

IAAS Monthly Astronomy Newsletter
March 2010

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.

This newsletter is now available as an iTunes podcast. Visit <http://www.apple.com>, download and install iTunes (for either Mac or Windows). Search for "IAAS" and subscribe to the podcast. You may also go to <http://www.ki0ar.com/astro.html> and click on the Subscribe/RSS link. Update your iPod or mp3 player and listen to the newsletter at your leisure. Since this is a new feature, comments and constructive criticisms are greatly appreciated.

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 area 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.

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

In This Newsletter...

- * The Moon
 - * The Planets
 - * Astronomical Events
 - * Planetary/Lunar Exploration Missions
 - * Web Sites of Interest
 - * Acknowledgments and References
 - * Subscription Information
-

The Month At-A-Glance at <http://www.ki0ar.com/ataglance.html>
A calendar displaying the daily astronomical events.

The Moon

Phases:

- * Last Quarter Moon occurs on the 7th.
 - * New Moon occurs on the 15th.
 - * First Quarter Moon occurs on the 23rd.
 - * Full Moon occurs on the 29th.
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- * The Moon is at Apogee on the 12th, 252,282 miles from Earth.
 - * The Moon is at Perigee on the 28th, 224,859 miles from Earth.

Moon/Planet Pairs:

- * The Moon passes 8° south of Saturn on the 2nd.
- * The Moon passes 4° north of Neptune on the 13th.
- * The Moon passes 7° north of Venus on the 17th.
- * The Moon passes 5° south of Mars on the 25th.
- * The Moon passes 8° south of Saturn on the 29th.

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

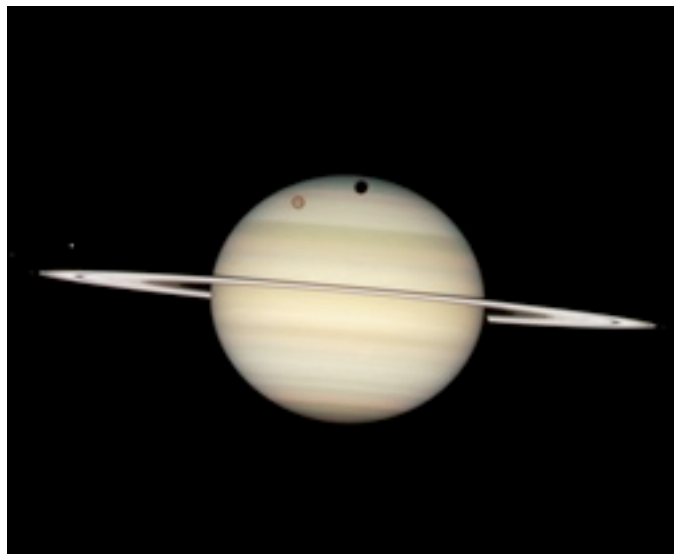
The Planets & Dwarf Planets

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** - "The March skies open with a spectacularly bright Venus hugging the western horizon just after sunset. Late in the month, Mercury joins Venus in the evening twilight. Mars rides high in the southeast as darkness falls. Although it is now past its best, the Red Planet remains an attractive sight with naked eyes and a worthwhile target for those with medium-sized scopes.

But the best is yet to come: Saturn reaches opposition March 21. The ringed planet then rises in the east at sunset, appears highest in the south at local midnight, and sets as dawn breaks. At opposition, Saturn appears at its biggest and brightest for the year." (Astronomy Magazine, March 2010, page 36.)



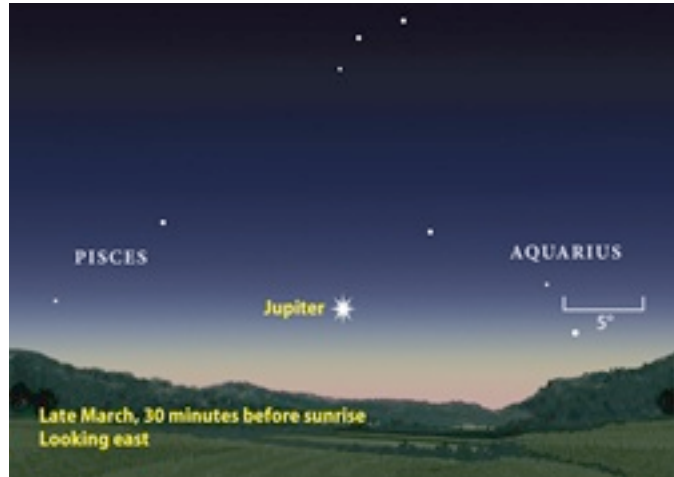
* **Mercury** - Is at superior conjunction on the 14th. Look for Mercury in the evening sky towards the end of the month. Mercury sets about 7:51 p.m. by month's end. Mercury is in the constellation of Pisces shining at magnitude -1.0.

* **Venus** - Has returned to the evening sky this month setting soon after sunset. Venus sets at 6:48 p.m. on the 1st and about 7:59 p.m. by month's end. Venus will appear higher and higher in the west-southwest as the month progresses. Venus moves from the constellation of Aquarius into Aries shining at magnitude -3.9.

* **Earth** - Vernal equinox occurs at 1:32 p.m. EDT on the 21st.

* **Mars** - Is stationary on the 11th. Mars is at aphelion (154.9 million miles from the Sun) on the 30th. Mars sets at 5:08 a.m. on the 1st and about 3:08 a.m. by month's end. Mars is in the constellation of Cancer shining at magnitude -0.2.

* **Jupiter** - Returns to the morning sky late in the month. Jupiter rises about 4:52 a.m. by month's end. Look for Jupiter rising in the east about less than an hour before sunrise. Jupiter is in the constellation of Aquarius shining at magnitude -2.0.



* **Saturn** - Is at opposition on the 21st, rising as the Sun sets. Saturn rises at 7:28 p.m. on the 1st and about 5:14 p.m. by month's end. Look for Saturn in the evening in the east. Saturn is in the constellation of Virgo shining at magnitude 0.5.

* **Uranus** - Is in conjunction with the Sun on the 17th. Uranus is not visible this month.

* **Neptune** - Has returned to the morning sky this month. Neptune rises at 6:00 a.m. on the 1st and about 4:01 a.m. by month's end. Neptune moves from the constellation of Capricornus into Aquarius this month shining at magnitude 8.0.

Dwarf Planets

* **Ceres** - Rises at 2:13 a.m. on the 1st and about 1:45 a.m. by month's end. Ceres moves from the constellation of Ophiuchus into Sagittarius this month shining at magnitude 8.6.

* **Pluto** - Rises at 2:44 a.m. on the 1st and about 12:44 a.m. by month's end. Pluto is in the constellation of Sagittarius shining at magnitude 14.0.

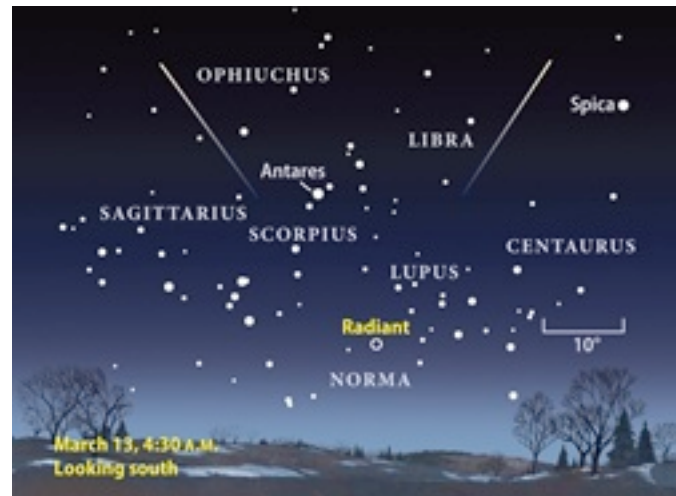
As always, good luck at spotting these two, a large telescope and dark skies will be needed.

Astronomical Events

Meteor Showers

* There are some minor meteor showers this month 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

* On the weekend of March 13 and 14, look for Comet C/2007 Q3 (Siding Spring) passing through the constellation of Draco the Dragon. Siding Spring passes about 2° from the galaxy M102 glowing at 10th magnitude.

* Comet C/2009/O2 passes north of the constellation of Pegasus.

* Comet 81P/Wild is in the constellation of Virgo.

* 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.

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.

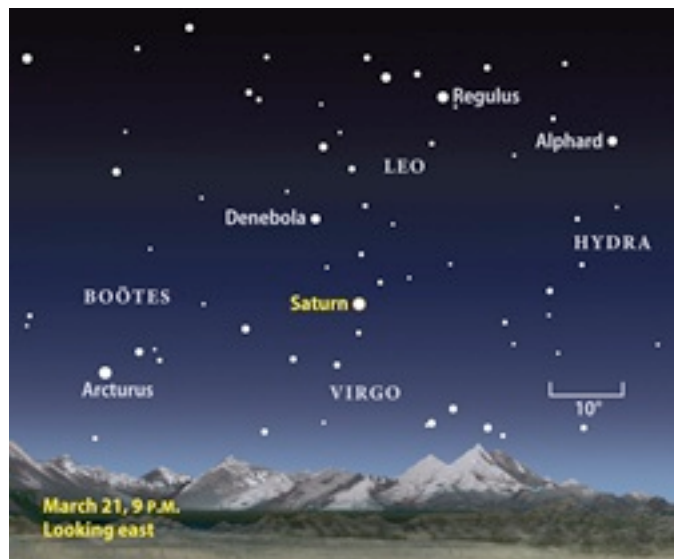
Asteroids (From west to east)

- * **Juno** is in the constellation of Cetus.
- * **Vesta** is in the constellation of Leo.
- * **Herculina** is at opposition on the 13th in the constellation of Coma Berenices.
- * **Metis** is in the constellation of Virgo.
- * **Pallas** is in the constellation of Serpens.

* Information about the Minor Planets can be found at <http://www.minorplanetobserver.com> the Minor Planet Observer web site.

Observational Opportunities

* Take a look at Saturn on the evening of the 21st when Saturn is at opposition. The rings will be tilted at an angle of 3.2° . much better than last years opposition when Saturn's rings were nearly edge on to our view.



Planetary/Lunar Exploration Missions

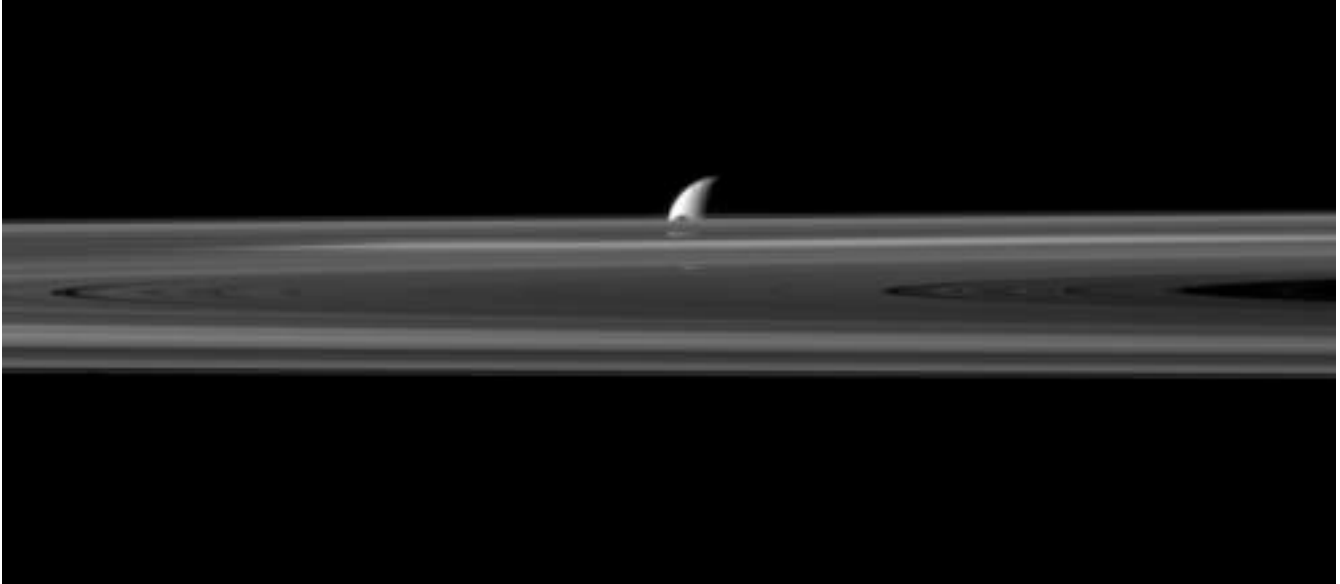
(Excerpts from recent mission updates)

* **Cassini** - February 26, 2010

Hidden Janus

Full-Res: PIA12558 (<http://photojournal.jpl.nasa.gov/catalog/PIA12558>)

"The small moon Janus is almost hidden between the planet's rings and the larger moon Rhea.



The northern part of Janus can be seen peeking above the rings in this image of a "mutual event" in which Janus (179 kilometers, or 111 miles across) moved past Rhea (1,528 kilometers, or 949 miles across). Mutual event observations such as this one, in which one moon passes close to or in front of another, help scientists refine their understanding of the orbits of Saturn's moons. See *Catching Big Sister* to watch a movie of a mutual event.

The view was acquired at a distance of approximately 2.7 million kilometers (1.7 million miles) from Janus and about 3.1 million kilometers (1.9 million miles) from Rhea. Rhea is a slightly overexposed in this image.

This view looks toward the northern, sunlit side of the rings from just above the ringplane.

The image was taken in visible light with the Cassini spacecraft narrow-angle camera on Nov. 11, 2009. Scale on Janus is about 16 kilometers (10 miles) per pixel. Scale on Rhea is about 19 kilometers (12 miles) per pixel."

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. (<http://saturn.jpl.nasa.gov/operations/present-position.cfm>)

* **New Horizons** - February 25, 2010

The Approach Begins

"Another milestone passed! Today NASA's New Horizons spacecraft is 15.96 astronomical units (about 2.39 billion kilometers, or 1.48 billion miles) from the Sun - putting it halfway between Earth's location on launch day in January 2006, and Pluto's place during New Horizons' encounter with the planet in July 2015.

"From here on out, we're on approach to an encounter with the Pluto system," says New Horizons Principal Investigator Alan Stern, from the Southwest Research Institute. "The second half of the journey begins."

This is rare territory; New Horizons is just the fifth probe, after Pioneers 10 - 11 and Voyagers 1 - 2, to traverse interplanetary space so far from the Sun. And it's the first to travel so far to reach a new planet for exploration.

Humming along at more than 16 kilometers per second - more than 36,600 miles per hour - the spacecraft will next cross a planetary boundary in March 2011, when it passes the orbit of Uranus."

New Horizons gallery <http://pluto.jhuapl.edu/gallery/sciencePhotos/>.

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** - No new news since November 13, 2009

Dawn Enters Asteroid Belt -- For Good

"ASTEROID BELT -- NASA's Dawn spacecraft re-entered our solar system's asteroid belt today, Nov. 13, and this time it will stay there.

Dawn first entered the belt (whose lower boundary may be defined as the greatest distance Mars gets from the sun (249,230,000 kilometers, or 154,864,000 miles) in June 2008. It remained within the belt for 40 days before its carefully planned orbital path brought it below the asteroid belt's lower boundary.

This time around, Dawn's flight path will remain above this hypothetical lower boundary for the rest of the mission and for the foreseeable future - Dawn will become the first human-made object to take up permanent residence in the asteroid belt."

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

* **MESSENGER** - February 27, 2010

MESSENGER's Odometer Reading: Four Billion Miles!

"Today the MESSENGER spacecraft crossed the four-billion-mile mark since its launch. The probe has completed about 81 percent of its journey toward its destination to be the first spacecraft inserted into orbit about Mercury.

That MESSENGER's odometer reading has reached another major milestone reminds us of the long and complex route that our spacecraft must follow. Mercury orbits deep within the Sun's gravity well. So, even though the planet can be as close as 82 million kilometers (51 million miles) from Earth, getting the probe into orbit around Mercury depends on an innovative trajectory that uses the gravity of Earth, Venus, and Mercury itself to slow and shape the probe's descent into the inner solar system.

On its 4.9 billion-mile journey to becoming the first spacecraft to orbit the planet Mercury, MESSENGER has flown by Earth once, Venus twice, and Mercury three times."

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

*** Mars Odyssey Orbiter - February 23, 2010**

No Signal Heard During First Day of Resumed Listening for Phoenix

"PASADENA, Calif. -- NASA's Mars Odyssey began a second campaign Monday to check on whether the Phoenix Mars Lander has revived itself after the northern Martian winter. The orbiter received no signal from the lander during the first 10 overflights of this campaign.

Odyssey will listen for Phoenix during 50 additional overflights, through Feb. 26, during the current campaign.

Phoenix landed on Mars on May 25, 2008, and operated successfully in the Martian arctic for about two months longer than its planned three-month mission. Operations ended when waning sunlight left the solar-powered craft with insufficient energy to keep working. The season at the Phoenix landing site is now mid-springtime, with the sun above the horizon for roughly 22 hours each Martian day. That is comparable to the illumination that Phoenix experienced a few weeks after completing its three-month primary mission.

Phoenix was not designed to withstand the extremely low temperatures and the ice load of the Martian arctic winter. In the extremely unlikely event that the lander has survived the winter and has achieved a stable energy state, it would operate in a mode where it periodically awakens and transmits a signal to any orbiter in view."

"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.la.asu.edu/latest.html>)

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 Exploration Rover Mission** (Spirit and Opportunity) -
February 17, 2010

SPIRIT UPDATE: Spirit Hunkers Down for Winter - sols 2171-2176,
February 10-15, 2010:

"Spirit is parked for the winter in the embedded area called "Troy" on the west side of Home Plate. Efforts continue to prepare the rover for winter.

On Sol 2174 (Feb. 13, 2010), the robotic arm (IDD) was positioned to the most favorable orientation for winter. Documentary imaging is being collected of the terrain and rover. On board flash memory is being emptied, getting down all essential data products. A special table of long-range UHF communication passes is being developed to cover the entire winter period and beyond. As energy levels decrease rover wake times are shortened and many communication passes are being deleted.

As of Sol 2176 (Feb. 15, 2010), the rover solar array energy production was to 173 watt-hours with an atmospheric opacity (τ) of 0.361 and a dust factor of 0.526. Total odometry is 7,730.50 meters (4.80 miles)."

OPPORTUNITY UPDATE: Sampling 'Chocolate Hills' - sols 2152-2157,
February 11-17, 2010:

"Opportunity is positioned near the rim of the very young crater "Concepcion."

The instruments on the rover's robotic arm (IDD) have been investigating targets on the rock called "Chocolate Hills." This rock is of interest because it exhibits a dark rind or crust that may be impact melt. On Sol 2152 (Feb. 11, 2010), the rover made a small turn to reposition the robotic arm for targets on the surface of the Chocolate Hills. On Sol 2154 (Feb. 14, 2010), the IDD collected a Microscopic Imager (MI) mosaic, then placed the Alpha Particle X-ray Spectrometer (APXS) on a light-colored rind called "Arogo." On Sol 2157 (Feb. 17, 2010), the rover repeated these two sets of measurements on a target called "Tears."

Further investigation of this rock is expected before the rover drives away. As of Sol 2157 (Feb. 17, 2010), the solar array energy production was 305 watt-hours with an atmospheric opacity (τ) of 0.432 and a dust factor of 0.496. Total odometry is 19,335.35 meters (12 miles)."

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

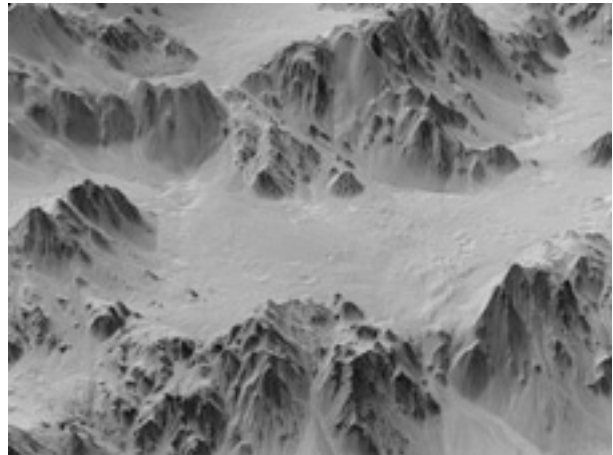
Visit the Mars Exploration Rover page at <http://marsrovers.jpl.nasa.gov/home/index.html>.

*** Mars Reconnaissance Orbiter**

Mission - February 17, 2010

Enhanced 3D Model of Mars Crater Edge Shows Ups and Downs

Full Image and caption (http://www.nasa.gov/mission_pages/MRO/multimedia/pia12840.html)



"A dramatic 3D Mars view based on terrain modeling from NASA's Mars Reconnaissance Orbiter data shows "highs and lows" of Mojave Crater.

The vertical dimension is exaggerated three-fold compared with horizontal dimensions in the synthesized images of a portion of the crater's wall. The resulting images look like the view from a low-altitude aircraft. They reflect one use of digital modeling derived from two observations by the orbiter's High Resolution Imaging Science Experiment camera.

This enhanced view shows material that has ponded and is backed up behind massive blocks of bedrock in the crater's terrace walls. Hundreds of Martian impact craters have similar ponding with pitted surfaces. Scientists believe these "pitted ponds" are created when material melted by the crater-causing impacts is captured behind the wall terraces.

Mojave Crater, one of the freshest large craters on Mars, is about 60 kilometers (37 miles) in diameter. In a sense, it is like the Rosetta Stone of Martian craters, because it is so fresh. Other craters of this size generally have already been affected by erosion, sediment and other geologic process. Fresh

craters like Mojave reveal information about the impact process, including ejecta, melting and deposits."

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 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.)

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

* **"TheSky" Software** - <http://www.bisque.com>

* **A Short Guide to Celestial Navigation** - <http://www.celnav.de/>

* **Astrogirl Homepage** - <http://www.astrogirl.org>

* **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>

* **Celestron Telescopes** - <http://www.celestron.com/c2/index.php> -
New beta website

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

- * **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.

- * **Denver Astronomical Society** - <http://www.denverastrosociety.org>

- * **Distant Suns** - <http://www.distant Suns.com/>
Desktop Astronomy package for PCs.

- * **Eric's Black Sun Eclipse website** - <http://www.ericblack sun eclipse.com>

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

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

- * **JPL Solar System Ambassador Program** - <http://www.jpl.nasa.gov/ambassador/front.html>

- * **JPL Solar System** - http://www.jpl.nasa.gov/solar_system/

- * **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 Science News** - <http://science.nasa.gov/>

- * **Northern Colorado Astronomical Society** - <http://ncastro.org/>

- * **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).
- * **Sky and Space** - <http://www.skyandspace.com.au/public/home.ehtml>
Astronomy from Down Under - The Southern Hemisphere's first astronomy and space magazine.
- * **Skymaps.com** - <http://www.skymaps.com/>
- * **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/>
- * **Space.com** - <http://space.com>
Interesting space and astronomy articles.
- * **Space.com** - Sky Watch Calendar - http://www.space.com/spacewatch/sky_calendar.html
- * **Spaceflight Now** - <http://spaceflightnow.com/>
- * **"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.
This site includes links to planetary updates such as Mercury Today, Venus Today, Earth Today, Moon Today, Mars Today, Jupiter Today, Saturn Today, Pluto Today, etc.
- * **Stellarium** - <http://www.stellarium.org>
Free, downloadable planetarium/astronomy software.
- * **Universe Today** - <http://www.universetoday.com>
- * **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!

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- Full documentation of the online administration system is available at <http://www.freelists.org/help/>. We encourage you to get the most out of the web interfaces, and we encourage subscribers to do the same. Please let your list members know about the advantages of exploring the FreeLists Web Login.
- 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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Last modified: March 01, 2010