# IAAS Monthly Astronomy Newsletter February 2022

The International Association for Astronomical Studies provides this newsletter as a service for interested persons worldwide.

This newsletter is published on the World Wide Web at The Home of KIØAR - and is received nationally and internationally. Download the PDF formatted version of the newsletter.

An Open Invitation - For amateur radio operators and scanner enthusiasts, when in the Denver metro area, please join the Colorado Astronomy Net on the Rocky Mountain Radio League's WØWYX **146.94 MHz** and **449.825 MHz** repeaters. Due to hardware issues, links with the Allstar node, Echolink and the Cripple Creek repeater are down until further notice. The net meets on Tuesday nights at 7 P.M. Mountain Time (US).

Obtain your Amateur Radio (Ham) License or your General Radio Operator's License (GROL)! Visit the South Metro VE Team website for more information. The South Metro VE Team provides test sessions on the 1st Saturday of each month at our new Eagle Street Facility, The City of Centennial, 7272 South Eagle Street, Centennial, Colorado 80112-4244 at 9 a.m.

** Check the website for current info during these COVID-19 times. **

The Colorado Astronomy Net and the IAAS are on Facebook page. Be sure to "Like" us.

Excerpts from JPL mission updates are provided as a public service as part of the JPL Solar System Ambassador / NASA Outreach program.

**Donate to the IAAS!**

Shop Smile.Amazon.com, sign up or sign in to smile.amazon.com and select the **International Association for Astronomical Studies**. 0.5% of every purchase will be donated to the group. Thank you!


*"Five planets (and the Moon) stretch across the sky on an early morning in February 2016. This month, the starting lineup might be different, but the players are the same." Astronomy Magazine, February 2022, P. 32.*
*John Chumack*

# In This Newsletter...

# The Month At-A-Glance

The current month's calendar displaying the daily astronomical events.

## The Moon

### Phases:

- New Moon occurs on the 1st.
- First Quarter Moon occurs  on the 8th.
- Full Moon occurs on the 16th.
- Last Quarter Moon occurs on the 23rd.

- The Moon is at apogee (251,591 miles from Earth) on the 10th.
- The Moon is at perigee (228,533 miles from Earth) on the 26th.

### Moon/Planet Pairs:

- The Moon passes 4° south of Jupiter on the 2nd.
- The Moon passes 4° south of Neptune on the 3rd.
- The Moon passes 1.2° south of Uranus on the 7th.
- The Moon passes 0.03° north of dwarf planet Ceres on the 9th.
- Venus passes 7° north of Mars on the 12th.
- The Moon passes 9° south of Venus on the 27th.
- The Moon passes 4° south of Mars on the 27th.
- The Moon passes 4° south of Mercury on the 28th.
- The Moon passes 4° south of Saturn on the 28th.

*For reference: The Full Moon subtends an angle of ~0.5°.*

# The Planets & Dwarf Planets

Planetary Reports are generated by "TheSkyX" software. These reports provide predicted data for the planets on the first of each month for the current year. The rise and set times for the Sun and the Moon for each day of the month as well as meteor shower radiants are also included in the reports. These reports have been optimized for the Denver, Colorado location, however, the times will be approximate for other locations on Earth.

*(All times are local unless otherwise noted.)*

## Planetary Highlights for February

"Venus achieves its greatest brilliancy, dominating the predawn sky all month with its spectacular glow. Mars and Mercury join the dawn chorus of planets, and late in the month Saturn reappears from behind the Sun. With Jupiter heading for conjunction with our star, there are five major planets spanning less than 50° along the ecliptic by the end of February." Astronomy Magazine, February 2022, P. 32.

## Mercury

Rises at 5:57 a.m. on the 1st and about 5:39 a.m. by month's end. Mercury is stationary on the 3rd. Mercury is at greatest western elongation (26°) on the 16th. Look for Mercury to the east about 30 minutes before sunrise. Mercury moves from the constellation of Sagittarius into Capricornus shining at magnitude 0.1 on the 15th.

Venus shares the morning sky with Mercury and Mars on Feb. 12, when it reaches greatest brilliancy.

## Venus

Rises at 4:52 a.m. on the 1st and about 4:06 a.m. by month's end. Venus is at greatest brilliancy (magnitude -4.9) on the 12th. Look for Venus low to the east before sunrise. Venus is in the constellation of Sagittarius shining at magnitude -4.9 on the 15th.

## Earth

N/A.

## Mars

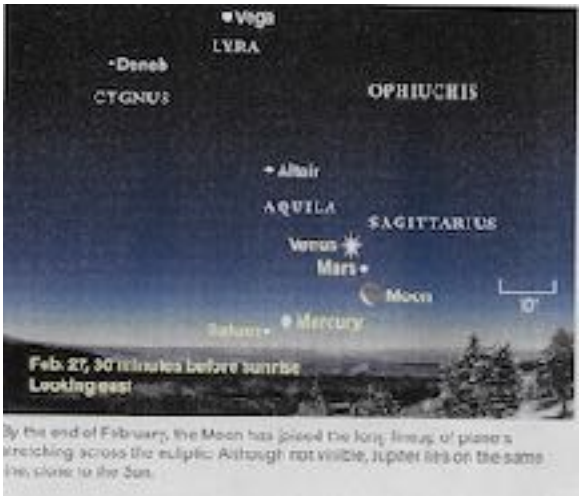
Rises at 5:01 a.m. on the 1st and about 4:31 a.m. by month's end. Look for Mars low to the southeast before sunrise. Mars is in the constellation of Sagittarius shining at magnitude 1.3 on the 15th.

### Jupiter

Sets at 7:19 p.m. on the 1st and about 6:46 p.m. by month's end. Look for Jupiter in the west-southwest, soon after sunset. Jupiter is in the constellation of Aquarius shining at magnitude -2.1.

## Saturn

Sets at 5:29 p.m. on the 1st. Saturn is in conjunction with the Sun on the 4th. After conjunction, Saturn returns to the morning sky, but will not be visible until the end of the month. Look for Saturn low to the east before sunrise. Saturn rises abut 5:41 a.m. by month's end. Saturn is in the constellation of Capricornus shining at magnitude 0.7.




## Uranus

Sets at 12:42 a.m. on the 1st and around 10:51 p.m. by month's end. By the time the Sun sets, Uranus I can be found in the southwest. Uranus is in the constellation of Aries shining at magnitude 5.8.

## Neptune

Sets at 8:29 p.m. on the 1st and about 6:44 p.m. by month's end. Look to the west-southwest once the skies darken after sunset. Neptune is in the constellation of Aquarius shining at magnitude 7.8.

## Dwarf Planets

### Ceres

Sets at 2:13 a.m. on the 1st and about 12:53 a.m. by month's end. Look for Ceres in the evening towards the southwest in the early to mid-evening. Ceres is in the constellation of Taurus shining at magnitude 8.5.


### Pluto

Rises at 6:26 a.m. on the 1st and about 4:39 a.m. by month's end. Pluto is lost in the morning twilight until about mid-month. Pluto is in the constellation of Sagittarius shining at magnitude 14.8.

As always, good luck at spotting Neptune, Ceres and Pluto, a large telescope and dark skies will be needed.

# Astronomical Events

Pick a time with a moonless sky to go in search of the zodiacal light's elusive glow.

## Meteor Showers

- There are a few minor meteor showers this month but none that produce rates much higher than 2-5 meteors per hour at their peaks. However, there's a possibility that observers may see a fireball or a bolide in the early hours before sunrise associated with the Beta Herculids or Delta Serpentids minor meteor showers.

For more information about Meteor Showers, visit Gary Kronk's Meteor Showers Online web page.

Meteor Shower Radiant Report

Meteor Scatter (or Meteor burst communications) -- "is a radio propagation mode that exploits the ionized trails of meteors during atmospheric entry to establish brief communications paths between radio stations up to 2,250 kilometres (1,400 mi) apart." Tune your shortwave or your HF amateur radio to 54.310 MHz USB CW and see if you can hear any pings. Try other frequencies as well... 6m FT8 digital - 50.313 Mhz & 50.276 Mhz, JP-65 digital mode and the carrier frequencies of the lower VHF bands for TV channels 2, 3 & 4.

Meteor Rx How-To by Terry Bullett (WØASP).

## Comets

- Comet 19P/Borrelly is in the constellation of Pisces fairly high in the evening sky for the first couple of days in February. The Moon interferes with this 9th-10th magnitude object until after the 18th. Then, Comet Borrelly can be found in Aries. An 8-inch scope with relatively high magnification (150x) may be needed to see the coma and fan shaped tail.


Comet Borrelly tracks from Pisces into Aries as February progresses, passing the 9th-magnitude face-on spiral galaxy M74 along the way. The position of Uranus is shown on Feb. 15.

For information, orbital elements and ephemerides on observable comets visit the Observable Comets page from the Harvard-Smithsonian Center for Astrophysics.

For more information about Comets, check out Gary Kronk's 6-volume series of books on Cometography.

## Eclipses

- No solar eclipse activity this month.

- No lunar eclipse activity this month.

## Observational Opportunities

*(from evening to morning)*

- Look for Jupiter in the early evening, just after sunset.
- Look for Neptune and Uranus in the evening, following Jupiter.
- Look for Mars Venus, Mercury, and Saturn in the early morning before sunrise.

## Asteroids

(From west to east)

- **Iris** is in the constellation of Gemini.
- **Massalia** is at opposition on the 5th in the constellation of Cancer.

Information about the Minor Planets can be found at the Minor Planet Observer web site.

## Occultations


Information on various occultations can be found at the International Occultation Timing Association's (IOTA) web site.

## Member Meteor Sightings

In this section I will post meteor, fireball, etc sightings that have been published on the American Meteor Society's web site. I want to make this an active section of the web pages and newsletter and would like to publish the links to member sightings. If you have any published sightings, please provide me with the links and I will post them here for all to enjoy.

| Event ID | Date/Time | Location | Observer | Link |
|---|---|---|---|---|
| 3871-2015 | 2015-11-13 01:55 MST | CO | Charles N | 3871a |
| 3587-2015 | 2015-11-22 17:38 MST | CO | Kevin S | 3587aw |
| 3829-2015 | 2015-12-05 18:06 MST | CO | Burness A | 3829a |
| 986-2020 | 2020-02-21 22:20 MST | CO | Lukas S | 986 |
| 3716-2020 | 2020-07-24 23:22 MDT | CO | Lukas S | 3716 |
| 4774-2021 | 2021-08-13 21:57 MDT | UT | Lukas S | 4774 |
| 7044-2021 | 2021-10-28 20:37 MDT | CO | Burness A | 249058 |

# Subscriber Gallery

I have created a web page containing images taken and submitted by subscribers to the email newsletter, check-ins to the Colorado Astronomy Net and readers of the online newsletter and some of my own images. Any one wishing to submit their images to the gallery, please let me know. The images must be taken by the submitter and be astronomy related. Please include a description and your information so that I can give proper credit to your work. I will post the most recent submissions here.

## StarLink Train (G4-3)
## STARLINK-3200 and others

**December 03, 2021**

*Courtesy of Burness Ansell*

*Taken with iPhone X @ 6:43 P.M. MST*

*Traveling from WSW to W passing close to the bright star Altair in Aquila.*

# Planetary/Lunar Exploration Missions

(Excerpts from recent mission updates)

## JPL Latest News

**The Latest from Space**

JPL Latest News

**January 20, 2022**
**NASA Solar Sail Mission to Chase Tiny Asteroid After Artemis I Launch**

Full Article & Images

**"NEA Scout will visit an asteroid estimated to be smaller than a school bus – the smallest asteroid ever to be studied by a spacecraft.**

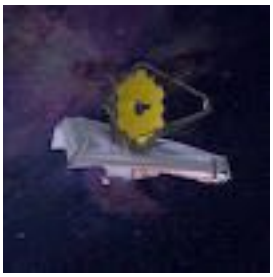
Launching with the Artemis I uncrewed test flight, NASA's shoebox-size Near-Earth Asteroid Scout will chase down what will become the smallest asteroid ever to be visited by a spacecraft. It will get there by unfurling a solar sail to harness solar radiation for propulsion, making this the agency's first deep space mission of its kind.

The target is 2020 GE, a near-Earth asteroid (NEA) that is less than 60 feet (18 meters) in size. Asteroids smaller than 330 feet (100 meters) across have never been explored up close before. The spacecraft will use its science camera to get a closer look, measuring the object's size, shape, rotation, and surface properties while looking for any dust and debris that might surround 2020 GE."

Read the latest news and discoveries from JPL's dozens of active space missions exploring Earth, the solar system and worlds beyond.

Past, Present, Future and Proposed JPL Missions

For special JPL programs and presentations in your area visit the JPL Solar System Ambassador web site.



## James Webb Space Telescope

**January 28, 2022**
**Ames Contributions to NASA's James Webb Space Telescope**

Full Article & Images

"The James Webb Space Telescope is the most complex space science observatory ever built. Its revolutionary science is made

possible by key contributions from NASA's expertise in Silicon Valley, and will allow scientists to explore parts of the universe never seen before.

Webb will peer more than 13.5 billion years back into cosmic history to a time when the first luminous objects were evolving. It's the first observatory capable of exploring the very earliest galaxies, and could transform our understanding of the universe. Webb will also study the atmospheres of planets orbiting other stars, and observe moons, planets, comets, and other objects within our own solar system. This data will reveal the molecules and elements that exist on distant planets, and could unlock clues to the origins of our planet and life as we know it.

NASA's Ames Research Center in California's Silicon Valley made significant contributions to early mission concepts, technology development, and modeling. Ames researchers also will lead and contribute to the mission's science investigations."

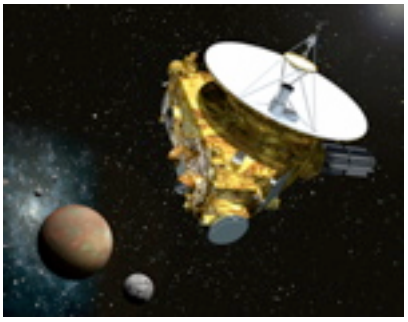
More information on the James Webb Space Telescope mission is available at The James Webb Space Telescope website.
The public can follow the mission on Facebook, Twitter and YouTube.

## Juno
**December 21, 2021**
**JUPITER WITH IO AND CALLISTO**

Full Article & Images

"The main image and the inset image were taken by the JunoCam imager a few hours before its closest approach to Jupiter on its 38th perijove pass, on Nov. 29, 2021, during an encounter with the Jovian moon Io. After snapping a series of Io images, JunoCam acquired this picture of Jupiter and Io together. Much fainter and more distant is Jupiter's moon Callisto, barely visible below and to the right of Io."

Images from NASA's JunoCam.
More information on the Juno mission is available at Juno and Mission Juno.
The public can follow the mission on Facebook and Twitter.



## New Horizons
**December 17, 2021**
**The PI's Perspective: Looking Back, Looking Forward**

Full Article & Images

"New Horizons remains healthy and continues to send valuable data from deep in the Kuiper Belt – more than 5 billion miles away -- even as it speeds farther and farther from the Earth and Sun.

As 2021 winds down, I want to recount what the New Horizons project has accomplished this year, and also look ahead to tell you about our plans for 2022.

During a busy and productive 2021, our science team published or submitted for publication no less than 49 research papers detailing discoveries about our flyby targets in the Pluto system and at the Kuiper Belt object (KBO) Arrokoth, other KBOs and dwarf planets, the outer heliosphere of the Sun, and even cosmology! Meanwhile, our mission operations and engineering teams have planned and executed literally dozens of new scientific observations, tested and uploaded new main-computer software to enhance spacecraft data-collection capabilities, and tested and uploaded software that enables new capabilities for our Solar Wind Around Pluto (SWAP) and Alice spectrometers. We've also sent another year's worth of data and six separate "metaproduct" datasets to NASA's Planetary Data System for use by anyone in the world, researcher or private citizen, and we've continued outreach and communications activities that inform the public about discoveries and other New Horizons news."

**New Horizons gallery**

Find New Horizons in the iTunes App Store.

For more information on the New Horizons mission -- the first mission to the ninth planet -- visit the New Horizons home page.

## TESS

**January 13, 2022**
**Citizen Scientists Spot Jupiter-like Planet in NASA TESS Data**

Full Article & Images

"Tom Jacobs of Bellevue, Washington, loves treasure hunts. Since 2010, the former U.S. naval officer has participated in online volunteer projects that allow anyone who is interested — "citizen scientists" — to look through NASA telescope data for signs of exoplanets, planets beyond our solar system.

Now, Jacobs has helped discover a giant gaseous planet about 379 light-years from Earth, orbiting a star with the same mass as the Sun. The Jupiter-size planet is special for astronomers because its 261-day year is long compared to many known gas giants outside our solar system. The result also suggests the planet is just a bit farther from its star than Venus is from the Sun. The finding was published in the Astronomical Journal and presented at an American Astronomical Society virtual press event on Jan. 13."

For more news and information on the TESS mission, visit the Latest Tess Stories page.

Past, Present, Future and Proposed JPL Missions.

# Mars Missions

## *Be A Martian*

**Mars website mobile version is here!**
**Simply type**
**http://mars.jpl.nasa.gov**
**into your mobile browser.**

## MARS WEATHER
## Mars Daily Weather Report


**Mars on the Go! NASA Be A Martian Mobile App**
**If you want the latest news as it happens, try our Be A Martian app.**
**Download on Mobile Devices**
**Android | iPhone | Windows Phone**

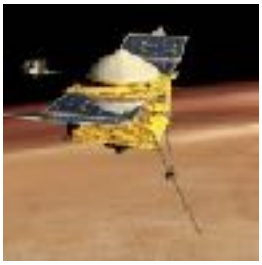
### JMARS

JMARS is an acronym that stands for Java Mission-planning and Analysis for Remote Sensing. It is a geospatial information system (GIS) developed by ASU's Mars Space Flight Facility to provide mission planning and data-analysis tools to NASA's orbiters, instrument team members, students of all ages, and the general public.


**Laboratory for Atmospheric and Space Physics**
"The Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado Boulder (CU) began in 1948, a decade before NASA. We are the world's only research institute to have sent instruments to all eight planets and Pluto.

LASP combines all aspects of space exploration through our expertise in science, engineering, mission operations, and scientific data analysis. As part of CU, LASP also works to educate and train the next generation of space scientists, engineers and mission operators by integrating undergraduate and graduate students into working teams. Our students take their unique experiences with them into government or industry, or remain in academia to continue the cycle of exploration.

LASP is an affiliate of CU-Boulder AeroSpace Ventures, a collaboration among aerospace-related departments, institutes, centers, government labs, and industry partners."



## LASP/MAVEN

**January 28, 2022**
**LASP scientists investigate life in volcanic habitats for clues to habitability on Mars**

Full Article & Images

"A new publication in Frontiers in Astronomy and Space Science led by Justin Wang, a graduate student at the Laboratory for Atmospheric and Space Physics at the University of Colorado Boulder, illustrates how life finds a way in one of the most hostile habitats on Earth, the hydrothermal crater lake of the Poás volcano in Costa Rica. These conditions are similar to those of Mars' early history, giving clues to the possibly habitability of the planet.

The water in the hydrothermal lake is ultra-acidic, full of toxic metals and with temperatures ranging from comfortable to boiling. In addition, recurrent 'phreatic eruptions' cause sudden explosions of steam, ash and rock. Despite such deadly eruptions, hydrothermal environments may be where the earliest forms of life began on Earth—and potentially also on Mars, if there ever was life. Beyond discovering how life can survive these harsh conditions, studying these microbes provides clues about if and how life might have existed on Mars."

Visit LASP and MAVEN for more information.

## Mars 2020 - Perseverance

**January 27, 2022**
**Out of Pebble Purgatory**

Full Article & Images

"The final two pebbles hitching a ride aboard our rover's bit carousel are gone but not forgotten. I'll give you the latest on why they are gone and then tell you why we are not forgetting them – or the two other pebbles that made our first month of 2022 a busy one.

**Confirmation**

We had more than a suspicion the rocks had departed the Perseverance rover on Sunday when imagery of the bit carousel came down after a short 16-foot (5 meter) drive to a nearby rocky outcrop. That drive, which took place on the previous sol, was designed to get us to a small rocky outcrop that would place the rover at an angle that could be beneficial for ejecting the pebbles.

To be thorough (because we Mars missions like to be), we did a full rotation of the bit carousel in both directions, with the rover oriented in a 13.2-degree roll to the left, and we found nothing hindering its progress. We also ran the rover's percussion drill to induce vibration, hoping to shake any possible remaining debris free from the bit holder. Finally, we docked the drill to the bit carousel and dropped off the bit.

With this last step we are happy to announce our sampling system is up and running and ready to go, which is a good thing, since we're going to use it right away. The science team wants another sample from the rock they call "Issole," so we drove the 16 feet (5 meters) back and are now in the process of collecting one. Our Twitter feed @NASAPersevere will update you on that progress."

Learn more about the Mars 2020 (Perseverance) mission.

## Mars Science Laboratory - Curiosity

**January 18, 2022**
**NASA's Curiosity Rover Measures Intriguing Carbon Signature on Mars**

Full Article & Images

"*The type of carbon is associated with biological processes on Earth. Curiosity scientists offer several explanations for the unusual carbon signals.*

After analyzing powdered rock samples collected from the surface of Mars by NASA's Curiosity rover, scientists have announced that several of the samples are rich in a type of carbon that on Earth is associated with biological processes.

While the finding is intriguing, it doesn't necessarily point to ancient life on Mars, as scientists have not yet found conclusive supporting evidence of ancient or current biology there, such as sedimentary rock formations produced by ancient bacteria, or a diversity of complex organic molecules formed by life."

Check out information about NASA's partnership with Foursquare.
Visit the Mars Science Laboratory page.

## Mars Reconnaissance Orbiter Mission

**January 26, 2022**
**NASA's MRO Finds Water Flowed on Mars Longer Than Previously Thought**

Full Article & Images

"*Caltech researchers used the Mars Reconnaissance Orbiter to determine that surface water left salt minerals behind as recently as 2 billion years ago.*

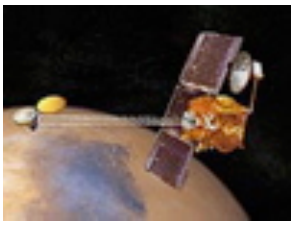
Mars once rippled with rivers and ponds billions of years ago, providing a potential habitat for microbial life. As the planet's atmosphere thinned over time, that water evaporated, leaving the frozen desert world that NASA's Mars Reconnaissance Orbiter (MRO) studies today.

It's commonly believed that Mars' water evaporated about 3 billion years ago. But two scientists studying data that MRO has accumulated at Mars over the last 15 years have found evidence that reduces that timeline significantly: Their research reveals signs of liquid water on the Red Planet as recently as 2 billion to 2.5 billion years ago, meaning water flowed there about a billion years longer than previous estimates.

The findings – published in AGU Advances on Dec. 27, 2021 – center on the chloride salt deposits left behind as icy meltwater flowing across the landscape evaporated."

**MARS RECONNAISSANCE ORBITER HIRISE IMAGES**

View all of the archived HiRISE images.
More information about the MRO mission is available online.



## Mars Odyssey Orbiter

**April 7, 2021**

**NASA's Odyssey Orbiter Marks 20 Historic Years of Mapping Mars**

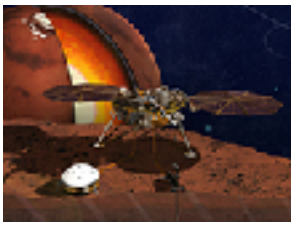
Full Article & Images

"NASA's 2001 Mars Odyssey spacecraft launched 20 years ago on April 7, making it the oldest spacecraft still working at the Red Planet. The orbiter, which takes its name from Arthur C. Clarke's classic sci-fi novel "2001: A Space Odyssey" (Clarke blessed its use before launch), was sent to map the composition of the Martian surface, providing a window to the past so scientists could piece together how the planet evolved."

**DAILY MARS ODYSSEY THEMIS IMAGES**
Thermal Emission Imaging System (THEMIS) web site.

The Odyssey data are available through a new online access system established by the Planetary Data System.

Visit the Mars Odyssey Mission page.



## Mars InSight - Journey to Mars

**InSight - Revealing the Heart of Mars**

**September 22, 2021**

**NASA's InSight Finds Three Big Marsquakes, Thanks to Solar-Panel Dusting**

Full Article & Images

"*The lander cleared enough dust from one solar panel to keep its seismometer on through the summer, allowing scientists to study the three biggest quakes they've seen on Mars.*

On Sept. 18, NASA's InSight lander celebrated its 1,000th Martian day, or sol, by measuring one of the biggest, longest-lasting marsquakes the mission has ever detected. The temblor is estimated to be about a magnitude 4.2 and shook for nearly an hour-and-a-half.

This is the third major quake InSight has detected in a month: On Aug. 25, the mission's seismometer detected two quakes of magnitudes 4.2 and 4.1. For comparison, a magnitude 4.2 quake has five times the energy of the mission's previous record holder, a magnitude 3.7 quake detected in 2019."

Interactive selection of raw images taken by the cameras aboard InSight.

Learn more about the InSight mission.

### Mars Missions Status

New Mars missions are being planned to include several new rover and sample collection missions. Check out the Mars Missions web page and the Mars Exploration page.

## Astronomy Links and Other Space News

(If you have a link you would like to recommend to our readers, please feel free to submit it.)

### Colorado Astronomy Links

### Radio Astronomy Links

### Other Astronomy Links

## Acknowledgments and References

Much of the information in this newsletter is from "Astronomy Magazine" (Kalmbach Publishing), JPL mission status reports, "Meteor Showers - A Descriptive Catalog" by Gary W. Kronk and other astronomical sources that I have stashed on my book shelves.

The author will accept any suggestions, constructive criticisms, and corrections. Please feel free to send me any new links or articles to share as well. I will try to accommodate any reasonable requests. Please feel free to send questions, comments, criticisms, or donations to the email address listed below. Enjoy!

## Subscription Information

- Email Newsletter archives.
- Full documentation of the online administration system.
- The latest version of the newsletter.

## Keep looking UP!

73 from KI0AR
Created by Burness F. Ansell, III
ki0ar@ki0ar.com

COO, Director of Aerospace Technologies, IAAS
JPL Solar System Ambassador, Colorado
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