IAAS Monthly Astronomy Newsletter January 2019

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

This newsletter is published on the World Wide Web at http://www.ki0ar.com/astro.html - The Home of KIØAR - and is received nationally and internationally. A PDF formatted downloadable version of the newsletter is at http://www.ki0ar.com/current_nl.pdf.

An Open Invitation - For amateur radio operators and scanner enthusiasts, when in the Denver metro area, please join the Colorado Astronomy Net on the Rocky Mountain Radio League's WØWYX **146.94 MHz** and **449.825 MHz** repeaters. The RMRL **146.94** repeater is also linked with the WBØWDF Cripple Creek **447.400 MHz** repeater and Allstar nodes **28298**, **28299**, **29436**. We are also linked via Echolink, links are **k0jsc-r** and **canoncty** courtesy of KØJSC and KØGUR. More information on the WBØWDF repeater links, Allstar nodes and Echolinks can be found at k0jsc.com. We are also linked with Allstar nodes in Florida as well, courtesy of KA4EPS. The net meets on Tuesday nights at 7 P.M. Mountain Time (US).

Obtain your Amateur Radio (Ham) License or your General Radio Operator's License (GROL)! Visit the South Metro VE Team website for more information. The South Metro VE Team provides test sessions on the 1st Saturday of each month at our new Eagle Street Facility, The City of Centennial, 7272 South Eagle Street, Centennial, Colorado 80112-4244 at 9am.

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

Excerpts from JPL mission updates are provided as a public service as part of the JPL Solar System Ambassador / NASA Outreach program.

Donate to the IAAS!

Shop Smile.Amazon.com, sign up or sign in to smile.amazon.com and select the **International Association for Astronomical Studies**. 0.5% of every purchase will be donated to the group. Thank you!

In This Newsletter...

"The orange glow from all Earth's sunrises and sunsets painted the Moon during the September 28, 2015, total lunar eclipse. Observers across the Americas should get a similar view the night of January 20/21." Astronomy Magazine, January 2019, p.36.
José J. Chambó

The Month At-A-Glance

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

The Moon

Phases:

- New Moon occurs on the 5th.
- First Quarter Moon occurs on the 14th.
- Full Moon occurs on the 21st.
- Last Quarter Moon occurs on the 27th.

- The Moon is at Apogee on the 8th, 252,850 miles from Earth.
- The Moon is at Perigee on the 21st, 222,042 miles from Earth.

Moon/Planet Pairs:

- The Moon passes 1.3° north of Venus on the 1st.
- The Moon passes 3° north of Jupiter on the 3rd.
- The Moon passes 3° south of Neptune on the 10th.
- The Moon passes 5° south of Mars on the 12th.
- The Moon passes 5° south of Uranus on the 14th.
- Venus passes 8° north of Antares on the 15th.
- Venus passes 2° north of Jupiter on the 22nd.
- The Moon passes 3° north of Jupiter on the 30th.
- The Moon passes 0.09° north of Venus on the 31st.

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

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 January

The highlight for the new year is the total lunar eclipse that occurs on the evening/ morning of the 20/21st. This eclipse will be visible over most of the U.S. Neptune, Mars and Uranus are visible early in the evenings. Venus, Jupiter and Saturn are visible in the early morning skies. The Quadrantid meteor shower peaks during the first week of the new year. Comet 46P/Wirtanen passes through Ursa Major.

Mercury

Is in superior conjunction on the 29th. Mercury is visible for the first two weeks in the month, then is lost in the morning twilight glow. Mercury rises at 6:13 a.m. on the 1st and about 7:24 a.m. by month's end. Look for Mercury low to the east about 30 minutes before sunrise. Mercury moves from the constellation of Ophiuchus into Capricornus this month shining at magnitude -0.4 on the 1st.

Venus

Is at greatest western elongation (47°) on the 5th. Venus rises at 3:36 a.m. on the 1st and about 4:12 a.m. by month's end. Look for Venus in the southeast about an hour before sunrise. Venus moves from the constellation of Libra into Sagittarius shining at magnitude -4.5 on the 15th.

Earth

Is at perihelion (91.4 million miles from the Sun) on the 2nd.

Mars

Sets at 11:20 p.m. on the 1st and about 11:04 p.m. by month's end. Look to the southwest soon after sunset to spot Mars. Mars is in the constellation of Pisces shining at magnitude 0.7.

Jupiter
Rises at 5:12 a.m. on the 1st and about 3:38 a.m. by month's end. Jupiter is visible in the morning sky before sunrise. Venus passes 2° north of Jupiter before dawn on the 22nd. Jupiter is in the constellation of Ophiuchus shining at magnitude -1.8.

Saturn
Is in conjunction with the Sun on the 2nd. Saturn rises at 7:22 a.m. on the 1st and about 5:34 a.m. by month's end. Look for Saturn towards the east during the last two weeks of January. Saturn is in the constellation of Sagittarius shining at magnitude 0.6.

Uranus
Is stationary on the 6th. Uranus sets at 1:42 a.m. on the 1st and about 11:38 p.m. by month's end. Look for Uranus about an hour or so after sunset to the southwest. Uranus moves from the constellation of Pisces into Aries shining at magnitude 5.8.

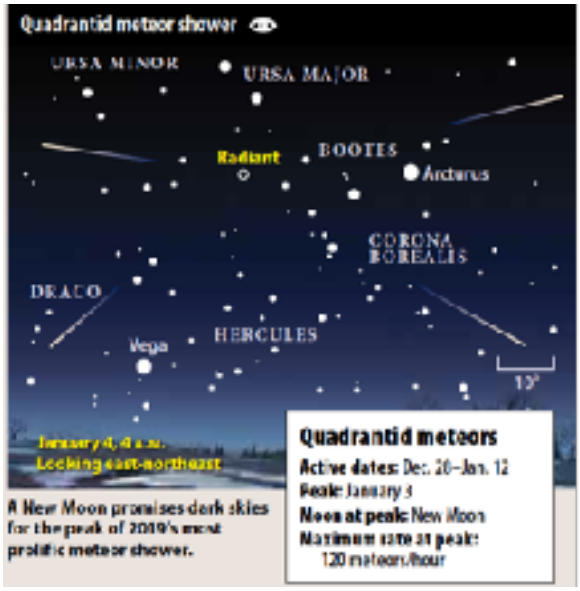
Neptune
Sets 9:56 p.m. on the 1st and about 7:58 p.m. by month's end. Neptune is visible to the southwest about an hour after sunset. Neptune is in the constellation of Aquarius shining at magnitude 7.9.

Dwarf Planets
Ceres
Rises at 3:16 a.m. on the 1st and about 2:07 a.m. by month's end. Ceres can be spotted low to the southeast in the early morning hours before sunrise. Ceres moves from the constellation of Libra into Scorpius shining at magnitude 8.9.

Pluto
Is in conjunction with the Sun on the 11th. Pluto is not visible this month as it is lost in the twilight glow of the Sun. Pluto is in the constellation of Sagittarius shining at magnitude 14.3.

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

Astronomical Events



Meteor Showers

- The Quadrantids - This shower is generally visible between December 28 and January 7, with a very sharp maximum of 45 to 200 meteors per hour occurring during January 3 and 4. The meteors tend to be bluish and possess an average magnitude of about 2.8.

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 - "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 46P/Wirtanen became the brightest periodic comet of 2018 in December, and it starts 2019 in nearly as good shape. Astronomers expect it to glow around 7th magnitude in early January as it crosses the border from northeastern Lynx into western Ursa Major. Fortunately, this region remains visible all night from mid-northern latitudes, climbing highest soon after midnight local time. Use 3rd-magnitude Omicron (o) Ursae Majoris — the nose of the Great Bear — as your guide. Wirtanen slides 1° south of Omicron on January 10." Astronomy Magazine, January 2019, p.42.

For information, orbital elements and ephemerides on observable comets visit the Observable Comets page from the Harvard-Smithsonian Center for Astrophysics. (http://cfa-www.harvard.edu/iau/Ephemerides/Comets/index.html)

For more information about Comets, visit Gary Kronk's Cometography.com web page at http://cometography.com/.

Eclipses

- A Partial Solar Eclipse occurs on January 6th. Unfortunately, this eclipse will be visible only from northeast Asia and the North Pacific and occurs at 8:42 p.m. EST. Predicted coverage: 20% of the sun covered from Beijing, 30% from Tokyo and 37% from Vladivostok, Russia.

- A Total Lunar Eclipse occurs on the evening of January 20/21.

This eclipse is the Super Blood Wolf Moon.

Timing of events	**Jan. 20, 2019**	**Jan. 21, 2019**
The Moon enters outer Penumbra	9:37 p.m. EST	
Partial eclipse begins	10:34 p.m. EST	
Totality begins	11:41 p.m. EST	
Totality ends		12:43 a.m. EST
Partial eclipse ends		1:51:a.m. EST
The Moon exits outer Penumbra		2:48 a.m. EST

Observational Opportunities

(from evening to morning)

- Enjoy the Total Lunar Eclipse on the evening of the 20/21st.
- View Mars in the early evening sky after sunset.
- Look for Mercury, Venus, Jupiter and Saturn shining brightly in the morning sky.
- Watch for the Quadrantid meteors.
- Try to spot Comet 46P/Wirtanen passing through Lynx and Ursa Major.

Asteroids

(From west to east)

- **Juno** is in the constellation of Eridanus.
- **Eros** is in the constellation of Auriga.
- **Hebe** is in the constellation of Orion.
- **Herculina** is in the constellation of Leo.
- **Pallas** is in the constellation of Virgo.

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.

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

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.

August 21, 2017 - Total Solar Eclipse - "Bailey's Beads" and the "Diamond Ring"
Taken by: Burness Ansell, Location: Guernsey, WY - More to come. I will be creating a special Solar Eclipse page to showcase subscriber contributions.

Planetary/Lunar Exploration Missions

(Excerpts from recent mission updates)

JPL Latest News

The Latest from Space

JPL Latest News

December 21, 2018
Holiday Asteroid Imaged with NASA Radar

Full Article & Images

"The December 2018 close approach by the large, near-Earth asteroid 2003 SD220 has provided astronomers an outstanding opportunity to obtain detailed radar images of the surface and shape of the object and to improve the understanding of its orbit.

The asteroid will fly safely past Earth on Saturday, Dec. 22, at a distance of about 1.8 million miles (2.9 million kilometers). This will be the asteroid's closest approach in more than 400 years and the closest until 2070, when the asteroid will safely approach Earth slightly closer.

The radar images reveal an asteroid with a length of at least one mile (1.6 kilometers) and a shape similar to that of the exposed portion of a hippopotamus wading in a river. They were obtained Dec. 15-17 by coordinating the observations with NASA's 230-foot (70-meter) antenna at the Goldstone Deep Space Communications Complex in California, the National Science Foundation's 330-foot (100-meter) Green Bank Telescope in West Virginia and the Arecibo Observatory's 1,000-foot (305-meter) antenna in Puerto Rico."

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

Past, Present, Future and Proposed JPL Missions - http://www.jpl.nasa.gov/missions.

For special JPL programs and presentations in your area visit the JPL Solar System Ambassador web site at http://www2.jpl.nasa.gov/ambassador/index.html.

Juno
December 11, 2018
NASA's Juno Mission Halfway to Jupiter Science

Full Article & Images

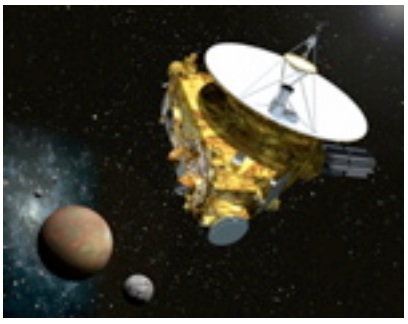
"On Dec. 21, at 8:49:48 a.m. PST (11:49:48 a.m. EST) NASA's Juno spacecraft will be 3,140 miles (5,053 kilometers) above Jupiter's cloud tops and hurtling by at a healthy clip of 128,802 mph (207,287 kilometers per hour). This will be the 16th science pass of the gas giant and will mark the solar-powered spacecraft's halfway point in data collection during its prime mission.

Juno is in a highly-elliptical 53-day orbit around Jupiter. Each orbit includes a close passage over the planet's cloud deck, where it flies a ground track that extends from Jupiter's north pole to its south pole."

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

More information on the Juno mission is available at: http://www.nasa.gov/juno

The public can follow the mission on Facebook and Twitter at:
http://www.facebook.com/NASAJuno
http://www.twitter.com/NASAJuno



New Horizons
December 27, 2018
The PI's Perspective: Anticipation on Ultima's Doorstep!

Full Article & Images

"The New Horizons spacecraft is healthy and on final approach to the first close-up exploration of a Kuiper Belt object in history, and the farthest exploration of any world, ever.

In just a few days, on New Year's Eve and New Year's Day, New Horizons will swoop three times closer to our target—2014 MU69 (nicknamed Ultima Thule)—than we flew past Pluto. The anticipation is palpable now: we are on the verge of an important scientific exploration almost 20 years in the making and, in many ways, unlike any other ever attempted."

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

November 07, 2018
Cosmic Detective Work: Why We Care About Space Rocks

Full Article & Images

"The entire history of human existence is a tiny blip in our solar system's 4.5-billion-year history. No one was around to see planets forming and undergoing dramatic changes before settling in their present configuration. In order to understand what came before us -- before life on Earth and before Earth itself -- scientists need to hunt for clues to that mysterious distant past.

Those clues come in the form of asteroids, comets and other small objects. Like detectives sifting through forensic evidence, scientists carefully examine these small bodies for insights about our origins. They tell of a time when countless meteors and asteroids rained down on the planets, burned up in the Sun, shot out beyond the orbit of Neptune or collided with one another and shattered into smaller bodies. From distant, icy comets to the asteroid that ended the reign of the dinosaurs, each space rock contains clues to epic events that shaped the solar system as we know it today -- including life on Earth."

For more information on the Dawn mission, visit the Dawn home page: http://www.nasa.gov/mission_pages/dawn/main/index.html.

TESS

September 25, 2018
NASA Is Taking a New Look at Searching for Life Beyond Earth

Full Article & Images

"Since the beginning of civilization, humanity has wondered whether we are alone in the universe. As NASA has explored our solar system and beyond, it has developed increasingly sophisticated tools to address this fundamental question. Within our solar system, NASA's missions have searched for signs of both ancient and current life, especially on Mars and soon, Jupiter's moon Europa. Beyond our solar system, missions, such as Kepler and TESS, are revealing thousands of planets orbiting other stars."

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

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

September 20, 2018
MAVEN Selfie Marks Four Years in Orbit at Mars

Full Article & Images

"Today, NASA's MAVEN spacecraft celebrates four years in orbit studying the upper atmosphere of the Red Planet and how it interacts with the Sun and the solar wind. To mark the occasion, the team has released a selfie image of the spacecraft at Mars."

Visit LASP and MAVEN for more information.

Mars Science Laboratory - Curiosity
December 21, 2018
Sols 2276-2278: Capturing Light into the New Year

Full Article & Images

"As we cross the winter solstice and daylight lengthens here on Earth, the Vera Rubin Ridge campaign on Mars is shortening up towards a science-filled end 'capturing the light' across all its splendid spectrum. On sol 2276, the plan includes a CheMin analysis to illuminate the drill sample "Rock Hall" in X-ray light, staring at the plasma glow from the ultra violet through the visible into the near infrared (what you see with your eyes and slightly beyond) from ChemCam on bedrock targets "Auchenheath," "Firth of Forth," and "Port Charlotte" as well as a panchromatic (artsy black and white) RMI mosaic of the large white vein "Hopetoun." All these targets also get viewed in their red-green-blues (i.e. color) using Mastcam."

To follow the Mars Curiosity rover and NASA on Foursquare, visit: http://www.foursquare.com/MarsCuriosity and http://www.foursquare.com/NASA

For information about NASA's partnership with Foursquare, visit: http://www.nasa.gov/connect/foursquare.html.

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

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

Mars Exploration Rover Mission (Spirit and Opportunity)
December 20, 2018

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: Over Six Months Without Word From Opportunity - *sols 5292 to 5299, Dec. 13, 2018 - Dec. 20, 2018:*

"Mars atmospheric opacity (tau) over the rover site remains at a storm-free range around 1.0.

No signal from Opportunity has been heard since Sol 5111 (June 10, 2018). Opportunity likely experienced a low-power fault, a mission clock fault and an up-loss timer fault. Since the loss of signal, the team has been listening for the rover over a broad range of times, frequencies and polarizations using the Deep Space Network (DSN) Radio Science Receiver.

They have been commanding "sweep and beeps" throughout each daily DSN pass with both right-hand and left-hand circular polarization to address a possible complexity with certain conditions within mission clock fault on the rover. The team has expanded the breath of sweep and beep commanding covering more times of day on Mars.

Mars is now in the seasonal period of past dust clearing events for the rover. Since loss of signal, 456 recovery commands have been radiated to the rover.

Total odometry is unchanged at 28.06 miles (45.16 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

December 21, 2018
The von Kármán Lecture Series: 2019

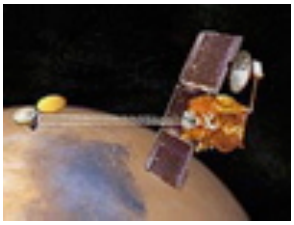
Full Article & Images

"Red Planet Rovers and Insights
January 10 & 11

Get the scoop on the latest missions at Mars. This lecture will bring you up to speed on all things Mars, including: The biggest dust storm in a decade, rolling (and drilling) on "Rubin Ridge," a new rover under construction, and a recent arrival on Mars preparing to get down to business."

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

July 30, 2018
Mars Terraforming Not Possible Using Present-Day Technology

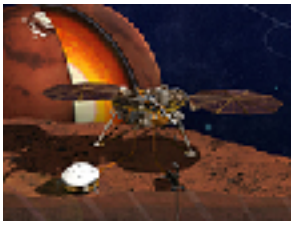
Full Article & Images

"Science fiction writers have long featured terraforming, the process of creating an Earth-like or habitable environment on another planet, in their stories. Scientists themselves have proposed terraforming to enable the long-term colonization of Mars. A solution common to both groups is to release carbon dioxide gas trapped in the Martian surface to thicken the atmosphere and act as a blanket to warm the planet."

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
December 19, 2018
NASA's InSight Places First Instrument on Mars

Full Article & Images

"NASA's InSight lander has deployed its first instrument onto the surface of Mars, completing a major mission milestone. New images from the lander show the seismometer on the ground, its copper-colored covering faintly illuminated in the Martian dusk. It looks as if all is calm and all is bright for InSight, heading into the end of the year."

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!

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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.

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

Keep looking UP!

73 from KI0AR

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