IAAS Monthly Astronomy Newsletter September 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.

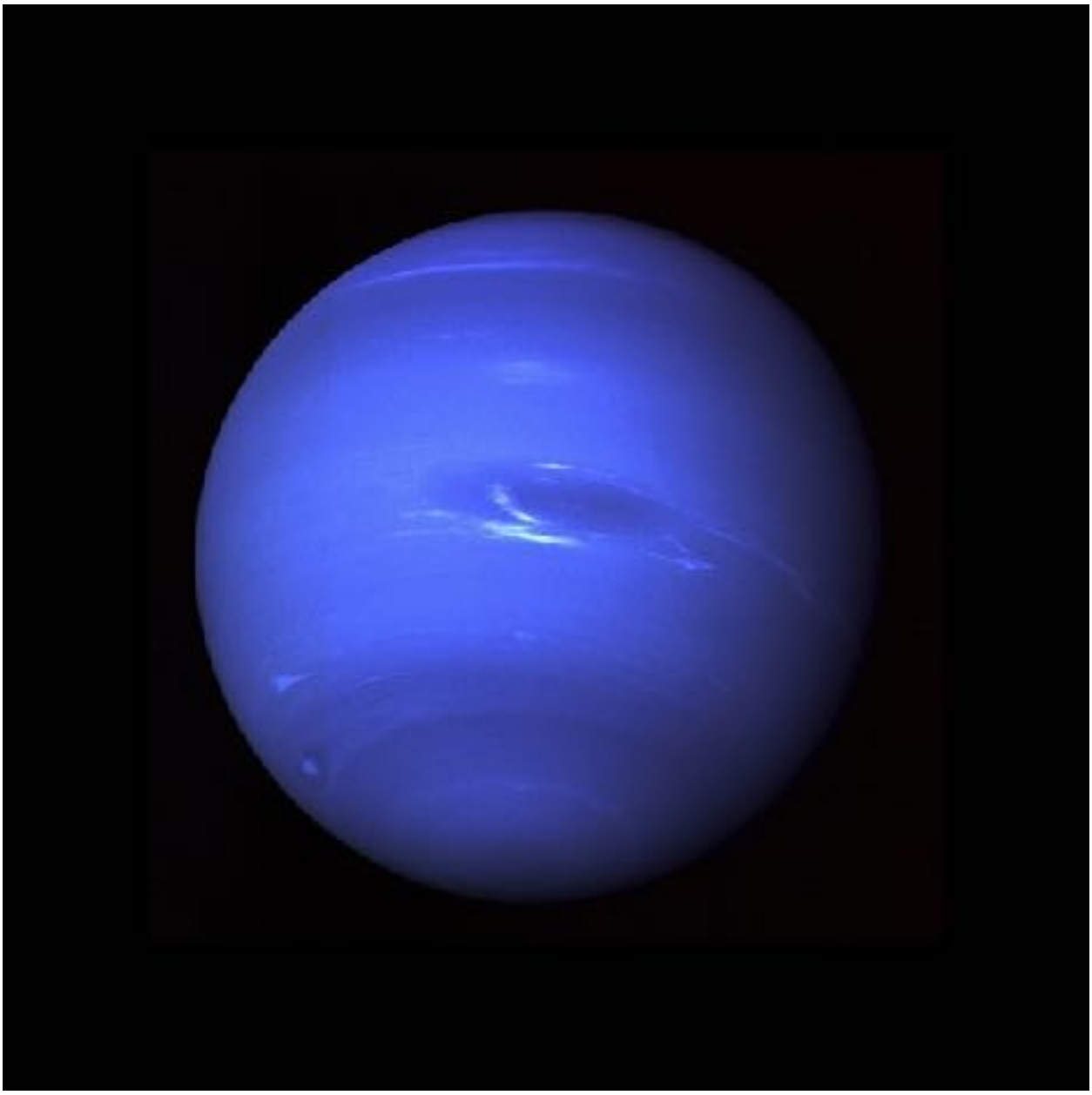
The Colorado Astronomy Net and the IAAS are on Facebook page. Be sure to "Like" us.

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...



"Neptune's distinct color shows up in amateur scopes, though the cloud features that Voyager 2 saw in 1989 are out of reach." Astronomy Magazine, September 2019, p.36.
NASA/JPL

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 14th.
- Last Quarter Moon occurs on the 21st.
- New Moon occurs on the 28th.

- The Moon is at Apogee on the 13th, 252,511 miles from Earth.
- The Moon is at Perigee on the 27th, 222,328 miles from Earth.

Moon/Planet Pairs:

- The Moon passes 2° north of Jupiter on the 6th.
- The Moon passes 0.04° south of Saturn on the 8th.
- The Moon passes 0.08° north of Pluto on the 8h.
- The Moon passes 4° south of Neptune on the 13th.
- The Moon passes 4° south of Uranus on the 17th.
- Mercury passes 1.4° north of Spica on the 28th.
- The Moon passes 6° 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 "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 September

"The giants of the solar system take center stage this month. While Jupiter and Saturn stand out every September evening and deserve the lion's share of your attention, Neptune ranks a close third as it reaches peak visibility. The distant world skims past a relatively bright star, making it easier to find than usual. Uranus lies farther east and makes a worthy morning object. Finally, Mercury and Venus appear in evening twilight at the end of the month." Astronomy Magazine, September 2019, p.36.

Mercury

Is in superior conjunction on the 3rd. Mercury sets at 7:33 p.m. on the 1st and about 7:24 p.m. by months end. Mercury has returned to the evening sky this month along with Venus. Look for Mercury low to the west about 30 minutes after sunset during the last week of September as Mercury is lost in the evening twilight early in the month. Mercury moves from the constellation of Leo into Virgo this month shining at magnitude -0.2 on the 30th.

Venus

Sets at 7:49 p.m. on the 1st and about 7:17 p.m. by month's end. Venus is lost in the Sun's evening twilight glow for most of the month. Look for Venus soon after sunset to the west during the last week of the month. Venus moves from the constellation of Leo into Virgo shining at magnitude -3.9 on the 30th.

Earth

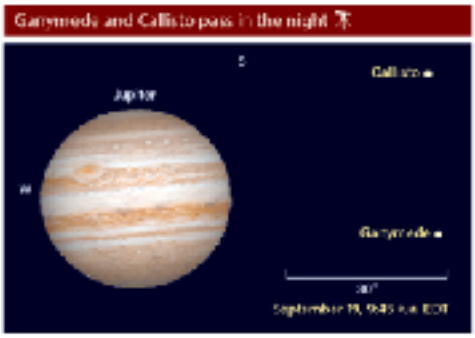
The Autumnal equinox occurs at 3:50 a.m. EDT on the 23rd.

Mars

Is in conjunction with the Sun on the 2nd, returning to the morning sky for the rest of the month, though it will remain lost in the early morning twilight. Mars rises at 6:29 a.m. on the 1st and about 6:07 a.m. by month's end. Mars is too close to the Sun this month to be visible. Mars will return to view in the morning sky in late October. Mars moves from the constellation of Leo into Virgo shining at magnitude 1.8.

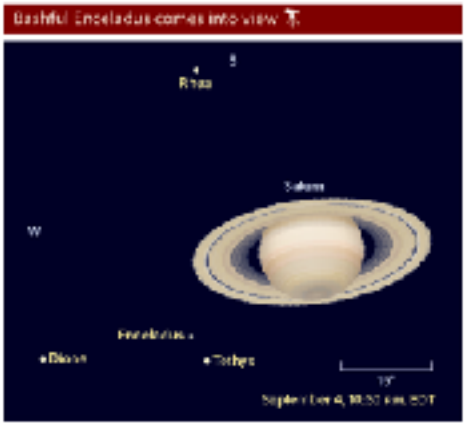
Jupiter

Jupiter sets at 11:56 p.m. on the 1st and about 10:09 p.m. by month's end. Look for Jupiter high in the south-southwest soon after the skies darken after sunset. Jupiter is in the constellation of Ophiuchus shining at magnitude -2.1.



Saturn

Is stationary on the 18th. Saturn sets at 2:04 a.m. on the 1st and about 12:05 a.m. by month's end. By the time the Sun sets, Saturn trails Jupiter and is visible, high in the south soon after sunset. Saturn is in the constellation of Sagittarius shining at magnitude 0.4.



Uranus

Rises at 9:45 p.m. on the 1st and about 7:45 p.m. by month's end. Look for Uranus to the south-southeast in the evening or after midnight. Uranus is in the constellation of Aries shining at magnitude 5.7.

Neptune

Is at opposition on the 10th, rising as the Sun sets. Neptune rises at 7:49 p.m. on the 1st and about 5:49 p.m. by month's end. Neptune is at it's best for the year. Look for Neptune to the southeast in the evening and to the south-southwest after midnight. Neptune is in the constellation of Aquarius shining at magnitude 7.8.

Dwarf Planets

Ceres

Sets at 11:15 p.m. on the 1st and about 9:43 p.m. by month's end. Ceres precedes Jupiter by less than an hour all month. Ceres moves from the constellation of Scorpius into Ophiuchus this month shining at magnitude 9.0.

Pluto

Sets at 2:32 a.m. on the 1st and about 12:33 a.m. by month's end. Pluto still trails Saturn by about 30

minutes all month long, which may aid in spotting this elusive planet. 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 Alpha Aurigids - This shower's duration seems to persist from August 25 to September 6. Maximum occurs on September 1. The annual maximum hourly rate may be as high as 9, but outbursts of over 30 occurred in 1935, 1986, and 1994, and observers recorded up to 130 meteors per hour in 2007.

- The Epsilon Perseids meteor shower is a relatively new meteor shower which can be observed from September 4 to the September 14. The Epsilon Perseids peaks on the night of the September 9, morning of September 10. Observers may expect to see up to 5 or 6 meteors per hour during the peak.

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

- "After a seemingly endless string of months without a decent comet, the tide starts to turn in September. Comet Africano (C/2018 W2) gets us started as it brightens to 9th magnitude this month.

  Africano does need time to flourish, however. Our first taste of the comet comes in early September,

when it glows at 11th magnitude against the backdrop of Perseus. It remains visible all night, climbing nearly overhead shortly before dawn.

The comet grows brighter and more intriguing when it comes closest to Earth at New Moon in September's final week. Our planet passes through the comet's orbital plane on the 24th. To see why this matters, imagine a comet's picture etched into a glass door, and look at it as you walk past the door edge-on. The comet's curved dust tail appears as a thin knife to the north while its southern flank sports a short anti-tail. It seems to poke out the other side simply because we see it from below." Astronomy Magazine, September 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 and Venus in the evening sky during the last week of the month.

Asteroids

(From west to east)

- **Eunomia** is in the constellation of Aquarius.
- **Laetitia** is at opposition on the 16th in the constellation of Capricornus.
- **Hertha** is at opposition on the 6th in the constellation of Aquarius.
- **Lutetia** is at opposition on the 27th in the constellation of Cetus.
- **Amphitrite** is in the constellation of Pisces.
- **Metis** is in the constellation of Cetus.
- **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

August 28, 2019
NASA Invites Students to Name Mars 2020 Rover

Full Article & Images

"Red rover, red rover, send a name for Mars 2020 right over! NASA is recruiting help from students nationwide to find a name for its next Mars rover mission.

Starting Tuesday, Aug. 27, K-12 students in U.S. public, private and home schools can enter the Mars 2020 Name the Rover essay contest. One grand prize winner will name the rover and be invited to see the spacecraft launch in July 2020 from Cape Canaveral Air Force Station in Florida."

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

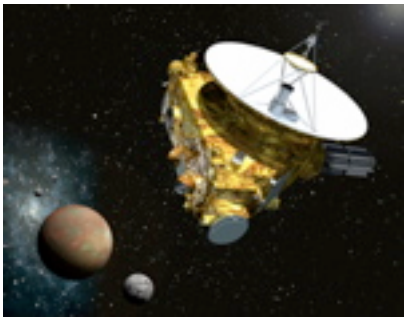
"NASA's Juno mission to Jupiter made the first definitive detection beyond our world of an internal magnetic field that changes over time, a phenomenon called secular variation. Juno determined the gas giant's secular variation is most likely driven by the planet's deep atmospheric winds.

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

August 8 2019
International Astronomical Union Approves Second Set of Pluto Feature Names

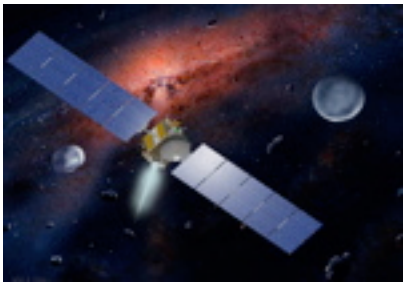
Full Article & Images

"Several people and missions who paved the way for the historic exploration of Pluto and the Kuiper Belt – the farthest worlds ever explored – are honored in the second set of official Pluto feature names approved by the International Astronomical Union (IAU), the international authority for naming celestial bodies and their surface features.

The new names were proposed by NASA's New Horizons team, which carried out the first reconnaissance of Pluto and its moons with the New Horizons spacecraft in 2015. Along with a short list of official names the IAU had already approved, the mission science team had been using these and other place names informally to describe the many regions, mountain ranges, plains, valleys and craters discovered during the first close-up look at Pluto's surface."

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

August 13, 2019
Follow That Planet! How Astronomers Chase New Worlds in TESS Data

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

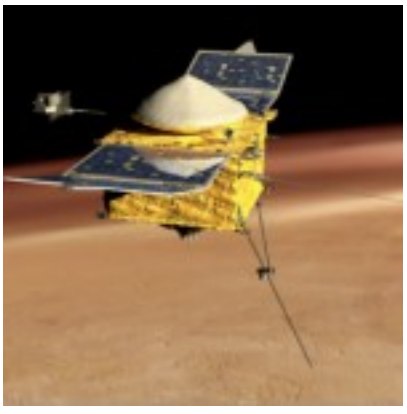
JMARS is an acronym that stands for Java Mission-planning and Analysis for Remote Sensing. It is a geospatial information system (GIS) developed by ASU's Mars Space Flight Facility to provide mission planning and data-analysis tools to NASA's orbiters, instrument team members, students of all ages, and 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
August 23, 2019
Sols 2506-2508: Until we meet again

Full Article & Images

"Today was the final opportunity to actively command Curiosity before the Sun comes between us and Mars. Most of the instruments are safely stored for the solar conjunction break, but intrepid Navcam was available for some last-minute science observations. Navcam will measure the amount of dust in the atmosphere, look for dust devils, and look for clouds in a series of images and movies on Sol 2506. After that, the remote sensing mast will turn its gaze down toward the workspace to guard against dust accumulation on the mast instruments.

While Curiosity will not receive commands from Earth during solar conjunction, she has already been loaded with a series of commands to keep her systematically gathering data for the next two weeks. REMS and RAD will acquire multiple measurements each sol, DAN will acquire one long passive measurement each sol, and Navcam and the front and rear Hazcams will each acquire one image per day. The mast's downward-looking view includes the "Glen Etive" drill hole, allowing Navcam to monitor any changes in the cuttings around the drill hole. DAN will also acquire active measurements twice during solar conjunction to exercise its neutron generator. The data gathered will be stored up for return once we regain reliable communications with Mars."

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.

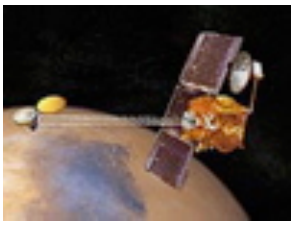
Mars Reconnaissance Orbiter Mission
July 12, 2019
HiRISE Spots Curiosity Rover at Mars' 'Woodland Bay'

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

August 23, 2019
What's Mars Solar Conjunction, and Why Does It Matter?

Full Article & Images

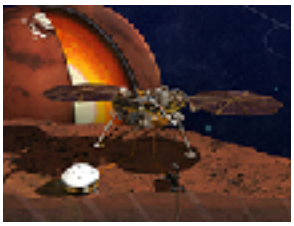
"The daily chatter between antennas here on Earth and those on NASA spacecraft at Mars is about to get much quieter for a few weeks.

That's because Mars and Earth will be on opposite sides of the Sun, a period known as Mars solar conjunction. The Sun expels hot, ionized gas from its corona, which extends far into space. During solar conjunction, this gas can interfere with radio signals when engineers try to communicate with spacecraft at Mars, corrupting commands and resulting in unexpected behavior from our deep space explorers."

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
August 22 2019
NASA-JPL Names 'Rolling Stones Rock' on Mars

Full Article & Images

"For decades, the music of The Rolling Stones has had a global reach here on Earth. Now, the band's influence extends all the way to Mars. The team behind NASA's InSight lander has named a Martian rock after the band: 'Rolling Stones Rock.'

The Rolling Stones — Mick Jagger, Keith Richards, Charlie Watts and Ronnie Wood — were delighted with the news and commented, "What a wonderful way to celebrate the 'Stones No Filter' tour arriving in Pasadena. This is definitely a milestone in our long and eventful history. A huge thank you to everyone at NASA for making it happen."

A little larger than a golf ball, the rock appeared to have rolled about 3 feet (1 meter) on Nov. 26, 2018, propelled by InSight's thrusters as the spacecraft touched down on Mars to study the Red Planet's deep interior. In images taken by InSight the next day, several divots in the orange-red soil can be seen trailing Rolling Stones Rock. It's the farthest NASA has seen a rock roll while landing a spacecraft on another planet."

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
Last modified: September 01, 2019