



Newsletter of the Pomona Valley Amateur Astronomers

If people sat outside and looked at the stars each night,
 I'll bet they'd live a lot differently.
Bill Watterson

Volume 37 Number 12

nightwatch

December 2017

Club Events Calendar

- December 9 Holiday Party
- No December Board Meeting
- January 5 General Meeting
- January 13 Star Party
- January 24 Board Meeting
- February 2 General Meeting
- February 10 Star Party
- February 21 Board Meeting
- March 2 General Meeting
- March 10 Star Party
- April 14 Star Party
- April 18 Board Meeting
- April 27 General Meeting
- May 16 Board Meeting
- May 24 – 28 RTMC
- June 1 General Meeting

President's Message

It's been another great year for the PVAA. I am very fortunate to work with such enthusiastic and curious people. I wish all of you a merry Christmas and a safe and happy holiday season. Please come out to the holiday party this Saturday, Dec. 9, from 7:00 to 9:00 at the IHOP at 80 North Euclid in Upland. There will be plenty of prizes and everyone will go home with something. I hope to see you there.

Matt Wedel

PVAA Officers and Board

| <u>Officers</u> | | |
|---------------------|----------------------|--------------|
| President | Mathew Wedel | 909-767-9851 |
| Vice President .. | Joe Hillberg | 909-949-3650 |
| Secretary | Howard Maculsay | 909-624-1667 |
| Treasurer | Gary Thompson | 909-935-5509 |
| VP Facilities | Jeff Felton | 909-622-6726 |

| <u>Board</u> | |
|-----------------------------|--------------|
| Jim Bridgewater (2018)..... | 909-599-7123 |
| Richard Wismer(2018) | |
| Ron Hoekwater (2019)..... | 909-706-7453 |
| Cori Charles (2019) | 909-646-0275 |

| <u>Directors</u> | |
|--|----------------------|
| Membership / Publicity....Gary Thompson .. | 909-935-5509 |
| Outreach | Jeff Schroeder |
| Programs | Ron Hoekwater |
| Nightwatch | John Stover |
| | 909-758-1840 |
| | 909-391-1943 |

PVAA General Meeting 11/03/17

The monthly meeting of the Pomona Valley Amateur Astronomers started off with Cori Charles giving her review of this year’s ‘Nightfall’ put on by the Riverside Astronomical Society. It is held at the Palm Canyon Hotel & RV Resort in Borrego Springs. Every year the hotel switches its outside lights to red to accommodate the astronomers. Cori gave high praise to the hotel and the speakers lined up for the 4 day & night event. She is definitely going to the next one.

It was also pointed out that the Mount Wilson 100” telescope just had its 100th birthday. It had its first light on November 1st, 1917.

The speaker for the night was Ken Elchert. Ken is a member of the PVAA, and is a retired aerospace engineer. He worked for Rockwell International and Boeing on the Space Shuttle, Delta IV, Constellation, and Missile Defense. His topic was “The Star of Bethlehem – A New Theory.” He freely admits that he is not a biblical scholar. All the positions of the Sun, Moon and planets are based of the Stellarium 0.12.0 program. His guiding principle was: “The ultimate goal of research is to find the truth, not to support preconceived ideas. To find the truth, follow the evidence.”

The gospel of Matthew is the only account of the Star of Bethlehem in the Bible. (Matt. 2:1-11) – about 230 words. The star is mentioned 4 times. The gospel of Luke also mentions the Nativity.

From examination of the Nativity accounts in the gospels of Matthew and Luke, the following 17 facts and inferences can be drawn:

- Herod the Great was alive at the time the star was seen (Matt. 2:1)
- Caesar Augustus decreed an empire-wide registration (Luke 2:1)
- Quirinius was governing Syria (Luke 2:2)
- It inferred birth (Matt. 2:2)
- It inferred kingship (Matt. 2:2)
- It inferred the Jewish nation (Matt. 2:2)
- The Magi saw it at its rising and then traveled to Jerusalem (Matt. 2:2)
- Seen from the East of Jerusalem -- The Magi were from the East (Matt. 2:1)
- The Magi provided Herod the exact time of its appearance (Matt. 2:7)
- It went ahead (south) of the Magi on their journey to Bethlehem from Jerusalem (Matt. 2:9)
- It stopped over Bethlehem (Matt. 2:9)
- It was star-like since it was referred to as a “star” (Matt. 2:2)
- It was a single object since it was referred to in the singular (Matt. 2:2)
- It was bright otherwise it would not have drawn attention (Matt. 2:2 and 2:9)
- It was probably a common object otherwise Herod’s astrologers would have known about it
- It existed for months since it was seen both at its rising and after the Magi’s journey to Jerusalem (Matt. 2:2 and 2:9)
- Its appearance left no doubt to the Magi of its significance since they undertook a long journey because of it – uncommon circumstances with a clear message

Assessment of Astronomical Objects for the Star of Bethlehem

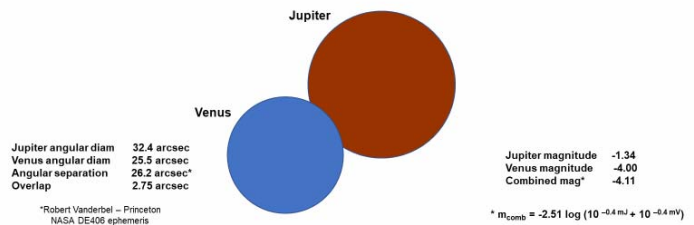
| | | Single Object? | Visible for Months? | Helical Rising in the East? | Visible South of Jerusalem? | Common Object? | Bright? | Star-like? | Motion Stops? | Associated w/ Kings? |
|---------------------|---------------------|----------------|---------------------|-----------------------------|-----------------------------|----------------|-----------|------------|---------------|----------------------|
| Atmospheric | Meteor | Yes | No | No | Yes | Yes | Yes | No | No | No |
| Large | Sun | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes? |
| Objects | Moon | Yes | Yes | No | Yes | Yes | Yes | No | Yes | No |
| Planets (star-like) | Mercury | Yes | No | Yes | No | Yes | No | Yes | Yes | No |
| | Venus | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | No |
| | Mars | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No |
| | Jupiter | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Saturn | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No |
| | Uranus | Yes | Yes | Yes | Yes | No | No | Yes | Yes | No |
| Small | Asteroid | Yes | No | Yes* | Yes | No | No | Yes | Sometimes | No |
| Objects | Comet | Yes | Yes | Yes* | Yes | No | Sometimes | No | Sometimes | Yes |
| Stellar Objects | Star (e.g. Regulus) | Yes | Yes | Some* | Yes | Yes | Some | Yes | No | Some |
| | Planetary Nebula | Yes | Yes | Some* | Yes | Yes | No | Yes | No | No |
| | Novae/Supernova | Yes | Yes | Some* | Yes | No | Yes | Yes | No | No |

*only those that do not appear near the celestial poles

Using the above assessment, Ken found several problems: Who were the Magi? Where did they come from? Why did they care? Babylonians would not have cared about the Jewish Messiah. But at least 3 times the Jewish people were conquered and carried into Babylonia. There were still pockets of Jews in the lands at the time. In fact, Babylonia contained the largest population of Jews outside of Herod’s domain.

Matthew states that the Magi saw the star rising in the east. Eventually it stopped moving. This could be in reference to the other stars. Jupiter will move, stop, and then move retrograde to the stars as seen from earth. Many have pointed to the Jupiter-Venus merger in 2 BC. Ken does not believe this to be the event for 2 big reasons: 1. too short – didn’t last long enough for the Magi’s trip. 2. It happened in the western part of the sky, not the east.

Depiction of the Jupiter-Venus Merger at Minimum Separation on June 17, 2 BC



Ken has concluded: If Matthew’s story about the star is true, it was probably Jupiter. There are good reasons to believe Jesus was born in late 3 BC or early 2 BC. The Magi likely came from the Babylonian region of the Parthian Empire. The Magi traveled to Bethlehem at the time of Jupiter’s first station in December of 2 BC.

The theory does not prove the story is true, but shows that it could be.

Gary Thompson

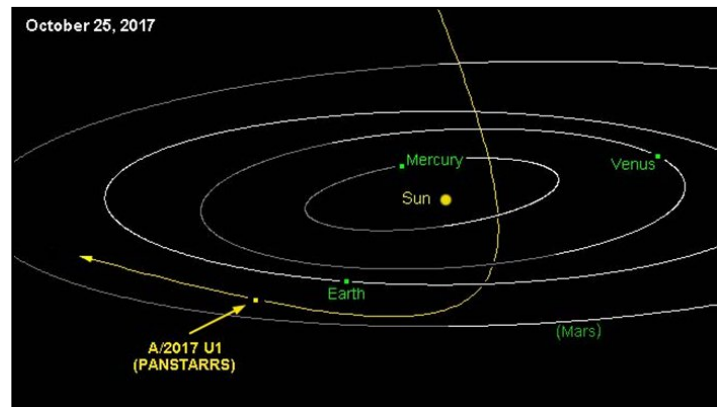
What's Up? - Cygnus, Swan / Northern Cross

A mystery object that sped through our solar system in October has been identified as the first observed interstellar rocky object. Discovered by the Pan-STARRS 1 telescope in Hawaii (pictured) on the island of Maui, it was classified A/2017



U1 but has been named Oumuamua. This is Hawaiian for a scout bearing a message or sent to discover the position of the enemy. An interstellar object is a body that's in interstellar space not attached by gravity to any star (sun).

A/ 2017 U1 or Oumuamua was first thought to be a comet because of its hyperbolic pathway, but it didn't have an extended icy halo. It had no comet tail formed from melting ice so was re-identified as an asteroid. The object is unique, not only because of its odd trajectory angle off the plane of our solar system which suggested an interstellar origin, but because of its super speed of 16 miles per second (26 kilometers). It was too fast to orbit our Sun and was not in any way gravitationally bound to our solar system. It came in a slingshot curve from the darkness of deep space passing within 15 million miles of Earth. Oumuamua also got close to our Sun, but its extreme speed kept it from being vaporized.



Additional observations by the William Herschel Telescope found it to have a low albedo of 10%. It was no more than 400 meters in diameter and had a featureless reddish color typical of Kuiper belt asteroid objects. With only 15 days to observe its odd hyperbolic passage it remains mysterious. It was only because of newer improved telescopes that it was discovered at all.

It came from the direction of the star Vega in Lyra and passed through the inner planets to head toward the constellation of Pegasus.

Science fiction readers compared it to the interstellar object featured in Arthur C. Clarke's novel "Rendezvous with Rama" (1973). When "Rama" is explored it turns out to be a hollow spacecraft with repair robots and cities absent of any alien inhabitants. It inspired three sequels.



Rocky Oumuamua didn't give any evidence of being an interstellar starship or probe. But it's already sped out of our solar system so we'll never really know.

Interstellar objects are probably ejected from their original orbits around other stars by gravitational encounters or explosions. Asteroids, comets and even planets can be forced out into interstellar space. Recently sunless "rogue" planets have been discovered orbiting the galactic center independently. Although it's very cold between stars these rogue planets can be heated by geothermal energy and thick atmospheres. Flash Gordon and Star Trek have both featured rogue planets with inhabitants but recently many observed objects have been reclassified as brown dwarf stars.

Interstellar rogue objects hidden in the darkness between stars will continue to be an exciting new astronomical mystery.

Lee Collins



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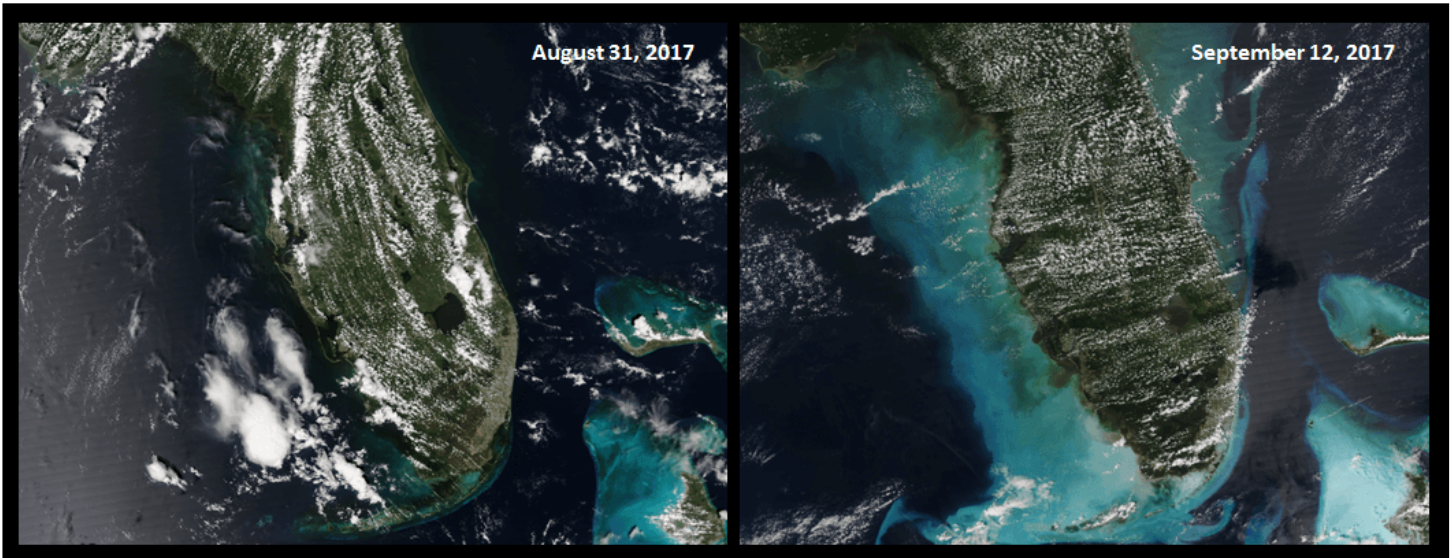
Studying Storms from the Sky

The United States had a rough hurricane season this year. Scientists collect information before and during hurricanes to understand the storms and help people stay safe. However, collecting information during a violent storm is very difficult.

Hurricanes are constantly changing. This means that we need a lot of really precise data about the storm. It's pretty hard to learn about hurricanes while inside the storm, and instruments on the ground can be broken by high winds and flooding. One solution is to study hurricanes from above. NASA and NOAA can use satellites to keep an eye on storms that are difficult to study on the ground.

Hurricanes can also have a huge impact on the environment—even after they're gone. To learn about how Hurricane Irma affected the Florida coast, scientists used images from an environmental satellite called Suomi National Polar-orbiting Partnership, or Suomi-NPP. One of the instruments on this satellite, called VIIRS (Visible Infrared Imaging Radiometer Suite), took pictures of Florida before and after the Hurricane.

Hurricane Irma was so big and powerful, that it moved massive amounts of dirt, water and pollution. The information captured by VIIRS can tell scientists how and where these particles are moving in the water. This can help with recovery



In Puerto Rico, Hurricane Maria was so strong that it knocked out radar before it even hit land. Radar can be used to predict a storm's path and intensity—and without radar, it is difficult to tell how intense a storm will be. Luckily, scientists were able to use information from a weather satellite called GOES-16, short for Geostationary Operational Environmental Satellite – 16.

The "G" in GOES-16 stands for geostationary. This means that the satellite is always above the same place on the Earth, so during Hurricane Maria, it never lost sight of the storm. GOES-16's job as a weather satellite hasn't officially started yet, but it was collecting information and was able to help.

From 22,000 miles above Earth, GOES-16 watched Hurricane Maria, and kept scientists on the ground up to date. Knowing where a storm is—and what it's doing—can help keep people safe, and get help to the people that need it.

efforts, and help us design better ways to prepare for hurricanes in the future.

By using satellites like GOES-16 and Suomi-NPP to observe severe storms, researchers and experts stay up to date in a safe and fast way. The more we know about hurricanes, the more effectively we can protect people and the environment from them in the future.

Teagan Wall

Caption: These images of Florida and the Bahamas were captured by a satellite called Suomi-NPP. The image on the left was taken before Hurricane Irma and the image on the right was taken after the hurricane. The light color along the coast is dirt, sand and garbage brought up by the storm. Image credit: NASA/NOAA

To learn more about hurricanes, check out NASA Space Place:

<https://spaceplace.nasa.gov/hurricanes/>

Starting a Library Telescope Lending Program

It wasn't very long after joining PVAA I learned of the club's philanthropic outreach program supporting the telescope lending program at Claremont Public Library. President Matt Wedel brought to the meeting a brand new 4-1/2" Orion Star Blaster Telescope. This was the third telescope to be donated by PVAA to the Claremont Library.

I thought how cool is that?! The idea to start a telescope lending program at Monrovia Public Library was planted. Not wanting to go it alone the idea was tendered to Old Town Sidewalk Astronomers, would they be interested in sponsoring this effort? OTSA practices urban gorilla astronomy every month on the corner of Library Park they seemed a perfect fit! Alas, not every loosely formed group wants to be a non-profit or expand into any other responsibility not related to their core mission of urban gorilla astronomy. So the idea was shelved until another member posted in an email the idea of sponsoring a telescope lending program. The quick response, Yes, I am in! In a very short chain of emails we had donations enough to purchase (3) telescopes. So as three independent individuals we would start a telescope lending program at Monrovia Public Library.

Our next step was to contact Matt Wedel. Matt forwarded all the files and internet links on everything one needs to know about establishing a library telescope lending program. The New Hampshire Astronomical Society has developed documents and videos to support establishing telescope lending programs. These documents detail the necessary telescope modifications and essential boilerplate for documents such as; telescope instructions, safety labels, and library check-in/checking out procedures. Hundreds of library telescope lending programs are based on NHAS templates.

Shortly after Christmas three telescopes, three Celestron Zoom Eyepieces and all the hardware needed to make the telescopes tamper proof were acquired and assembled. With the telescopes ready to go and drafts of all the supporting documents ready, all that was needed was the library to review and say, "Yes!" To make a long story shorter, it took 3 months to get approval of the program. No one at the library had the authority to approve the donation and the plan to lend the telescopes. It had to wind its way through the City's bureaucracy including a pass across the City Attorney's desk.

A few months later I am happy to report the program is wildly successful. The wait list is holding steady at 8 weeks. Monthly the telescopes are inspected, cleaned and collimated as needed. This past Saturday standing at the corner of library Park with my Dob and several other OTSA members, one accidental astronomer remarked he was wait listed to check out a telescope through the lending program at Monrovia Public Library. He was a bit dismayed that it would be a long 8 week wait. "What great timing, you will have the Orion Constellation, its nebula and glory coming into view in the early night sky."

Kay Hoevel

MOTTO TO LIVE BY

Life should NOT be
a journey to the grave
with the intention
of arriving safely in
an attractive and
well preserved body,
but rather to
skid in sideways,
body thoroughly
used up,
totally worn out and
screaming
"WOO HOO,
WHAT A RIDE!"