IAAS Monthly Astronomy Newsletter October 2021

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!

"Mercury takes center stage in this early stage January 2018 shot. The solar system's smallest planet once again rules the dawn twilight this month in its best morning appearance of 2021." Astronomy Magazine, October 2021, P. 32.
Alan Dyer

In This Newsletter...

The Month At-A-Glance

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

The Moon

Phases:

- New Moon occurs on the 6th.
- First Quarter Moon occurs on the 12th.
- Full Moon occurs on the 20th.
- Last Quarter Moon occurs on the 28th.

- The Moon is at perigee on the 8th, 225,797 miles from Earth.
- The Moon is at apogee on the 24th, 252,038 miles from Earth.

Moon/Planet Pairs:

- The Moon passes 3° north of Venus on the 9th.
- The Moon passes 4° south of Saturn on the 14th.
- The Moon passes 4° south of Jupiter on the 15th.
- Venus passes 1.5° north of Antares on the 16th.
- The Moon passes 4° south of Neptune on the 17th.
- The Moon passes 1.3° south of Uranus on the 21st.
- Mercury passes 4° north of Spica on the 31st.

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.

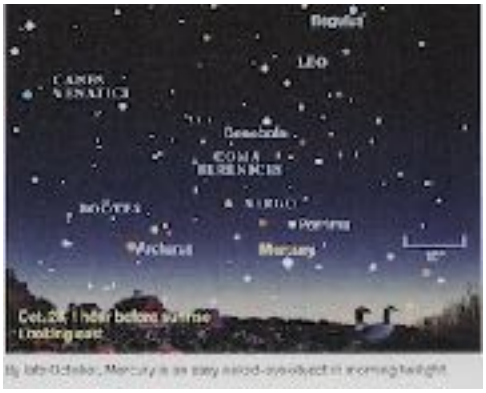
(All times are local unless otherwise noted.)

Planetary Highlights for October

"Mercury springs into action in the last two weeks of October, offering its best morning appearance for 2021. Venus, by contrast, hangs low in the southwestern sky all month. Jupiter and Saturn dominate the evening sky, visible through midnight. And late-evening binocular views of Uranus and Neptune beckon more adventurous observers." Astronomy Magazine, October 2021, P. 32.

Mercury

Is in inferior conjunction on the 9th. Mercury is stationary on the 17th. Mercury is at greatest western elongation (18°) on the 25th. Mercury sets at 7:00 p.m. on the 1st After the 9th, Mercury returns to the morning sky, rising with the Sun. Mercury rises around 6:05 a.m. by month's end. Look for Mercury to the east about 30 minutes before sunrise during the last two weeks of October. The best morning to try and spot Mercury is on the 25th, when Mercury is highest in the east. Mercury is in the constellation of Virgo shining at magnitude -0.8 on the 31st.



Venus

Is at greatest eastern elongation (47°) on the 29th. Venus sets at 8:30 p.m. on the 1st and about 8:23 p.m. by month's end. Look for Venus in the west soon after sunset. Venus moves from the constellation of Libra into Ophiuchus shining at magnitude -4.4 on the 15th.

Earth

N/A.

Mars

Is in conjunction with the Sun on the 7th. Mars is too close to the Sun to be visible this month. Mars will return to the morning sky in December. Mars is in the constellation of Virgo shining at magnitude 1.6.

Jupiter
Sets at 3:13 a.m. on the 1st and about 1:10 a.m. by month's end. Jupiter is stationary on the 18th. Look for Jupiter in the south, soon after sunset. Jupiter is in the constellation of Capricornus shining at magnitude -2.6.

Saturn
Rises at 1:53 a.m. on the 1st and about 11:49 p.m. by month's end. Saturn is stationary on the 10th. Look for Saturn in the south, soon after sunset. Saturn is in the constellation of Capricornus shining at magnitude 0.5.

Uranus
Rises at 8:06 p.m. on the 1st and around 6:01 p.m. by month's end. Look for Uranus to the southeast after the skies darken to spot Uranus with binoculars or a small telescope. Uranus is in the constellation of Aries shining at magnitude 5.7.

Neptune
Rises at 5:58 p.m. on the 1st and about 3:55 p.m. by month's end. By the time the Sun sets, Neptune should be high enough in the southeast to be spotted once the skies are very dark. Neptune is in the constellation of Aquarius shining at magnitude 7.7.

Dwarf Planets
Ceres
Rises at 10:03 p.m. on the 1st and about 7:52 p.m. by month's end. Look for Ceres in the late evening, or around midnight, when it is higher in the southern sky. Ceres is in the constellation of Taurus shining at magnitude 8.0.

Pluto
Sets at 12:45 a.m. on the 1st and about 10:40 p.m. by month's end. Pluto is visible in the evening sky, to the southwest, but will require moonless, dark sky nights well away from city lights. Pluto is in the constellation of Sagittarius shining at magnitude 14.4.

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.

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

- "WE HAVE A MULTITUDE of 10th- to 11th-magnitude comets to choose from this month. The least erratic is 67P/Churyumov-Gerasimenko. Approaching as close to us as Mars, it receives a modest cooking from the Sun's rays, pouring out dust in a reasonably reliable way.

After midnight, find it following Aldebaran up the northeastern sky. On Oct. 8, it skims only 1° north of the Crab Nebula (M1). And your reward for waiting until moonset before dawn on the 16th is the comet posing with the splashy star cluster M35 in Gemini.

This snowball's soft glow will need a 4-inch scope under dark skies. An 8-inch aperture reveals the well-defined bow shock on the eastern flank, where the solar wind pushes back the dust. At month's end, Earth passes through the plane of the comet's orbit, giving us an edge-on view and a good chance at seeing a weak anti-tail, where the dust and ion stream poke out the other side.

Also don't miss 4P/Faye, cruising 8° to the south. It too gives us a plane crossing (on the 6th). About the same distance to Churyumov-Gerasimenko's northeast, perhaps C/2019 L3 (ATLAS) will be acting up. Meanwhile, 6P/d'Arrest swipes past globular cluster M55 in Sagittarius midmonth, but this small comet will be a pale fuzz in comparison." Astronomy Magazine, October 2021, 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

- No solar eclipse activity this month.

- No lunar eclipse activity this month.

Observational Opportunities

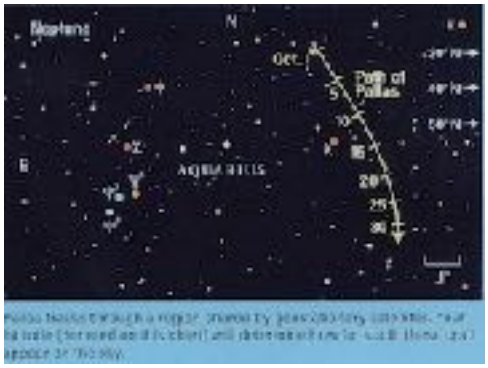
(from evening to morning)

- Look for Venus in the early evening, just after sunset.
- Look for Saturn and Jupiter in the evening before midnight.
- Look for Neptune and Uranus in the late evening and early morning.
- Look for Mercury in the early morning before sunrise late in the month.

Asteroids

(From west to east)

- **Hebe** is in the constellation of Sagittarius.
- **Pallus** is in the constellation of Aquarius.
- **Harmonia** is at opposition on the 1st in the constellation of Cetus.
- **Nysa** is in the constellation of Taurus.
- **Iris** is in the constellation of Gemini.



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
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
3716-2020	2020-07-24 23:22 MDT	CO	Lukas S	3716
4774-2021	2021-08-13 21:57 MDT	UT	Lukas S	4774

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.

Jupiter/Saturn Conjunction December 21, 2020

Several images from the recent conjunction.
Courtesy of Milton Omoto and Ed Hubbs

Planetary/Lunar Exploration Missions

(Excerpts from recent mission updates)

JPL Latest News

The Latest from Space

JPL Latest News

September 28, 2021
NASA's Mars Fleet Lies Low With Sun Between Earth and Red Planet

Full Article & Images

"The missions will continue collecting data about the Red Planet, though engineers back on Earth will stop sending commands to them until mid-October.

NASA will stand down from commanding its Mars missions for the next few weeks while Earth and the Red Planet are on opposite sides of the Sun. This period, called Mars solar conjunction, happens every two years.

The Sun expels hot, ionized gas from its corona, which extends far into space. During solar conjunction, when Earth and Mars can't "see" each other, this gas can interfere with radio signals if engineers try to communicate with spacecraft at Mars. That could corrupt commands and result in unexpected behavior from our deep space 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

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

Juno

August 5, 2021
NASA's Juno Celebrates 10 Years With New Infrared View of Moon Ganymede

Full Article & Images

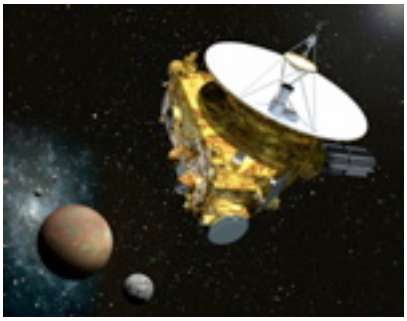
"*The spacecraft used its infrared instrument during recent flybys of Jupiter's mammoth moon to create this latest map, which comes out a decade after Juno's launch.*

The science team for NASA's Juno spacecraft has produced a new infrared map of the mammoth Jovian moon Ganymede, combining data from three flybys, including its

latest approach on July 20. These observations by the spacecraft's Jovian Infrared Auroral Mapper (JIRAM) instrument, which "sees" in infrared light not visible to the human eye, provide new information on Ganymede's icy shell and the composition of the ocean of liquid water beneath.

JIRAM was designed to capture the infrared light emerging from deep inside Jupiter, probing the weather layer down to 30 to 45 miles (50 to 70 kilometers) below Jupiter's cloud tops. But the instrument can also be used to study the moons Io, Europa, Ganymede, and Callisto (known collectively as the Galilean moons in honor of their discoverer, Galileo)."

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

July 14, 2021
Great Exploration Revisited: New Horizons at Pluto and Charon

Full Article & Images

"Six years ago today, NASA's New Horizons spacecraft made history with the first up-close exploration of the Pluto system – providing breathtaking views and detailed data on Pluto and its largest moon, Charon, revealing the surfaces of these distant, mysterious worlds at the outer reaches of our solar system.

These simulated flights over Pluto and Charon include some of the sharpest images and topographic data that New Horizons gathered during its historic flyby on July 14, 2015. These are the first "movies" of Pluto and Charon made from the highest-resolution black-and-white image strips, taken by New Horizons' Long Range Reconnaissance Imager (LORRI), as the spacecraft zipped by at more than 30,000 miles per hour."

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

August 4, 2021

NASA's TESS Tunes into an All-sky 'Symphony' of Red Giant Stars

Full Article & Images

"Using observations from NASA's Transiting Exoplanet Survey Satellite (TESS), astronomers have identified an unprecedented collection of pulsating red giant stars all across the sky. These stars, whose rhythms arise from internal sound waves, provide the opening chords of a symphonic exploration of our galactic neighborhood.

TESS primarily hunts for worlds beyond our solar system, also known as exoplanets. But its sensitive measurements of stellar brightness make TESS ideal for studying stellar oscillations, an area of research called asteroseismology."

A paper describing the findings, led by Hedges, was published in The Astronomical Journal."

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

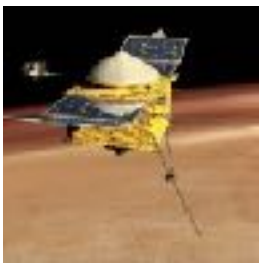
JMARS

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

September 23, 2021
CUTE, LASP's latest cereal box-sized spacecraft, to study 'Hot Jupiter' exoplanets

Full Article & Images

"A new miniature satellite designed and built by CU Boulder's Laboratory for Atmospheric and Space Physics (LASP) researchers and engineers is providing proof that "cute" things can take on big scientific challenges.

The Colorado Ultraviolet Transit Experiment (CUTE) is slated to launch into space Sept. 27. The approximately $4 million spacecraft, a smaller-than-usual type of satellite known as a "CubeSat," is about as large as a "family-sized box of Cheerios," said LASP researcher Kevin France, principal investigator for the mission.

But it has mighty goals: Over the course of about 7 months, the mission will track the volatile physics around a class of extremely hot planets orbiting stars far away from Earth. It's the first CubeSat mission funded by NASA to peer at these distant worlds—marking a major test of what small spacecraft may be capable of."

Visit LASP and MAVEN for more information.

Mars 2020 - Perseverance

September 23, 2021
NASA's Perseverance Rover Cameras Capture Mars Like Never Before

Full Article & Images

"*Scientists tap into an array of imagers aboard the six-wheeled explorer to get a big picture of the Red Planet.*

NASA's Perseverance rover has been exploring Jezero Crater for more than 217 Earth days (211 Martian days, or sols), and the dusty rocks there are beginning to tell their story -- about a volatile young Mars flowing with lava and water.

That story, stretching billions of years into the past, is unfolding thanks in large part to the seven powerful science cameras aboard Perseverance. Able to home in on small features from great distances, take in vast sweeps of Martian landscape, and magnify tiny rock granules, these specialized cameras also help the rover team determine which rock samples offer the best chance to learn whether microscopic life ever existed on the Red Planet."

Learn more about the Mars 2020 (Perseverance) mission.

Mars Science Laboratory - Curiosity

September 27, 2021
MISSION UPDATES - Sols 3251-3253: Celebrating Another Go Around

Full Article & Images

"Solar conjunction is once again upon us - the time when the Sun comes between Mars and Earth in their orbital dances and precludes reliable communication between us and our robotic friends. This is the fifth conjunction Curiosity has experienced, and such a regular, cosmic event like conjunction provides the perfect time to reflect - where were we the last time Mars, Earth and the Sun aligned like this? Looking back over what we were up to around each conjunction is very much like looking through a scrapbook of memories.

We headed into our first conjunction, starting on Sol 236 (April 2013), fresh off the excitement of finding evidence of a habitable environment in our first drill sample "John Klein," and still feeling the relief of having survived a major fault with the A side computer. Curiosity runs on the B side computer to this day."

Check out information about NASA's partnership with Foursquare.

Visit the Mars Science Laboratory page.

Mars Reconnaissance Orbiter Mission

September 15, 2021
NASA Confirms Thousands of Massive, Ancient Volcanic Eruptions on Mars

Full Article & Images

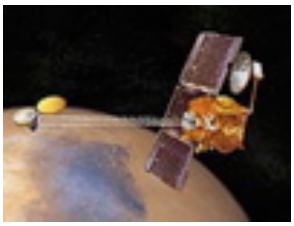
"*Scientists found evidence that a region of northern Mars called Arabia Terra experienced thousands of "super eruptions," the biggest volcanic eruptions known, over a 500-million-year period.*

Some volcanoes can produce eruptions so powerful they release oceans of dust and toxic gases into the air, blocking out sunlight and changing a planet's climate for decades. By studying the topography and mineral composition of a portion of the Arabia Terra region in northern Mars, scientists recently found evidence for thousands of such eruptions, or "super eruptions," which are the most violent volcanic explosions known.

Spewing water vapor, carbon dioxide, and sulfur dioxide into the air, these explosions tore through the Martian surface over a 500-million-year period about 4 billion years ago. Scientists reported this estimate in a paper published in the journal Geophysical Research Letters in July 2021."

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

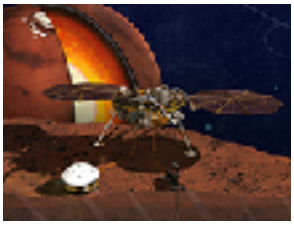
Full Article & Images

"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
September 22, 2021
NASA's InSight Finds Three Big Marsquakes, Thanks to Solar-Panel Dusting

Full Article & Images

"*The lander cleared enough dust from one solar panel to keep its seismometer on through the summer, allowing scientists to study the three biggest quakes they've seen on Mars.*

On Sept. 18, NASA's InSight lander celebrated its 1,000th Martian day, or sol, by measuring one of the biggest, longest-lasting marsquakes the mission has ever detected. The temblor is estimated to be about a magnitude 4.2 and shook for nearly an hour-and-a-half.

This is the third major quake InSight has detected in a month: On Aug. 25, the mission's seismometer detected two quakes of magnitudes 4.2 and 4.1. For comparison, a magnitude 4.2 quake has five times the energy of the mission's previous record holder, a magnitude 3.7 quake detected in 2019."

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.
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Keep looking UP!

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JPL Solar System Ambassador, Colorado
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