IAAS Monthly Astronomy Newsletter August 2019

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 http://www.ki0ar.com/astro.html - The Home of KIØAR - and is received nationally and internationally. A PDF formatted downloadable version of the newsletter is at http://www.ki0ar.com/current_nl.pdf.

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 RMRL **146.94** repeater is also linked with the WBØWDF Cripple Creek **447.400 MHz** repeater and Allstar node **28368**. We are also linked via Echolink - **canoncty** - courtesy of KØJSC and KØGUR. More information on the WBØWDF repeater links, Allstar nodes and Echolinks can be found at k0jsc.com. We are also linked with Allstar nodes in Florida as well, courtesy of KA4EPS. 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 9am.

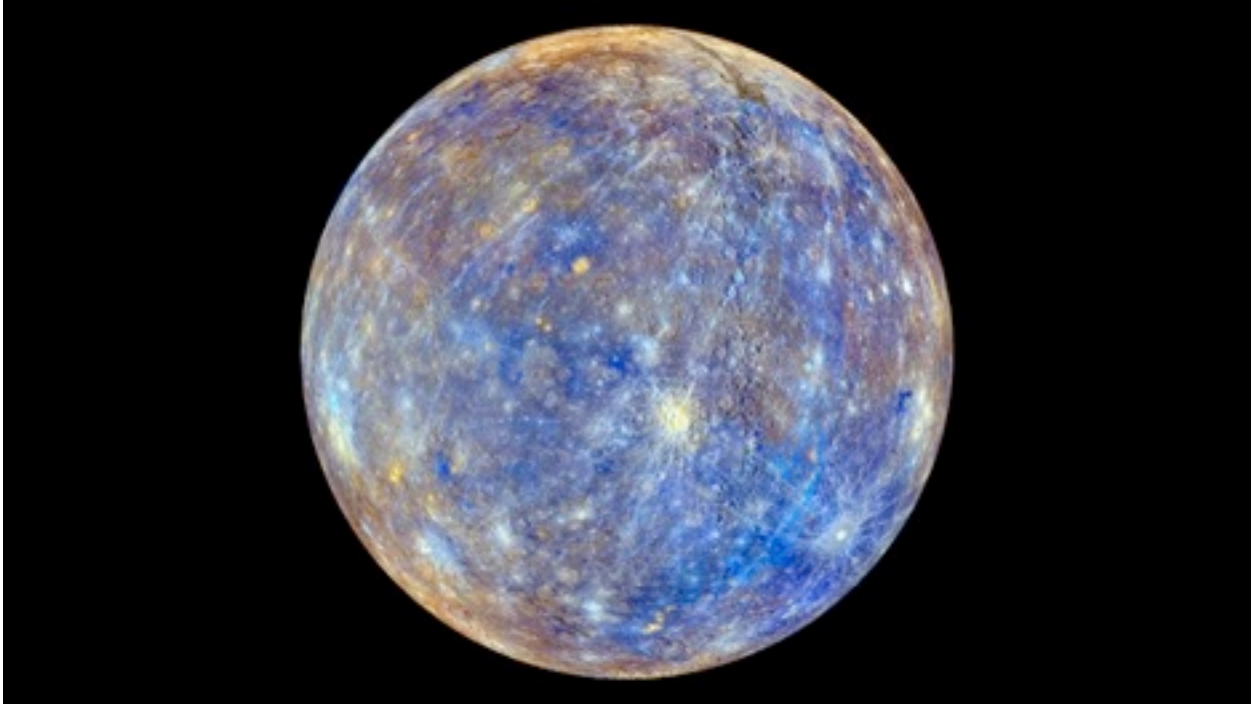
The Colorado Astronomy Net and the IAAS are on Facebook page. Be sure to "Like" us.

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!

In This Newsletter...



"Although earthbound observers never see Mercury as more than a blur, the MESSENGER spacecraft revealed it to be a dynamic, crater-pocked world." Astronomy Magazine, August 2019, p.36.
NASA/JHUAPL/CIW

The Month At-A-Glance

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

The Moon

Phases:

- First Quarter Moon occurs on the 7th.
- Full Moon occurs on the 15th.
- Last Quarter Moon occurs on the 23rd.
- New Moon occurs on the 30th.

- The Moon is at Perigee on the 2nd, 223,320 miles from Earth.
- The Moon is at Apogee on the 17th, 252,429 miles from Earth.
- The Moon is at Perigee on the 30th, 221,939 miles from Earth.

Moon/Planet Pairs:

- Mercury passes 9° south of Pollux on the 5th.
- The Moon passes 2° north of Jupiter on the 9th.
- The Moon passes 0.04° south of Saturn on the 12th.
- The Moon passes 0.1° north of Pluto on the 12th.
- The Moon passes 4° south of Neptune on the 17th.
- The Moon passes 5° south of Uranus on the 21st.

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

The Planets & Dwarf Planets

Planetary Reports are generated by "TheSky" 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

"Jupiter and Saturn dominate August evenings, riding high in the south as darkness falls. The morning sky offers subtler but still noteworthy attractions. Neptune lies close to a 4th-magnitude star, making the distant world easy to find. And Mercury has a fine predawn appearance at midmonth. You can view the inner world after soaking in the annual Perseid meteor shower, which peaks the morning of August 13 under the unwanted light of a nearly Full Moon." Astronomy Magazine, August 2019, p.36.

Mercury

Is at greatest western elongation (19°) on the 9th. Mercury rises at 4:57 a.m. on the 1st and about 6:14 a.m. by months end. Look for Mercury low to the east about 30 minutes before sunrise most of the month. Mercury moves from the constellation of Gemini into Leo this month shining at magnitude -0.7 on the 15th.

Venus

Is in superior conjunction on the 14th. Venus rises at 5:40 a.m. on the 1st. After mid-month, Venus returns to the evening sky setting about 7:49 p.m. by month's end. Venus is lost in the Sun's glow this month. Venus moves from the constellation of Cancer into Leo shining at magnitude -3.9 on the 31st.

Earth

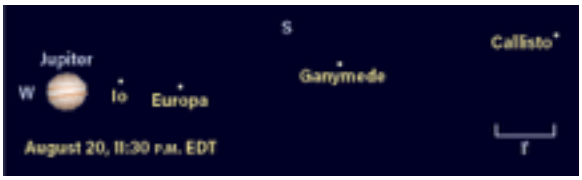
N/A.

Mars

Sets at 8:46 p.m. on the 1st and about 7:35 p.m. by month's end. Mars, as with Venus, is also lost in the sun's glow and is not visible this month. Mars is at aphelion (154.9 million miles from the Sun) on the 25th. Mars is in the constellation of Leo shining at magnitude 1.8.

Jupiter

Is stationary on the 11th. Jupiter sets at 2:00 a.m. on the 1st and about 11:56 p.m. by month's end. Look for Jupiter high in the south soon after the skies darken after sunset. Jupiter is in the constellation of Ophiuchus shining at magnitude -2.3.



Saturn

Rises at 6:42 p.m. on the 1st and about 4:34 p.m. by month's end. By the time the Sun sets, Saturn is high in the south for easy viewing. Saturn is in the constellation of Sagittarius shining at magnitude 0.2.

Uranus

Rises at 11:48 p.m. on the 1st and about 9:45 p.m. by month's end. Look for Uranus to the south in the late evening or after midnight. Uranus is in the constellation of Aries shining at magnitude 5.8.

Neptune

Rises at 9:52 p.m. on the 1st and about 7:49 p.m. by month's end. Look for Neptune to the southeast in late evening and to the south after midnight. Neptune is in the constellation of Aquarius shining at magnitude 7.8.

Dwarf Planets

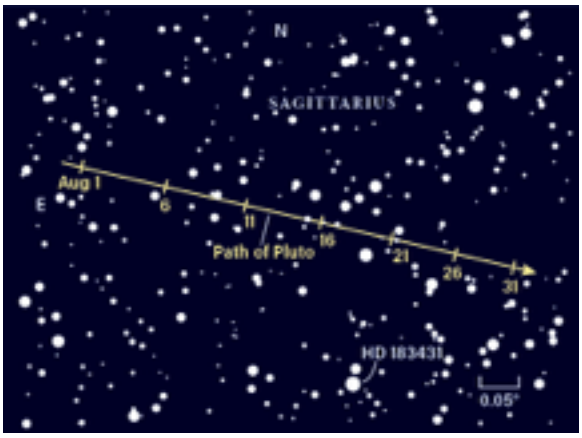
Ceres

Sets at 2:09 a.m. on the 1st and about 11:15 p.m. by month's end. Ceres precedes Jupiter by about an hour or less all month. Ceres moves from the constellation of Libra into Scorpius this month shining at magnitude 8.6.

Pluto

Rises at 7:06 p.m. on the 1st and about 5:02 p.m. by month's end. Pluto still trails Saturn by about 20 to 30 minutes all month long, which may aid in spotting this elusive planet. Pluto is in the constellation of Sagittarius shining at magnitude 14.2.

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 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, this year, the nearly full Moon interferes with all but the brightest of the meteors streaking through the skies.

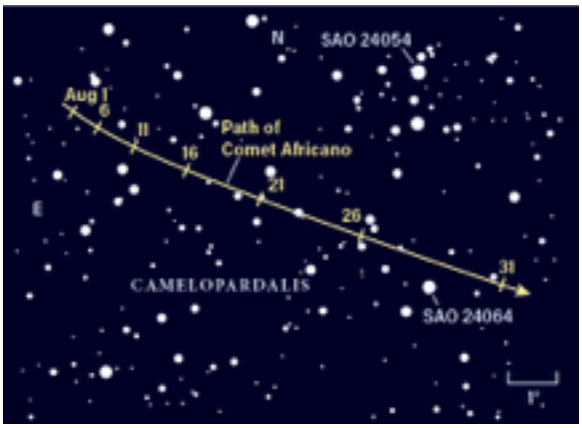
For more information about Meteor Showers, visit Gary Kronk's Meteor Showers Online web page at http://meteorshowersonline.com/.

Meteor Shower Radiant Report

Meteor Scatter (or Meteor burst communications) -- http://en.wikipedia.org/wiki/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.

Comets

- "Starting in September, the solar system will deliver a near-continuous stretch of 9th-magnitude or brighter comets that will last for more than a year. You can glimpse the first of these — Comet Africano (C/2018 W2) — as it brightens to 11th magnitude in August." Astronomy Magazine, August 2019, p.42.



For information, orbital elements and ephemerides on observable comets visit the Observable Comets page from the Harvard-

Smithsonian Center for Astrophysics.
(http://cfa-www.harvard.edu/iau/Ephemerides/Comets/index.html)

For more information about Comets, visit Gary Kronk's Cometography.com web page at http://cometography.com/.

Eclipses

- No solar eclipse activity this month.

- No lunar eclipse activity this month.

Observational Opportunities

(from evening to morning)

- Look for Jupiter and Saturn in the early evening sky soon after sunset.
- Look for Ceres in the evening sky.
- Look for Pluto, Neptune, Uranus in the late evening sky.
- Look for Mercury in the morning sky.

Asteroids

(From west to east)

- **Pallas** is in the constellation of Boötes.
- **Melpomene** is in the constellation of Ophiuchus.
- **Psyche** is at opposition on the 6th in the constellation of Capricornus.
- **Eunomia** is at opposition on the 13th in the constellation of Aquarius.
- **Laetitia** is at opposition on the 16th in the constellation of Aquarius.
- **Hertha** is in the constellation of Aquarius.
- **Amphitrite** is in the constellation of Pisces.
- **Vesta** is in the constellation of Taurus.

Information about the Minor Planets can be found at http://www.minorplanetobserver.com the Minor Planet Observer web site.

Occultations

Information on various occultations can be found at http://lunar-occultations.com/iota/iotandx.htm, the International Occultation Timing Association's (IOTA) web site.

Member Meteor Sightings

This is a new section where 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
3587-2015	2015-11-22 17:38 MST	CO	Kevin S	3587aw
3829-2015	2015-12-05 18:06 MST	CO	Burness A	3829a
3871-2015	2015-11-13 01:55 MST	CO	Charles N	3871a

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.

Lunar Eclipse January 20/21, 2019

A short video clip of images taken by some of our subscribers on the evening of January 20, 2019, during the Super Blood Moon Lunar Eclipse. (Click on the image above to start the video.)

Planetary/Lunar Exploration Missions

(Excerpts from recent mission updates)

JPL Latest News

The Latest from Space

JPL Latest News

July 26, 2019
NASA's Mars 2020 Rover Does Biceps Curls

Full Article & Images

"The robotic arm on NASA's Mars 2020 rover does not have deltoids, triceps or biceps, but it can still curl heavy weights with the best. In this time-lapse video, taken July 19, 2019, in the clean room of the Spacecraft Assembly Facility at the Jet Propulsion Laboratory in Pasadena, California, the rover's 7-foot-long (2.1-meter-long) arm handily maneuvers 88 pounds' (40 kilograms') worth of sensor-laden turret as it moves from a deployed to a stowed configuration."

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 - http://www.jpl.nasa.gov/missions.

For special JPL programs and presentations in your area visit the JPL Solar System Ambassador web site at http://www2.jpl.nasa.gov/ambassador/index.html.

Juno

May 20, 2019
NASA's Juno Finds Changes in Jupiter's Magnetic Field

Full Article & Images

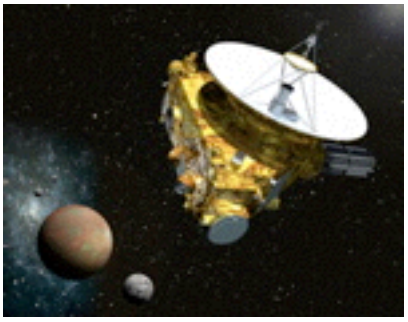
"NASA's Juno mission to Jupiter made the first definitive detection beyond our world of an internal magnetic field that changes over time, a phenomenon called secular variation. Juno determined the gas giant's secular variation is most likely driven by the planet's deep atmospheric winds.

The discovery will help scientists further understand Jupiter's interior structure -- including atmospheric dynamics -- as well as changes in Earth's magnetic field. A paper on the discovery was published today in the journal Nature Astronomy."

NASA's JunoCam website can be visited at: https://www.missionjuno.swri.edu/junocam

More information on the Juno mission is available at: http://www.nasa.gov/juno

The public can follow the mission on Facebook and Twitter at:
http://www.facebook.com/NASAJuno
http://www.twitter.com/NASAJuno



New Horizons

June 26, 2019

The Journey Continued

Exactly Five Years Ago, the New Horizons Team Discovered 2014 MU69 -- and Prepared to Make the Distant Kuiper Belt Object Part of Space Exploration History

Full Article & Images

"It was during a survey of the skies in June 2014 that the New Horizons team, using the powerful Hubble Space Telescope, located several small, ancient Kuiper Belt objects that New Horizons spacecraft could reach with the expected fuel remaining onboard after its planned, first exploration of Pluto the following summer.

One of those objects, spotted in Hubble images on June 26, 2014, by science team member Marc Buie, was given the designation "PT1" -- the first of three "potentially targetable" candidate flyby targets. It was the faintest and smallest of the lot, but it was most reachable within the mission's fuel budget and in the ideal timeline. So in August 2015 -- now with the official designation 2014 MU69 -- it was selected by NASA and the New Horizons mission team to be the farthest object ever explored by spacecraft. Later that year, New Horizons fired its engines to target the intercept of MU69."

New Horizons gallery

For more information on the New Horizons mission -- the first mission to the ninth planet -- visit the New Horizons home page: http://pluto.jhuapl.edu/.

Dawn

April 10, 2019

NASA's Dawn Mission Honored by Space Foundation

Full Article & Images

"The Space Foundation presented NASA's Dawn mission

with the 2019 John L. "Jack" Swigert, Jr., Award for Space Exploration at the opening ceremony of the foundation's 35th Space Symposium on April 8, 2019.

Dawn is managed by NASA's Jet Propulsion Laboratory in Pasadena, California. Project Manager Marc Rayman of JPL and Dave Gallagher, associate director for strategic integration at JPL, accepted the award in front of about a thousand symposium attendees in Colorado Springs, Colorado."

For more information on the Dawn mission, visit the Dawn home page: http://www.nasa.gov/mission_pages/dawn/main/index.html.

TESS

July 25, 2019

NASA's TESS Mission Completes First Year of Survey, Turns to Northern Sky

Full Article & Images

"NASA's Transiting Exoplanet Survey Satellite (TESS) has discovered 21 planets outside our solar system and captured data on other interesting events occurring in the southern sky during its first year of science. TESS has now turned its attention to the Northern Hemisphere to complete the most comprehensive planet-hunting expedition ever undertaken.

TESS began hunting for exoplanets (or worlds orbiting distant stars) in the southern sky in July of 2018, while also collecting data on supernovae, black holes and other phenomena in its line of sight. Along with the planets TESS has discovered, the mission has identified over 850 candidate exoplanets that are waiting for confirmation by ground-based telescopes."

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

Send your name to Mars
onboard the Mars 2020 rover

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

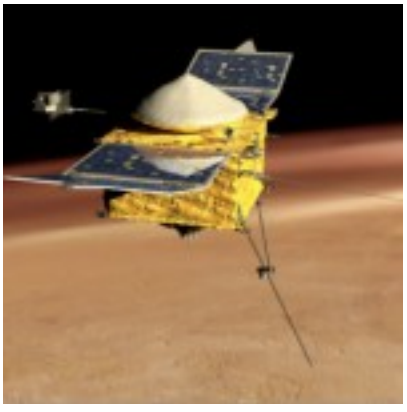
JMARS is an acronym that stands for Java Mission-planning and Analysis for Remote Sensing. It is a geospatial information system (GIS) developed by ASU's Mars Space Flight Facility to provide mission planning and data-analysis tools to NASA's orbiters, instrument team members, students of all ages, and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

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."



MAVEN

April 29, 2019
MAVEN sets its sights beyond Mars

Full Article & Images

"For more than four years, NASA's Mars Atmosphere and Volatile Evolution (MAVEN) mission has explored the mysteries of the Red Planet's upper atmosphere. More recently, the spacecraft has gotten up close and personal with that same expanse of gas."

Visit LASP and MAVEN for more information.

Mars Science Laboratory - Curiosity
July 27, 2019
Sol 2478 - 2480 - Goin' Up

Full Article & Images

"Over the last few weeks Curiosity has collected hundreds of spectacular images, like the one above, that document the layers and textures of rocks exposed in the "Visionarium." (And as we heard in the last blog, we also set a mission record yesterday for having the highest tilt we've ever had while conducting contact science -- over 25 degrees!) With all of this imaging under our belt, we're now hoping to delve deeper into studying the composition of the rocks in the Visionarium, so we are beginning to look for our next potential drill target."

To follow the Mars Curiosity rover and NASA on Foursquare, visit: http://www.foursquare.com/MarsCuriosity and http://www.foursquare.com/NASA

For information about NASA's partnership with Foursquare, visit: http://www.nasa.gov/connect/foursquare.html.

Mars Rover Landing - Free for the Xbox 360 (requires Kinect)

Visit the Mars Science Laboratory page.

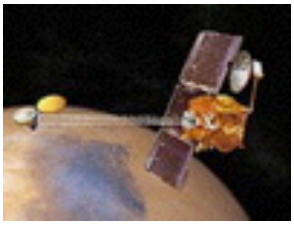
Mars Reconnaissance Orbiter Mission
July 12, 2019
HiRISE Spots Curiosity Rover at Mars' 'Woodland Bay'

Full Article & Images

"A dramatic Martian landscape can be seen in a new image taken from space, showing NASA's Curiosity rover examining a location called "Woodland Bay." It's just one of many stops the rover has made in an area referred to as the "clay-bearing unit" on the side of Mount Sharp, a 3-mile-tall (5-kilometer-tall) mountain inside of Gale Crater."

MARS RECONNAISSANCE ORBITER HIRISE IMAGES

All of the HiRISE images are archived here: http://hirise.lpl.arizona.edu/.
More information about the MRO mission is available online.



Mars Odyssey Orbiter
July 19, 2019
'Storm Chasers' on Mars Searching for Dusty Secrets

Full Article & Images

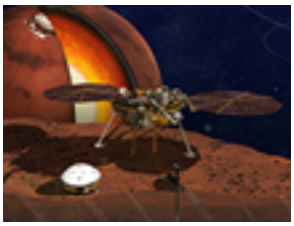
"Storm chasing takes luck and patience on Earth -- and even more so on Mars.

For scientists watching the Red Planet from data gathered by NASA's orbiters, the past month has been a windfall. "Global" dust storms, where a runaway series of storms creates a dust cloud so large it envelops the planet, only appear every six to eight years (that's three to four Mars years). Scientists still don't understand why or how exactly these storms form and evolve."

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 at: http://starbrite.jpl.nasa.gov/pds/

Visit the Mars Odyssey Mission page.



InSight - Journey to Mars
InSight - Revealing the Heart of Mars
July 22, 2019
What Does a Marsquake Look Like?

Full Article & Images

"Southern California got all shook up after a set of recent quakes. But Earth isn't the only place that experiences quakes: Both the Moon and Mars have them as well. NASA sent the first seismometer to the Moon 50 years ago, during the Apollo 11 mission; the agency's InSight lander brought the first seismometer to Mars in late 2018, and it's called the Seismic Experiment for Interior Structure (SEIS)."

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

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JPL Solar System Ambassador, Colorado
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