

# IAAS Monthly Astronomy Newsletter July 2017



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



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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 146.94 MHz](#) and [449.825 MHz](#) repeaters. The RMRL [146.94](#) repeater is also linked with the WB0WDF Cripple Creek [447.400 MHz](#) repeater and [Allstar](#) nodes [28298](#), [28299](#), [29436](#). We are also linked via Echolink, links are [k0jsc-r](#) and [canoncty](#). More information on the WB0WDF repeater links, Allstar nodes and Echolinks can be found at [k0jsc.com](http://k0jsc.com). The net meets on Tuesday nights at 7 P.M. Mountain Time (US).

Interested in obtaining 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 from 9am until 1pm.

The [Colorado Astronomy Net](#) now has a 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!

If you shop 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!

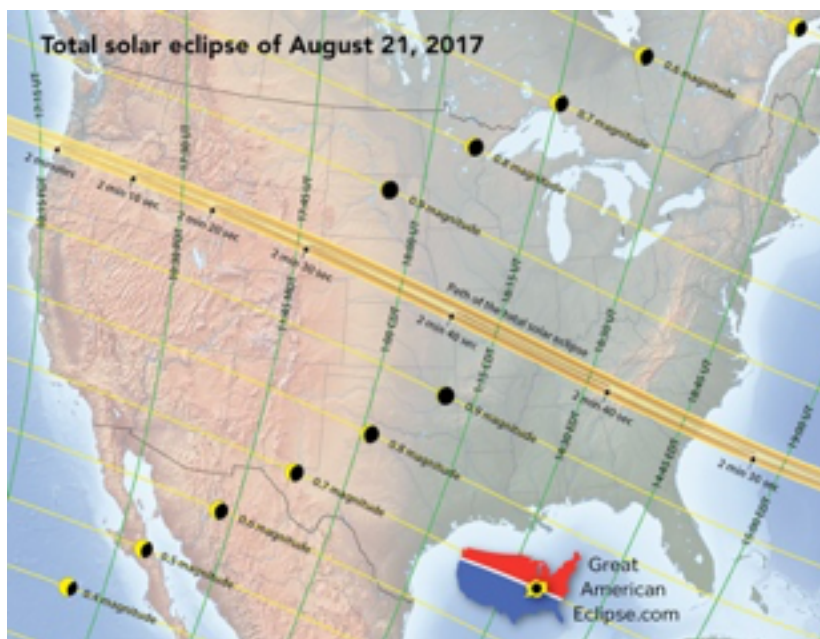
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**Solar Eclipse 2017**  
**August 21, 2017**  
[Links and Information](#)



## The Month At-A-Glance

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

### The Moon

#### Phases:

- Full Moon occurs on the 9th.
  - Last Quarter Moon occurs on the 16th.
  - New Moon occurs on the 23rd.
  - First Quarter Moon occurs on the 30th.
- 
- The Moon is at Apogee on the 6th, 252,236 miles from Earth.
  - The Moon is at Perigee on the 21st, 224,462 miles from Earth.



#### Moon/Planet Pairs:

- The Moon passes  $3^\circ$  north of Jupiter on the 1st.
- Mercury passes  $5^\circ$  south of Pollux on the 2nd.
- The Moon passes  $3^\circ$  north of Saturn on the 6th.
- The Moon passes  $0.9^\circ$  south of Neptune on the 13th.
- Venus passes  $3^\circ$  north of Aldebaran on the 14th.
- The Moon passes  $4^\circ$  south of Uranus on the 16th.
- The Moon passes  $0.4^\circ$  north of Aldebaran on the 19th.
- The Moon passes  $3^\circ$  south of Venus on the 20th.
- The Moon passes  $0.9^\circ$  north of Mercury on the 25th.
- The Moon passes  $0.07^\circ$  north of Regulus on the 25th.
- Mercury passes  $1.1^\circ$  south of Regulus on the 26th.
- The Moon passes  $3^\circ$  north of Jupiter on the 28th.

*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 July

"The solar system's two largest planets, Jupiter and Saturn, put on superb shows every clear summer evening. Each has an orbiting spacecraft returning detailed images from close-up to complement your telescopic views from afar. Meanwhile, Uranus and Neptune stage nice but more-subtle displays after midnight. July nights wrap up with brilliant Venus making a dash across the splendid backdrop of Taurus the Bull."

Astronomy Magazine, June 2017, p. 36.

## Mercury

Is at greatest eastern elongation ( $27^\circ$  east of the Sun) on the 30th. Mercury sets at 9:25 p.m. on the 1st and about 9:15 p.m. by month's end. Look for Mercury in the west about 30 minutes after sunset. Mercury will be best viewed by the end of the month when it is highest above the western horizon. Mercury moves from the constellation of Gemini into Leo this month shining at magnitude -0.2.

## Venus

Rises at 2:59 a.m. on the 1st and about 3:02 a.m. by month's end. Look for Venus shining brightly in the early morning hours before sunrise. Venus moves from the constellation of Taurus into Gemini shining at magnitude -4.1.

## Earth

Is at aphelion (94.5 million miles from the Sun) on the 3rd.

## Mars

Is in conjunction with the Sun on the 26th. Mars sets at 9:04 p.m. on the 1st and about 8:10 p.m. by month's end. Mars is lost in the Sun's twilight glow all month, returning to the morning sky sometime in September. Mars moves from the constellation of Gemini into Cancer.

## Jupiter

Sets at 1:04 a.m. on the 1st and about 11:38 p.m. by month's end. By the time the Sun sets, Jupiter is high in the evening sky and will be the first object visible as the skies darken besides the Moon. Jupiter is in the constellation of Virgo shining at magnitude -2.0.



## **Saturn**

Rises at 7:04 p.m. on the 1st and about 4:55 p.m. by month's end. Saturn is easily spotted soon after sunset towards the east. As Jupiter is setting, Saturn rides high in the south for best evening viewing. Saturn is in the constellation of Ophiuchus shining at magnitude 0.2.

## **Uranus**

Rises at 1:30 a.m. on the 1st and about 11:25 p.m. by month's end. Uranus is best viewed in the early morning at least an hour before sunrise. Uranus is in the constellation of Pisces shining at magnitude 5.8.

## **Neptune**

Rises at 11:42 p.m. on the 1st and about 9:39 p.m. by month's end. Neptune is best viewed in the late evening and early morning hours. Neptune is in the constellation of Aquarius shining at magnitude 7.8.

## **Dwarf Planets**

### **Ceres**

Rises at 5:38 a.m. on the 1st and about 4:29 a.m. by month's end. Ceres is lost in the morning twilight glow for most of the month, reappearing just a few degrees above the eastern horizon during the last week of July. Ceres moves from the constellation of Taurus into Gemini shining at magnitude 8.8.

### **Pluto**

Is at opposition, rising as the Sun sets, on the 10th. Pluto rises at 8:49 p.m. on the 1st and about 6:44 p.m. by month's end. Pluto is visible all night long, but is best viewed around midnight on dark nights, when it is highest in the sky. 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 Southern Delta Aquarids - This Meteor Shower has a duration of July 14 - August 18. Maximum hourly rates of 15-20 occur on July 28/29.
- The Northern Delta Aquarids extends from July 16 to September 10. Maximum occurs on August 13. The hourly rates reach a high of 10.

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.

## Comets

"Comet hunters typically seek out dark skies and avoid the Moon like the plague. But July provides an exception in Comet Johnson (C/2015 V2), which should glow at 6th or 7th magnitude in the evening sky and show up quite easily through binoculars or a telescope from the suburbs. And the only time you'll have to steer clear of the Moon is on the 2nd, when our satellite appears as a waxing gibbous less than 5° north of the comet.

Comet Johnson passed closest to both the Sun and Earth in June, so it should deliver an excellent performance during July. Early in the month, binoculars will show it as a cotton ball some two fields of view to the upper left of 1st-magnitude Spica in Virgo. A 6-inch telescope should reveal a fuzzy ball



with both a gas and dust tail flowing to the east. If we're lucky, the gas tail might glow bright enough to show a subtle green color through 10-inch instruments." Astronomy Magazine, July 2017, 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

- Solar Eclipses
  - N/A.
- Lunar Eclipses
  - N/A.

## Observational Opportunities

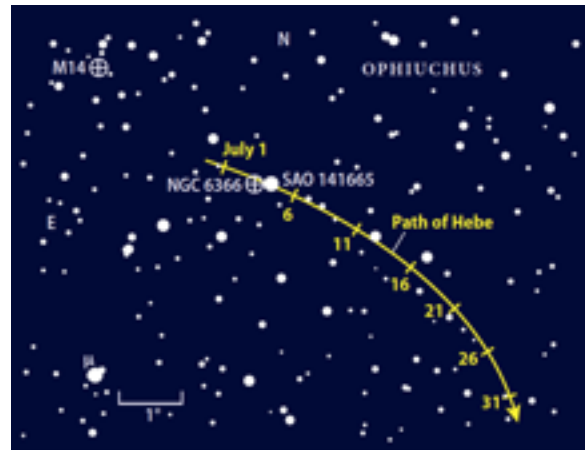
*(from evening to morning)*

- Enjoy Jupiter in the evening.
- Observe Saturn all night long.
- Look for Venus in the morning skies before sunrise.
- Try to spot Comets Johnson and PANSTARRS.
- Try to see some of the meteor activity late in the month.

## Asteroids

(From west to east)

- **Hebe** is in the constellation of Ophiuchus.
- **Harmonia** is in the constellation of Sagittarius.
- **Hygiea** is in the constellation of Sagittarius.
- **Juno** reaches opposition on the 2nd in the constellation of Scutum.
- **Julia** is in the constellation of Pisces just to the north of Neptune.
- **Iris** is in the constellation of Pisces just to the north of Uranus.
- **Pallas** is in the constellation of Cetus.



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.

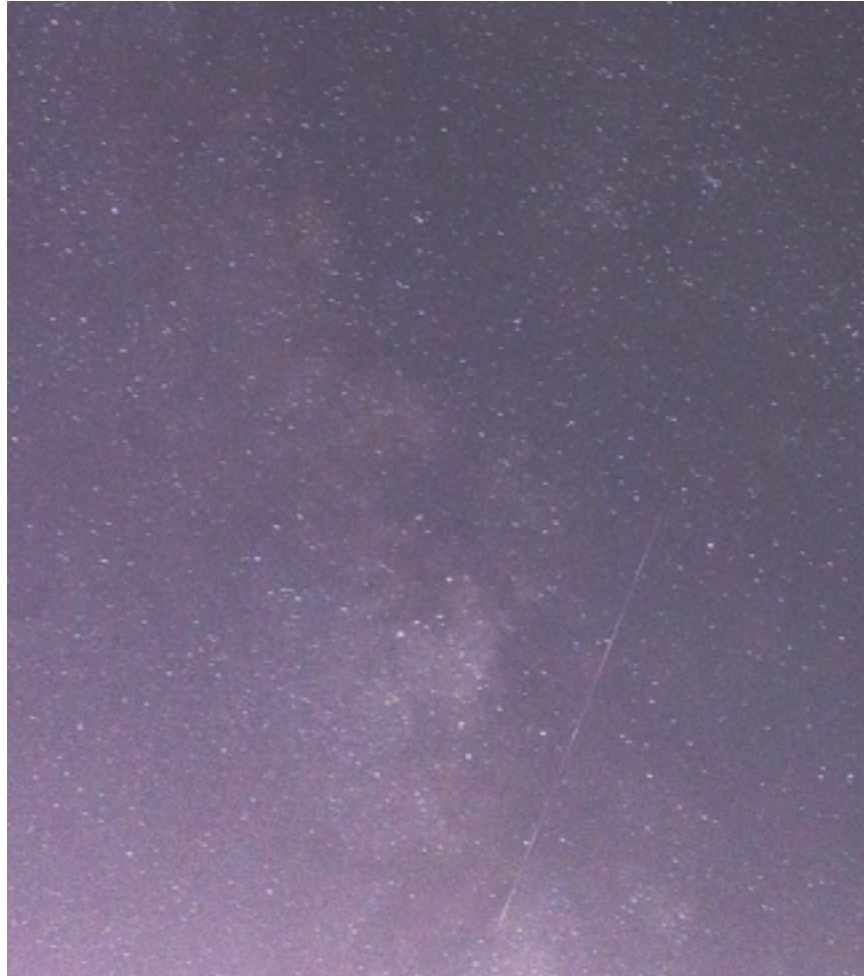
## Member Meteor Sightings

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.



Tumbling Satellite: Soviet Union satellite called Molinya 1-44. It was launched in 1979 and is classified as decaying and is predicted to completely decay sometime this year.

EXIF INFO: Canon 6D-Sigma 35mm f1.4: ISO 1250, f4.5, 25 seconds.

Taken: 4:43AM on 4-28-2017

Direction: South-Southwest.

Taken by: Kimberly Thornton

Location: Pueblo, CO

# Planetary/Lunar Exploration Missions

(Excerpts from recent mission updates)



## JPL Latest News

The Latest from Space

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

[JPL Latest News](#)



## Juno

June 30, 2017

**NASA's Juno Spacecraft to Fly Over Jupiter's Great Red Spot**

July 10

[Full Article & Images](#)

"Just days after celebrating its first anniversary in Jupiter orbit, NASA's Juno spacecraft will fly directly over Jupiter's Great Red Spot, the gas giant's iconic, 10,000-mile-wide (16,000-kilometer-wide) storm. This will be humanity's first up-close and personal view of the gigantic feature -- a storm monitored since 1830 and possibly existing for more than 350 years."

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>



**Cassini**  
**June 28, 2017**  
**Launching Cassini Leaves Legacy of Lasting Pride**

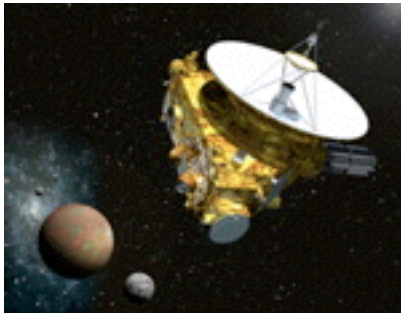
[Full Article & Images](#)

*"By Steven Sicheloff,  
NASA's Kennedy Space Center, Florida*

As NASA's Cassini spacecraft spends its last few weeks in orbit around Saturn before making a controlled impact with the planet in what NASA dubbed Cassini's "Grand Finale," some of those who helped launch the mission 20 years ago are thrilled with the success of the massive probe they helped dispatch to one of the solar system's most intriguing worlds."

Raw images are available at <http://saturn.jpl.nasa.gov/photos/raw/index.cfm>.

More information about Cassini is available at the following sites:  
<http://saturn.jpl.nasa.gov> & <http://www.nasa.gov/cassini>.



**New Horizons**  
**June 23, 2017**  
**NASA's New Horizons Mission Honors Memory of  
Engineer Lisa Hardaway**

[Full Article & Images](#)

"Team Dedicates 'LEISA' Instrument to Ball Aerospace  
Program Manager

NASA's New Horizons mission team honored the life and contributions of aerospace engineer Lisa Hardaway on Thursday by dedicating the spectrometer she helped to develop - which brought the first color close-up images of Pluto to the world - in her memory.

Hardaway, who died in January at age 50, was the program manager at Ball Aerospace for "Ralph," one of seven instruments flying aboard the New Horizons spacecraft. Ralph contains a powerful infrared spectrometer called LEISA - an acronym for Linear Etalon Imaging Spectral Array, and pronounced "Lisa" - that the team has now named after Hardaway."

[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/>.



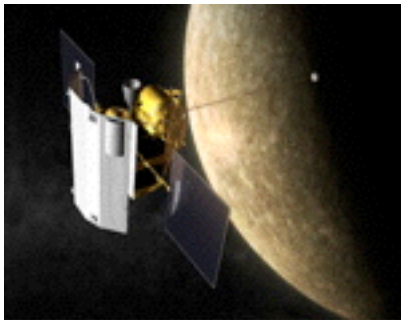
**Dawn**  
**May 16, 2017**  
**Movie Shows Ceres at Opposition from Sun**

[Full Article & Images](#)

"NASA's Dawn spacecraft successfully observed Ceres at opposition on April 29, taking images from a position exactly between the sun and Ceres' surface. Mission specialists had carefully maneuvered Dawn into a special orbit so that the spacecraft could view Occator Crater, which contains the brightest area of Ceres, from this new perspective.

A new movie shows these opposition images, with contrast enhanced to highlight brightness differences. The bright spots of Occator stand out particularly well on an otherwise relatively bland surface. Dawn took these images from an altitude of about 12,000 miles (20,000 kilometers)."

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).



**MESSENGER**

The MESSENGER mission is officially ended but there is a lot to learn about the planet closest to our Sun. Visit the new, updated MESSENGER website:

[UNLOCKING THE MYSTERIES OF PLANET MERCURY](#)

for resources, to learn, and to explore.

(Click Link above for Full Article & Images)

**TOP 10 SCIENCE RESULTS AND TECHNOLOGY INNOVATIONS**

"After more than 10 years in operation, the MErcury Surface, Space ENvironment, GEochemistry, and Ranging (MESSENGER) spacecraft impacted the surface of

Mercury on April 30, 2015, at a speed of more than 3.91 kilometers per second (8,750 miles per hour), marking the end of operations for the hugely successful Mercury orbiter. At the MESSENGER Nears End of Operations media and public event, scientists and engineers discussed the mission's accomplishments, providing the top 10 scientific discoveries, as well as the technological innovations that grew out of the mission."

The [MESSENGER app](#) is available for download on iTunes.

For more information on the MESSENGER mission, visit the MESSENGER home page: <http://messenger.jhuapl.edu/>.

### **Pack Your Backpack**

Calling all explorers! Tour JPL with our new Virtual Field Trip site. Stops include Mission Control and the Rover Lab. Your guided tour starts when you select a "face" that will be yours throughout the visit. Cool space images and souvenirs are all included in your visit.

+ <http://virtualfieldtrip.jpl.nasa.gov/>

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>.

# Mars Missions

## [Be A Martian](#)



Mars website mobile version is here!

Simply type

<http://mars.jpl.nasa.gov>

into your mobile browser.



### **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.

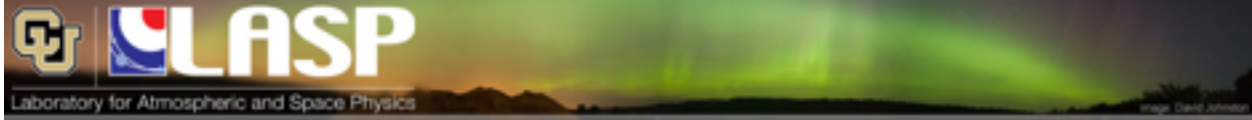
Download on Mobile Devices

[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

June 16, 2017

**1,000 Days in Orbit: MAVEN's Top 10 Discoveries at Mars**

[Full Article & Images](#)

"On June 17, the MAVEN mission will celebrate 1,000 Earth days in orbit around the Red Planet. Since its launch in November 2013 and its orbit insertion in September 2014, MAVEN has been exploring the upper atmosphere of Mars. MAVEN is bringing insight to how

the sun stripped Mars of most of its atmosphere, turning a planet once possibly habitable to microbial life into a barren desert world."

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





## Mars Science Laboratory - Curiosity

June 28, 2017

Sols 1741-1743: "Cat Sized Island"

[Full Article & Images](#)

"Last evening (June 27) between 8pm and 9pm PDT, Curiosity drove approximately 34 meters to the east to position herself just north of a large field of ripples on her way closer to ascending the iron oxide-bearing Vera Rubin Ridge. As Curiosity progresses towards the east, scientists back on Earth continue to look for opportunities to both gaze ahead towards interesting locations on the ridge itself, in addition to looking at the local rocks and sediment surrounding the rover. As we approach the lower units of Vera Rubin Ridge, our measurements of the "typical" rock that surrounds the rover will be vital to helping scientists understand how and why the ridge is different than the other units that have been investigated thus far in Gale Crater. Are we going to observe a very sharp transition in the composition and textures of rocks as we cross the threshold between the underlying mudstones of the Murray formation and the lowermost units of Vera Rubin Ridge? Or, alternatively, are we going to see a very subtle transition that might have gone unnoticed if not for the methodical measurements made upon approaching the ridge? Only time will tell, but we are making sure that we have the information necessary to definitively understand the nature of this transition."

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 (requires Kinect)

Visit the Mars Science Laboratory page at <http://mars.jpl.nasa.gov/msl>.



## **Mars Exploration Rover Mission (Spirit and Opportunity)**

**June 27, 2017**

### **SPIRIT UPDATE: Spirit Remains Silent at Troy - sols 2621-2627, May 18-24, 2011:**

"More than 1,300 commands were radiated to Spirit as part of the recovery effort in an attempt to elicit a response from the rover. No communication has been received from Spirit since Sol 2210 (March 22, 2010). The project concluded the Spirit recovery efforts on May 25, 2011. The remaining, pre-sequenced ultra-high frequency (UHF) relay passes scheduled for Spirit on board the Odyssey orbiter will complete on June 8, 2011.

Total odometry is unchanged at 7,730.50 meters (4.80 miles)."

### **OPPORTUNITY UPDATE: Opportunity Continuing Science Campaign at 'Perseverance Valley' - sols 4767 - 4773, June 21, 2017 - June 27, 2017:**

"Opportunity is at the top of "Perseverance Valley" on the rim of Endeavour Crater.

The rover is completing the remaining science as part of a walkabout campaign above Perseverance Valley before the solar conjunction moratorium in July.

Although there are new considerations regarding steering (no use of the front steering actuators), Opportunity is continuing to drive. Solar conjunction is when the Sun comes between Earth and Mars, which occurs about once every 26 months. During this time, there will be diminished communications to Opportunity. More on solar conjunction here: <https://mars.jpl.nasa.gov/allaboutmars/nightssky/solar-conjunction/>

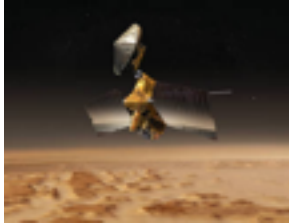
On Sol 4767 (June 21, 2017), the rover headed southwest at just over 46 feet (14 meters). And as is typical, Navigation Camera (Navcam) and Panoramic Camera (Pancam) were collected at the end of the drive. On Sol 4769 (June 23, 2017), Opportunity drove again towards the northeast just over 33 feet (10 meters). These drives have been employing "tank steering" that does not require the use of the steering actuators, instead differentially runs the wheels on either side of the rover. On Sol 4772 (June 26, 2017), Opportunity drove just about 26 feet (8 meters), but this time used the rear steering actuators to perform a gentle arc and finished the drive with a turn-in-place that toes-in both rear wheels. On Sol 4773 (June 27, 2017), the test of the right-front steering actuator was tried, after more than 12 years of inactivity. No motion was observed, although another test is planned.

As of Sol 4773 (June 27, 2017), the solar array energy production was 336 watt-hours with an atmospheric opacity (Tau) of 0.771 and a solar array dust factor of 0.535.

Total odometry is 27.90 miles (44.90 kilometers)."

Landing sites link - <http://marsoweb.nas.nasa.gov/landingsites/>

Visit the Mars Exploration Rover page at  
<https://mars.nasa.gov/mer/home/>.



## **Mars Reconnaissance Orbiter Mission**

**June 20, 2017**

### **NASA Mars Orbiter Views Rover Climbing Mount Sharp**

[Full Article & Images](#)

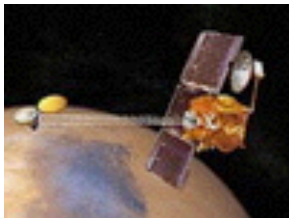
"Using the most powerful telescope ever sent to Mars, NASA's Mars Reconnaissance Orbiter caught a view of the Curiosity rover this month amid rocky mountainside terrain.

The car-size rover, climbing up lower Mount Sharp toward its next destination, appears as a blue dab against a background of tan rocks and dark sand in the enhanced-color image from the orbiter's High Resolution Imaging Science Experiment (HiRISE) camera. The exaggerated color, showing differences in Mars surface materials, makes Curiosity appear bluer than it really looks.

The image was taken on June 5, 2017, two months before the fifth anniversary of Curiosity's landing near Mount Sharp on Aug. 5 PDT (Aug. 6, 2017, EDT and Universal Time)."

## **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 at <http://www.nasa.gov/mro>.



## **Mars Odyssey Orbiter**

**January 04, 2017**

### **NASA Mars Odyssey Orbiter Resumes Full Operations**

[Full Article & Images](#)

## **"MARS ODYSSEY MISSION STATUS REPORT**

*UPDATED Jan. 4, 2017, at 2 p.m. PST*

*NASA's Mars Odyssey spacecraft has resumed full service following recovery after entering a safe standby mode on Dec. 26, 2016.*

The orbiter resumed communication relay assistance to Mars rovers on Dec. 30, 2016. Science observations of Mars by instruments on Odyssey resumed on Jan. 3, 2017, with its Thermal Emission Imaging System, and on the next day with its High Energy Neutral Spectrometer and the Neutron Spectrometer."

### **DAILY MARS ODYSSEY THEMIS IMAGES**

Thermal Emission Imaging System (THEMIS) web site: (<http://themis.asu.edu/gallery>)

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 at <http://mars.jpl.nasa.gov/odyssey/index.html>.



### **Journey to Mars**

**InSight - Revealing the Heart of Mars**

**September 02, 2016**

**NASA Approves 2018 Launch of Mars InSight Mission**

"InSight (Interior Exploration using Seismic Investigations, Geodesy and Heat Transport) is a NASA Discovery Program mission that will place a single geophysical lander on Mars to study its deep interior.

NASA is moving forward with a spring 2018 launch of its InSight mission to study the deep interior of Mars, following final approval this week by the agency's Science Mission Directorate."

Learn more about the InSight mission at: <http://www.jpl.nasa.gov/missions/insight/>

### **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: <http://mars.jpl.nasa.gov/missions/> and the Mars Exploration page: <http://marsprogram.jpl.nasa.gov/>.

## **[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 -

[http://ki0ar.com/pipermail/astronews\\_ki0ar.com/](http://ki0ar.com/pipermail/astronews_ki0ar.com/)

- Full documentation of the online administration system is available at [http://ki0ar.com/mailman/listinfo/astronews\\_ki0ar.com](http://ki0ar.com/mailman/listinfo/astronews_ki0ar.com).

- The latest version of the newsletter is accessible from <http://www.ki0ar.com/astro.html>.

## **Keep looking UP!**

73 from KI0AR

Created by Burness F. Ansell, III  
[ki0ar@ki0ar.com](mailto:ki0ar@ki0ar.com)

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