IAAS Monthly Astronomy Newsletter
May 2020

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

This newsletter is published on the World Wide Web at The Home of KIØAR - and is received nationally and internationally. Download the PDF formatted version of the newsletter.

An Open Invitation - For amateur radio operators and scanner enthusiasts, when in the Denver metro area, please join the Colorado Astronomy Net on the Rocky Mountain Radio League's WØWYX **146.94 MHz** and **449.825 MHz** repeaters. Due to hardware issues, links with the Allstar node, Echolink and the Cripple Creek repeater are down until further notice. 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.

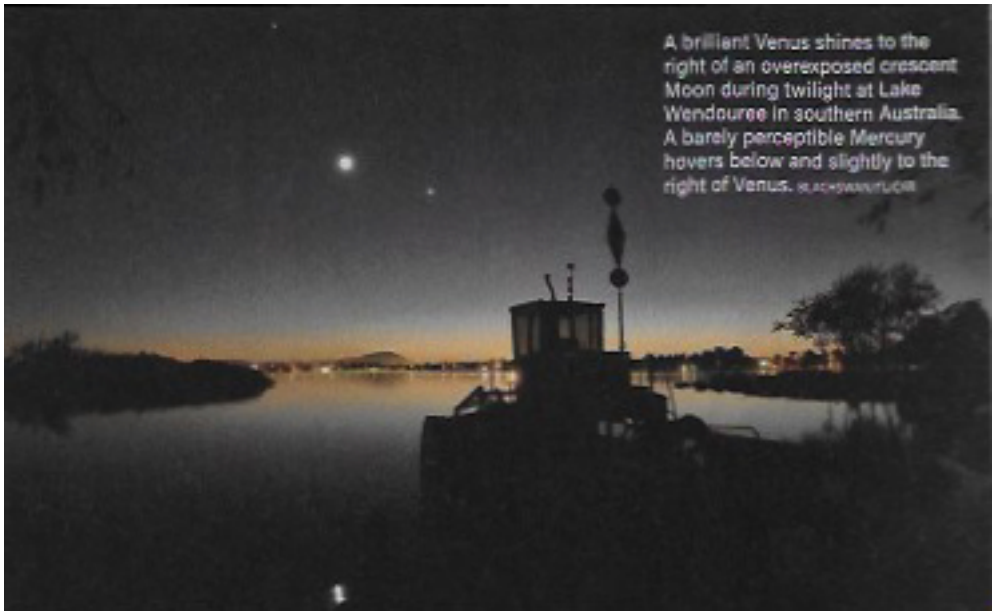
The Colorado Astronomy Net and the IAAS are on Facebook page. Be sure to "Like" us.

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...



A brilliant Venus shines to the right of an overexposed crescent Moon during twilight at Lake Wendouree in southern Australia. A barely perceptible Mercury hovers below and slightly to the right of Venus.
Blackswan/Flickr

The Month At-A-Glance

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

The Moon

Phases:

- Full Moon occurs on the 7th.
- Last Quarter Moon occurs on the 14th.
- New Moon occurs on the 22nd.
- First Quarter Moon occurs on the 29th.

- The Moon is at Perigee on the 5th, 223,478 miles from Earth.
- The Moon is at Apogee on the 18th, 252,018 miles from Earth.

Moon/Planet Pairs:

- The Moon passes 2° south of Jupiter on the 12th.
- The Moon passes 2° south of Pluto on the 12th.
- The Moon passes 3° south of Saturn on the 12th.
- The Moon passes 3° south of Mars on the 14th.
- The Moon passes 4° south of Neptune on the 16th.
- Mercury passes 7° north of Aldebaran on the 17th.
- The Moon passes 4° south of Uranus on the 20th.
- Mercury passes 0.9° south of Venus on the 22nd.
- The Moon passes 4° south of Venus on the 23rd.
- The Moon passes 3° south of Mercury on the 24th.
- The Moon passes 0.6° north of asteroid Vesta on the 24th.

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

The Planets & Dwarf Planets

Planetary Reports are generated by "TheSkyX" software. These reports provide predicted data for the planets on the first of each month for the current year. The rise and set times for the Sun and the Moon for each day of the month as well as meteor shower radiants are also included in the reports. These reports have been optimized for the Denver, Colorado location, however, the times will be approximate for other locations on Earth.

(All times are local unless otherwise noted.)

Planetary Highlights for May

"Whether you prefer evening or morning observing -- or both -- May has you covered. Venus and Mercury appear in the night sky this month, offering fine views during evening twilight. Meanwhile, the morning sky holds the magnificent trio of Jupiter, Saturn, and Mars. All three planets are improving as they approach their respective oppositions later this year, which results in larger disks when viewed with a telescope." Astronomy Magazine, May 2020, P. 36.

Mercury

Is in superior conjunction on the 4th. Mercury sets at 7:34 p.m. on the 1st and about 10:14 p.m. by month's end. Look for Mercury low to the west-southwest about 30 minutes after sunset after the second week of the month. Mercury is in conjunction with Venus on the 22nd, but for U.S. observers, the best time to spot the pair near closest approach will be on the evening of the 21st when the pair will be about 1° apart from each other just after sunset. Mercury moves from the constellation of Aries into Gemini this month shining at magnitude 0.0 on the 31st.

Venus

Is stationary on the 13th. Venus sets at 11:17 p.m. on the 1st and about 8:35 p.m. by month's end. Look for Venus soon after sunset to the west. Venus is in the constellation of Taurus shining at magnitude -4.6.

Earth

N/A.

Mars

Rises at 2:50 a.m. on the 1st and about 1:46 a.m. by month's end. Look to the southeast before sunrise to spot Mars. Mars moves from the constellation of Capricornus into Aquarius this month shining at magnitude 0.2.

Jupiter
Rises at 1:27 a.m. on the 1st and about 11:20 p.m. by month's end. Look for Jupiter to the south before sunrise. Jupiter is in the constellation of Sagittarius shining at magnitude -2.4.

Saturn
Rises at 1:47 a.m. on the 1st and around 11:37 p.m. by month's end. Look for Saturn to the south before sunrise. Saturn is in the constellation of Capricornus shining at magnitude 0.5.

Uranus
Rises at 5:50 a.m. on the 1st and around 3:53 a.m. by month's end. Uranus rises during twilight for most of this month, so it will still be difficult to spot until next month. Uranus is in the constellation of Aries shining at magnitude 5.9.

Neptune
Rises at 3:59 a.m. on the 1st and about 1:58 a.m. by month's end. Look for Neptune to the southeast before sunrise. Neptune is in the constellation of Aquarius shining at magnitude 7.9.

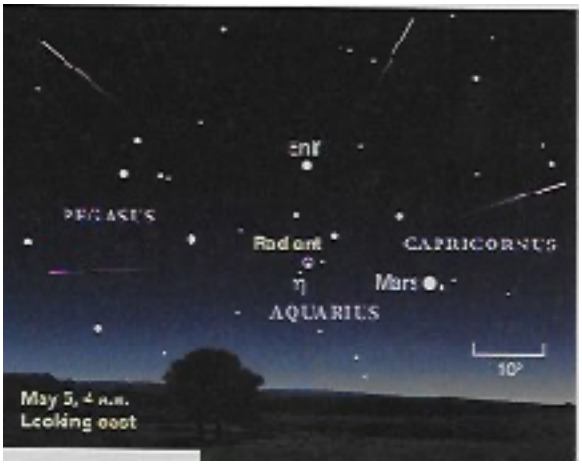
Dwarf Planets
Ceres
Rises at 3:48 a.m. on the 1st and around 2:13 a.m. by month's end. Look for Ceres, to the southeast before sunrise. Ceres is in the constellation of Aquarius shining at magnitude 9.1.

Pluto
Rises at 1:22 a.m. on the 1st and around 11:16 p.m. by month's end. Pluto is situated near Jupiter and may be visible if skies are dark enough. Pluto is in the constellation of Sagittarius shining at magnitude 14.7.

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

Astronomical Events

Meteor Showers



- The Eta Aquarids Meteor Shower - This shower is visible during the period of April 21 to May 12. It reaches maximum on May 5. During the period of greatest activity hourly rates usually reach 20 for observers in the northern hemisphere and 50 for observers in the southern hemisphere.

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

Meteor Shower Radiant Report

Meteor Scatter (or Meteor burst communications) -- "is a radio propagation mode that exploits the ionized trails of meteors during atmospheric entry to establish brief communications paths between radio stations up to 2,250 kilometres (1,400 mi) apart." Tune your shortwave or your HF amateur radio to 54.310 MHz USB CW and see if you can hear any pings. Try other frequencies as well... 6m FT8 digital - 50.313 Mhz & 50.276 Mhz, JP-65 digital mode and the carrier frequencies of the lower VHF bands for TV channels 2, 3 & 4.

Comets

- "Comet PanSTARRS (C/2017 T2) shares a low-power field with the Cigar Galaxy (M82)! As ideal as modest-telescope comets get, PanSTARRS hits a peak brightness of 8th or 9th magnitude while sailing high in the northern sky. The comet makes its closest approach to the Sun, or reaches perihelion, May 4, at a distance of 149 million miles. On the plus side, PanSTARRS crests near Polaris, making it accessible to northern observers all night." Astronomy Magazine, May 2020, P. 42.

For information, orbital elements and ephemerides on observable comets visit the Observable Comets page from the Harvard-Smithsonian Center for Astrophysics.

For more information about Comets, check out Gary Kronk's 6-volume series of books on Cometography.

Eclipses

- No solar eclipse activity this month.

- No lunar eclipse activity this month.

Observational Opportunities

(from evening to morning)

- Look for Venus and Mercury in the early evening sky soon after sunset.
- Look for Mars, Jupiter and Saturn in the early morning before sunrise.
- Look for Comet PanSTARRS in Ursa Major.

Asteroids

(From west to east)

- **Harmonia** is in the constellation of Virgo.
- **Thalia** is in the constellation of Virgo.
- **Iris** is in the constellation of Sagittarius.
- **Herculina** is in the constellation of Sagittarius.

Information about the Minor Planets can be found at the Minor Planet Observer web site.

Occultations

Information on various occultations can be found at the International Occultation Timing Association's (IOTA) web site.

Member Meteor Sightings

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
986-2020	2020-02-21 22:20 MST	CO	Lukas S	986

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

May 1, 2020
Newly Reprocessed Images of Europa Show 'Chaos Terrain' in Crisp Detail

Full Article & Images

"The surface of Jupiter's moon Europa features a widely varied landscape, including ridges, bands, small rounded domes and disrupted spaces that geologists call "chaos terrain." Three newly reprocessed images, taken by NASA's Galileo spacecraft in the late 1990s, reveal details in diverse surface features on Europa."

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

Past, Present, Future and Proposed JPL Missions

For special JPL programs and presentations in your area visit the JPL Solar System Ambassador web site.

Juno

May 1, 2020
Jupiter's Great Red Spot: A Rose By Any Other Name

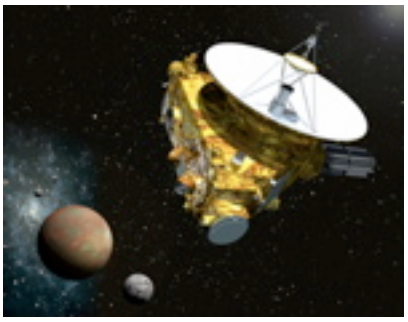
Full Article & Images

"Jupiter's already vibrant colors become especially striking in this artistic interpretation of an image from NASA's Juno mission that shows the planet's famous Great Red Spot. Citizen scientist Mary J. Murphy processed an image from the spacecraft's JunoCam instrument, increasing the color saturation to create a piece Murphy calls "The Rose."

The Great Red Spot is a storm in Jupiter's southern hemisphere with crimson-colored clouds that spin counterclockwise at wind speeds that exceed those in any storm on Earth. The Great Red Spot has slowly changed over the years, and is currently about 1.3 times as wide as our planet. Data returned by the Juno mission helped scientists determine that the storm's roots extend at least 200 miles (320 kilometers) into Jupiter's

atmosphere. For comparison, a typical tropical cyclone on Earth only extends about 9 miles (15 kilometers) from the top of the storm to the bottom."

Images from NASA's JunoCam.
More information on the Juno mission is available at Juno and Mission Juno.
The public can follow the mission on Facebook and Twitter.



New Horizons
April 24, 2020
Thoughts on Interstellar Navigation by Parallax

Full Article & Images

"Forever and forever we have taken the stars as fixed markers in the sky -- old friends to guide your way on land, at sea, in the air and even in space. We flew to the Moon decades ago and shot the stars all along the way. One needs a sense of direction to embark on the unknown. There was a new world to explore, but one framed by the old stars you learned when you were a kid in Ohio."

New Horizons gallery

Find New Horizons in the iTunes App Store.

For more information on the New Horizons mission -- the first mission to the ninth planet -- visit the New Horizons home page.

TESS
January 24, 2020
How Earth Climate Models Help Scientists Picture Life on Unimaginable Worlds

Full Article & Images

"In a generic brick building on the northwestern edge of NASA's Goddard Space Flight Center campus in Greenbelt, Maryland, thousands of computers packed in racks the size of vending machines hum in a deafening chorus of data crunching. Day and night, they spit out 7 quadrillion calculations per second. These machines collectively are known as NASA's Discover supercomputer and they are tasked with running sophisticated climate models to predict Earth's future climate.

But now, they're also sussing out something much farther away: whether any of the more than 4,000 curiously weird planets beyond our solar system discovered in the past two decades could support life."

For more news and information on the TESS mission, visit the Latest Tess Stories page.

Past, Present, Future and Proposed JPL Missions.

Mars Missions

Be A Martian

Mars website mobile version is here!
Simply type
http://mars.jpl.nasa.gov
into your mobile browser.

MARS WEATHER
Mars Daily Weather Report

Mars on the Go! NASA Be A Martian Mobile App
If you want the latest news as it happens, try our Be A Martian app.
Download on Mobile Devices
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.

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

April 22, 2020
ESCAPE funded for Phase A concept study

Full Article & Images

"A new spacecraft proposed by scientists at CU Boulder could soon be NASA's nose in space, sniffing out the environments beyond Earth's solar system that might host planets with thick atmospheres.

Astrophysicist Kevin France is leading the development of that mission, called the Extreme-ultraviolet Stellar Characterization for Atmospheric Physics and Evolution (ESCAPE). He's hoping it will provide the critical reconnaissance work in humanity's search for life far away from home."

Visit LASP and MAVEN for more information.

Mars 2020 - Perseverance

May 1, 2020
NASA's Perseverance Rover Will Look at Mars Through These 'Eyes'

Full Article & Images

"When it launches this summer, NASA's Perseverance rover will have the most advanced pair of "eyes" ever sent to the Red Planet's surface: Its Mastcam-Z instrument packs a next-gen zoom capability that will help the mission make 3D imagery more easily. Rover operators, who carefully plan out each driving route and each movement of a rover's robotic arm, view these stereo images through 3D goggles to see the contours of the landscape."

Learn more about the upcoming Mars 2020 (Perseverance) mission.

Mars Science Laboratory - Curiosity

May 1, 2020
Sols 2751-2753: 'Glas-going' to Drill!

Full Article & Images

"To me, it seems like Curiosity was sitting on top of the Greenheugh pediment getting ready to drill "Edinburgh" just yesterday, and yet we're already preparing to drill another rock in this weekend's plan, a target we've named "Glasgow." Combined with "Hutton," these three drilled samples will give us a wonderful snapshot of the range of compositions of the three major geologic units we've explored in this region."

Follow the Mars Curiosity rover on Foursquare.

Check out information about NASA's partnership with Foursquare.

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

Visit the Mars Science Laboratory page.

Mars Reconnaissance Orbiter Mission

February 18, 2020
NASA's Mars Reconnaissance Orbiter Undergoes Memory Update

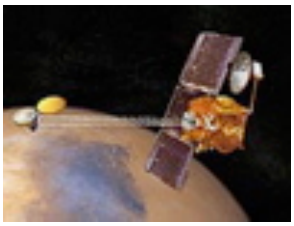
Full Article & Images

"From Feb. 17 to Feb. 29, 2020, NASA's Mars Reconnaissance Orbiter (MRO) will go on hiatus from its science mission and its relay operations while engineers on Earth conduct long-distance maintenance. During the hiatus, other orbiters will relay data from the Mars Curiosity rover and Mars InSight lander to Earth.

The maintenance work involves updating battery parameters in the spacecraft's flash memory — a rare step that's been done only twice before in the orbiter's 15 years of flight. This special update is necessary because it was recently determined that the battery parameters in flash were out of date and if used, would not charge MRO's batteries to the desired levels."

MARS RECONNAISSANCE ORBITER HIRISE IMAGES

View all of the archived HiRISE images.
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

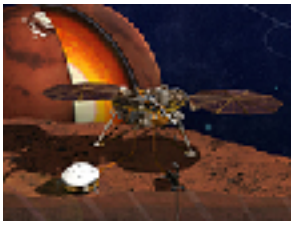
"The daily chatter between antennas here on Earth and those on NASA spacecraft at Mars is about to get much quieter for a few weeks.

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.

Visit the Mars Odyssey Mission page.



InSight - Journey to Mars

InSight - Revealing the Heart of Mars
February 24, 2020
A Year of Surprising Science From NASA's InSight Mars Mission

Full Article & Images

"A new understanding of Mars is beginning to emerge, thanks to the first year of NASA's InSight lander mission. Findings described in a set of six papers published today reveal a planet alive with quakes, dust devils and strange magnetic pulses."

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!

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- 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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