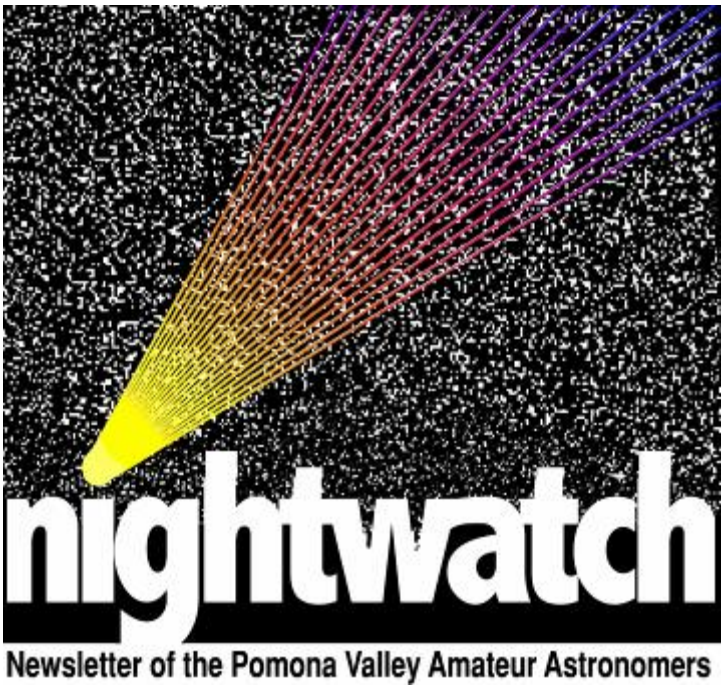


Newsletter of the Pomona Valley Amateur Astronomers

Non-stupid people always underestimate the damaging power of stupid individuals. ***Carlo Cipolla***

CHECK OUT PVAAs YOUTUBE CHANNEL

Volume 45 Number 5 ***nightwatch*** **May 2025**

Club Events Calendar

May 9	**General Meeting 7:30 PM Ken Elchert "The Moons of the Solar System and Gravitation"**
May 24	**Star Party – GMARS**
Jun 4	**Board Meeting 6:15 PM**
Jun 13	**General Meeting 7:30 PM**
Jun 21	**Star Party – White Mountain**
July 2	**Board Meeting 6:15 PM**
July 11	**General Meeting 7:30 PM**
July 26	**Star Party – GMARS**
July 30	**Board Meeting**
Aug 8	**General Meeting 7:30 PM**
Aug 23	**Star Party – GMARS**
Aug 27	**Board Meeting**
Sep 5	**General Meeting 7:30 PM**
Sept 20	**Star Party – GMARS**
Oct 1	**Board Meeting 6:15 PM**
Oct 10	**General Meeting 7:30 PM**
Oct 18	**Star Party – GMARS**
Oct 29	**Board Meeting 6:15 PM**
Nov 7	**General Meeting 7:30 PM**
Nov 22	**Star Party – GMARS**
Dec 3	**Board Meeting 6:15 PM**
Dec 6	**Holiday Party**

PVAA Officers and Board

Officers

President ….....	Mathew Wedel	909-767-9851
Vice President ..	Joe Hillberg	909-949-3650
Secretary	position is currently open	
Treasurer	Gary Thompson	909-935-5509

Board

Jim Bridgewater (2026).....	909-599-7123
Richard Wismer(2026)	
Ron Hoekwater (2025).....	909-706-7453
Howard Maculsay (2025)……	909-913-1195

Directors

Membership / Publicity....	Gary Thompson .	909-935-5509
Outreach	Jeff Schroeder	909-758-1840
Programs	Ron Hoekwater	909-391-1943

April 11 PVAA General Meeting

The meeting was started by Gary Thompson with a reminder that your yearly club dues are now due. $30 for an individual, $40 for a family, and only $12 for students under 18.

Ken Elchert gave his monthly rundown of 'Astronomical and Aerospace Events.' Venus, Mercury, and Saturn are grouped together just before sunrise April 12-18. The Lyrid meteor shower peaks after midnight on April 22nd. The Eta Aquarids meteor show peaks in the early mornings of May 5-6.

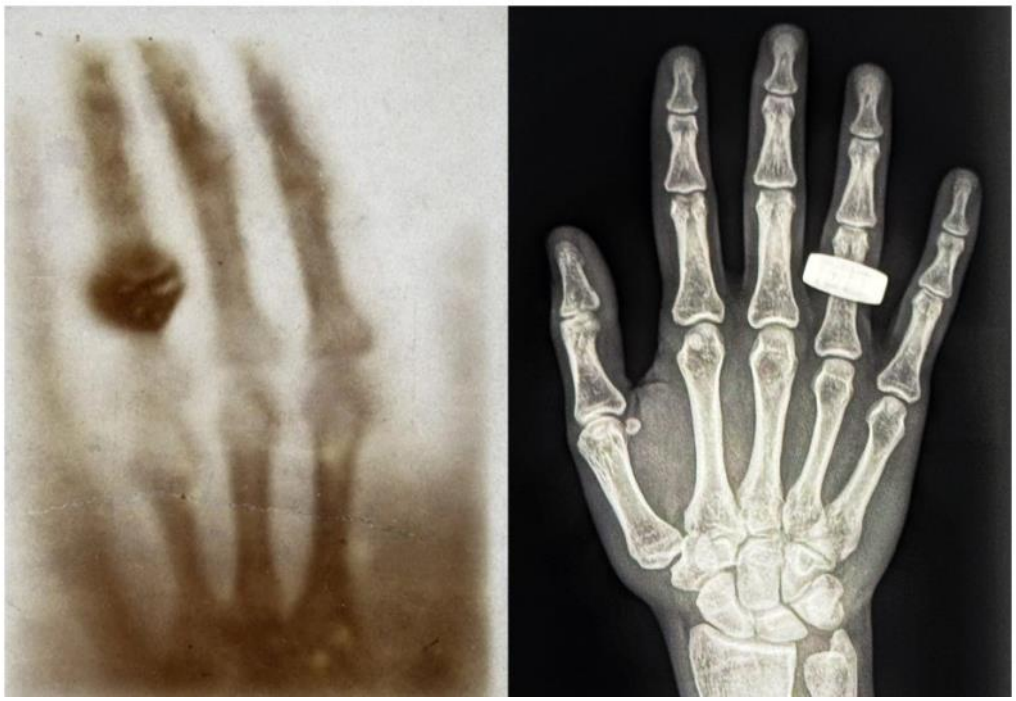
Ken also pointed out that May 14 is the 90th anniversary of the opening of Griffith Observatory. Butch and Sunni returned with Crew 9, and The Fram2 all-civilian mission circled the globe in a first-ever for humans: polar orbit. They conducted several experiments and took the first ever x-ray (radiograph) in space.

The SPHEREx spacecraft took its first images after being launched into orbit on March 11th of this year.

Marth 14, 2025 Lunar eclipse as seen from the Earth (Left), and the Blue Ghost Lunar Lander on the Moon (Right).
Pictures by Andrew Yee and Firefly Aerospace (Blue Ghost)

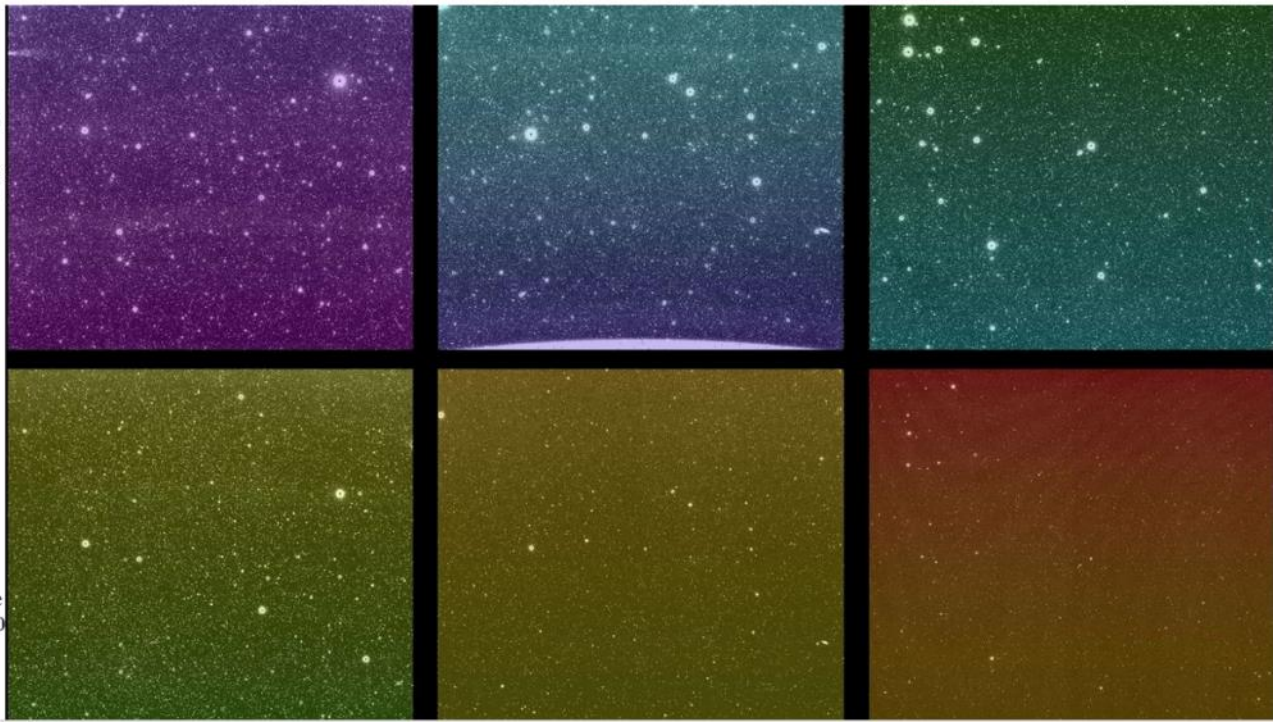
First X-ray in Space Obtained During the Fram2 Mission

The first radiograph ("Hand mit Ringen") taken by Wilhelm Conrad Roentgen of his wife's (Anna Bertha Roentgen's) left hand on December 22, 1895



The first radiograph taken in space of the right hand of Chun Wang, commander of the Fram2 mission, on April 1, 2025.

First Images From the Spectro-Photometer for the History of the Universe, Epoch of Reionization and Ices Explorer (SPHEREx}



SPHEREx's complete field of view (10 degrees) spans the top 3 images; the same area of the sky is also captured in the bottom 3 images. Six detectors, ea w/ 17 unique IR bands -- 102 bands total. Redder parts represent longer wavelengths; more purple parts represent shorter wavelengths. In each of these six test images, there are about 100,000 astronomical sources. h = 700 km = 430 mi

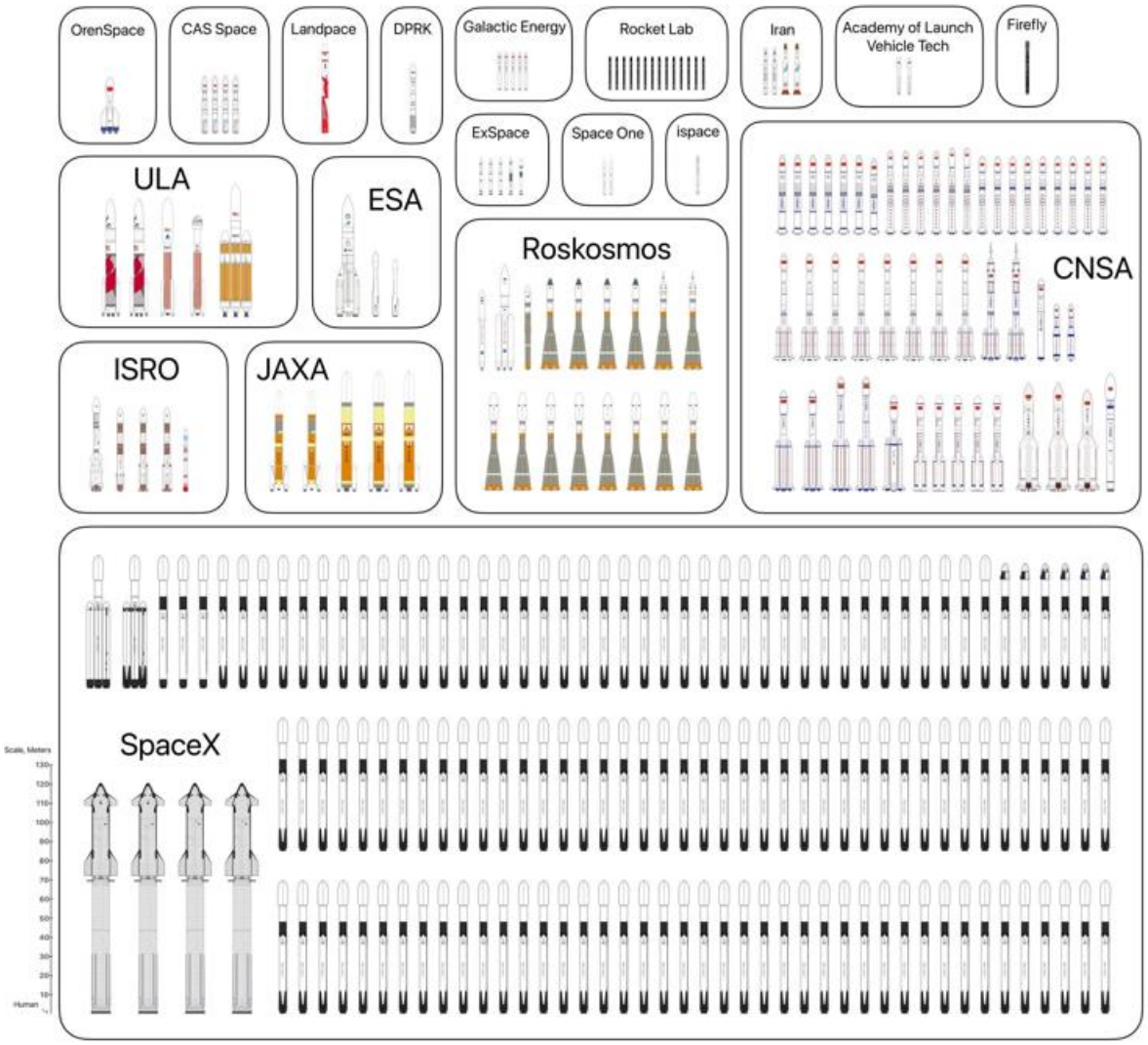
So, How Much? (The ULTIMATE Challenge)

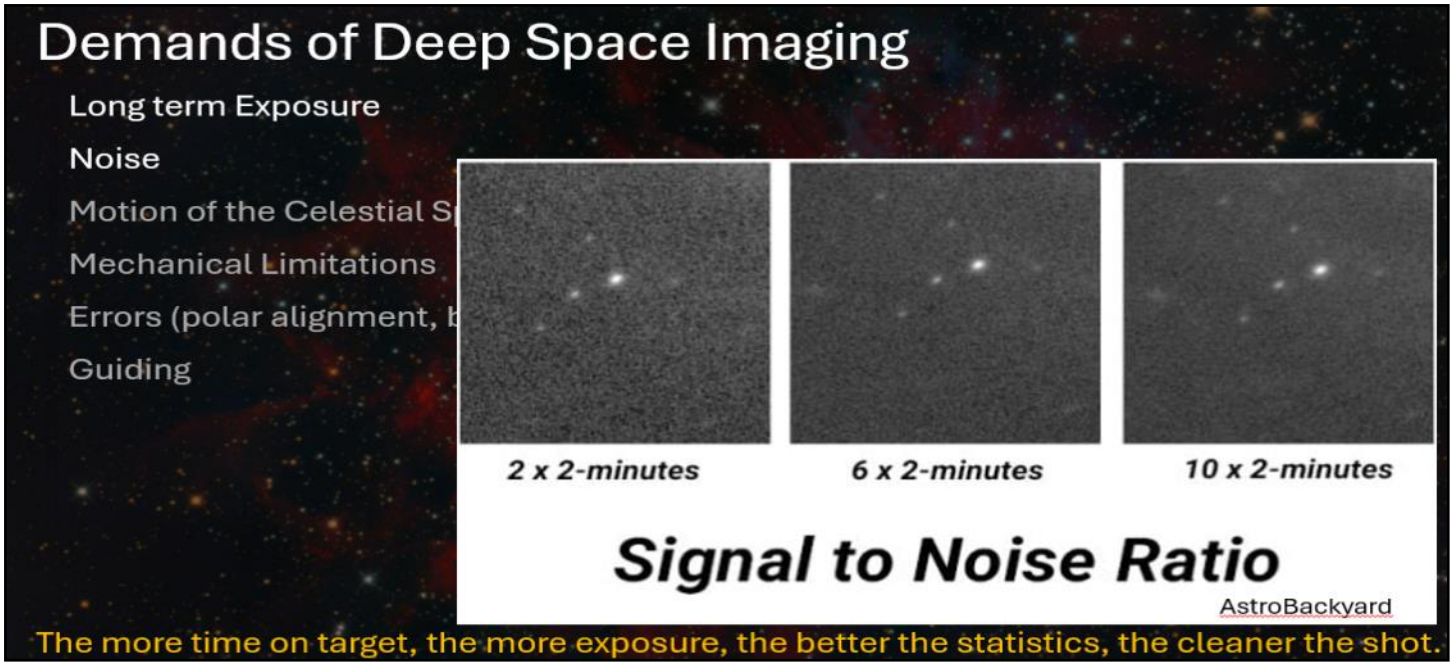
Item	New	New Range	Used	Notes
Mount	1900	1400-2500	1200	30-40 pounds min
Scope	800	625-4000	400	500-700 FL Rrefractor
Camera	1400	1200-2400	600	APS C Color
Guider	300	200-600	200	-----
Computer	200	130-1200	150	Used Laptop
Software	350	0-500	---	No "used" but "Free"
Miscellaneous	150	50-150	---	Already Have
TOTAL	5100		2550	

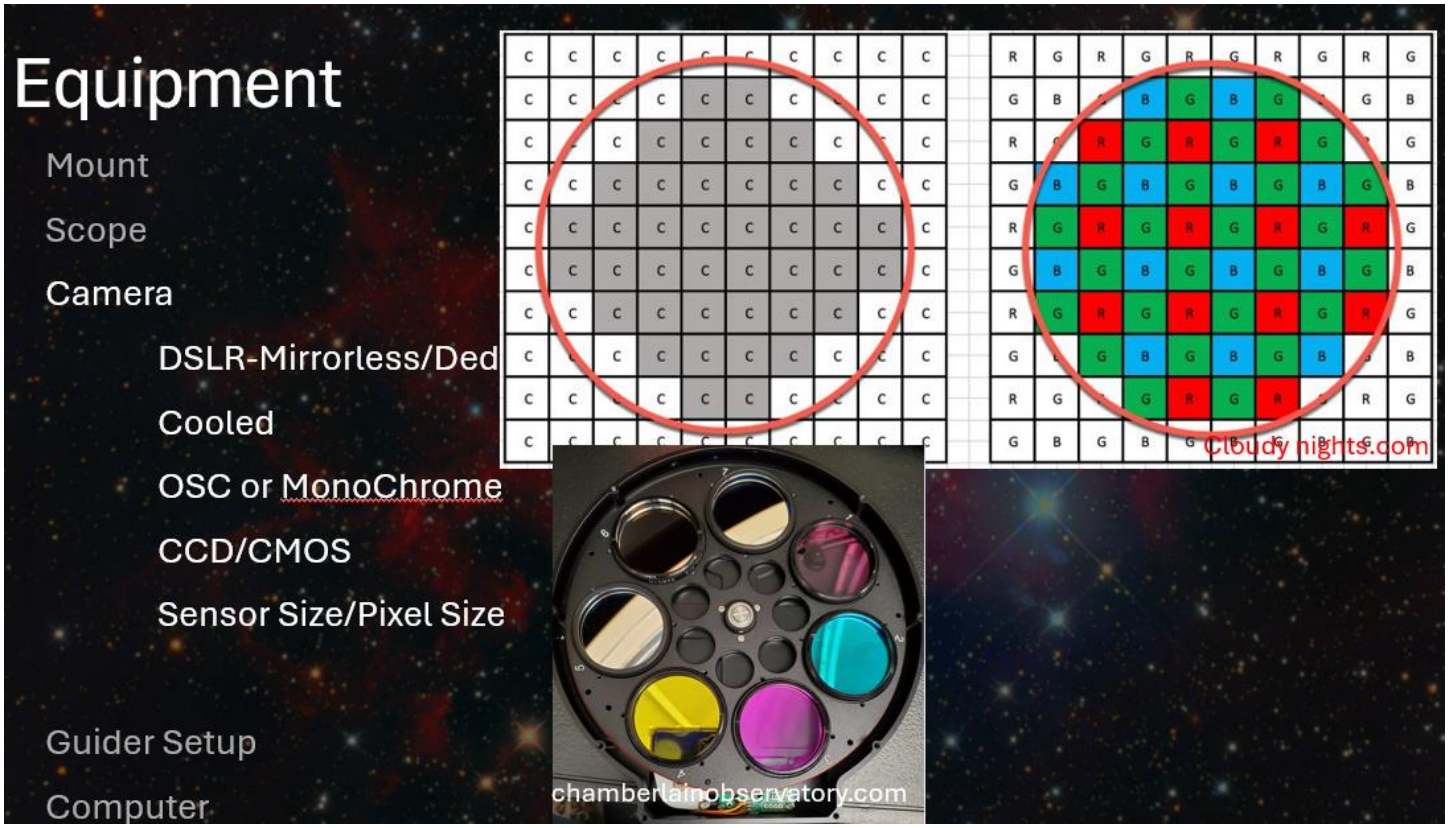
Start from Scratch, No "borrowing," Usable/good quality, All new

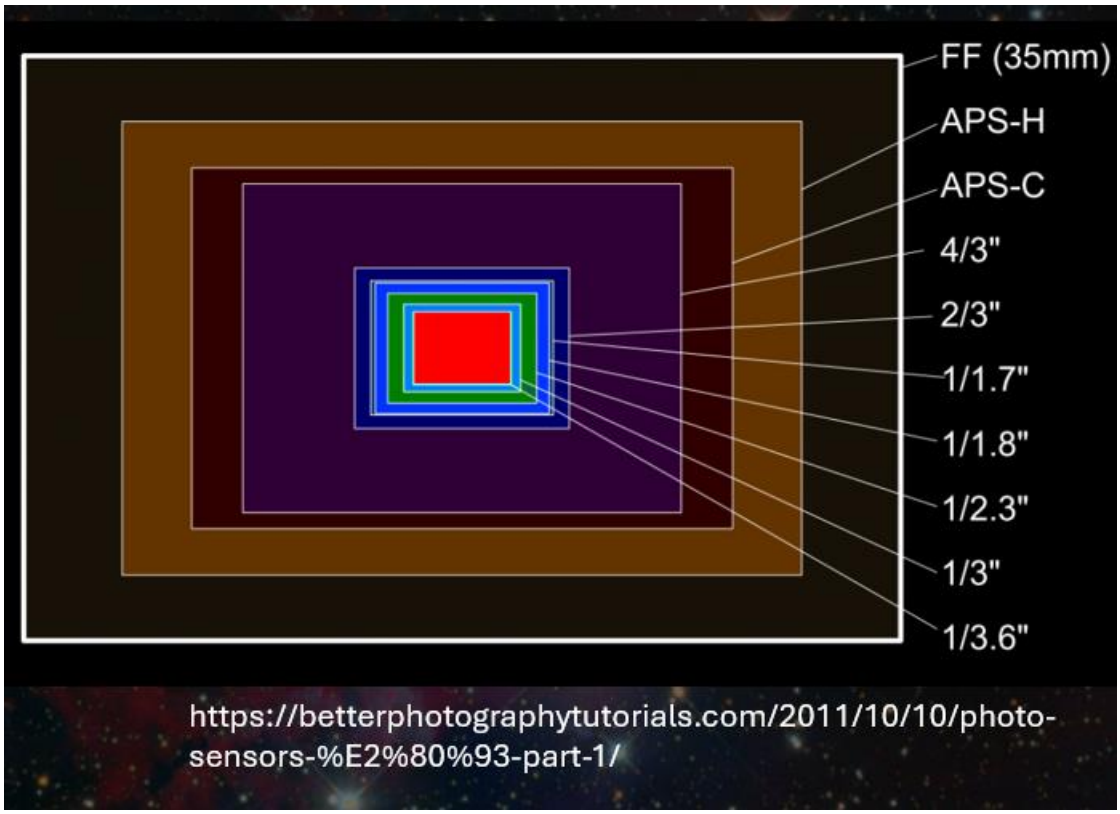
(If you could put a dollar value on time, patience, and sanity, it is much more)

Orbital Launch Attempts of 2024









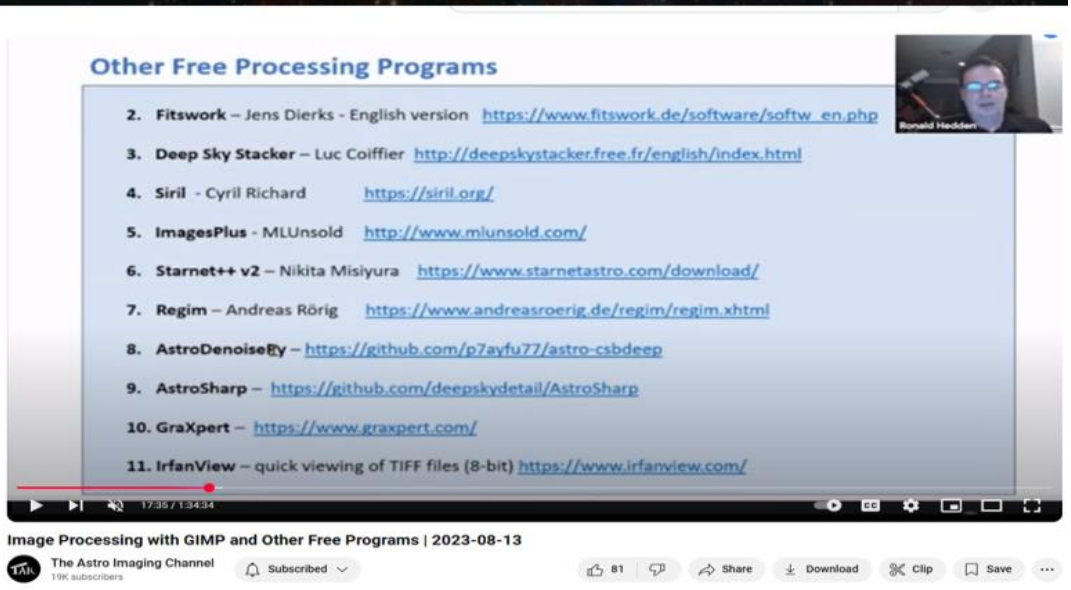
Sensor size matters. Usually, the larger the better. Try to get an APS-C or larger.

Equipment

- Mount
- Scope
- Camera
- Guider Setup
- Computer
- Connectors/Power Supplies/Filters/Etc.
  - Reducers/Flatteners/Correctors
  - Splitters and Cords
  - Power Supply
  - Carpet/Ground Cloth/Table/Chair

Acquisition and Processing Software

- NINA
- Processing
- Lower Cost



To Summarize the Recommendations

Item	Notes
Mount	30-40 pounds min Low/Correctible Periodic Error
Scope	450-700 Focal Length Refractor 70 MM aperture
Camera	APS-C Sensor, One-Shot Color, Cooled
Guider	Separate Guide Scope Sensitive Camera/larger Chip
Computer	Used Laptop Mini
Software	NINA PixInsight (or other processing software)
Miscellaneous	Chairs, ground cover, cables, Port Splitter, Battery
Patience	

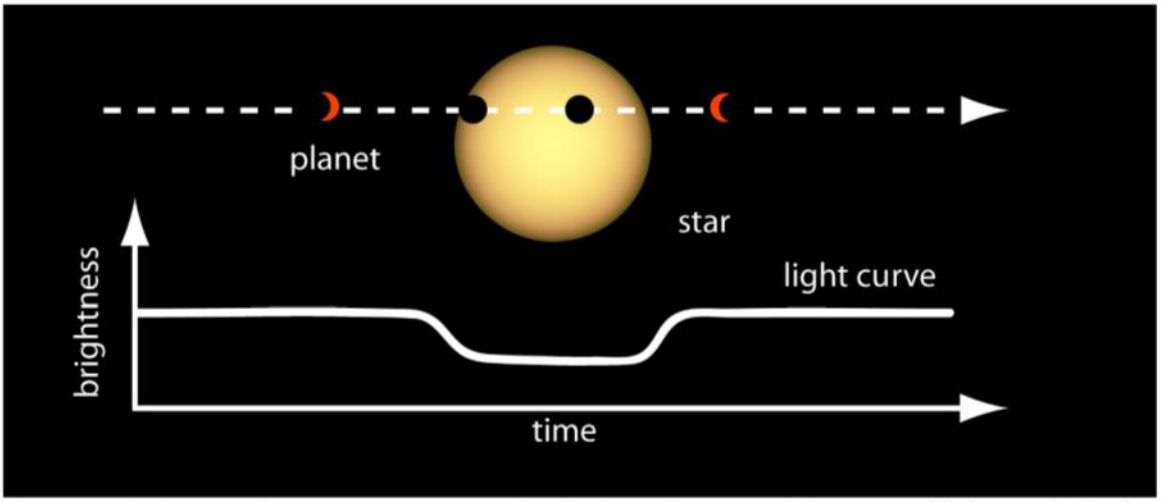
This article is distributed by NASA's Night Sky Network (NSN).
The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit go.nasa.gov/nightskynetwork to find local clubs, events, and more!

May's Night Sky Notes: How Do We Find Exoplanets?

By: Dave Prosper
Updated by: Kat Troche

Astronomers have been trying to discover evidence that worlds exist around stars other than our Sun since the 19th century. By the mid-1990s, technology finally caught up with the desire for discovery and led to the first discovery of a planet orbiting another sun-like star, Pegasi 51b. Why did it take so long to discover these distant worlds, and what techniques do astronomers use to find them?

The Transit Method

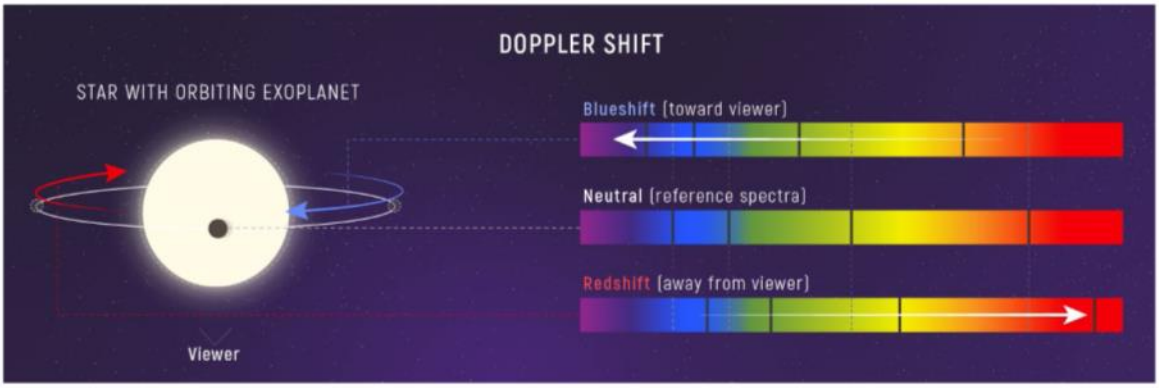


A planet passing in front of its parent star creates a drop in the star's apparent brightness, called a transit. Exoplanet Watch participants can look for transits in data from ground-based telescopes, helping scientists refine measurements of the length of a planet's orbit around its star. Credit: NASA's Ames Research Center

One of the most famous exoplanet detection methods is the **transit method**, used by Kepler and other observatories. When a planet crosses in front of its host star, the light from the star dips slightly in brightness. Scientists can confirm a planet orbits its host star by repeatedly detecting these incredibly tiny dips in brightness using sensitive instruments. If you can imagine trying to detect the dip in light from a massive searchlight when an ant crosses in front of it, at a distance of tens of miles away, you can begin to see how difficult it can be to spot a planet from light-years away! Another drawback to the transit method is that the distant solar system must be at a favorable angle to our point of view here on Earth – if the distant system's angle is just slightly askew, there will be no transits. Even in our solar system, a transit is very rare. For example, there

were two transits of Venus visible across our Sun from Earth in this century. But the next time Venus transits the Sun as seen from Earth will be in the year 2117 – more than a century from now, even though Venus will have completed nearly 150 orbits around the Sun by then!

The Wobble Method



As a planet orbits a star, the star wobbles. This causes a change in the appearance of the star's spectrum called Doppler shift. Because the change in wavelength is directly related to relative speed, astronomers can use Doppler shift to calculate exactly how fast an object is moving toward or away from us. Astronomers can also track the Doppler shift of a star over time to estimate the mass of the planet orbiting it. Credit: NASA, ESA, CSA, Leah Hustak (STScI)

Spotting the Doppler shift of a star's spectra was used to find Pegasi 51b, the first planet detected around a Sun-like star. This technique is called the **radial velocity or "wobble" method.** Astronomers split up the visible light emitted by a star into a rainbow. These spectra, and gaps between the normally smooth bands of light, help determine the elements that make up the star. However, if there is a planet orbiting the star, it causes the star to wobble ever so slightly back and forth. This will, in turn, cause the lines within the spectra to shift ever so slightly towards the blue and red ends of the spectrum as the star wobbles slightly away and towards us. This is caused by the blue and red shifts of the planet's light. By carefully measuring the amount of shift in the star's spectra, astronomers can determine the size of the object pulling on the host star and if the companion is indeed a planet. By tracking the variation in this periodic shift of the spectra, they can also determine the time it takes the planet to orbit its parent star.

Direct Imaging

Finally, exoplanets can be revealed by **directly imaging** them, such as this image of four planets found orbiting the star HR 8799! Space telescopes use instruments called **coronagraphs** to block the bright light from the host star and capture the dim light from planets. The Hubble Space Telescope has captured images of giant planets orbiting a few nearby systems, and the James Webb Space Telescope has only improved on these observations by uncovering more details, such as the colors and spectra of exoplanet atmospheres, temperatures, detecting potential exomoons, and even scanning atmospheres for potential biosignatures!

NASA Night Sky Notes May 2025

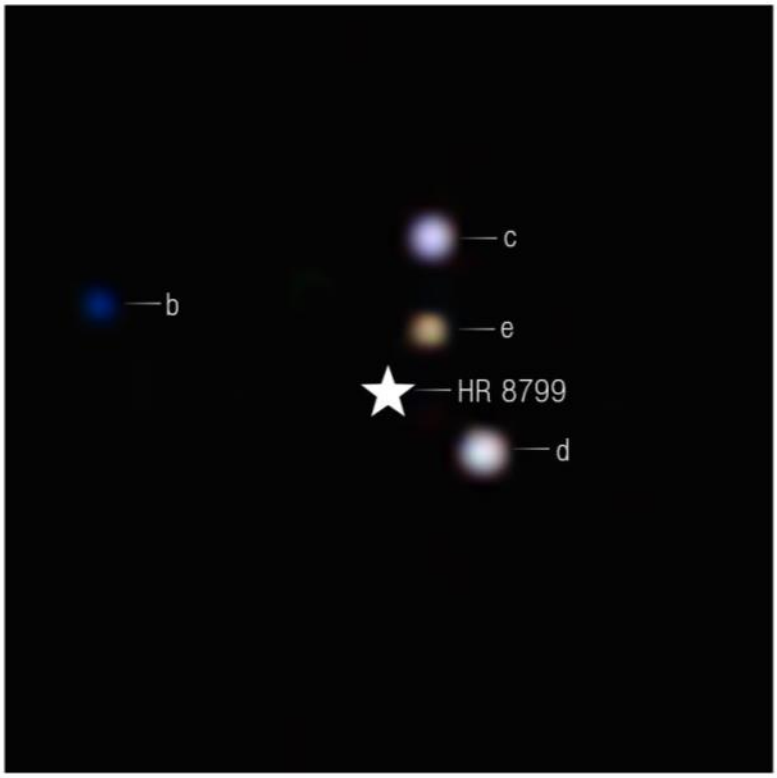


Image taken by the James Webb Space Telescope of four exoplanets orbiting HR 8799. Credit: NASA, ESA, CSA, STScI, Laurent Pueyo (STScI), William Balmer (JHU), Marshall Perrin (STScI)

You can find more information and activities on NASA's Exoplanets page, such as the Eyes on Exoplanets browser-based program, The Exoplaneteers, and some of the latest exoplanet news. Lastly, you can find more resources in our News & Resources section, including a clever demo on how astronomers use the wobble method to detect planets!

The future of exoplanet discovery is only just beginning, promising rich rewards in humanity's understanding of our place in the Universe, where we are from, and if there is life elsewhere in our cosmos.