IAAS Monthly Astronomy Newsletter March 2014

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 KI0AR - 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 (http://rmrl.hamradios.com/) 146.94 MHz repeater on Tuesday nights at 7 P.M. local time.

Special Notice to Denver, CO residents and visitors to the area: The Plains Conservation Center in Aurora hosts Full Moon Walks every month, weather permitting, on or near the night of the full Moon. Visit http://www.plainsconservationcenter.org for more information and directions.

Also S&S Optika hosts Backyard Star Parties in Littleton several times a month, weather permitting. Come down and enjoy the fun and check out their fine selection of optical instruments.

Excerpts from JPL mission updates are provided as a public service as part of the JPL Solar System Ambassador / NASA Outreach program. http://www2.jpl.nasa.gov/ambassador/index.html

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 1st.
- First Quarter Moon occurs on the 8th.
- Full Moon occurs on the 16th.
- Last Quarter Moon occurs on the 23rd.
- New Moon occurs on the 30th.

- The Moon is at Apogee on the 11th, 251,881 miles from Earth.
- The Moon is at Perigee on the 27th, 227,238 miles from Earth.

Moon/Planet Pairs:

- The Moon passes 2° north of Uranus on the 3rd.
- The Moon passes 5° south of Jupiter on the 10th.
- The Moon passes 3° south of Mars on the 18th.
- The Moon passes 0.2° south of Saturn on the 20th.
- Mercury passes 1.2° south of Neptune on the 22nd.
- The Moon passes 4° north of Venus on the 27th.
- The Moon passes 5° north of Neptune on the 28th.
- The Moon passes 6° north of Mercury on the 29th.
- Mars passes 5° north of Spica on the 30th.

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

The Planets & Dwarf Planets

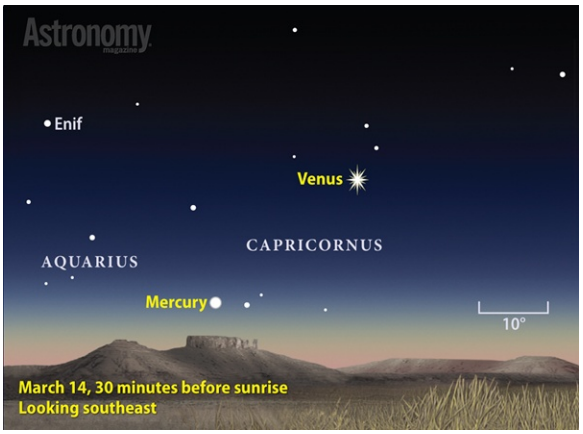
Planetary Reports are generated by "TheSky" software. (http://www.ki0ar.com/planrpts.html) These reports provide predicted data for the planets on the first of each month for the current year. The rise and set times for the Sun and the Moon for each day of the month are also included in the reports. 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 March

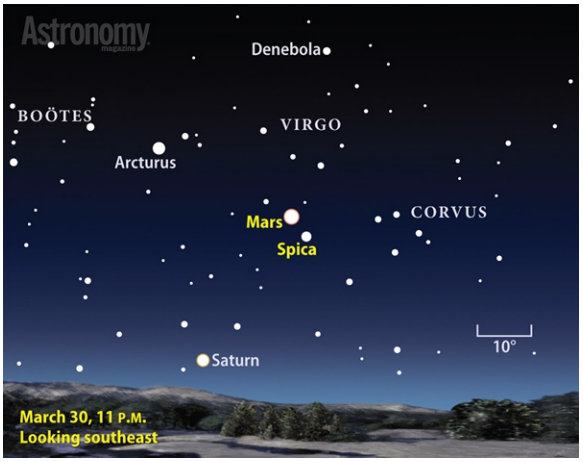
Jupiter continues to dominate the evening skies this month and is still prominent until the early hours of the morning. Venus reaches its farthest point away from the Sun and Mercury reaches its highest point above the horizon in the morning sky. Mars, Ceres and Saturn are all visible in the late evening and early morning sky. Uranus can be spotted in the early evening and Neptune has returned to the morning sky this month.

Mercury
Is at greatest western elongation (28° above the eastern horizon) on the 14th. Mercury is visible, low on the eastern horizon about 30 minutes before sunrise for the month of March. Mercury rises about 5:27 a.m. on the 1st and about 6:05 a.m. by month's end. Mercury is in the constellation of Aquarius shining at magnitude 0.1 on the 15th.

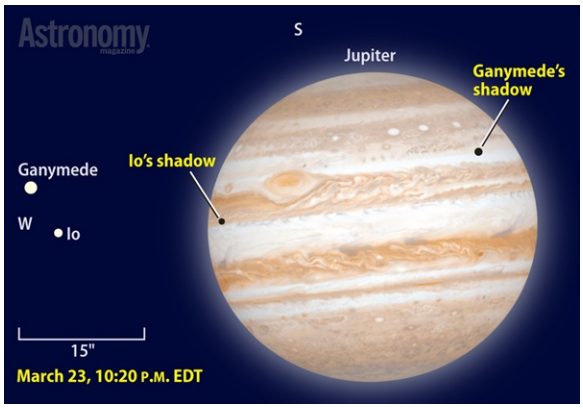


Venus
Venus rises about 4:07 a.m. on the 1st and about 4:48 a.m. by month's end. Venus appears at its farthest from the Sun on the 22nd, 47° west of the Sun. Venus will be easy to spot moving from the constellation Sagittarius into Capricornus shining at magnitude -4.6 on the 15th.

Earth
Daylight Savings Time begins at 2 a.m. local time for most of the US on the 9th. The Vernal equinox occurs at 12:57 p.m. EDT on the 20th.



Mars
Mars is stationary on the 1st. Mars rises at 9:30 p.m. on the 1st and about 7:59 p.m. by month's end. Mars viewing is getting better and better as it approaches opposition next month, so get out those binoculars and telescopes and observe Mars in the evenings this month. Mars is in the constellation of Virgo this month shining at magnitude -0.9.



Jupiter
Jupiter is stationary on the 6th. Jupiter still shines brilliantly in the evening sky this month. Jupiter sets at 3:36 a.m. on the 1st and about 2:38 a.m. by month's end. Look for Jupiter in the evening and early morning skies after midnight. Jupiter is in the constellation of Gemini shining at magnitude -2.3.

Saturn
Is stationary on the 2nd. Saturn rises at 11:39 a.m. on the 1st and about 10:33 p.m. by month's end. Look for Saturn rising in the east in late evening. Saturn is in the constellation of Libra shining at magnitude 0.4.

Uranus
Sets at 8:16 p.m. on the 1st and about 7:23 p.m. by month's end. Uranus is visible in the early evening sky after sunset. Spot Uranus with binoculars or a small telescope. Uranus is in the constellation of Pisces shining at magnitude 5.9.

Neptune
Has returned to the morning sky this month. Neptune rises at 6:23 a.m. on the 1st and about 5:24 a.m. by month's end. Neptune is still lost in the pre-dawn sky until later in the month, though it will still be difficult to spot. Neptune is in the constellation of Aquarius shining at magnitude 8.0.

Dwarf Planets
Ceres
Is stationary on the 1st. Ceres rises at 9:33 p.m. on the 1st and about 9:12 p.m. by month's end. Ceres is in the constellation of Virgo shining at magnitude 7.5.

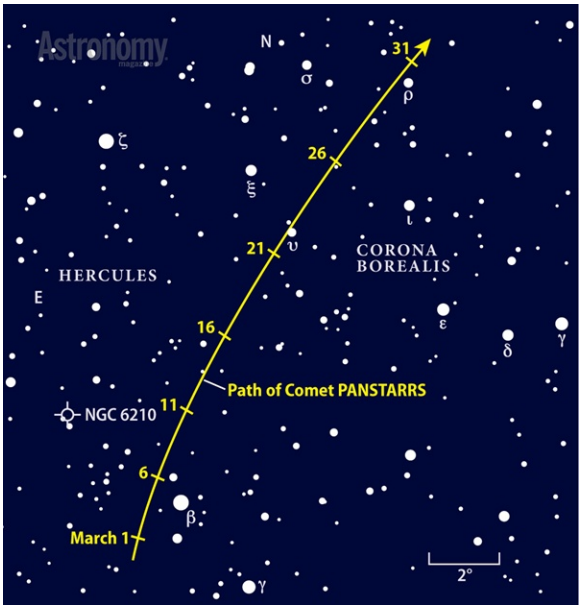
Pluto
Has returned to the morning sky this month. Pluto rises at 3:25 a.m. on the 1st and about 2:25 a.m. by month's end. Pluto is in the constellation of Sagittarius shining at magnitude 14.2.

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

Astronomical Events

Meteor Showers
There are some minor meteor showers but none that produce rates much higher than 2-5 per hour, except the Gamma Normids that extend over the period of March 11 to 21, with the maximum occurring on March 16. The maximum rate reaches about 5-9 meteors per hour.

For more information about Meteor Showers, visit Gary Kronk's Meteor Showers Online web page at http://meteorshowersonline.com/.



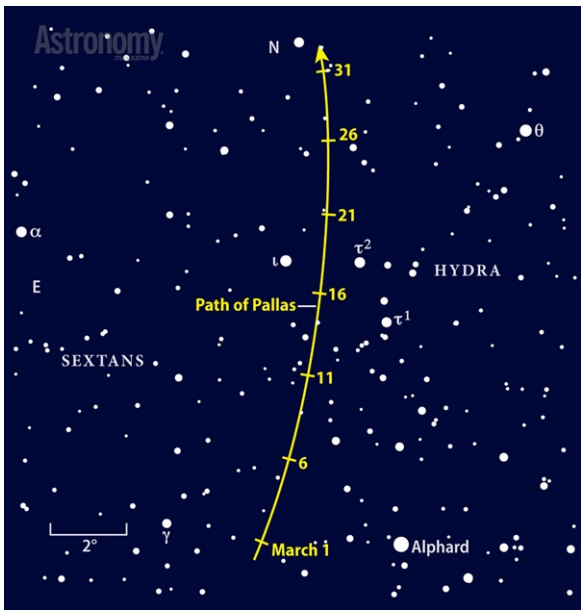
Comets
Look for Comet PANSTARRS (C/2012 K1) making its presence known this month. Look for Comet PANSTARRS passing through the constellation of Hercules at the beginning of the month. Comet PANSTARRS then passes through Corona Borealis after mid-month. Comet PANSTARRS C/2012 K1 shines at 10th magnitude this month.

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
No eclipse activity this month.



Observational Opportunities
- Look for Mercury in the morning sky.
- Observe Venus, in the early morning sky before sunrise.
- Try to find Uranus in the early evening sky.
- Jupiter at its best in the evening sky.
- View Mars and Saturn in the evening and after midnight.

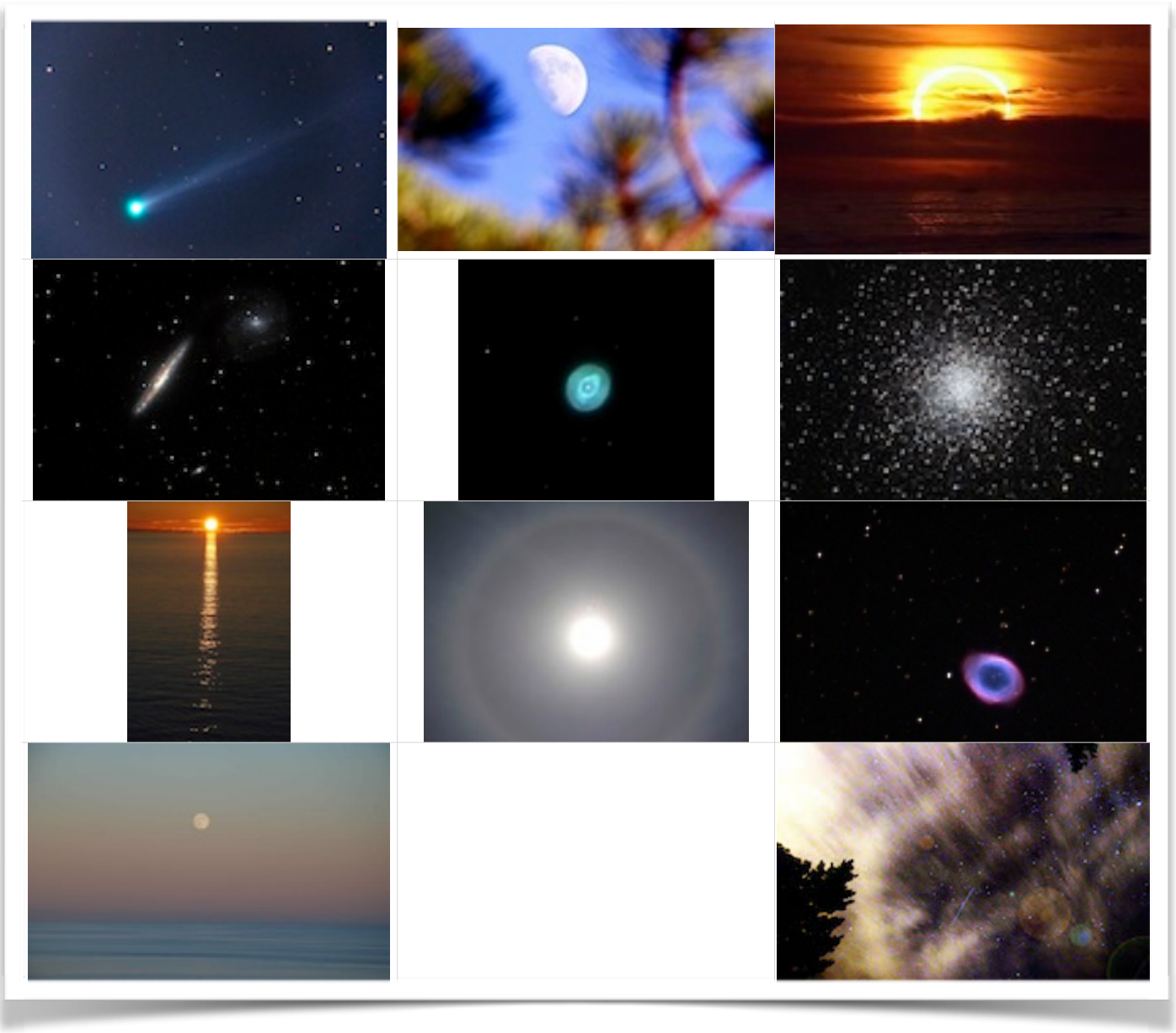
Asteroids
(From west to east)
- **Pallus** is stationary on the 24th in the constellation of Hydra.
- **Vesta** is stationary on the 5th in the constellation of Virgo.

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.

Subscriber Gallery

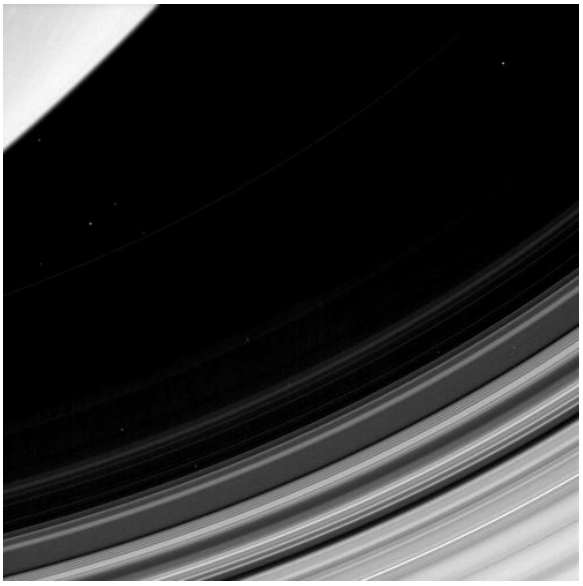
I have created a web page containing images taken and submitted by subscribers to the email newsletter, check-ins to the Colorado Astronomy Net and readers of the online newsletter and some of my own images. Any one wishing to submit their images to the gallery, please let me know. The images must be 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.



Planetary/Lunar Exploration Missions

(Excerpts from recent mission updates)

Cassini
February 24, 2014
Dusty D Ring
Full-Res: PIA17150



"Saturn's D ring is easy to overlook since it's trapped between the brighter C ring and the planet itself. But this dusty ring has plenty to teach us. In this view, all that can be seen of the D ring is the faint and narrow arc as it stretches from top right of the image.

If all goes as planned, Cassini will pass between the D ring and Saturn in its final orbits in 2017. Scientists expect to gather unprecedented data from these orbits.
Also visible in this image are 12 stars.

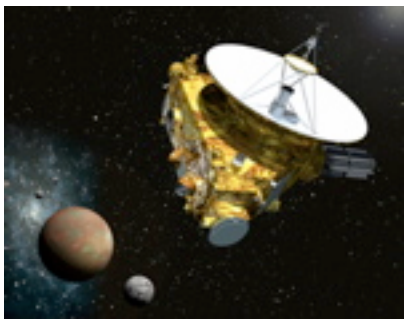
This view looks toward the unilluminated side of the rings from about 41 degrees below the ringplane. The image was taken in visible light with the Cassini spacecraft narrow-angle camera on Oct. 21, 2013.

The view was obtained at a distance of approximately 1.5 million miles (2.4 million kilometers) from Saturn and at a Sun-Saturn-spacecraft, or phase, angle of 140 degrees. Image scale is 8.7 miles (14 kilometers) per pixel."

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

Cassini Imaging Team's website - http://ciclops.org.

For the latest mission status reports, visit http://saturn.jpl.nasa.gov/home/index.cfm. The speed and location of the spacecraft can be viewed on the "Present Position" web page.



New Horizons
February 27, 2014

New Horizons Reaches the Final 4 (AU)

"New Horizons sailed past another milepost today when the NASA spacecraft moved to within four astronomical units (AU) of Pluto -

Did you know? An astronomical unit (AU) is the average distance between the Earth and sun, about 93 million miles or 149 million kilometers. New Horizons' journey from Earth to Pluto will cover more than 32 AU.

which is less than four times the distance between the Earth and the sun, or about 371 million miles (598 million kilometers).

"We're as close to the Pluto system now as Earth ever gets to Jupiter, a first for any spacecraft," says New Horizons Principal Investigator Alan Stern, of the Southwest Research Institute, Boulder, Colo. “And hold on to your hat, it just gets more and more exciting from here."

Since launch on January 19, 2006, New Horizons has covered nearly 2.89 billion miles (4.62 billion kilometers). It makes a temporal connection with one NASA's legendary deep-space explorers this summer when it crosses the orbit of Neptune on Aug. 25 -- exactly 25 years after Voyager 2 made its historic flight past that giant planet. When New Horizons arrives at Pluto on July 14, 2015, it will have traveled farther than any spacecraft ever has to reconnoiter its prime target.

Follow New Horizons on its journey to Pluto and beyond."

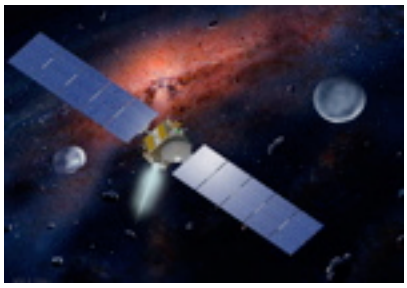
“How Do We Get to Pluto? Practice, Practice, Practice”

Part I: The Encounter Begins	- Small mp4 (38 MB, 640x360) - Large mp4 (116 MB, 1280x720)
Part II: Passing Pluto	- Small mp4 (34 MB, 640x360) - Large mp4 (102 MB, 1280x720)"

Find New Horizons in the iTunes App Store here. (http://itunes.com/apps/newhorizonsanasavoyagetopluto)

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/.



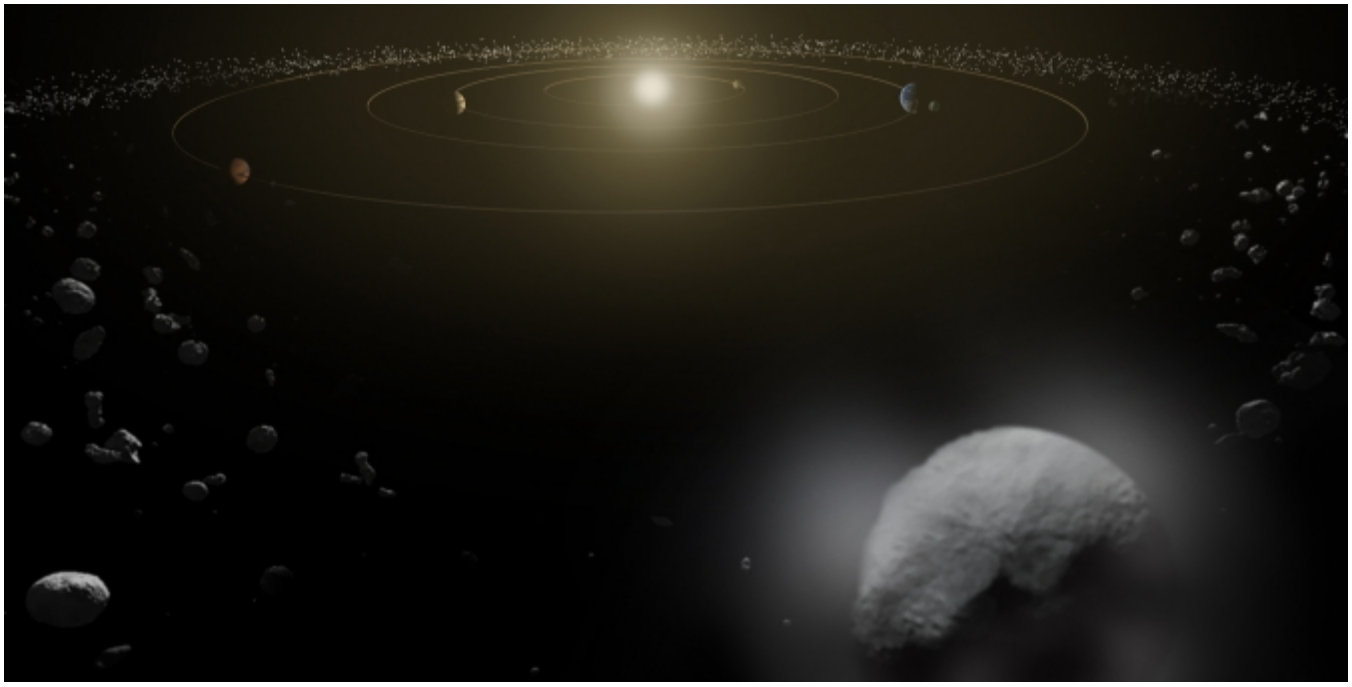
Dawn
January 22, 2014
Herschel Telescope Detects Water on Dwarf Planet
(Full image and caption)

"Scientists using the Herschel space observatory have made the first definitive detection of water vapor on the largest and roundest object in the asteroid belt, Ceres.

Plumes of water vapor are thought to shoot up periodically from Ceres when portions of its icy surface warm slightly. Ceres is classified as a dwarf planet, a solar system body bigger than an asteroid and smaller than a planet.

Herschel is a European Space Agency (ESA) mission with important NASA contributions.

"This is the first time water vapor has been unequivocally detected on Ceres or any other object in the asteroid belt and provides proof that Ceres has an icy surface and an atmosphere," said Michael Küppers of ESA in Spain, lead author of a paper in the journal Nature.

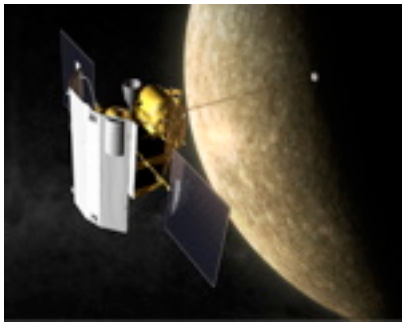


The results come at the right time for NASA's Dawn mission, which is on its way to Ceres now after spending more than a year orbiting the large asteroid Vesta. Dawn is scheduled to arrive at Ceres in the spring of 2015, where it will take the closest look ever at its surface."

Dawn's Virtual Flight over Vesta

A gallery of images can be found online at: http://www.nasa.gov/mission_pages/dawn/multimedia/gallery-index.html.

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



MESSENGER
February 6, 2014
MESSENGER Surpasses 200,000 Orbital Images of Mercury

"MESSENGER has now returned more than 200,000 images acquired from orbit about Mercury. The 1996 proposal for the mission promised a return of at least 1,000 images says Robert Gold, MESSENGER's Science Payload Manager. "We expected then that we would have some data compression that would probably raise the image total to somewhere near 2,000

images," says Gold, of the Johns Hopkins University Applied Physics Laboratory (APL), but scientists did not imagine then the degree to which MESSENGER would surpass that goal.

"Returning over 200,000 images from orbit about Mercury is an impressive accomplishment for the mission, and one I've been personally counting down for the last few months," says APL's Nancy Chabot, the Instrument Scientist for the Mercury Dual Imaging System (MDIS). "However, I'm really more excited about the many thousands of images that are still in MESSENGER's future, especially those that we plan to acquire at low altitudes and will provide the highest resolution views yet of Mercury's surface."

During MESSENGER's second extended mission, the spacecraft is making a progressively closer approach to Mercury's surface with each successive orbit. In about two months, each closest approach will be at a lower altitude than at any previous point in the mission, enabling the acquisition of unprecedentedly high-spatial-resolution data. For spacecraft altitudes below 350 kilometers, Narrow Angle Camera (NAC) images will be acquired with pixel scales ranging from 20 meters to as little as 2 meters.

To commemorate the milestone, image scientists released this four-image mosaic -- one of the first from the MDIS low-altitude imaging campaign -- that reveals, among other features, hollows that appear to have formed in one layer in the wall of this 15-kilometer-diameter crater."

The MESSENGER app is available for download on iTunes.

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

Pack Your Backpack
Calling all explorers! Tour JPL with our new Virtual Field Trip site. Stops include Mission Control and the Rover Lab. Your guided tour starts when you select a "face" that will be yours throughout the visit. Cool space images and souvenirs are all included in your visit.
+ http://virtualfieldtrip.jpl.nasa.gov/
Past, Present, Future and Proposed JPL Missions - http://www.jpl.nasa.gov/missions.

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

Mars Missions

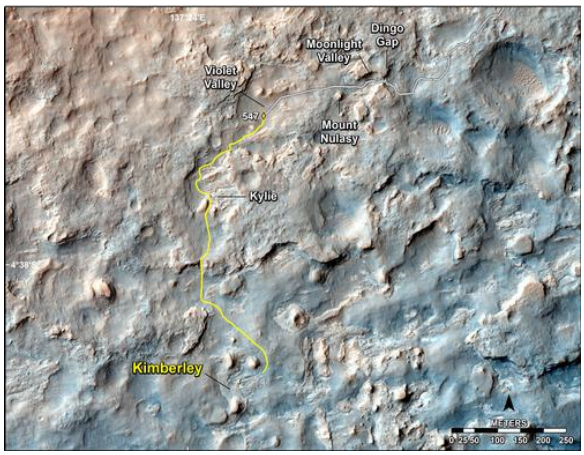
Be A Martian

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

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

JMARS
https://jmars.mars.asu.edu/
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.

Mars Science Laboratory - Curiosity
February 19, 2014
Curiosity Adds Reverse Driving for Wheel Protection
(Full image and caption)



"Terrain that NASA's Curiosity Mars rover is now crossing is as smooth as team members had anticipated based on earlier images from orbit.
On Tuesday, Feb. 18, the rover covered 329 feet (100.3 meters), the mission's first long trek that used reverse driving and its farthest one-day advance of any kind in more than three months.

The reverse drive validated feasibility of a technique developed with testing on Earth to lessen damage to Curiosity's wheels when driving over terrain studded with sharp rocks.
However, Tuesday's drive took the rover over more benign ground.

"We wanted to have backwards driving in our validated toolkit because there will be parts of our route that will be more challenging," said Curiosity Project Manager Jim Erickson of NASA's Jet Propulsion Laboratory, Pasadena, Calif.

The rover team used images taken from orbit to reassess possible routes, after detecting in late 2013 that holes in the vehicle's aluminum wheels were accumulating faster than anticipated. Getting to the chosen route, which appeared to be less hazardous for the wheels, required crossing a 3-foot-tall (1-meter-tall) dune. Curiosity crossed the dune on Feb. 9.

Erickson said, "After we got over the dune, we began driving in terrain that looks like what we expected based on the orbital data. There are fewer sharp rocks, many of them are loose, and in most places there's a little bit of sand cushioning the vehicle."

The mission's destinations remain the same: a science waypoint first and then the long-term goal of investigating the lower slopes of Mount Sharp, where water-related minerals have been detected from orbit."

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

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

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

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

Mars Exploration Rover Mission (Spirit and Opportunity)
February 12, 2013

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: Busy Week of Imaging and Robotic Arm Studies - *sols 3568-3575, Feb. 05, 2014-Feb. 12, 2014*:

"Opportunity is climbing 'Murray Ridge' up on Solander Point, part of the rim of Endeavour Crater.

The rover continues to explore the region called 'Cook Haven.' The rover has turned its attention to other rocks within this area. On Sol 3568 (Feb. 5, 2014), Opportunity lifted her robotic arm so 13-filter Panoramic Camera (Pancam) images of the surface target, called 'Green Island' could be collected, along with some Navigation (Navcam) images. On the next sol, the rover used the Rock Abrasion Tool (RAT) to brush a spot on Green Island and followed that with a Microscopic Imager (MI) mosaic and a placement of the Alpha Particle X-ray Spectrometer (APXS).

On Sol 3571 (Feb. 8, 2014), the rover collected a 13-filter Pancam image of the brushed spot on Green Island before bumping about 9.8 feet (3 meters) to a new rock target, called 'Stuart Island.' Opportunity began the in-situ (contact) investigation of Stuart Island on Sol 3573 (Feb. 10, 2014), with a MI mosaic and APXS placement for an overnight integration. The rover repeated this again on the next sol with more MI mosaics, but with an offset placement of the APXS. Continuing the campaign on Sol 3575 (Feb. 12, 2014), Opportunity collected more MI mosaics and performed a third offset of the APXS.

As of Sol 3575 (Feb. 12, 2014), the solar array energy production was 387 watt-hours with an atmospheric opacity (Tau) of 0.548 and a solar array dust factor of 0.610.

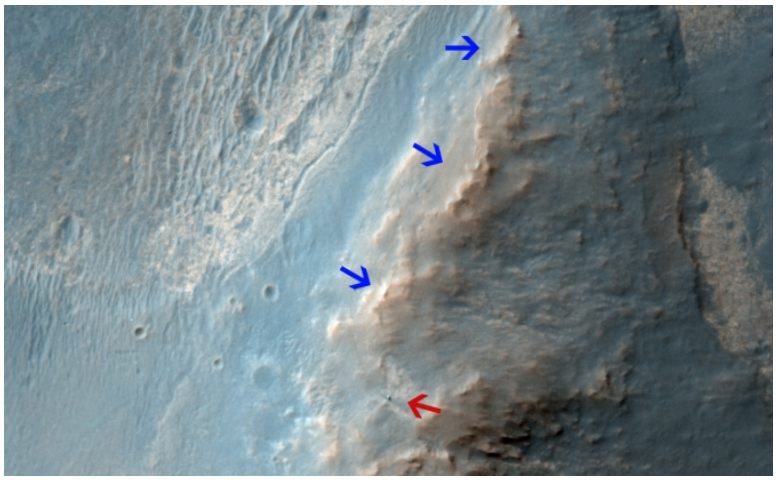
Total odometry is 24.07 miles (38.74 kilometers)."

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

Visit the Mars Exploration Rover page at
http://marsrovers.jpl.nasa.gov/home/index.html.

Mars Reconnaissance Orbiter Mission
February 19, 2014
Mars Orbiter Images Rover and Tracks in Gale Crater
(Full image and caption)

"A new image from a telescopic camera orbiting Mars shows NASA's Mars Exploration Rover Opportunity at work on "Murray Ridge," without any new impact craters nearby.



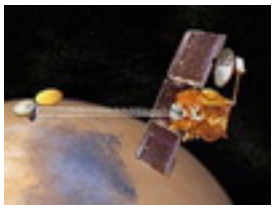
The Feb. 14 view from the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter is available online at http://www.jpl.nasa.gov/spaceimages/details.php?id=PIA17941. Rover tracks from Opportunity, as well as the rover itself, are visible.

A rock, dubbed "Pinnacle Island," appeared in January 2014 next to Opportunity where it had been absent a few days earlier. After that, researchers using HiRISE planned this observation to check the remote possibility that a fresh impact by an object from space might have excavated a crater near Opportunity and thrown this rock to its new location. No fresh impact site is seen in the image. Meanwhile, observations by the rover solved the Pinnacle Island mystery by finding where the rock had been struck, broken and moved by a rover wheel.

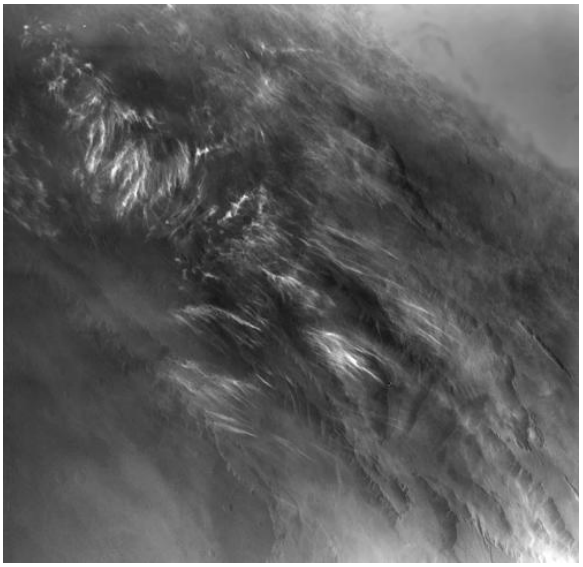
Murray Ridge is part of the western rim of Endeavour Crater, an impact scar that is billions of years old and about 14 miles (22 kilometers) in diameter."

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
February 12, 2014
NASA Moves Longest-Serving Mars Spacecraft for New Observations
(Full image and caption)



"NASA's Mars Odyssey spacecraft has tweaked its orbit to help scientists make the first systematic observations of how morning fogs, clouds and surface frost develop in different seasons on the Red Planet.

The maneuver took place Tuesday, Feb. 11. Odyssey team engineers at NASA's Jet Propulsion Laboratory in Pasadena, Calif., and Lockheed Martin Space Systems of Denver, designed the gentle move to accelerate Odyssey's drift toward a morning-daylight orbit. The desired change will occur gradually until the intended orbit geometry is reached in November 2015 and another maneuver halts the drift.

The change will enable observation of changing ground temperatures after sunrise and after sunset in thousands of places on Mars. Those observations could yield insight about the composition of the ground and about temperature-driven processes, such as warm-season flows observed on some slopes, and geysers fed by spring thawing of carbon-dioxide ice near Mars' poles.

"We're teaching an old spacecraft new tricks," said Odyssey Project Scientist Jeffrey Plaut of JPL. "Odyssey will be in position to see Mars in a different light than ever before."

Neither Odyssey, nor any other NASA Mars orbiter since the 1970s, has flown an orbital pattern with a view of the ground in morning daylight. Earlier NASA orbiters and the European Space Agency's Mars Express orbiter have provided some tantalizing views of morning mists on Mars, but have concentrated on afternoon observation times when views of the surface are less hazy.

Odyssey was launched in 2001 and began its science mission 12 years ago this month. It is the longest-working spacecraft ever sent to Mars."

See the Mars As Art Gallery

Dulles Airport Full News Release

Global Martian Map

"A simulated fly-through using the newly assembled imagery is available online at http://www.nasa.gov/mission_pages/mars/missions/odyssey/20060313.html.

The fly-through plus tools for wandering across and zooming into the large image are at http://themis.asu.edu/."

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.

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/.

Links and Other Space News

(If you have a link you would like to recommend to our readers, please feel free to submit it.)

A Guide to the Galaxy Right from our Bedroom Window - http://www.bedroomfurniturespot.com/guide-to-galaxies - An interesting site suggested by the students from Lexington Middle School Science Club in Nebraska. Lots of good basic astronomy information.

A Kid's Guide to Astronomy - http://www.jmacsupply.com/astronomy-guide-for-kids-a/316.htm - A great site with other links to learn about stars and astronomy for kids of all ages.

"TheSky" Software - http://www.bisque.com - Astronomy software by Software Bisque.

A Short Guide to Celestial Navigation - http://www.celnav.de/ - Celestial navigation is the art and science of finding one's geographic position by means of astronomical observations, particularly by measuring altitudes of celestial objects − sun, moon, planets, or stars.

Astrogirl Homepage - http://www.astrogirl.org - Family friendly educational astronomy website.

Astronomical Lexicon - http://www.ki0ar.com/astrolex.html - Many of the astronomical terms used in this newsletter are defined here.

Astronomy Picture of the Day - http://antwrp.gsfc.nasa.gov/apod/astropix.html - A different picture of the cosmos every day.

Astronomy 2009 - http://www.surveillance-video.com/astronomy-sept-2009.html - This site has some good links a young, interested student wishes to share.

Black Hole Encyclopedia - http://blackholes.stardate.org/ - Excellent site from StarDate - University of Texas McDonald Observatory (http://mcdonaldobservatory.org/)

Caelum Observatory - http://www.caelumobservatory.com/index.html - The LARGEST dedicated public telescope in the Southwest at the Mount Lemmon SkyCenter!

Celestial Bodies and Astronomy - http://ellejet.com/celestial-bodies.php.

Celestron Telescopes - http://www.celestron.com/ - Celestron telescopes.

Clear Skies Observing Guides - http://www.clearskies.eu - CSOG, short for Clear Skies Observing Guides is a new concept in visual amateur astronomy. It is a digital publication that

will enable observers to target all deepsky objects and carbon stars within reach of their equipment.

Cloudbait Observatory, Guffey Colorado - http://www.cloudbait.com - Submit your fireball reports here. Interesting, knowledgeable site.

Colorado Springs Astronomical Society - http://csastro.org

The Constellations and Their Stars - http://www.astro.wisc.edu/~dolan/constellations/constellations.html - Good site for finding out more about the 88 constellations and their associated stars.

CosmoQuest - http://cosmoquest.org/ - The place where you map other worlds, explore out universe and contribute to science.

Denver Astronomical Society - http://www.denverastrosociety.org - Promotes the enjoyment and understanding of astronomical phenomena, history and lore by providing educational and observing opportunities for our members, general public, and outreach activities at the University of Denver's historic Chamberlin Observatory, schools, and nature centers.

Distant Suns - http://www.distantsuns.com/ - Desktop Astronomy package for PCs.

EarthSky - http://earthsky.org - Astronomy news.

Green Laser - http://www.greenlaser.com - If you're looking for a reasonably priced laser pointer that is great for astronomy work, visit this site.

Groovy Adventures - http://www.groovyadventures.com - Unique adventures and vacations including astronomy related vacations.

Heavens Above - http://www.heavens-above.com - As the name implies - What's up in the heavens, particularly satellite passes.

The International Dark-Sky Association - http://www.darksky.org - To preserve and protect the nighttime environment and our heritage of dark skies.

informED: 10 Teaching Tools for Educators - http://www.opencolleges.edu.au/informed/teacher-resources/ - informED - Teacher Resources.

iTelescope.net - http://www.itelescope.net - iTelescope.Net is the world’s premier network of Internet connected telescopes, allowing members to take astronomical images of the night sky for the purposes of education, scientific research and astrophotography.

JPL Solar System Ambassador Program - http://www.jpl.nasa.gov/ambassador/front.html - "Volunteers Bringing the Solar System to the Public"

JPL Solar System - http://www.jpl.nasa.gov/solar_system/ - Jet Propulsion Laboratory information on our solar system.

Kids Space Center - Telescopes and Astronomy - http://www.orlandofuntickets.com/kids-space-center-telescopes-and-astronomy/ - Another site suggested by a young student - Great info about telescopes.

Mars Exploration, Mars Rovers Information, Facts, News, Photos - http://science.nationalgeographic.com/science/space/space-exploration/mars-exploration-article/ - National Geographic - Mars Exploration - Investigating the Red Planet.

Meade Advanced Products Users Group - http://www.mapug-astronomy.net/ - Mapug-Astronomy Topical Archive & information resource, containing a massive 335 page archive of discussions about Meade equipment, and much more: observatories, observing lists, permanent piers, equatorial wedges, remote operations, software, eyepieces, etc.

My Stars Live - http://www.mystarslive.com/ - Interactive Star Chart

NASA - Lunar and Planetary Science - http://nssdc.gsfc.nasa.gov/planetary/planets/cometpage.html - General information, Missions to Comets, Data, Press Releases, Meteors and Meteorites, Other topics of Interest.

NASA Science News - http://science.nasa.gov/ - NASA missions, updates, astronomy news, excellent resource.

National Archives info on space exploration - http://www.archives.gov/research/alic/reference/space-exploration.html - Archives Library Information Center (ALIC) - Space Exploration - Information about the United States' space flight programs, including NASA missions and the astronauts who participate in the efforts to explore space.

Northern Colorado Astronomical Society - http://ncastro.org/ - The purpose of our organization is to encourage the understanding & interest in the science & hobby of astronomy.

Rocky Mountain Star Stare - http://www.rmss.org - The Premier Star Part in The Rocky Mountains

Sangre Stargazers - http://sangrestargazers.skymtn.com/ - New astronomy club in the Wet Mountain Valley of Custer County (about 45 miles due west of Pueblo, CO).

Skymaps.com - http://www.skymaps.com - Free sky maps each month.

Skywatch Sightings from NASA - http://spaceflight.nasa.gov/realdata/sightings/ - This site gives you the best times to watch the ISS pass over or near your location.

Southern Colorado Astronomical Society - http://www.scasastronomy.info/ - Site under construction.

Space.com - http://space.com - Interesting space and astronomy articles.

Spaceflight Now - http://spaceflightnow.com/ - Launches and satellite news.

SpaceLinks/Space Careers - http://www.spacelinks.com/SpaceCareers/ - SPACELINKS is a specialist staffing consultancy sourcing and supplying high caliber professionals for a wide range of world class organizations in the Space and Defense industry.

"SpaceRef.com" - http://www.spaceref.com/ - SpaceRef's 21 news and reference web sites are designed to allow both the novice and specialist alike to explore outer space and Earth observation.

Space Weather - http://www.spaceweather.com - Check out what the Sun is doing as seen from space.

Stellarium - http://www.stellarium.org - Free, downloadable planetarium/astronomy software.

Universe Today - http://www.universetoday.com - Short, interesting articles about space and related topics.

Wikisky - http://www.wikisky.org - WIKISKY is a non-commercial project. The main purpose of WIKISKY is to consolidate astronomical, astrophysical and other information about different space objects and astrophysical facts.

Acknowledgments and References

Much of the information in this newsletter is from "Astronomy Magazine" (Kalmbach Publishing), JPL mission status reports, "Meteor Showers - A Descriptive Catalog" by Gary W. Kronk and other astronomical sources that I have stashed on my book shelves.

The author will accept any suggestions, constructive criticisms, and corrections. Please feel free to send me any new links or articles to share as well. I will try to accommodate any reasonable requests. Please feel free to send questions, comments, criticisms, or donations to the email address listed below. Enjoy!

Subscription Information

- Email Newsletter archives -
http://ki0ar.com/pipermail/astronews_ki0ar.com/

- 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

Created by Burness F. Ansell, III
ki0ar@ki0ar.com

COO, Director of Aerospace Technologies, IAAS
JPL Solar System Ambassador, Colorado
Last modified: March 01, 2014