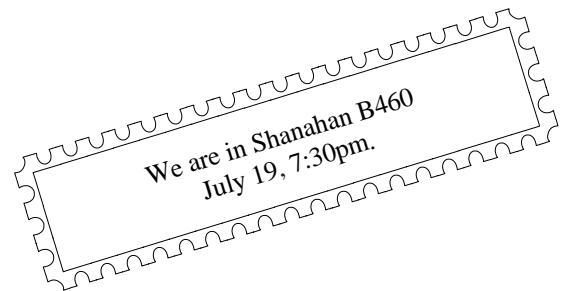




Newsletter of the Pomona Valley Amateur Astronomers

A naked moon stood in a naked sky..  
G. K. Chesterton



Volume 39 Number7

*nightwatch*

July 2019

### Important Message

Our July speaker will be Jason Gallicchio from Harvey Mudd College. Jason was on a team which conducted a test on the Canary Island of La Palma. The experiment, which used light from distant quasars along with some of the world's largest telescopes, confirmed quantum entanglement.

Here is a link to an overview of the test and its results:

<https://www.igoqi-vienna.at/en/detail/news/quantum-entanglement-confirmed-with-light-from-distant-quasars-1/>

Please join fellow members for a talk on this experiment, whose results were published in 2018. As always, the public is welcome to attend this free lecture.

The Club would like to extend it's thanks to Cori Charles, Member since 2012 and Board Member from 2015 – 2019. Her life has taken her east to the dark skies of Arizona so she resigned her position. We appreciate all her time helping to run the Club. She was especially active in public outreach and attended many school and library events to share the solar system and the night sky with others. All the best as she and her telescope settle into a new home – you will be missed, Cori!

We would also like to welcome new Board member Jay Zacks who was elected at the June General Meeting. Thank you for stepping up to play a leadership role in the Club.

*Claire Stover*

### Club Events Calendar

**Jul 19** General Meeting - Jason Gallicchio on Quantum Entanglement

**Jul 27** Star Party – Cow Canyon Saddle

**Aug 3** Nature at Night GS Camp - Nawakwa

**Aug 7** Board Meeting

**Aug 16** General Meeting – Scott and Nathan Little on Cosmic Strings and Webb Scope

**Aug 31** Star Party – TBD

**Sept 4** Board Meeting

**Sept 13** General Meeting

**Sept 19-22** RTMC

**Sept 28** Star Party – TBD

**Oct 2** Board Meeting

**Oct 11** General Meeting

**Oct 26** Star Party – TBD

**Nov 6** Board Meeting

**Nov 15** General Meeting Apollo 12

**Nov 23** Star Party – TBD

## General Meeting 06/14/19

Mathew Wedel opened the meeting, which was held at our old meeting site of Beckman Hall on the Claremont campus. Elections were held. No surprises as everyone was re-elected. Cori Charles has moved out of state, and Jay Zacks was elected to take her board seat.

Jay gave a Power Point presentation he found on-line. It had what the author deemed the best 10 Hubble photos, and a few other thoughts. The author wanted to remind everyone just how small and insignificant we are compared to the awesome size of the universe. It also had pictures taken by the Cassini spacecraft. It showed how small Earth was from that distance. The presentation also included an artist's rendition of the Milky Way galaxy, and our position in it. A video to see why we believe this to be accurate contains Dr. Becky's explanation:

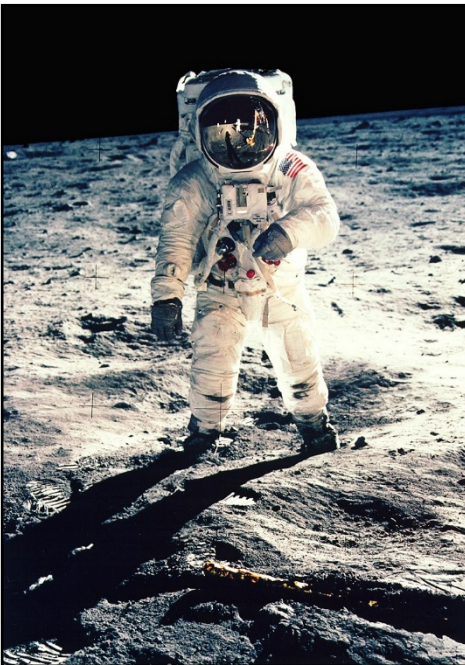
<https://www.youtube.com/watch?v=yq0zyA6Yr7o>

The main presenter was Ken Elchert and his presentation was on Apollo 11. Not everyone present was alive when this happened, and a few were too young to remember. When President Kennedy announced the challenge of landing a man on the moon and returning him safely to the earth, the United States had only 1 manned sub-orbital flight into space. The whole flight from liftoff to splashdown lasted 15 minutes and 28 seconds. That is how much manned spaceflight experience the United States had when the president made that challenge. The Redstone rocket used for the sub-orbital flight only had 78,000 pounds of thrust, and could not put the Mercury capsule in orbit. NASA and the Air Force were working on the new Atlas rocket to do that.

Finally in 1969 Apollo 11 was designated to be the first manned landing on the moon. The USSR was not taking this laying down, and 3 days before Apollo 11 launched, they launched Luna 15 to the moon. Luna 15's mission was to land on the moon, get a lunar sample, and return it to earth before Apollo 11, so they could have the 1<sup>st</sup> lunar sample. They had a previous mission to do this – launched on June 14, 1969, but had a 3<sup>rd</sup> stage failure and did not reach orbit. Luna 15 made it to lunar orbit on July 17<sup>th</sup>. Frank Borman, commander of the Apollo 8 mission, called the USSR space agency in an effort to get Luna 15's flight plan. This was to avoid any chance of collision between the Luna and Apollo vehicles, transmission crossovers, etc. The USSR gave Borman all he needed to keep Apollo 11 safe. This was the first instance of Soviet-American space cooperation. Luna 15 attempted to land a few hours before Apollo 11 left the lunar surface. The Soviets lost contact with the vessel when it was 3 kilometers from the surface, and it crashed on the moon.

Several sites on the moon were selected as landing sites. All were near the moon's equator, and were 12 degrees apart. The reason they were 12 degrees apart was the day/night terminator line moved 12 degrees per day. If there was a delay of the launch, then the next site – 12 degrees away - would be the landing site.

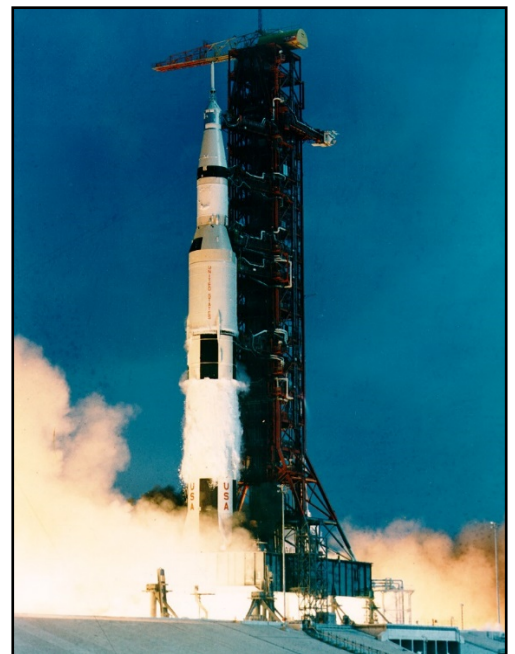
*Gary Thompson*



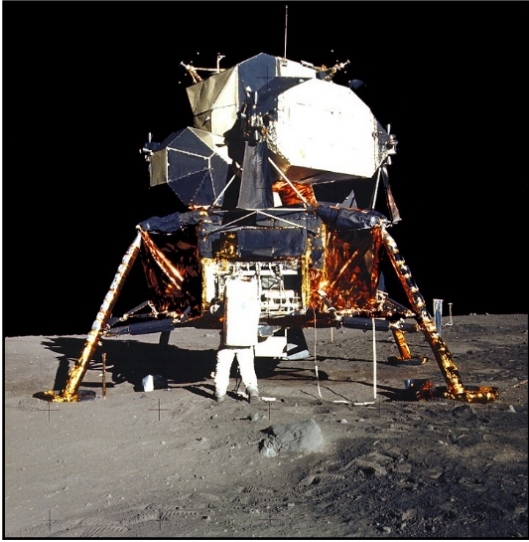
Aldrin on the moon's surface



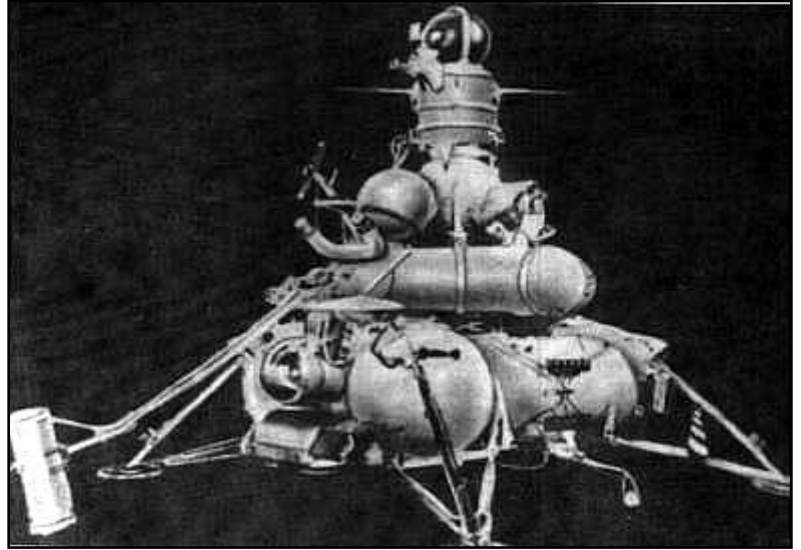
Moon & Earth seen from  
Apollo 11 Command Module



Apollo 11 launch



Aldrin at Lunar Module – Size comparison



Luna 15

**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

**Board**

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
Outreach .....	Jeff Schroeder .....	909-758-1840
Programs .....	Ron Hoekwater .....	909-391-1943



## 2019 Grand Canyon Star Party

For the second time, PVAA members made a small but mighty contribution to the Grand Canyon Star Party, now in its 29<sup>th</sup> year. For a little history, there was a small “event” of sorts 30 years ago that was the inspiration for what was to follow. In 1991 an astronomy loving couple were celebrating their first anniversary at the Canyon. They found a telescope set up to view the Canyon below during the day or the skies above at night soon gathered a crowd. That experience was the inspiration for public events the following years and became what has now morphed into the GSCP which in 2019 saw up to 75 telescopes, thousands of visitors each night and a total of over 70,000 contacts during the full 8 nights of the Star Party. These take place on both North and South rims of the Canyon with the larger one of the South sponsored and organized by the Tucson Amateur Astronomy Association in conjunction with the National Park Service and the Grand Canyon Conservancy.

PVAA was well represented this year by myself along with Ludd and Robin Trozpek. Ron Hoekwater made a valiant effort to join us but was undone by a bent trailer axle. Hopefully he’ll be able to attend next year as I know his 25-inch Obsession as well as his vast knowledge of the night sky was much appreciated last year. Between the three in attendance, around 100 hours were contributed via Ludd’s binoculars and Robin and Claire pounding the pavement to let the public know what the event was all about. Out of the 8 nights, 5 were crystal clear and dark. While one night was pretty well clouded out and the other 2 had some degree of cloud cover, a lot of observing was conducted anyway by diligent cloud hold hoppers, including our friend Mike Magras who along with his 14-inch Celestron Edge could be counted on to entertain the public with his excellent dark sky educational talks even when views through his scope were fleeting.

Ludd made what I suspect will be an even more long-lasting contribution this year, compiling a 4-page GCSP frequently asked questions guide, over 1000 of which were distributed over the course of the week. It contained sunrise, sunset, Jupiter moon, Red Spot, and transit timings and positions for the week along with July star charts. In addition, there was data on many of the clusters, galaxies, stars, and nebulas we would see during the week as well as general definitions of meteors, light years, and the structure of the universe. It was an excellent resource and much of the information remains a reference long after the Star Party ended. By the end of the week it was widely enough distributed that we were starting to get unsolicited requests for “that sheet someone had on the shuttle bus” from not only the public but from our fellow astronomers. Ludd has already been approached by the Tucson group’s board about using the document for future GCSP events. Well done, Ludd!

One of the things I found most interesting about a public event at this “bucket list” location was the sheer volume of visitors from around the world we encountered and communicated with each evening. During my casual survey, here are the over 20 origin countries of our visitors: Brazil, Argentina, Russia, Taiwan, Hong Kong, as well as mainland China, France, Belgium, Hungary, Thailand, Australia, Mongolia, India, South Korea, South Africa, England, Singapore, Finland, Germany, Holland, Spain, Japan, Curacao, Sri Lanka, Malaysia, Armenia, Denmark, and The Czech Republic. In general these international visitors spoke English quite well. There were a few challenges but we were always able to find some combination of simple words, our rudimentary other language skills, and hand gestures to communicate. And of course the common language of gasps, oohs, and aahs on viewing Saturn’s rings or the Milky Way for the first time was well understood by all.

In addition to all this fun at night, days were filled with shuttle bus rides to Canyon overlooks, museum visits, naturalist talks, and hikes into the Canyon. There were also many shared meals and chats around camp during the day. An extremely enjoyable event that I hope even more from our Club can attend next year!

*Claire Stover*

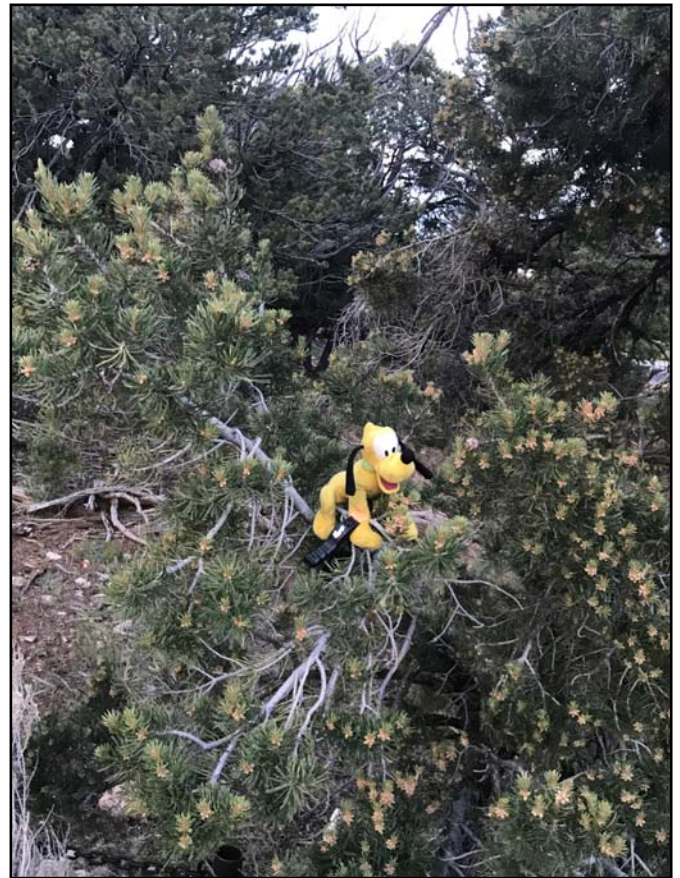


Lacking Ron’s 25” scope, we had to make do with this 40” Dob, which of course had hour long lines most of the time. The eyepiece was reached using an extremely tall orchard ladder! Photo credit Mike Magras





As you may know, Ludd has quite a few pairs of binoculars in his collection. His wife Robin thought this pair in the Bright Angel Lodge, might be a nice addition to his equipment.



Who says we can't show Dwarf Planets to the public even if we're clouded out!



The Park Ranger organizing the Star Party for the Park invited the public to record their feelings about the night sky. The younger members of the event got to learn new tech as they figure out how to dial "STAR" using a rotary phone.



Mike Magras and his 14" Celestron Edge.  
Credit Mike Magras





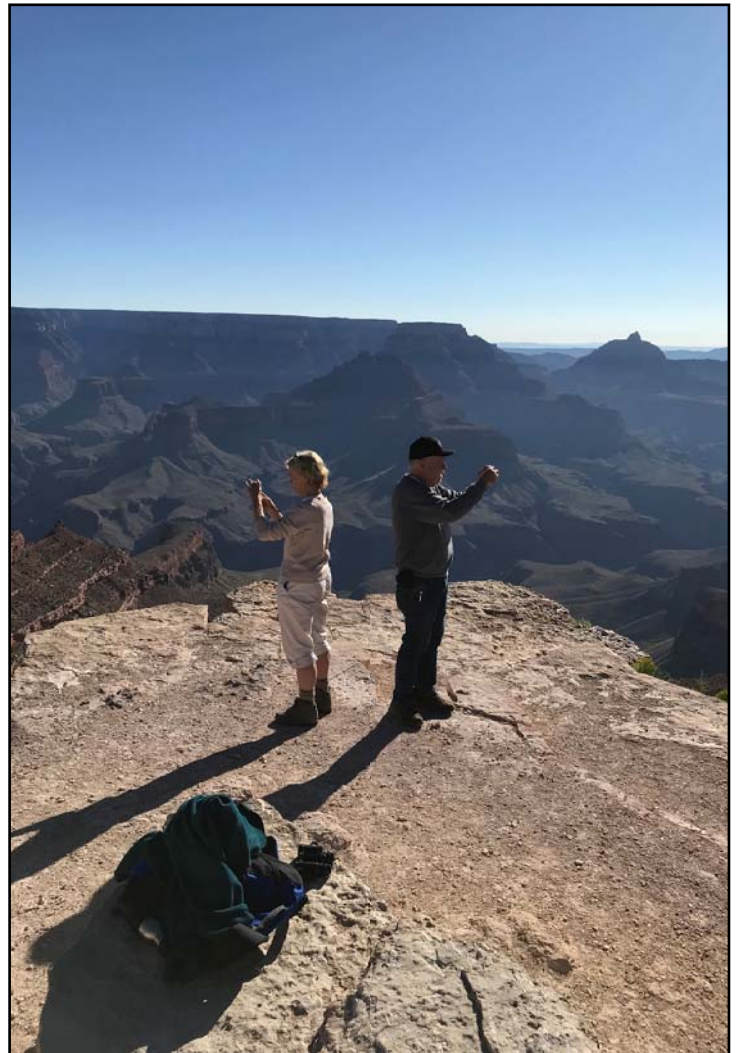
Grand Canyon is declared an International Dark Sky Park



Mike and Wendy Magras, Claire Stover, Robin and Ludd Trozpek. Oh – and the Grand Canyon... Credit Mike Magras



Ludd "assisting" Mike with scope setup. Credit Mike Magras



Photos at 3 Paces – Robin and Ludd Trozpek





Sunset over the Telescope Field



View from Bright Angel Trail



View #2 Bright Angel Trail



**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](http://nightsky.jpl.nasa.org) to find local clubs, events, and more!

**Observe the Moon and Beyond: Apollo 11 at 50**

**Saturn** is at opposition this month, beckoning to future explorers with its beautiful rings and varied, mysterious moons. The **Moon** prominently passes Saturn mid-month, just in time for the 50<sup>th</sup> anniversary of **Apollo 11!**

**Saturn** is in opposition on July 9, rising in the east as the Sun sets in the west. It is visible all night, hovering right above the teapot of Sagittarius. Saturn is not nearly as bright as Jupiter, next door in Scorpius, but both giant planets are easily the brightest objects in their constellations, making them easy to identify. A full **Moon** scrapes by the ringed planet late in the evening of the 15<sup>th</sup> through the early morning of the 16<sup>th</sup>. Some observers in South America will even see the Moon occult, or pass in front of, Saturn. Observe how fast the Moon moves in relation to Saturn throughout the night by recording their positions every half hour or so via sketches or photos.

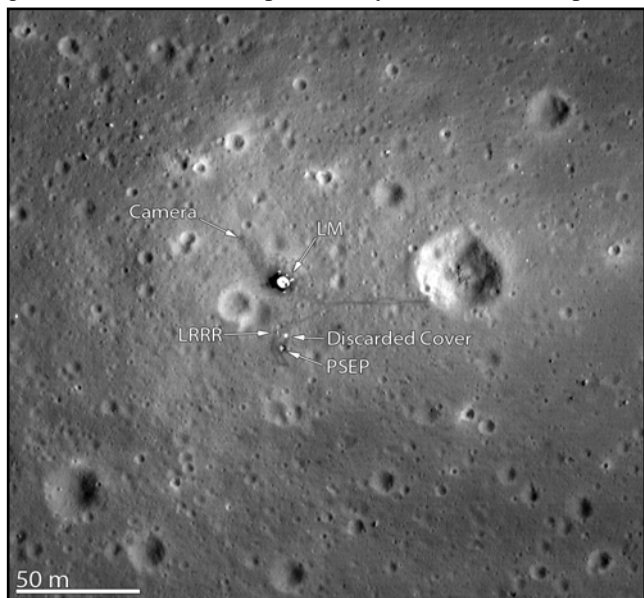
While observing the Saturn-Moon celestial dance the early morning of the 16<sup>th</sup>, you can also contemplate the 50<sup>th</sup> anniversary of the launch of the **Apollo 11** mission! On June 16, 1969, Apollo 11 blasted off from Cape Canaveral in Florida on a journey of almost a quarter million miles to our nearest celestial neighbor, a mission made possible by the tremendous power of

the Saturn V rocket – still the most powerful rocket ever launched. Just a few days later, on July 20, 1969 at 10:56 pm EDT, Neil Armstrong and Buzz Aldrin set foot on the lunar surface and became the first people in history to walk on another world. The astronauts set up equipment including a solar wind sampler, laser ranging retroreflector, and seismometer, and gathered up almost 22 kilograms (48 pounds) of precious lunar rocks and soil samples. After spending less than a day on the Moon’s surface, the duo blasted off and returned to the orbiting Columbia Command Module, piloted by Michael Collins. Just a few days later, on July 24, all three astronauts splashed down safely in the Pacific Ocean. You can follow the timeline of the Apollo 11 mission in greater detail at [bit.ly/TimelineApollo11](http://bit.ly/TimelineApollo11) and dig deep into mission history and science on **NASA’s Apollo History Site**: [bit.ly/ApolloNASA](http://bit.ly/ApolloNASA).

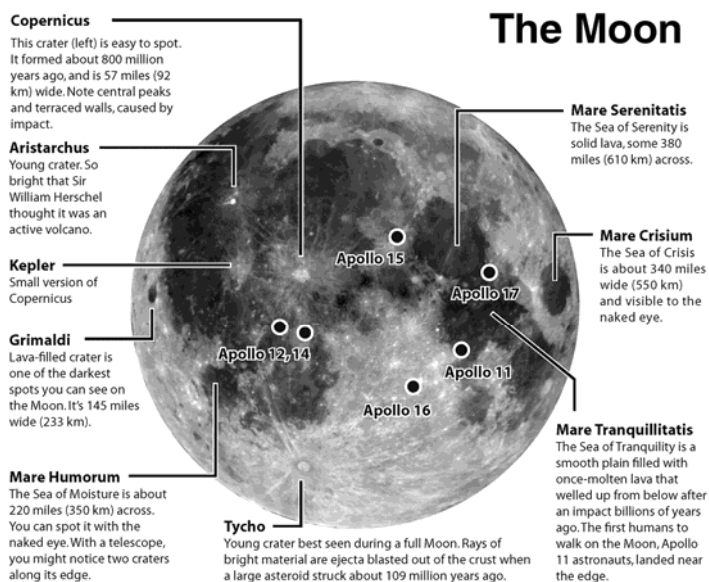
Have you ever wanted to see the flag on the Moon left behind by the Apollo astronauts? While no telescope on Earth is powerful enough to see any items left behind the landing sites, you can discover how much you **can** observe with **the Flag on the Moon** handout: [bit.ly/MoonFlag](http://bit.ly/MoonFlag)

*By David Prosper*

You can catch up on all of NASA’s current and future missions at [nasa.gov](http://nasa.gov)



**Caption:** Earth-based telescopes can’t see any equipment left behind at the Apollo 11 landing site, but the cameras onboard NASA’s Lunar Reconnaissance Orbiter (LRO) can. This is Tranquility Base as seen from the LRO, just 24 kilometers (15 miles) above the Moon’s surface, with helpful labels added by the imaging team. Image Credit: NASA Goddard/Arizona State University. See more landing sites at: [bit.ly/ApolloLRO](http://bit.ly/ApolloLRO)



SOURCES: NASA, ADVANCED SKYWATCHING, CAMBRIDGE ATLAS OF ASTRONOMY, DK VISUAL ENCYCLOPEDIA  
 Photos: James Scala. Layout and text for Moon map used with permission: Robert Roy Britt/SPACE.com.

**Caption:** Observe the larger details on the Moon with help from this map, which also pinpoints the Apollo landing site. Full handout available at [bit.ly/MoonHandout](http://bit.ly/MoonHandout)