IAAS Monthly Astronomy Newsletter
August 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. The net meets on Tuesday nights at 7 P.M. Mountain Time (US).

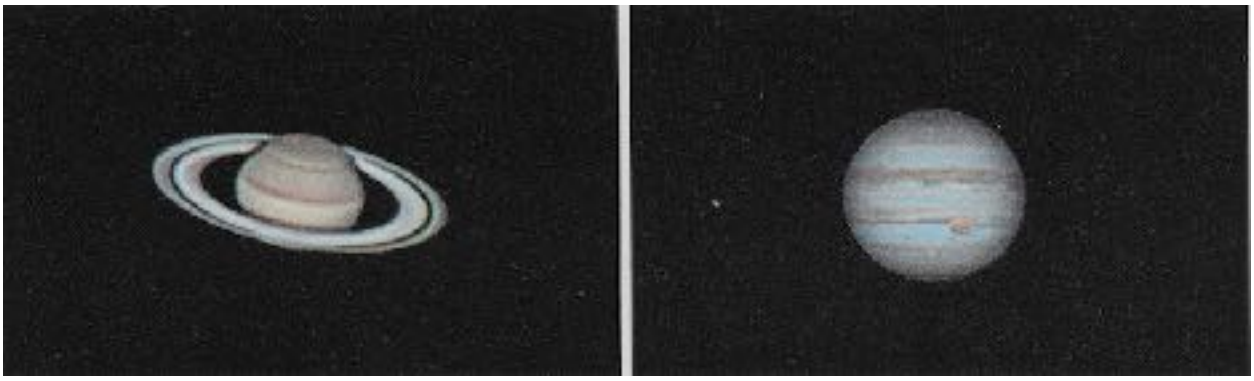
Obtain your Amateur Radio (Ham) License or your General Radio Operator's License (GROL)! Visit the South Metro VE Team website for more information. The South Metro VE Team provides test sessions by appointment only. Check the website for current information.

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

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 for your support!

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

In This Newsletter...



"The solar system's giant planets take center stage on August nights. The time is ripe to look for stunning detail in the rings of Saturn (left) and on Jupiter's disk (right)." Ariel Adorno, Astronomy Magazine, August 2022, p. 32.

The Month At-A-Glance

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

The Moon

Phases:

- First Quarter Moon occurs on the 5th.
- Full Moon occurs on the 11th.
- Last Quarter Moon occurs on the 19th.
- New Moon occurs on the 27th.

- The Moon is at perigee (223,587 miles from Earth) on the 10th.
- The Moon is at apogee (251,915 miles from Earth) on the 22nd.

Moon/Planet Pairs:

- Mars passes 1.4° south of Uranus on the 1st.
- Mercury passes 0.7° north of Regulus on the 4th.
- Venus passes 7° south of Pollux on the 7th.
- The Moon passes 4° south of Saturn on the 11th.
- The Moon passes 3° south of Neptune on the 14th.
- The Moon passes 1.9° south of Jupiter on the 15th.
- The Moon passes 0.6° north of Uranus on the 18th.
- The Moon passes 3° north of Mars on the 19th.
- The Moon passes 0.7° south of dwarf planet Ceres on the 25th.
- The Moon passes 4° north of Venus on the 25th.
- The Moon passes 7° north of Mercury on the 29th.

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 August

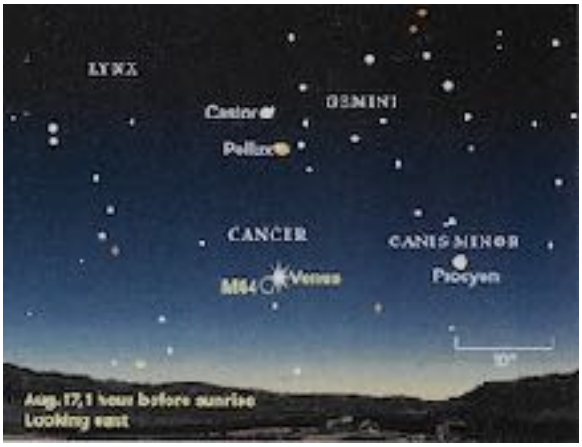
"Midsummer observing means giant planets, with Jupiter and Saturn visible before midnight. Both planets offer hours of amazing views. Saturn is visible all night, while Jupiter rises a bit later. You might catch elusive Mercury in the early evening if you're lucky. And the morning sky carries the glories of a growing Mars and a brilliant Venus." Astronomy Magazine, August 2022, P. 32.

Mercury

Is at greatest eastern elongation (27°) on the 27th. Mercury sets at 9:04 p.m. on the 1st and about 8:18 p.m. by month's end. Look for Mercury low to the west about 30 minutes after sunset. Mercury moves from the constellation of Leo into Virgo shining at magnitude 0.4 on the 31st.

Venus

Rises at 4:12 a.m. on the 1st and about 5:19 a.m. by month's end. Look for Venus to the southeast before sunrise. Venus moves from the constellation of Gemini into Leo shining at magnitude -3.9.

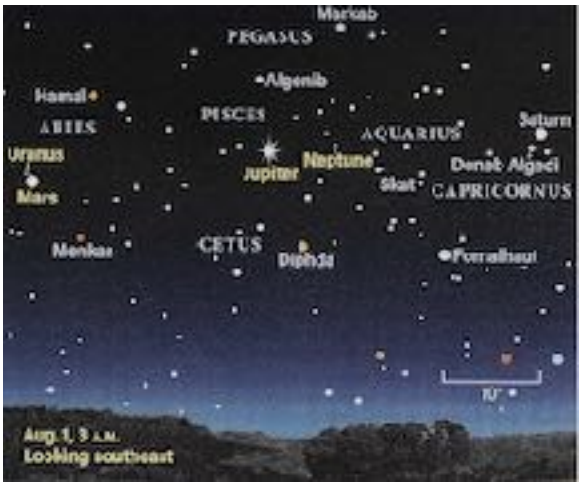


Earth

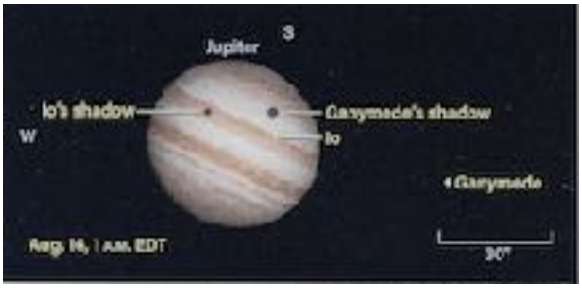
N/A.

Mars

Rises at 12:29 a.m. on the 1st and about 11:22 p.m. by month's end. Look for Mars to the south before sunrise. Mars moves from the constellation of Aries into Taurus shining at magnitude 0.0.



Jupiter
Rises at 10:41 p.m. on the 1st and about 8:35 p.m. by month's end. Jupiter can be spotted to the east in the late evening. Jupiter is in the constellation of Cetus shining at magnitude -2.8.



Saturn
Is at opposition on the 14th, rising as the Sun sets. Saturn rises at 8:48 p.m. on the 1st and about 6:41 p.m. by month's end. Look for Saturn to the east in the evening after sunset, and follow it across the sky as the night progresses. Saturn is at its best viewing for the year this month. Saturn will be visible all night long this month. Saturn is in the constellation of Capricornus shining at magnitude 0.2.

Uranus
Is stationary on the 24th. Uranus rises at 12:24 a.m. on the 1st and about 10:18 p.m. by month's end. Look to the south before sunrise to spot Uranus. Uranus is in the constellation of Aries shining at magnitude 5.8.

Neptune
Rises at 10:08 p.m. on the 1st and about 8:05 p.m. by month's end. Look for Neptune to the east in the evening once the skies darken. Neptune moves from the constellation of Pisces into Aquarius shining at magnitude 7.7.

Dwarf Planets
Ceres
Rises at 5:19 a.m. on the 1st and about 4:28 a.m. by month's end. Look for Ceres low to the east in the early morning before sunrise. Ceres moves from the constellation of Cancer into Leo shining at magnitude 8.6.

Pluto
Pluto rises at 7:33 p.m. on the 1st and about 5:29 p.m. by month's end. Pluto still remains in an optimum position for evening viewing. Pluto is in the constellation of Sagittarius shining at magnitude 14.3.

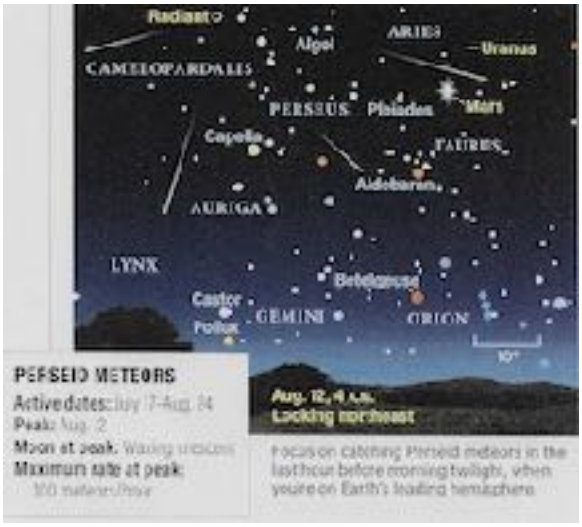
As always, good luck at spotting Neptune, Ceres and Pluto, a large telescope and dark skies will be needed.

Astronomical Events

Meteor Showers

- The Northern Delta Aquarids [meteor shower] extends from July 16 to September 10. Maximum occurs on August 13. The hourly rates reach a high of 10.

- The Perseids meteor shower is generally visible between July 23 and August 22. Maximum occurs during August 12/13. The hourly rate typically reaches 80, although some years have been as low as 4 and as high as 200. The meteors tend to be very fast, possess an average magnitude of 2.3 and leave persistent trains.



Unfortunately, the Full Moon occurs just 1 day before peak, so only the brightest of the meteors will be visible this year. You may have a better chance of seeing some of the Perseids a week prior to and a week after the peak.

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

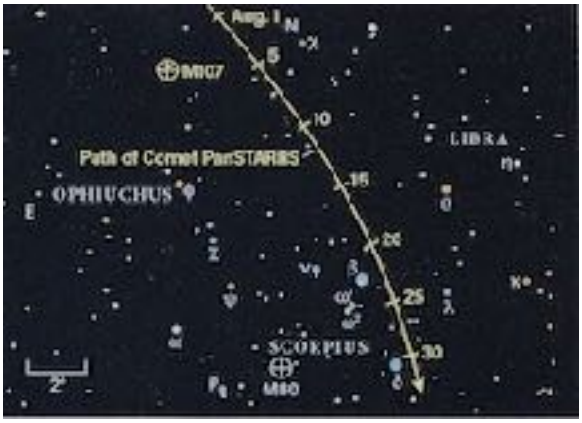
Meteor Shower Radiant Report

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 C/2017 K2 (PanSTARRS) is traveling between the constellations of Ophiuchus and Libra into the constellation of Scorpius this month, shining around 7th magnitude. A 4 inch telescope should be able to pick this comet out under a dark sky. However, the



full Moon will interfere with viewing around mid-month.

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)

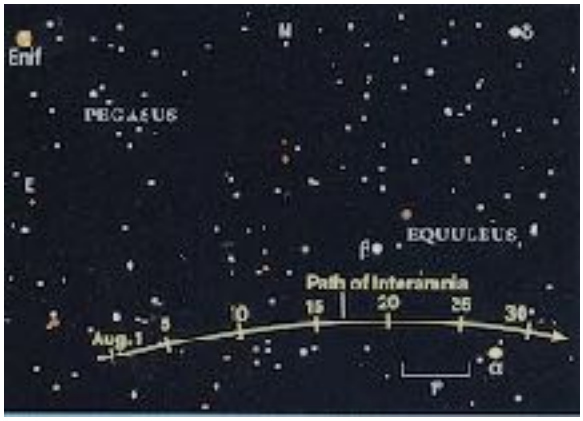
- Look for Mercury, Saturn, Neptune and Jupiter in the late evening.
- Look for Uranus, Mars and Venus and early morning before sunrise.

Asteroids

(From west to east)

- **Vesta** is at opposition on the 22nd in the constellation of Aquarius.
- **Juno** is in the constellation of Pisces.
- **Pallas** is in the constellation of Orion.

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

July 27, 2022
NASA Will Inspire World When It Returns Mars Samples to Earth in 2033

Full Article & Images

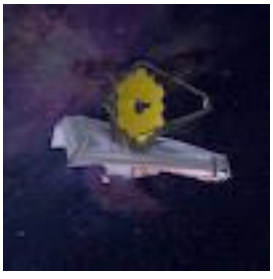
"This advanced mission architecture will include two sample recovery helicopters.

NASA has finished the system requirements review for its Mars Sample Return Program, which is nearing completion of the conceptual design phase. During this phase, the program team evaluated and refined the architecture to return the scientifically selected samples, which are currently in the collection process by NASA's Perseverance rover in the Red Planet's Jezero Crater."

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

July 19, 2022
Stress Tests: Making a Hardy Webb

Full Article & Images

"As the world marvels over the first public images from the James Webb Space Telescope, Webb Deputy Project Manager for Technical Verification Paul Geithner is able to recall another first-of-its-kind moment: when the Webb team thought for a brief — blessedly brief — moment it had actually broken part of the observatory.

A portion of the Webb structure, custom-made of graphite epoxy composite, underwent vibration testing at NASA's Goddard Space Flight Center in late 2016. Connection points in the instrument's deployable components were stressed to see how they would

hold up. All was going well, until it wasn't. There was a loud crack. The sound wasn't pretty.

"People said 'Oh my god, did we just break it?" Geithner remembers. "I mean, it sounded bad. Then the test automatically shut down. That was probably the scariest point."

No harm was done. Tuned mass dampers were added to the telescope's secondary mirror support structure to suppress any resonances that would threaten the structure's survival during launch. Testing then, and in the months and several years to come, continued as the mission team assessed the observatory's hardiness for the extreme conditions it would encounter, both during launch and in its eventual permanent Lagrange Point 2 (L2) "halo" orbit — larger than the size of the Moon's orbit around Earth — gravitationally balanced between Earth and the Sun."

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

July 26, 2022

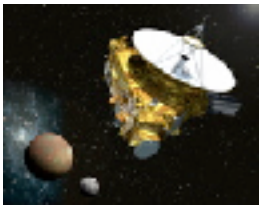
NASA'S JUNO MISSION SPIES VORTICES NEAR JUPITER'S NORTH POLE

Full Article & Images

"As NASA's Juno mission completed its 43rd close flyby of Jupiter on July 5, 2022, its JunoCam instrument captured this striking view of vortices — hurricane-like spiral wind patterns — near the planet's north pole.

These powerful storms can be over 30 miles (50 kilometers) in height and hundreds of miles across. Figuring out how they form is key to understanding Jupiter's atmosphere, as well as the fluid dynamics and cloud chemistry that create the planet's other atmospheric features. Scientists are particularly interested in the vortices' varying shapes, sizes, and colors. For example, cyclones, which spin counter-clockwise in the northern hemisphere and clockwise in the southern, and anti-cyclones, which rotate clockwise in the northern hemisphere and counter-clockwise in the southern hemisphere, exhibit very different colors and shapes."

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
July 5, 2022
Scientists Spot a Possible Source for Charon's Red Cap

Full Article & Images

"Scientists combined data from NASA's New Horizons mission with novel laboratory experiments and exospheric modeling to reveal the likely composition of the red cap on Pluto's moon Charon and how it may have formed. This first-ever description of Charon's dynamic methane atmosphere using new experimental data provides a fascinating glimpse into the origins of this moon's red spot as described in two recent papers."

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
June 15, 2022
Discovery Alert: Two New, Rocky Planets in the Solar Neighborhood

Full Article & Images

"The discovery: NASA's TESS mission has found two rocky worlds orbiting the relatively bright, red dwarf star HD 260655, only 33 light-years away. The new planets, HD 260655 b and HD 260655 c, are among the closest-known rocky planets yet found outside our solar system that astronomers can observe crossing the faces of their stars."

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
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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."

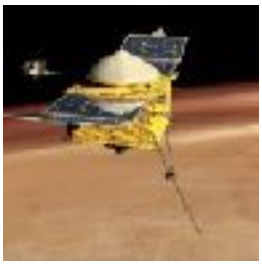
LASP
July 6, 2022

NASA robotic mission to explore the Moon's mysterious Gruithuisen Domes

Full Article & Images

"NASA has selected a new science mission that will land a spacecraft on a part of the Moon that's never before been visited: the Gruithuisen Domes. Scientists, mission operators, and data analysts from the Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado Boulder will play an important role in this mission, which will be led by researchers at the University of Central Florida (UCF).

The domes, located along the western rim of the Imbrium Basin, the largest impact crater on the Moon's near side, remain a mystery to scientists. Flyover data from previous missions indicate the surface in this region is unlike most other volcanic features on the Moon. Rather than the dark, magnesium- and iron-rich volcanic minerals that once crystallized from molten magma in the Moon's mare, or "seas", the Gruithuisen domes instead appear to be composed of lighter-colored, more silica-rich volcanic minerals."



MAVEN
June 1, 2022
NASA's MAVEN Spacecraft Resumes Science & Operations, Exits Safe Mode

Full Article & Images

"NASA's Mars Atmosphere and Volatile EvolutioN, or MAVEN, mission returned to normal science and relay operations on May 28, 2022, after recovering from an extended safe mode event. The spacecraft encountered problems in February with its Inertial Measurement Units (IMUs). The mission team successfully diagnosed the issue with these navigation instruments and developed a system for the spacecraft to navigate by the stars, which should allow for continued MAVEN mission operations through the next decade."

Visit LASP and MAVEN for more information.

Mars 2020 - Perseverance

July 11, 2022
NASA's Perseverance Scouts Mars Sample Return Campaign Landing Sites

Full Article & Images

"*The six-wheeled explorer has inspected a stretch of the Red Planet to see if it is flat enough for NASA's next Mars lander.*

NASA's Perseverance Mars rover is conducting its science campaign, taking samples at Jezero Crater's ancient river delta, but it's also been busy scouting. The rover is looking for locations where the planned Mars Sample Return (MSR) Campaign can land spacecraft and collect sample tubes Perseverance has filled with rock and sediment. The sites being scouted are under consideration because of their proximity to the delta and to one another, as well as for their relatively flat, lander-friendly terrain.

Learn more about the Mars 2020 (Perseverance) mission.

Mars Science Laboratory - Curiosity

June 27, 2022
NASA's Curiosity Takes Inventory of Key Life Ingredient on Mars

Full Article & Images

"*Newly published research quantifies the presence of organic carbon in Martian rocks.*

Scientists using data from NASA's Curiosity rover measured the total organic carbon – a key component in the molecules of life – in Martian rocks for the first time.

"Total organic carbon is one of several measurements [or indices] that help us understand how much material is available as feedstock for prebiotic chemistry and potentially biology," said Jennifer Stern of NASA's Goddard Space Flight Center in Greenbelt, Maryland. "We found at least 200 to 273 parts per million of organic carbon. This is comparable to or even more than the amount found in rocks in very low-life places on Earth, such as parts of the Atacama Desert in South America, and more than has been detected in Mars meteorites."

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

Mars Reconnaissance Orbiter Mission

June 28, 2022
Help NASA Scientists Find Clouds on Mars

Full Article & Images

"*By identifying clouds in data collected by NASA's Mars Reconnaissance Orbiter, the public can increase scientists' understanding of the Red Planet's atmosphere.*

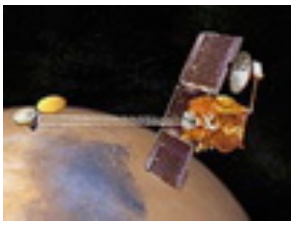
NASA scientists hope to solve a fundamental mystery about Mars' atmosphere, and you can help. They've organized a project called Cloudspotting on Mars that invites the public to identify Martian clouds using the citizen science platform Zooniverse. The information may help researchers figure out why the planet's atmosphere is just 1% as dense as Earth's even though ample evidence suggests the planet used to have a much thicker atmosphere.

The air pressure is so low that liquid water simply vaporizes from the planet's surface into the atmosphere. But billions of years ago, lakes and rivers covered Mars, suggesting the atmosphere must have been thicker then.

How did Mars lose its atmosphere over time? One theory suggests different mechanisms could be lofting water high into the atmosphere, where solar radiation breaks those water molecules down into hydrogen and oxygen (water is made of two hydrogen atoms and one oxygen atom). Hydrogen is light enough that it could then drift off into space."

MARS RECONNAISSANCE ORBITER HIRISE IMAGES

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



Mars Odyssey Orbiter

May 5, 2022
Science at Sunrise: Solving the Mystery of Frost Hiding on Mars

Full Article & Images

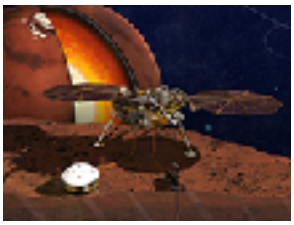
"*A new study using data from NASA's Mars Odyssey orbiter may explain why Martian frost can be invisible to the naked eye and why dust avalanches appear on some slopes.*

Scientists were baffled last year when studying images of the Martian surface taken at dawn by NASA's Mars Odyssey orbiter. When they looked at the surface using visible light – the kind that the human eye perceives – they could see ghostly, blue-white morning frost illuminated by the rising Sun. But using the orbiter's heat-sensitive camera, the frost appeared more widely, including in areas where none was visible."

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
June 21, 2022
NASA's InSight Gets a Few Extra Weeks of Mars Science

Full Article & Images

"The mission's team has chosen to operate its seismometer longer than previously planned, although the lander will run out of power sooner as a result.

As the power available to NASA's InSight Mars lander diminishes by the day, the spacecraft's team has revised the mission's timeline in order to maximize the science they can conduct. The lander was projected to automatically shut down the seismometer – InSight's last operational science instrument – by the end of June in order to conserve energy, surviving on what power its dust-laden solar panels can generate until around December."

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

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- The latest version of the newsletter.

Keep looking UP!

73 from KI0AR
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ki0ar@ki0ar.com

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