



Greg Smith – editor

**Volume 25, No.2
June 2019**

Program: Summer Solstice Picnic

**Meeting: June 21 2019
Willow Grove Park**

Father's Day and Summer Solstice



I have the best daughter a space loving dad could have. On the left is the Father's

Day gift she arranged for me to have. She coordinated with my wife and her sister to get me the new Lego Apollo Lander set. Two years ago, she got me the Limited-edition Saturn V rocket Lego set. In order for me to put the lander together, I must find the many hours that it will take to assemble it. That will be a chore as I am highly involved in the startup of my oldest daughter and her husband's new chocolate shop in downtown Longview (Storyboard Delights).

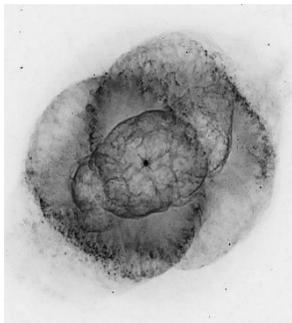
It is also the Summer Solstice, a short night and a long day the first day of Summer. I find that this time of year is also the hardest time for me to do observing; especially this year with all the energy expended on the chocolate shop. I find I am exhausted and with a lack motivation to drag out my telescope to do observing so late in the evening. Hope fully after the chocolate shop is up and running, I will have more

motivation to go out and look. By that time the days will be shorter, and I won't have to stay up so late.

This month's yearly picnic will be a very good one. We will have guests from the winter solstice event, some new members and it looks like good weather is in offering as well. Solar minimum is still in full swing, so not likely to have any spots to show off, but you can never tell what be visible on the sun's surface.

I, like a number of astronomers, have concerns with the projected launching of thousands of small satellites into Earth orbit. How will they affect the observing of stellar objects and the hunt for exoplanets around far off stars? Could our sky be filled with space junk like the scene in "Wall-E" as he flies through the cloud of dead satellites. With all this space junk and light pollution, will we totally destroy our ability to explore our place in the universe?

**Every Day is a Star Filled Day
Every Night is a Starry Night**



Snoopy
Come
Home



Astronomers Might Have Found Apollo 10's "Snoopy" Module

By: [David Dickinson](#) | June 14, 2019

A small near-Earth object might be a historic piece of space hardware: the Apollo 10 lunar module, dubbed "Snoopy."

On May 23, 1969, astronauts aboard Apollo 10 jettisoned the Snoopy lunar module and headed for Earth. That's the last time humans set eyes on Snoopy — now, astronomers may have rediscovered this fascinating artifact of space history.

Fellow of the Royal Astronomical Society astronomer [Nick Howes](#) shared the possible discovery recently at [Cheltenham Science Festival](#). Howes, who began the search for Snoopy in 2011, said in a recent [Sky News report](#) that he is 98% certain that the object in question is, in fact, Snoopy. However, it will require follow-up observations to conclusively prove (or disprove) this conclusion.

Astronomers started the hunt in 2011 using the Faulkes North Telescope in Hawai'i, the Faulkes South Telescope in Australia, and data from the Catalina Sky Survey, located outside of Tucson, Arizona. The break came last year during observations taken at the Mt Lemmon and other survey observatories, with the discovery of the small Earth-crossing asteroid 2018 AV2. Orbiting the Sun once every 382 days; 2018 AV2 spends most of its time trailing Earth in its orbit around the Sun. Two factors grabbed astronomers' attention: its low orbital inclination (less than 1°) relative to the ecliptic, and its low speed, less than a kilometer per second relative to Earth's orbital velocity.

Other factors also led to the conclusion that 2018 AV2 is likely to be Snoopy. It's already listed as an artificial object on the International Astronomical Union Minor Planet Center's [Distant Artificial Objects](#) page. According to Howes, the object's brightness also corresponded to "a size in the right ballpark." In addition, Howes says he had received mail "from a trusted astronomer at the Arizona Sky Survey indicating that JPL teams had also worked on it, and it looked like it was in the right place in 1969."

Apollo 10: Prelude to History

Often forgotten between the dramatic Apollo 8 mission around the Moon and the first crewed Moon landing of Apollo 11, Apollo 10 was still a vital mission. After Apollo 9 tested the lunar module in space for the first time in Earth orbit, Apollo 10 acted as a dress rehearsal for the Moon landing. The astronauts flew the lunar module down to within 14.5 kilometers (9 miles) of the lunar surface. The module was named "Snoopy" after the [Peanuts comics strip character](#), while the corresponding command module was named Charlie Brown.

Snoopy's trajectory was unique among the Apollo missions. Unlike in the five missions that landed on the Moon, the Snoopy lunar module was ultimately jettisoned into an orbit around the Sun.

False Alarms

There have been several false finds over the years in the hunt to recover Snoopy. Around 2015 astronomers were convinced that the small near-Earth asteroid WT1190F was in fact the lost lunar module. [WT1190F struck Earth](#) in the Indian Ocean near Sri Lanka on November 13, 2015, and is now thought to have been the trans-lunar injection stage from the 1998 Lunar Prospector mission.

In 2006 one of the first temporary [mini-moons of the Earth](#) was discovered, 2006 RH120. As the ranks of near-Earth asteroids has grown in the years since, astronomers have realized that small asteroids are occasionally captured by the Earth-Moon system, following complex orbits around the pair before being ejected back out into solar orbit. These objects may be confused with discarded Space Age hardware, which often follows the same path. For example, asteroid [J002E3](#) was spotted back in 2002, but astronomers soon realized that its spectra matched paint used by NASA in the late 1960s. The object turned out to be a third-stage booster from Apollo 12. Another asteroid, 2013 QW1, [turned out to be an upper stage booster](#) from China's Chang'e 2 Moon mission.

Unfortunately, 2018 AV2 is currently 0.374 astronomical units (34.7 million miles) from Earth, making it a faint +29.5 magnitude object. Its next close approach won't come until July 10, 2037, when it will pass 4 million miles from Earth, equivalent to 16 times the Earth-Moon distance.

However, it would theoretically be possible to observe the object now: Howes notes that a Falcon Heavy or Delta IV rocket could traverse the current distance in a year. Another possibility would be to send a small CubeSat along with a future SLS launch, with the purpose of flying by the object to make observations.

Spectral analysis, a radar profile, and other observations would go a long ways towards confirming or rejecting the object's identity. After all, hollow metallic artificial objects react differently to solar heating and radiative pressure (known as the Yarkovsky effect) than solid space rocks.

Certainly, Snoopy is one of the more curious objects man-made objects in solar orbit. Elon Musk's Tesla Roadster, which SpaceX launched into solar orbit via its [inaugural Falcon Heavy flight](#) in 2018, probably wins for "most curious." Howes notes that Musk is a big fan of the Apollo program, so maybe a salvage isn't totally out of the question. The module has suffered from a half-century of continuous ultraviolet radiation exposure, but it should be relatively intact.

"There's clearly a lot from humankind's first foray in to deep space still out there," says Howes, "and whilst the scientific argument to retrieve them is marginal, I think with Snoopy you have a unique, one-off remnant of our greatest technical achievement . . . One I'd love to show close-up images of to [Apollo 10 astronauts] Tom Stafford and the family of Gene Cernan one day."

For now though, it's an interesting idea to consider as we approach the 50th anniversary of the Apollo 11 moon landing, that a part of the precursor mission that made it all possible is still out there, silently orbiting the Sun

Minutes of the May Meeting

Greg Smith called the meeting to order. He introduced the guests.

The first thing on the Agenda for tonight is the election of new officers. President - Ted Gruber, Vice President - Mark Thorson, Treasurer - Steve Powell, Secretary - Becky Kent, and ALCOR - Tom Meek. Carolyn Hail made a motion to accept the slate of officers as stated. The motion was approved.

Upon the completion of election, Ted Gruber took over the meeting. Ted thanked Greg for doing the monthly newsletter. He also mentioned that Membership Dues of \$24 are payable tonight.

Ted introduced our guest speaker, Greg Cermac. Greg spoke on Big History and Factfulness. You can take a quiz at factfulness.com.

A proposed Viewing Schedule was talked about.

Ted gave the Sky Report. Mars is still visible in the evening sky. It is magnitude 1.7 in the northwestern sky as darkness falls until it sets around 11 pm. About the same time that Mars sets, Jupiter rises. It is at magnitude -2.6 and rises in the southeast and remains visible overnight. About 2 hours after Jupiter rises, Saturn rises at a magnitude 0.4. Venus rises in the east-northeast between 5 - 5:30 am. The Messier of the Month is M3. It is a magnitude 6.2 globular cluster in the constellation Canes Venatici. It contains about 500,000 stars and is about 33,900 light years away.. It appears as a fuzzy patch through binoculars, smaller telescopes will reveal the cluster's core, a 6" scope will resolve some out stars, while and 8" or larger scope will resolve stars throughout the cluster except within the core.

The June meeting will take place on Friday, June 21st with a potluck dinner. Mark Thorson has a sign up available. The July and August meetings will be the the Canterbury Park.

We have a telescope library that is available to use.

We had a Star Party at Cascade Middle School on May 3rd. We had 5 scopes there. There was a great turn out from the middle schoolers.

Greg talked about Earth Day. We had a good number of people. We ran out of handouts.

We have a few upcoming events. 1st the Sidewalk Astronomy scheduled this weekend has been cancelled due to weather. If it clears up Ted will send out an email. 2nd, Rose City Astronomers is having an Astronomy Day at OMSI in the Auditorium on Monday May 20th from 7-9 pm. 3rd, there is a club Star Party at Mike Fiest's home on May 31st. 4th, another Star Party at Mike's house.

Our club will be helping with the Summer Reading Program in conjunction with the Apollo Mission.

Mt. St. Helen's Institute Star Party will be August 23rd - 24th. More information to come.

Meeting adjourned.

☞ **June 2019 Meeting** ☞

DATE: Friday June 21, 2019

TIME 5:00 pm

**PLACE: Willow Grove Park
Picnic Shelter**

PROGRAM: Summer Solstice Picnic

SNACKS: Pot Luck.

DRINKS: Bring what you like. Bring your own utensils and plates and etc.

2019 FoG Activities and Viewing Schedule

JUN MOON: NEW=3, FULL=17

14>15 Club Star Party (Mike's)

21 Friday - Solstice Picnic/Sun+Star Party (Willow Grove)

JUL MOON: NEW=2, FULL=16, NEW=31

4 Independence Day

5 Club Star Party (Mike's)

or RCA Star Party (Stub Stewart)

12>13 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

16+17 Moon Class (Kelso and Longview Libraries)

17 Club Meeting (Canterbury Park, President's Room)

26>27 Club Star Party (Mike's)

30 Oregon Star Party begins (through August 4)

AUG MOON: FULL=15, NEW=30

2>3 Club Star Party if 7/26+7/27 cancel (Mike's)

9>10 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

21 Club Meeting (Canterbury Park, President's Room)

23-24 Mt. St. Helens Sky & Star Party (Coldwater SLC)

SEP MOON: FULL=14, NEW=28

2 Labor Day

6>7 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

18 Club Meeting (MMHS)

27>28 Club Star Party (Mike's)

OCT MOON: FULL=13, NEW=27

4>11 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

16 Club Meeting (MMHS)

NOV MOON: FULL=12, NEW=26

11 Transit of Mercury (TBA)

20 Club Meeting (MMHS)

28 Thanksgiving Day

DEC MOON: FULL=12, NEW=26

11>18 Annual Christmas Party (Location TBA)

21 Solstice Lantern Walk (Lake Sacajawea)

Friends of Galileo Club Officers

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|----------------------------------|--------------|
| PRESIDENT | Ted Gruber |
| VICE-PRESIDENT/ PROGRAM CHAIR | Mark Thorson |
| SECRETARY | Becky Kent |
| TREASURER | Steve Powell |
| WEBSITE | Ted Gruber |
| NEWSLETTER ED. | Greg Smith |
| ALCOR | Tom Meek |

Next Month's Newsletter Deadline

The deadline for items in next month's newsletter is:

Wednesday: seven days before next meeting.

Please feel free to send in your thoughts and experiences about your astronomical adventure.

Submit your material by E-mail to:

grlyth@msn.com