

# IAAS Monthly Astronomy Newsletter October 2019



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

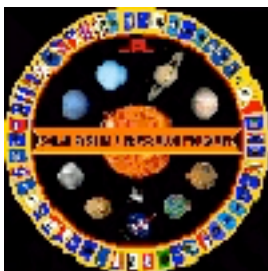


This newsletter is published on the World Wide Web at <http://www.ki0ar.com/astro.html> - The Home of KIØAR - and is received nationally and internationally. A PDF formatted downloadable version of the newsletter is at [http://www.ki0ar.com/current\\_nl.pdf](http://www.ki0ar.com/current_nl.pdf).

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](http://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](http://smile.amazon.com) and select the **International Association for Astronomical Studies**. 0.5% of every purchase will be donated to the group.

Thank you!

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*"Uranus' blue-green color shows up through amateur instruments, but you won't see the clouds and rings the Keck Telescope reveals." Astronomy Magazine, October 2019, p. 36.*

**Lawrence Sromovsky (UW-Madison)/Keck Observatory**

# 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 13th.
- Last Quarter Moon occurs on the 21st.
- New Moon occurs on the 27th.
  
- The Moon is at Apogee on the 10th, 252,214 miles from Earth.
- The Moon is at Perigee on the 27th, 224,508 miles from Earth.

### Moon/Planet Pairs:

- Venus passes  $3^\circ$  north of Spica on the 2nd.
- The Moon passes  $1.9^\circ$  north of Jupiter on the 3rd.
- The Moon passes  $0.3^\circ$  south of Saturn on the 5th.
- The Moon passes  $0.1^\circ$  south of Pluto on the 6th.
- The Moon passes  $4^\circ$  south of Neptune on the 10th.
- The Moon passes  $4^\circ$  south of Uranus on the 14th.
- The Moon passes  $5^\circ$  north of Mars on the 26th.
- The Moon passes  $4^\circ$  north of Venus on the 29th.
- The Moon passes  $7^\circ$  north of Mercury on the 29th.
- Mercury passes  $3^\circ$  north of Venus on the 30th.
- The Moon passes  $1.3^\circ$  north of Jupiter on the 31st.

*For reference: The Full Moon subtends an angle of  $\sim 0.5^\circ$ .*

## 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 October

"Jupiter and Saturn continue their reign during October, shining brightly in the southwestern sky as darkness falls. Mercury and Venus present a bigger challenge - the inner planets hug the horizon after sunset and will be hard to see without optical aid. Uranus takes center stage during the overnight hours. The ice giant world reaches opposition and peak visibility this month, climbing higher in our sky than it has in more than 50 years. And for those of you who have missed Mars these past few months, it returns to view before dawn in late October." Astronomy Magazine, October 2019, p.36.

### Mercury

Is at greatest eastern elongation ( $25^\circ$ ) on the 19th. Mercury is stationary on the 31st. Mercury sets at 7:24 p.m. on the 1st and about 6:38 p.m. by months end. Look for Mercury low to the southwest about 30 minutes after sunset throughout the month. Mercury moves from the constellation of Virgo into Libra this month shining at magnitude -0.1 on the 15th.

### Venus

Sets at 7:17 p.m. on the 1st and about 6:58 p.m. by month's end. Look for Venus soon after sunset to the southwest throughout the month, though it doesn't get much higher than  $2^\circ$  above the horizon making it difficult to spot. Venus moves from the constellation of Virgo into Scorpius shining at magnitude -3.8 on the 31st.

### Earth

N/A.

### Mars

Rises at 6:07 a.m. on the 1st and about 5:45 a.m. by month's end. Mars is visible in the pre-dawn skies during the latter half of the month. Look to the east about an hour before sunrise about  $7^\circ$  above the horizon. Mars is in the constellation of Virgo shining at magnitude 1.8.



For the first time in the past four months, the Red Planet emerges from the predawn twilight in late October.

## Jupiter

Sets at 10:09 p.m. on the 1st and about 8:27 p.m. by month's end. Look for Jupiter low in the south-southwest soon after the skies darken after sunset. Jupiter is in the constellation of Ophiuchus shining at magnitude -2.0.

## Saturn

Sets at 12:05 a.m. on the 1st and about 10:05 p.m. by month's end. Look to the south-southwest soon after sunset to spot Saturn. Saturn is in the constellation of Sagittarius shining at magnitude 0.5.



Saturn's outermost major moon reaches 12th magnitude in early October, when it lies farthest west of the planet and its bright hemispherical face is lit.

## Uranus

Is at opposition on the 28th, rising as the Sun sets. Uranus rises at 7:45 p.m. on the 1st and about 5:39 p.m. by month's end. Follow Uranus across the skies as the night progresses. Uranus is at its viewing best this month. Uranus is in the constellation of Aries shining at magnitude 5.7.



Uranus peaks at opposition the night of October 27/28, when it reaches in a fair yet dimly lit part of Aries, the Ram, an increasingly attractive constellation.

## Neptune

Rises at 5:49 p.m. on the 1st and about 3:45 p.m. by month's end. Track Neptune across the evening skies leading Uranus by about 2 hours all month. Neptune is in the constellation of Aquarius shining at magnitude 7.8.

## Dwarf Planets

### Ceres

Sets at 9:43 p.m. on the 1st and about 8:20 p.m. by month's end. Ceres precedes Jupiter by less than 30 minutes all month. Ceres is in the constellation of Ophiuchus this month shining at magnitude 9.1.

### Pluto

Is stationary on the 2nd. Pluto sets at 12:33 a.m. on the 1st and about 10:27 p.m. by month's end. Pluto still trails Saturn by less than 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 Draconids - This shower is associated with periodic comet Giacobini-Zinner. The duration may extend from October 6 to 10, though the point of maximum is very sharply defined within a 4-hour interval on October 9, but the annual maximum hourly rates are not consistent. The radiant rarely produces any recognizable shower except during years especially close to the parent comet's perihelion passage. The meteors are slow and tend to be relatively faint. They are generally yellow.
- The Orionids - The duration of this meteor shower extends from October 15 to 29, with maximum occurring on (the morning of) October 21. The maximum hourly rate is usually about 20 and the meteors are described as fast.
- The Southern Taurids - This meteor shower is active from September 10 to November 20. Maximum occurs on the morning of October 10. Maximum hourly rate is 5 meteors per hour. The meteors are described as bright and move more slowly than typical meteors, making them prime subjects for imaging and viewing.



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](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

- "Comet Africano (C/2018 W2) peaked around 9th magnitude when it came closest to Earth on September 27, and it should maintain this brightness into early October.

Although not a good target for suburban observers, it is ripe for viewing from dark-sky sites through a 4-inch telescope." Astronomy Magazine, October 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)

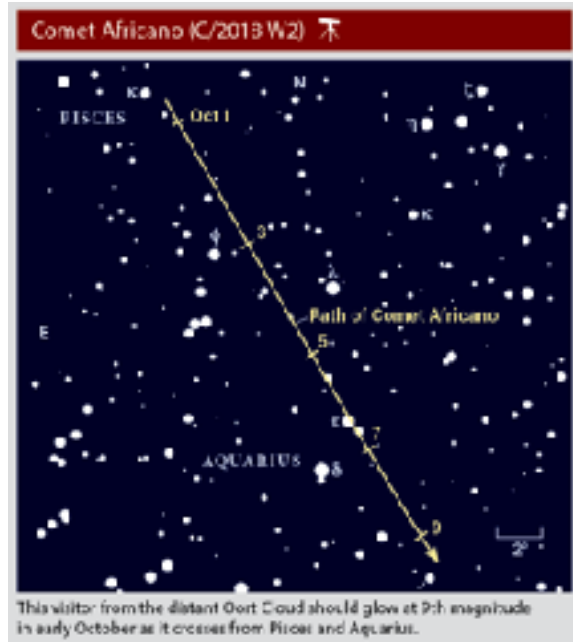
- Look for Jupiter, Ceres and Saturn in the early evening sky soon after sunset.
- Follow Neptune and Uranus all night long.
- Look for Mercury and Venus in the very early evening sky during the latter part of the month.
- Look for Mars in the pre-dawn skies just before sunrise.

## Asteroids

(From west to east)

- **Eunomia** is in the constellation of Aquarius.
- **Lutetia** is in the constellation of Cetus (near the head).
- **Amphitrite** is at opposition on the 13th in the constellation of Pisces.
- **Metis** is at opposition on the 25th in the constellation of Cetus (near the tail).
- **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.

| <u>Event ID</u> | <u>Date/Time</u>     | <u>Location</u> | <u>Observer</u> | <u>Link</u>            |
|-----------------|----------------------|-----------------|-----------------|------------------------|
| 3587-2015       | 2015-11-22 17:38 MST | CO              | Kevin S         | <a href="#">3587aw</a> |
| 3829-2015       | 2015-12-05 18:06 MST | CO              | Burness A       | <a href="#">3829a</a>  |
| 3871-2015       | 2015-11-13 01:55 MST | CO              | Charles N       | <a href="#">3871a</a>  |

## [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](#)

**September 25, 2019**

### NASA Designing Shapeshifting Robots for Saturn's Moons

[Full Article & Images](#)

"Mini robots that can roll, fly, float and swim, then morph into a single machine? Together they form Shapeshifter, a developing concept for a transformational vehicle to explore treacherous, distant worlds.

In a dusty robotics yard at NASA's Jet Propulsion Laboratory in Pasadena, California, the Shapeshifter team is testing a 3D-printed prototype of this unusual explorer. A contraption that looks like a drone encased in an elongated hamster wheel rolls across the yard, then splits in half. Once separated, the two halves rise on small propellers, effectively becoming flying drones for aerial exploration. These 3D-printed parts are only the beginning; the team imagines a series of up to 12 robots that could transform into a swimming probe or a team of cave explorers."

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** **September 26, 2019** **MOON SHADOW**

[Full Article & Images](#)

"Jupiter's volcanically active moon Io casts its shadow on the planet in this dramatic image from NASA's Juno spacecraft. As with solar eclipses on the Earth, within the dark

circle racing across Jupiter's cloud tops one would witness a full solar eclipse as Io passes in front of the Sun.

Such events occur frequently on Jupiter because it is a large planet with many moons. In addition, unlike most other planets in our solar system, Jupiter's axis is not highly tilted relative to its orbit, so the Sun never strays far from Jupiter's equatorial plane (+/- 3 degrees). This means Jupiter's moons regularly cast their shadows on the planet throughout its year."

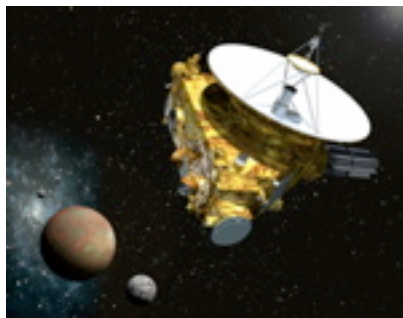
NASA's JunoCam website can be visited at: <https://www.missionjuno.swri.edu/junocam>

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**

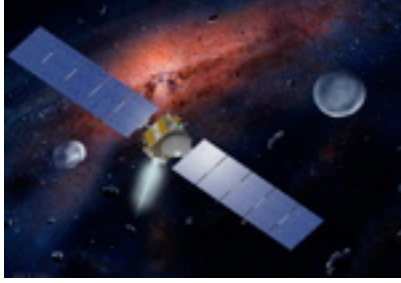
[Full Article & Images](#)

"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](http://www.nasa.gov/mission_pages/dawn/main/index.html).



## **TESS**

**September 26, 2019**

### **NASA's TESS Mission Spots Its 1st Star-shredding Black Hole**

[Full Article & Images](#)

"For the first time, NASA's planet-hunting Transiting Exoplanet Survey Satellite (TESS) watched a black hole tear apart a star in a cataclysmic phenomenon called a tidal disruption event. Follow-up observations by NASA's Neil Gehrels Swift Observatory and other facilities have produced the most detailed look yet at the early moments of one of these star-destroying occurrences.

"TESS data let us see exactly when this destructive event, named ASASSN-19bt, started to get brighter, which we've never been able to do before," said Thomas Holoiien, a Carnegie Fellow at the Carnegie Observatories in Pasadena, California. "Because we identified the tidal disruption quickly with the ground-based All-Sky Automated Survey for Supernovae (ASAS-SN), we were able to trigger multiwavelength follow-up observations in the first few days. The early data will be incredibly helpful for modeling the physics of these outbursts.

A paper describing the findings, led by Holoiien, was published in the Sept. 27, 2019, issue of The Astrophysical Journal and is [now available online](#)."

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.

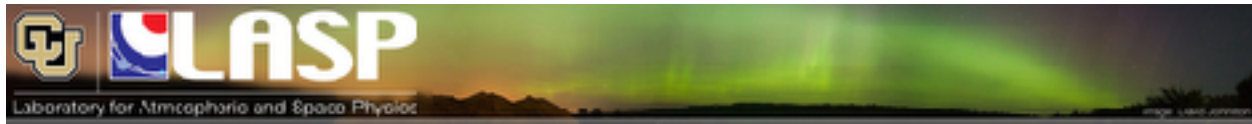
Download on Mobile Devices

**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."



## LASP/MAVEN

September 16, 2019

**Think Saturn's rings are old? Not so fast**

[Full Article & Images](#)

"A team of researchers has reignited the debate about the age of Saturn's rings with a study that dates the rings as most likely to have formed early in the solar system.

In a paper published today in *Nature Astronomy* and presented at the EPSC-DPS Joint Meeting 2019 in Geneva, the authors, including LASP research associate, Sean Hsu, suggest that

processes that preferentially eject dusty and organic material out of Saturn's rings could make the rings look much younger than they actually are."

Visit [LASP](#) and [MAVEN](#) for more information.



## **Mars Science Laboratory - Curiosity**

**September 25, 2019**

**Sols 2538-2539: An Intermission Filled with Remote Sensing**

[Full Article & Images](#)

"Today started off with the news that yestersol's plan did not fully complete. There was an issue in the set of planned SAM activities that resulted in those activities not completing. While we diagnose the issue, we are taking a break from drill activities and filling the plan with lots of remote science.

Part of the plan will include retaking observations that did not complete on sol 2537. This includes ChemCam LIBS observations of "Peeblesshire," "Perthshire," and the offset from the "Glen Etive 1" dump pile. Peeblesshire and Perthshire are both pebbles near the drill site."

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'**

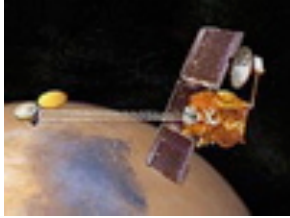
[Full Article & Images](#)

"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**

**September 16, 2019**

**NASA Wins Two Emmy Awards for Interactive Mission Coverage**

[Full Article & Images](#)

"NASA's efforts to engage a broader audience in exploration through the use of social media and online features was recognized with two Emmy Awards for interactive programming this weekend. During ceremonies held Sept. 14-15 at the Microsoft Theatre in Los Angeles, the Academy of Television Arts & Sciences recognized NASA

for its coverage of a Mars mission and the agency's first test of a spacecraft that will help bring crewed launches to the International Space Station back to U.S. soil."

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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