IAAS Monthly Astronomy Newsletter
April 2022

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 9 a.m.

** Check the website for current info during these COVID-19 times. **

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...

"In November 2019, Jupiter and Venus came within 1.4° of each other. This month brings a closer conjunction, with just 12' ultimately separating the pair." Bill Hood, Astronomy Magazine, April 2022, p. 32.

The Month At-A-Glance

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

The Moon

Phases:

- New Moon occurs on the 1st.
- First Quarter Moon occurs on the 9th.
- Full Moon occurs on the 16th.
- Last Quarter Moon occurs on the 23rd.
- New Moon occurs on the 30th.

- The Moon is at apogee (251,306 miles from Earth) on the 7th.
- The Moon is at perigee (226,890 miles from Earth) on the 19th.

Moon/Planet Pairs:

- The Moon passes 0.6° south of Uranus on the 3rd.
- Mars passes 0.3° south of Saturn on the 4th.
- The Moon passes 0.2° south of dwarf planet Ceres on the 6th.
- Jupiter passes 0.1° north of Neptune on the 12th.
- The Moon passes 5° south of Saturn on the 24th.
- The Moon passes 4° south of Mars on the 25th.
- The Moon passes 4° south of Venus on the 26th.
- The Moon passes 4° south of Neptune on the 26th.
- The Moon passes 4° south of Jupiter on the 27th.
- Venus passes 0.007° south of Neptune on the 27th.
- Venus passes 0.2° south of Jupiter on the 30th.

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 April

"Mercury is at its best for Northern Hemisphere observers this month. It's a highlight in the evening sky. The rest of the planetary action takes place in the morning, with the finest conjunction of the year between the two brightest planets, Jupiter and Venus on the last day of the month. In the run-up to that conjunction, Mar, Venus and Saturn open the month in a fine display that constantly changes appearance and makes April mornings a good time to spring out of bed early and catch the continuing spectacle each day." Astronomy Magazine, April 2022, p. 32.

Mercury

Sets at 7:16 p.m. on the 1st and about 9:42 p.m. by month's end. Mercury is in superior conjunction on the 2nd. Mercury is at greatest eastern elongation (21°) on the 29th. Look for Mercury to the west about 30 minutes after sunset one time after mid-month. Mercury moves from the constellation of Pisces into Taurus shining at magnitude 0.3 on the 30.

Venus

Rises at 4:49 a.m. on the 1st and about 4:22 a.m. by month's end. Look for Venus passing just 0.2° south of Jupiter on the 30th. Look for Venus low to the southeast before sunrise. Venus moves from the constellation of Capricornus into Pisces shining at magnitude -4.6.

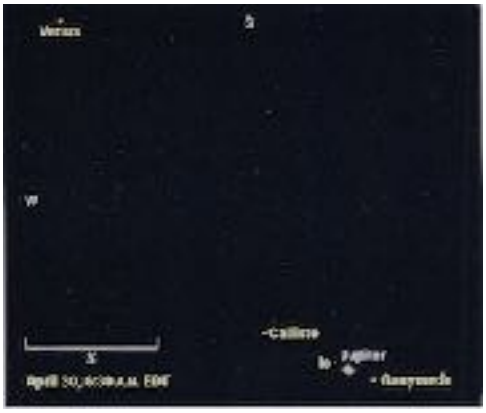
Earth

- N/A.

Mars

Rises at 4:43 a.m. on the 1st and about 3:45 a.m. by month's end. Look for Mars low to the southeast before sunrise. Mars passes 0.3° south of Saturn on the 4th. Mars moves from the constellation of Capricornus into Aquarius shining at magnitude.

Jupiter



Rises about 6:02 a.m. on the 1st and about 4:20 a.m. by month's end. Jupiter can be spotted low to the east-southeast before sunrise. Jupiter passes 0.1° north of Neptune on the 12th. Jupiter moves from the constellation of Aquarius into Pisces shining at magnitude -2.1 .

Saturn

Rises at 4:48 a.m. on the 1st and about 2:56 a.m. by month's end. Look for Saturn low to the southeast before sunrise. Saturn is in the constellation of Capricornus shining at magnitude 0.7.

Uranus

Sets at 9:56 p.m. on the 1st and around 8:06 p.m. by month's end. Look to the southwest soon after sunset to spot Uranus during the first half of the month, after that, Uranus will be lost in the evening twilight glow. Uranus is in the constellation of Aries shining at magnitude 5.9.

Neptune

Rises about 6:08 a.m. on the 1st and about 4:12 a.m. by month's end. Neptune is lost in the morning twilight glow until about mid-month. Look for Venus passing just 0.007° south of Neptune on the 27th. Neptune moves from the constellation of Aquarius into Pisces shining at magnitude 7.8.

Dwarf Planets

Ceres

Sets at 12:36 a.m. on the 1st and about 11:34 p.m. by month's end. Look for Ceres towards the southwest in the early evening. Ceres is in the constellation of Taurus shining at magnitude 8.9.

Pluto

Rises at 3:40 a.m. on the 1st and about 1:43 a.m. by month's end. Pluto is stationary on the 30th. Pluto is in the constellation of Sagittarius shining at magnitude 15.2.

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

Astronomical Events

Meteor Showers

- The Lyrids [meteor shower] are typically visible between April 16 and 25. Maximum occurs during April 21-22. Although the maximum rate is about 10, there have been instances during the last 200 years when rates were near or over 100 per hour. The average magnitude of the meteors is near 2.4 and the speed is described as rapid. About 15% of the meteors leave persistent trains.

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.

Meteor Rx How-To by Terry Bullett (WØASP).

Comets

- "IT'S A FOOL'S ERRAND to think one can reliably predict a comet's maximum brightness, but C/2021 03 (PanSTARRS) has the right characteristics on paper to become the comet of the decade. Could it fizzle? Yes. But with potential disappointment in mind, let's hope the following evening scenario comes to pass.

  Those south of the equator get the first glimpse on the 10th with binoculars, watch it flower into a wonderful sword straight up from the horizon, then all but lose it by the 30th. In the lowest 48 states, the core may rival Mercury on the 21st, as the comet reaches its closest point to the Sun. An ion or sharp dust tail could become visible as twilight deepens. The rest of North America joins in on the 23rd or 24th, when the comet is at peak brightness. Ensure you are away from the city with a clear western horizon shortly after sunset. The comet sets all too quickly as twilight deepens.

  Don't worry about fading post peak: PanSTARRS climbs into a darker sky night after

night, increasing the contrast of its tails against the deep blue twilight. When comets pass between us and the Sun, the brightness boost from forward scattering can be amazing. The geometry is only a bit less favorable and it could last through the first week in May. Consider traveling if you must for this spectacle!" Astronomy Magazine, April 2022, p. 38.

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

- A partial solar eclipse occurs on the 30th. Partiality is visible for parts of the southern Pacific to the west of South America and Antarctica. Greatest partiality occurs over the Straits of Magellan.

- No lunar eclipse activity this month.

Observational Opportunities

(from evening to morning)

- Look for Uranus in the evening.
- Look for Jupiter, Mars, Venus and Saturn in the early morning before sunrise.
- Look for Mercury in the evening late in the month.

Asteroids

(From west to east)

- **Pallas** is in conjunction with the Sun on the 11th.
- **Hygiea** is at opposition on the 28th in the constellation of Libra.

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

In this section 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
3871-2015	2015-11-13 01:55 MST	CO	Charles N	3871a
3587-2015	2015-11-22 17:38 MST	CO	Kevin S	3587aw
3829-2015	2015-12-05 18:06 MST	CO	Burness A	3829a
986-2020	2020-02-21 22:20 MST	CO	Lukas S	986
3716-2020	2020-07-24 23:22 MDT	CO	Lukas S	3716
4774-2021	2021-08-13 21:57 MDT	UT	Lukas S	4774
7044-2021	2021-10-28 20:37 MDT	CO	Burness A	249058

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.

StarLink Train (G4-3)
STARLINK-3200 and others

December 03, 2021

Courtesy of Burness Ansell

Taken with iPhone X @ 6:43 P.M. MST

Traveling from WSW to W passing close to the bright star Altair in Aquila.

Planetary/Lunar Exploration Missions

(Excerpts from recent mission updates)

JPL Latest News

The Latest from Space

JPL Latest News

March 24, 2022
NASA Finalizes Plans for Its Next Cosmic Mapmaker

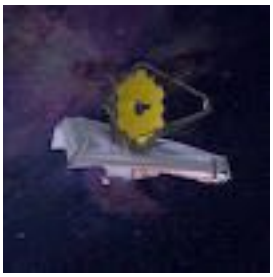
Full Article & Images

"NASA's upcoming SPHEREx mission will be able to scan the entire sky every six months and create a map of the cosmos unlike any before. Scheduled to launch no later than April 2025, it will probe what happened within the first second after the big bang, how galaxies form and evolve, and the prevalence of molecules critical to the formation of life, like water, locked away as ice in our galaxy. Achieving these goals will require cutting-edge technology, and NASA has this month approved final plans for all the observatory's components."

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.



James Webb Space Telescope

March 16, 2022
NASA's Webb Reaches Alignment Milestone, Optics Working Successfully

Full Article & Images

"Following the completion of critical mirror alignment steps, NASA's James Webb Space Telescope team expects that Webb's optical performance will be able to meet or exceed the science goals the observatory was built to achieve.

On March 11, the Webb team completed the stage of alignment known as "fine phasing." At this key stage in the commissioning of Webb's Optical Telescope Element, every optical parameter that has been checked and tested is performing at, or above, expectations. The team also found no critical issues and no measurable contamination

or blockages to Webb's optical path. The observatory is able to successfully gather light from distant objects and deliver it to its instruments without issue."

More information on the James Webb Space Telescope mission is available at The James Webb Space Telescope website.
The public can follow the mission on Facebook, Twitter and YouTube.

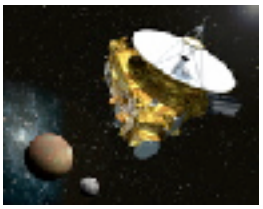
Juno

March 16, 2022
NASA'S JUNO SPACECRAFT GLIMPSES JUPITER'S MOONS IO AND EUROPA

Full Article & Images

"NASA's Juno mission captured this view of Jupiter's southern hemisphere during the spacecraft's 39th close flyby of the planet on Jan. 12, 2022. Zooming in on the right portion of the image (Figure B) reveals two more worlds in the same frame: Jupiter's intriguing moons Io (left) and Europa (right)."

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

March 29, 2022
Pluto's giant ice volcanos may have formed from multiple eruption events

Full Article & Images

"Scientists on NASA's New Horizons mission team have determined multiple episodes of cryovolcanism may have created some kinds of surface structures on Pluto, the likes of which are not seen anywhere else in the solar system. Material expelled from below the surface of this distant, icy planet could have created a region of large domes and rises flanked by hills, mounds and depressions. New Horizons was NASA's mission to make the first exploration of Pluto and its system of five moons."

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 13, 2022
Citizen Scientists Spot Jupiter-like Planet in NASA TESS Data

Full Article & Images

"Tom Jacobs of Bellevue, Washington, loves treasure hunts. Since 2010, the former U.S. naval officer has participated in online volunteer projects that allow anyone who is interested — "citizen scientists" — to look through NASA telescope data for signs of exoplanets, planets beyond our solar system.

Now, Jacobs has helped discover a giant gaseous planet about 379 light-years from Earth, orbiting a star with the same mass as the Sun. The Jupiter-size planet is special for astronomers because its 261-day year is long compared to many known gas giants outside our solar system. The result also suggests the planet is just a bit farther from its star than Venus is from the Sun. The finding was published in the Astronomical Journal and presented at an American Astronomical Society virtual press event on Jan. 13."

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

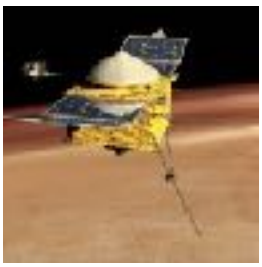
JMARS

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

February 25, 2022
'Go for launch'—the next GOES satellite to include instrument built at CU Boulder

Full Article & Images

LASP
"The newest addition to the National Oceanic and Atmospheric Administration's (NOAA) weather-observing and environmental-monitoring satellite system is slated to launch from the Kennedy Space Center on March 1. The third satellite in the GOES-R+ series includes an instrument built by the Laboratory for Atmospheric and Space Physics (LASP) at CU Boulder that will serve as the nation's "eyes" on the Sun."

MAVEN
February 3, 2022
The MAVEN Team Playlist
"Ever wonder what the MAVEN team is listening to while studying the Red Planet? We asked the scientists and engineers behind the MAVEN mission what they listen to while working and what they thought MAVEN's favorite songs might be. This led to an amazing playlist with songs of all different genres. Listen along to MAVEN's favorite hits!"

Listen on Spotify!

Visit LASP and MAVEN for more information.

Mars 2020 - Perseverance

March 18, 2022
NASA's Perseverance Rover Hightails It to Martian Delta

Full Article & Images

"NASA's Perseverance Mars rover is trying to cover more distance in a single month than any rover before it – and it's doing so using artificial intelligence. On the path ahead are sandpits, craters, and fields of sharp rocks that the rover will have to navigate around on its own. At the end of the 3-mile (5-kilometer) journey, which began March 14, 2022, Perseverance will reach an ancient river delta within Jezero Crater, where a lake existed billions of years ago."

Learn more about the Mars 2020 (Perseverance) mission.

Mars Science Laboratory - Curiosity

March 30, 2022
Sols 3430-3431: Out Like a Lamb... "Baa"

Full Article & Images

"The rover engineers better understand the minor issue that occurred after our weekend activities. While we're still in the same location, they can fix the issue in this plan. Our arm activities in the previous plan executed successfully. Today we focused on recovering the mast activities, as well as getting bonus, additional contact science at this location before driving."

Check out information about NASA's partnership with Foursquare.
Visit the Mars Science Laboratory page.

Mars Reconnaissance Orbiter Mission

February 14, 2022
How Do Spacecraft Deal with Dust Storms on Mars?

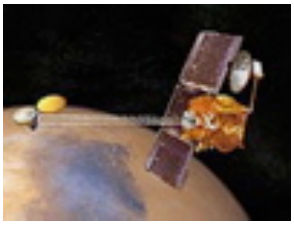
Full Article & Images

"A large dust storm on Mars, nearly twice the size of the United States, covered the southern hemisphere of the Red Planet in early January 2022, leading to some of NASA's explorers on the surface hitting pause on their normal activities. NASA's Insight lander put itself in a "safe mode" to conserve battery power after dust prevented sunlight from reaching the solar panels. NASA's Ingenuity Mars Helicopter also had to postpone flights until conditions improved. A fleet of NASA orbiters monitor Martian dust storms like this one and serve as lifelines to Earth by relaying data from the rovers and

lander on the ground back to the team. This includes the Mars Reconnaissance Orbiter, MAVEN, and Odyssey. Odyssey, while facing its technical issue, was able to recover quickly enough to come to InSight's aid during the dust storm."

MARS RECONNAISSANCE ORBITER HIRISE IMAGES

View all of the archived HiRISE images.
More information about the MRO mission is available online.



Mars Odyssey Orbiter

April 7, 2021
NASA's Odyssey Orbiter Marks 20 Historic Years of Mapping Mars

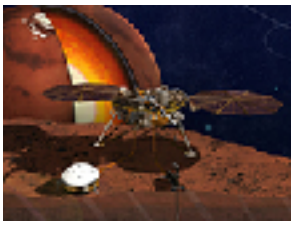
Full Article & Images

"NASA's 2001 Mars Odyssey spacecraft launched 20 years ago on April 7, making it the oldest spacecraft still working at the Red Planet. The orbiter, which takes its name from Arthur C. Clarke's classic sci-fi novel "2001: A Space Odyssey" (Clarke blessed its use before launch), was sent to map the composition of the Martian surface, providing a window to the past so scientists could piece together how the planet evolved."

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.



Mars InSight - Journey to Mars

InSight - Revealing the Heart of Mars
January 11, 2022
NASA's InSight Sees Power Levels Stabilize After Dust Storm

Full Article & Images

"***Updated Feb. 15, 2022, at 2:35 p.m. PST (5:35 p.m. EST):***

Several weeks after the end of a dust storm on Mars, the solar panels of NASA's InSight lander are producing almost as much power as they did before the storm. That power level should enable the lander to continue science operations into the summer.

The team anticipates that continued dust accumulation will progressively diminish the spacecraft's overall power budget in the months ahead and has been carefully

conserving energy by turning on science instruments for limited periods of time. Having completed all primary mission science objectives, the goal now is to enable the spacecraft to operate through the end of its extended mission in December. A passing whirlwind that removes dust or a new dust storm that increases the dust accumulation could alter the timeline."

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: April 01, 2022