



AU AstroNews

The Newsletter of the Astronomical Unit

February 2021

Sponsored by the Santa Barbara Museum of Natural History



Tim Crawford caught this wonderful image from his front porch after our late-January rains.

OUTREACH SUMMARY

Because of the ongoing pandemic, there was no public telescope outreach in January. Please stay safe and healthy by wearing masks, washing your hands frequently, and practicing physical distancing. Get vaccinated when you can!

OUTREACH EVENTS

The SBAU radio hour on KZSB 1290 AM <https://radio.securenetsystems.net/v5/index.cfm?stationCallSign=KZSB> at 9 AM on the second and fourth Monday of each month will continue as a phone-in show, thanks to the dedication of Baron Ron Herron. Otherwise, there will be no SBAU meetings, public telescope outreach, or school events.

FEBRUARY SPACE STATION AND STARS

The International Space Station will be making a few visible passes through Santa Barbara's evening skies in early February, if the sky is clear. Its orbit may change from time to time, so to get the latest and most complete predictions, visit Heavens Above <<https://tinyurl.com/y5yt22ch>>

On Monday, February 1, the space station will make a brief appearance for 27 seconds low in the NNW, at 5:16 PM PST, between Cygnus and Draco.

Tuesday's pass will be brighter and longer, starting at 6:29 PM in the N, passing below Ursa Minor's Little Dipper asterism, and ending at 6:32 PM just after crossing the bowl of the Big Dipper asterism in the NE.

The ISS will rise on Wednesday at 7:18 PM in the NW in Cygnus, climbing up into the house shape of Cepheus in the NNW, where it will vanish into our shadow at an altitude of 32 degrees at 7:20 PM.

The station will appear twice on Thursday. It will rise at 6:30 PM in the NNW, near the tail of Cygnus, cruise below Polaris, the North Star, and then through the nose of Ursa Major, and fade out in the E at 6:35 PM in dim Cancer, the Crab. On the next orbit, it will pop up for 7 seconds at 8:07 PM in the W just below the Great Square asterism of Pegasus.

On Friday, February 5, it will start in the WNW at 7:20 PM, and pass through Cygnus, Pegasus, Pisces, and Cetus before fading away in the SSW in dim Eridanus at 7:23 PM.

Saturday's pass should be the best and brightest, rising at 6:32 PM in the NW in Cygnus, visiting Lacerta, Andromeda, and Aries, then past Mars down into Lepus to set in the SE below the hind leg of Canis Major at 6:39 PM.

We won't see the ISS on Sunday, but it will make a lower, dimmer repeat of Saturday's pass on Monday, starting at 6:35 PM in the W, and ending in the S at 6:39 PM.

The ISS will return to our evening sky in mid-March, but in the interim, it will have some bright predawn appearances that you may find at the [Heavens Above link](#).

THE SKY FOR FEBRUARY

February 2 is Groundhog Day, and is a cross-quarter day marking the middle of Winter. Whether Punxsutawney Phil sees his shadow, or not, we still have about six weeks left.

Mars is still hanging around in our night sky, but has become much dimmer and smaller as we race away in our orbit. Still, it will be in the news this month as the spacecraft launched in July get there. The first will be the Hope orbiter of the United Arab Emirates, arriving on February 9. The next day, the Chinese Tianwen-1 ("Heavenly Questions") orbiter and lander will show up. NASA's Perseverance rover follow them on February 18, landing around lunch time for us.

The Winter Circle of stars centered on Betelgeuse is prominent on February evenings. This is the biggest assemblage of bright stars you'll see all year long. The perimeter of circle is marked by Rigel, Aldebaran, Capella, Castor, Pollux, Procyon, and Sirius.

While you're out enjoying the sights in and around Orion, take a telescopic peek at a fun asterism up in his club. Officially, it is called NGC 2169, since it is entry number 2,169 in the New General Catalog of astronomical objects, which dates back to William Herschel's list of observations from the late 1700s. But NGC 2169 has another, unofficial name and number to amateur astronomers. Because of its appearance, it's called the 37 cluster. If your scope gives a correct view, the stars seem to form the numerals 3 and 7. If you have a flipped view, it sort of looks like a shopping cart.

Finally, in the predawn sky on February 25, look for Mercury, Jupiter, and Saturn low in the ESE.

FROM THE PRESIDENT

Jerry Wilson

It is about three weeks until the next NASA Mars rover, Perseverance, attempts its landing in Jezero crater. [February 18](#) will be a nail biter. Success hinges on the 7 minutes of terror from when the lander enters the atmosphere to its safe touchdown. All told, about half of all landing attempts do not survive. The US has the highest success rate of the big three,

Russia, Europe, and the US. This time around there are actually three missions on their way to the red planet: two that will attempt landings, NASA and China, and one from the UAE that will go into orbit.

These are Perseverance, Tianwen-1 and Hope. The Perseverance mission is a combination of science and technology development. The science part builds on previous rover results that have established the presence of water and past oceans, or at least large lakes and rivers. The conclusion from these previous missions is that conditions on Mars were once consistent with the development of life as we know it, and some may still be holding on. Perseverance will look for that life or evidence of past life. We're talking microbial life, not multicellular organisms or molecular indicators of life.

Perseverance is landing in a delta-like formation, likely formed by water as it entered the lake, now known as Jezero crater. This lake would have been about the size of Lake Tahoe. Samples in the form of drilled cores will be examined, then stored in small containers and cached at an easily accessible site on Mars for return to Earth by a future mission. Who knows? Maybe one of Elon's passengers will walk over, pick it up, and FedEx it back to NASA.

Technology development involves a number of developmental instruments that will one day benefit human exploration missions to the Moon and Mars. One called [MOXIE](#) (Mars Oxygen In-Situ Resource Utilization Experiment) will generate oxygen from the Martian atmosphere. Oxygen is useful for breathing and as a fuel component for future visitors. Among the future-looking technologies on this mission that will benefit human exploration is [Terrain-Relative Navigation](#). As part of the spacecraft's landing system, Terrain-Relative Navigation will enable the descending spacecraft to quickly and autonomously comprehend its location over the Martian surface and modify its trajectory.

Two other instruments will help engineers design systems for future human explorers to land and survive on Mars: The [MEDLI2](#) (Mars Entry, Descent, and Landing Instrumentation 2) package is a next-generation version of what flew on the Mars Science Laboratory mission that delivered the Curiosity rover, while the MEDA (Mars Environmental Dynamics Analyzer) instrument suite provides information about weather, climate, and surface ultraviolet radiation and dust.

Perseverance is also giving a ride to the [Ingenuity Mars Helicopter](#), a technology experiment separate from the rover's science mission. Ingenuity is a lightweight mechanism supported by two counter rotating sets of blades moving at very high RPM to achieve flight in the very thin Martian atmosphere. Mars' surface air pressure is about 1% compared to Earth's.

ARTS CORNER

History says, don't hope
On this side of the grave.
But then, once in a lifetime
The longed-for tidal wave
Of justice can rise up,
And hope and history rhyme.
Seamus Heaney

For there is always light,
if only we are brave
enough to see it,
If only we are brave
enough to be it.
"The Hill We Climb"
Amanda Gorman



"Let me know, Dr. Freedman, if you need any help translating the Principia into English." Photo credit: Tom Totton.

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February 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8 TECH TALK KZSB (AM1290) 9-10 AM	9 HOPE	10 TIANWEN-1	11	12	13
14	15	16	17	18 PERSEVERANCE	19	20
21	22 TECH TALK KZSB (AM1290) 9-10 AM	23	24	25 MERCURY, JUPITER, SATURN	26	27
28						