

You can catch up on all of NASA's current and future missions at nasa.gov