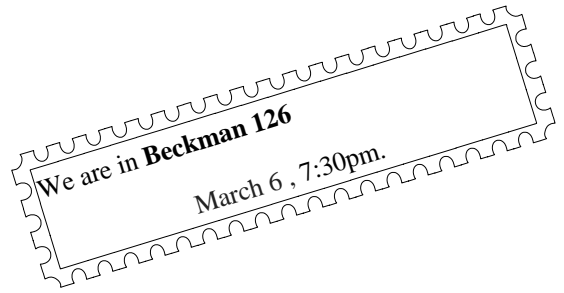




Newsletter of the Pomona Valley Amateur Astronomers

"Cerca, trova" (Seek and you shall find).
Giorgio Vasari



Volume 40 Number 3

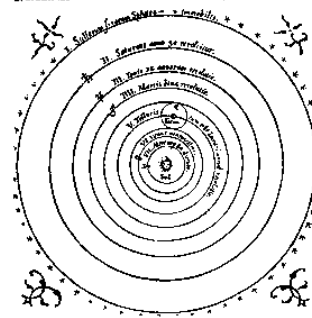
nightwatch

March 2020

Speaker Announcement

Our March 6 speaker is David Nakamoto and the title of his talk is "Tipping the Scales." He describes his talk like this: "I will be talking about the scale model of the Solar System to give some sense of the emptiness of space around it."

Looks like an interesting evening, hope many of you can make it to the meeting!



Club Events Calendar

- Mar 6 General Meeting – David Nakamoto –
Tipping the Scales
- Mar 21 Star Party – Mecca Beach, Salton Sea
- Apr 1 Board Meeting
- Apr 10 General Meeting - Apollo 13
- Apr 25 Star Party – Afton Canyon
- Apr 29 Board Meeting
- May 8 General Meeting
- May 23 Star Party -- TBD
- May 27 Board Meeting

- Jun 5 General Meeting – Curtis Croulet-
History of Palomar Observatory
- Jun 20 Star Party – TBD
- Jul 22 Board Meeting
- Jul 31 General Meeting
- Aug 15 Star Party -- TBD
- Aug 19 Board Meeting
- Aug 28 General Meeting
- Sep 12 Star Party -- TBD
- Sep 16 Board Meeting

PVAA Officers and Board

Officers

President	Mathew Wedel	909-767-9851
Vice President ..	Joe Hillberg	909-949-3650
Secretary	Ken Elchert	626-541-8679
Treasurer	Gary Thompson	909-935-5509
VP Facilities	Jeff Felton	909-622-6726

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Jim Bridgewater (2018).....	909-599-7123
Richard Wismer(2018)	
Ron Hoekwater (2019).....	909-706-7453
Jay Zacks (2019)	

Directors

Membership / Publicity....	Gary Thompson ..	909-935-5509
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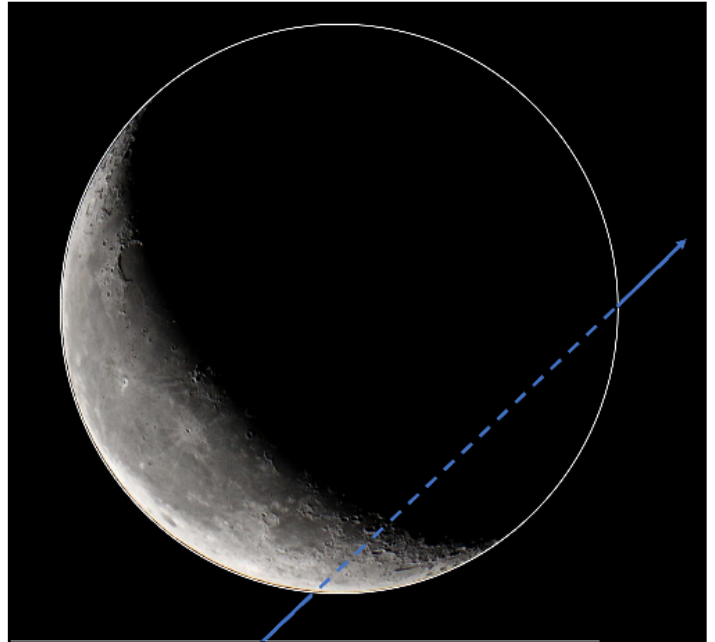
PVAA General Meeting 02/7/20

This meeting we actually had 3 presentations. First our own Ken Elchert gave a short presentation of the then upcoming Lunar-Mars occultation. This occurred on February 18th. The moon passed in front of Mars, and blocked it out for 50 minutes for the LA area. You can see a short video of the occultation from Arizona here:

<https://www.space.com/amazing-moon-mars-occultation-video-february-2020.html>

This shows the apparent path of Mars. The Earth's rotation and the Moon's orbit are doing most of the moving.

The second presentation was by PVAA's President, Mathew Wedel. It was an update on his archeological dig in Utah.



Bone in cast for moving.

This is actually harder than it looks.
Can't we just 'beam' it out of here?





Made it to Utah Field House of Natural History

The third and main presentation of the night was by NASA Ambassador Salem Emar. His subject was the Mars InSight Mission. The Mars InSight Mission launched on May 5th, 2018 from Vandenberg Air Force Base, California, landing in the Elysium Planitia on Mars on November 26th, 2018. This was the first interplanetary mission launched from California. While most American spacecraft originate from JPL in California, Mars InSight was built in Littleton, Colorado by Lockheed Martin. Most of the scientific instruments were built by European space agencies. This was also the first mission to have interplanetary CubeSats: MarCO-A and MarCO-B, which were built by JPL in Pasadena. The CubeSat probes were each about the size of a briefcase, or 6 single CubeSats. A single CubeSat is 10cm x 10cm x 10cm.

InSight is the name for **I**nterior Exploration using **S**eismic Investigations, **G**eodesy and **H**eat Transport. InSight was originally planned to launch in March 2016, but was held up due to a leak in the seismometer experiment SEIS (**S**eismic Experiment for **I**nterior **S**tructure) – designed and built by the French Space Agency (CNES).

Other instruments onboard the InSight Lander are: TWINS – Temperature and Winds for **I**nSight. HP³ – Heat Flow and Physical Properties Package, RISE – Rotation and Interior Structure Experiment, a Vector Magnetometer provided by UCLA, a Barometer from JPL, LaRRI – Laser RetroReflector for InSight provided by the Italian Space Agency, and an Environmental Monitoring Station (Air temp, wind speed & direction). InSight is the first Mars lander to dig/drill into Mars farther than a scoop.

Clydesdales to the rescue.

One, and then two horses used.



The SEIS instrument has detected Mars quakes, and that Mars is still geologically active. More than 20 quakes have registered in the magnitude 3 to 4 range. Most of these quakes happen very deep down, and would not be felt by humans, had they been on the surface. One experiment is currently having problems. The probe in the HP³ experiment has not been able to burrow into the surface of Mars. The probe burrows by pushing against the soil around it for friction. Unfortunately the loosely packed soil does not provide the friction for it to continue downward. The probe has actually bounced most of the way out of its hole. Scientist are trying a variety of methods, so far without luck, to get the probe to dig deeper. InSight's mission is to find out as much about Mars as it can to help answer the question of how our solar system got started, and how did it get to its current condition.

Mars InSight

<https://mars.nasa.gov/insight/>

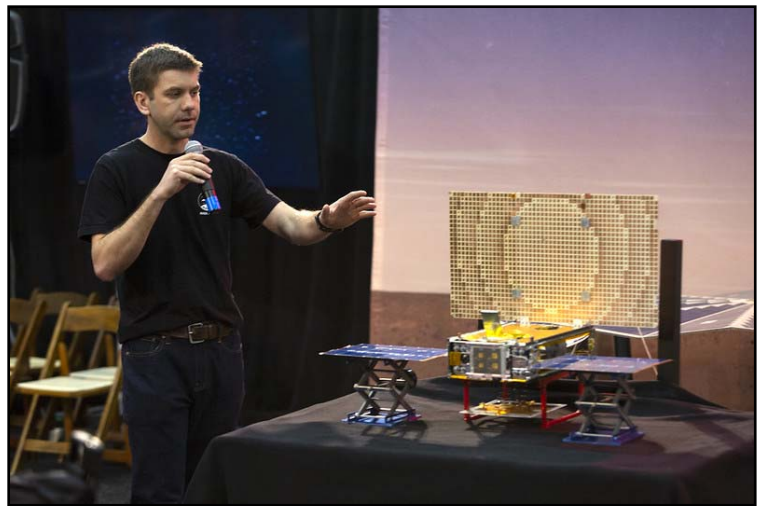
<https://vimeo.com/261856765>

https://www.jpl.nasa.gov/news/press_kits/insight/launch/appendix/mars-cube-one/



Self-portrait 12-11-18

Full scale model of MarCO CubeSat space probe.



SEIS experiment deployed on Mars.

Off the Wall

So – does your day ever begin with an email, phone call, or text that begins “This is off the wall, but...” If you have a friend like Ludd Trozpek, you’ll know that this is a possibility and you realize that you take your chances when this occurs. Of course, you may end up being whisked off to the Grand Canyon to participate in the GC Star Party so in my case, responding to Ludd’s unusual suggestions can result in a pretty great payoff!

The early-December email was no exception and began as described above, asking if my husband John and I would be willing to act as intermediaries in the evaluation and possible purchase of gigantic, 6-inch aperture JMI RB-66 binoculars which were for sale and located near our part of the state while Ludd was 450 miles away. After delays for the holidays, for everyone’s schedules to align, and for numerous emails to be exchanged, January 12th dawned cool, and most critically foggy, at our country place in Knights Landing. The seller, Tom Duncan texted that he was running about 15 minutes late. That small delay proved to be crucial to our evaluation of the equipment. From Tom’s van wheels rolling to a stop, quick introductions made, and the binos set up on the tripod and eyepieces installed – only 7 minutes had elapsed and the fog between us and the 1-mile away trees we planned to use as a test target had dissipated. The plan was coming together!

Tom showed us how all the controls worked and I focused in on the clump of trees. There was an “Aha” moment as I performed the last of the alignment/focusing steps and the image snapped crisply into view. It was now John’s turn to look under the hood as he and Tom removed the bino’s cover and evaluated all the motors and the sturdiness of construction. Having passed all the tests, funds were exchanged and in less than an hour Tom hit the road – off to new optical work. He is affiliated with an Astronomy Club and seems to delight in refurbishing equipment donated to the Club but not needed by them. He enjoys finding a good and appropriate homes for the scopes and binoculars he works on.

The final step took place a few days later when John and I headed south on a car delivery project, trailer in place and binos safely in the back of our Dodge van. We met the optical analysis team of Ludd and Bob Akers at an Upland café and, after filling up on breakfast, we headed to the parking lot and descended on the rear of the van to look over the RB-66’s. They met with Ludd’s approval and were moved to their new home in the back of his van – adventure both fun for all and complete!

Claire Stover



Tom Duncan and John Stover in Knights Landing



John Stover, Ludd Trozpek, and Bob Akers



Under the hood



John Stover, Ludd Trozpek, and Bob Akers

NASA Night Sky Notes

March 2020



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!

Dim Delights in Cancer

David Prosper

Cancer the Crab is a dim constellation, yet it contains one of the most beautiful and easy-to-spot star clusters in our sky: the **Beehive Cluster**. Cancer also possesses one of the most studied exoplanets: the superhot super-Earth, **55 Cancri e**.

Find **Cancer's** dim stars by looking in between the brighter neighboring constellations of Gemini and Leo. Don't get frustrated if you can't find it at first, since Cancer isn't easily visible from moderately light polluted areas. Once you find Cancer, look for its most famous deep-sky object: the **Beehive Cluster**! It's a large open cluster of young stars, three times larger than our Moon in the sky. The Beehive is visible to unaided eyes under good sky conditions as a faint cloudy patch, but is stunning when viewed through binoculars or a wide-field telescope. It was one of the earliest deep-sky objects noticed by ancient astronomers, and so the Beehive has many other names, including Praesepe, Nubulum, M44, the Ghost, and Jishi qi. Take a look at it on a clear night through binoculars. Do these stars look like a hive of buzzing bees? Or do you see something else? There's no wrong answer, since this large star cluster has intrigued imaginative observers for thousands of years.

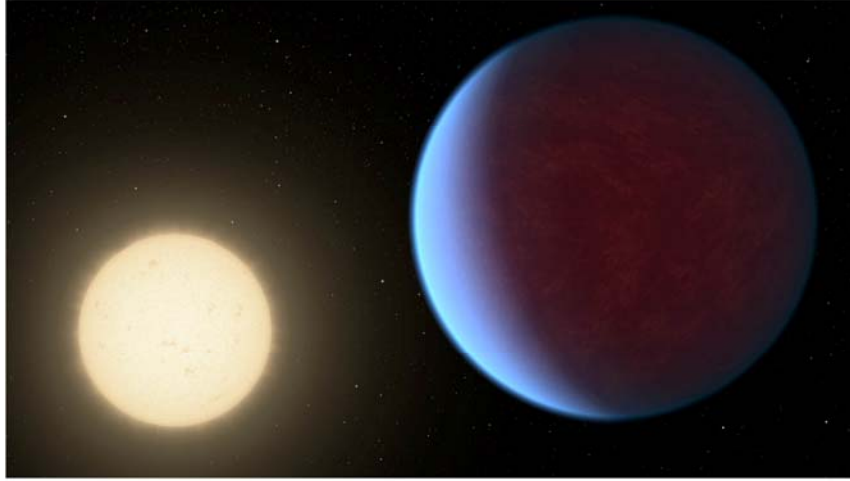
55 Cancri is a nearby binary star system, about 41 light years from us and faintly visible under excellent dark sky conditions. The larger star is orbited by at least five planets including **55 Cancri e**, (a.k.a. Janssen, named after one of the first telescope makers). Janssen is a "super-earth," a large rocky world 8 times the mass of our Earth, and orbits its star every 18 hours, giving it one of the shortest years of all known planets! Janssen was the first exoplanet to have its atmosphere successfully analyzed. Both the Hubble and recently-retired Spitzer space telescopes confirmed that the hot world is enveloped by an atmosphere of helium and hydrogen with traces of hydrogen cyanide: not a likely place to find life, especially since the surface is probably scorching hot rock. The NASA Exoplanet Catalog has more details about this and many other exoplanets at bit.ly/nasa55cancrie.

How do astronomers find planets around other star systems? The Night Sky Network's "How We Find Planets" activity helps demonstrate both the transit and wobble methods of exoplanet detection: bit.ly/findplanets. Notably, 55 Cancri e was discovered via the wobble method in 2004, and then the transit method confirmed the planet's orbital period in 2011!

Want to learn more about exoplanets? Get the latest NASA news about worlds beyond our solar system at nasa.gov.

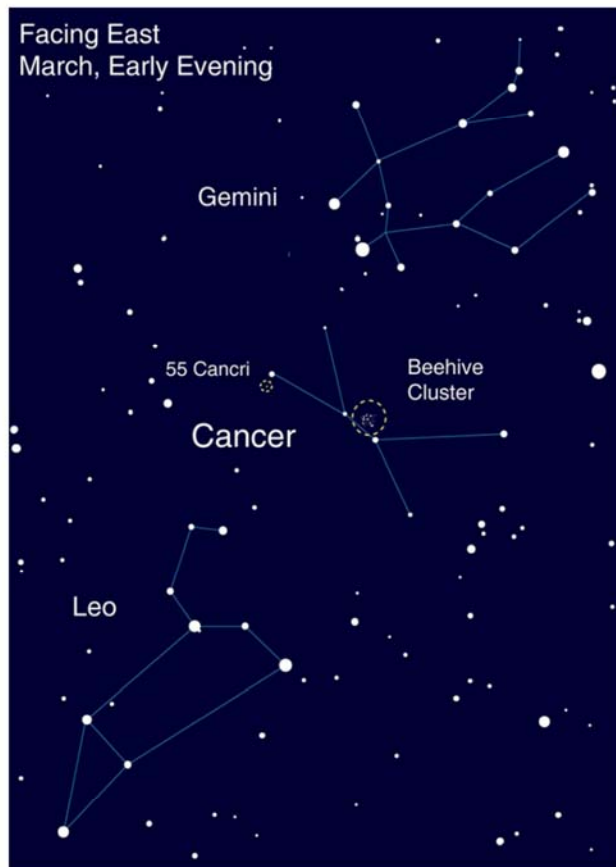
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Artist concept of 55 Cancri e orbiting its nearby host star. Find details from the Spitzer Space Telescope's close study of its atmosphere at: bit.ly/spitzer55cancrie and the Hubble Space Telescope's observations at bit.ly/hubble55cancrie

Credit: NASA/JPL-Caltech



Look for Cancer in between the "Sickle" or "Question Mark" of Leo and the bright twin stars of Gemini. You can't see the planets around 55 Cancri, but if skies are dark enough you can see the star itself. Can you see the Beehive Cluster?