

The Objective View

Newsletter of the Northern Colorado Astronomical Society

November 2005

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Longmont Astronomical Society
November 17 7 pm FRCC, 2121 Miller Rd
<http://longmontastro.org/>

October 6 Program

Cassini at Saturn

Dr. John Spencer, Southwest Research Institute

A year has passed, and all kinds of interesting stuff has come out of this extremely successful mission. The Cassini spacecraft with its Saturn orbiter and Huygens probe for Titan was the last and biggest of the "battleship" missions. It is schoolbus-sized, versatile, and very capable. Twelve instruments loaded the orbiter, and Huygens carried six more.

Its one weakness is its lack of a scan platform for its camera. It was built in the 1990s and launched in 1997. Spencer became involved in 2001. We are a quarter into the planned 4 year tour. A 2 year extension of the mission is possible.

Cassini performed 2 swings by Venus, 1 by Earth, then by Jupiter in December 2000. Three months of science were completed at Jupiter. Detailed movies were obtained of Jupiter's cloud tops. It complemented Galileo which was hampered by its low data rate. Volcanic plumes and eclipse glows were imaged on Io. By late 2002 Cassini was matching the quality of Earth-based views. By May 2004, Saturn loomed too large to fit in a single image. The moon Phoebe was the site of "landfall" in the system. The 130 mile moon was imaged and its surface temperature and composition were mapped. It has surface ice, CO₂, iron, and CN or H₂S.

Saturn orbit insertion came on July 1 2004. The whole mission was riding on the single main engine. Almost no science was done on the approach, because no one wanted to take risks with insertion. The path gave the mission's closest approach to the rings. The rings are the thinnest thing known, 100,000 miles wide and less than 100 yards thick. They have a mass equal to a 400 km satellite. They contain billions of orbiting ice chunks. The rings are made of water ice, and a small amount of dirt. Transient darker blotches in the B ring are termed spokes. They were discovered from Earth and confirmed by Voyager. They are believed to be composed of dust held by an electrostatic effect. The rings are sculpted by the gravity of Saturn's moons and other forces. They show signs of many orbital resonances, even a 35/34 resonance. The Encke Gap is cleared by the moon Pan. Extreme close-ups show clumping of ice chunks. The C ring is very complicated, and not completely understood. The F ring is relatively thin and faint, outside the main rings. Shepherd moons Prometheus and Pandora confine the F ring.

Prometheus is seen drawing a stream from it. The D ring extends nearly to Saturn's cloud tops. The G ring is outside F and extremely faint. Farther out, the E ring is extremely diffuse and extends in to the realm of the icy satellites. It appears to be in part from Enceladus. The latest moon count totals 34, comprised of large Titan, many medium-sized and small moons. Titan is 3193 miles in diameter, close in size to Ganymede (3262 mi), Callisto (2976 mi), Mercury (3024 mi), larger than Earth (2155 mi). Titan is unique for its atmosphere

Next Meeting: November 3, 7:30 PM

Mars, Mystery and Science

Dr. Roger Culver

Professor of Physics and Astronomy, CSU

NCAS Business at 7 PM

Meeting directions **Discovery Science Center**
703 East Prospect Rd, Fort Collins

<http://www.dcsm.org/index.html>

In Fort Collins, from the intersection of College Ave and Prospect Rd, head East about 1/2 mile. See the Discovery Center sign to the South. Enter the West Wing at the NE corner. From I-25, take Exit 268, West to Lemay Ave, continue West 1/2 mile, see Discovery Center on the left.

Observatory Village Marswatch

3733 Galileo Drive, Fort Collins

November 5 6 PM

weather backup date November 12

<http://www.villagehomes.com/TOUR/observatoryvillage/driving.asp?cookies=True>

Discovery Science Center Starwatch

703 E Prospect Road, Fort Collins

November 11 6:30 PM

January 6 6:30 PM

NCAS Programs

Feb 2 Jim Bergstrom Mars Recon Orbiter HiRISE

Other Events

Little Thompson Observatory Star Night, Berthoud

November 18 7 pm Luke Dones, SWRI,

Rings of Saturn <http://www.starkids.org>

Cheyenne Astronomical Society, Cheyenne Botanical Garden

November 18 7 pm

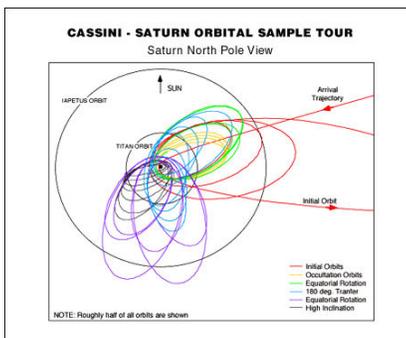
<http://home.bresnan.net/~curranm/>

Open House, Chamberlain Observatory, dusk to 10 pm

Nov 5, Dec 10 303 871 5172

<http://www.du.edu/~rstencil/Chamberlain/>

of nitrogen, at 1.5 times Earth's atmospheric pressure. The surface is at -180C. Haze obscures the surface. UV acts on methane to make hydrocarbon smog. Boom flexure limits the approach of Cassini to Titan. Infrared imaging can show surface features. No glints have been captured which would hint at large hydrocarbon lakes. The best lake candidate is a dark feature with a rounded outline about 20 miles long. Radar mapping is also underway. Maps show other sites with apparent drainage channels. The Huygens probe was a spectacular success for ESA. It performed direct observations of Titan's atmosphere and surface. Its path and landing site have been identified. It settled on a surface littered with small round rocks. It survived several hours on the surface. The icy satellites of Saturn range down in size from Rhea, 1528 km. We see ancient, cratered surfaces. Mimas has a huge crater reminiscent of the Star Wars Death Star. Dione shows fault lines. Enceladus is 498 km in diameter and notable for its high albedo, 0.9, almost pure ice. This may also suggest recent surface activity. Its density is 1.5 times water. It shows massive fracturing, like Europa. A July flyby took Cassini near the South Pole, and blue streaks suggesting water ice were seen. Spencer's life became most interesting then, when his thermal map showed the streaks to be 15K warmer than expected. The magnetometer team detected a big cloud of gas perturbing the field. A UV stellar occultation confirms a plume of material streaming from the pole. The center of the E ring was so bright, he thought there might be volcanoes. Hyperion is an outer moon. It has a low albedo, 0.25, and very low density. It must have voids inside. It has chaotic rotation. Iapetus is dark on its forward face, thought to be a type of debris accumulation from Phoebe. It has a unique equatorial ridge. There are many small Saturnian satellites. Some share orbits with larger satellites, or with each other. Atlas has a flying saucer shape. Pandora is very smooth. Spencer closed with a gallery of the most recent stunning Saturn images, and invited members to take advantage of the raw images as they are posted on the Cassini website.



**NCAS Business
October 6 2005**

President Greg Halac called the meeting to order. The Crow Valley Star Party carried 100 visitors by bus from Greeley. Dave Chamness joined Gary Garzone from LAS and about 10 others for an excellent night under dark skies. NCAS dues remain \$15. Collection is planned annually in January 2006. Discovery Science Center observing nights were announced.

Greg Halac planned to consult with Observatory Village about some public observing nights for Mars.

Mars Images From Vern Raben, Oct 24

Here are some images of Mars taken early this morning. Atmospheric turbulence was reasonably good, probably around 7/10, clear, no wind, temperature about 29F. Images taken with Celestron Nexstar 11 with 5X Powermate, Baader UV/IR cut filter, Toucam 740K webcam (5 minutes of video, 10 fps, shutter 1/20 sec, 60% gain, 50% brightness, 100% saturation, 0 gamma). Processed with Registax3. North is approximately up and east is to the left in the images.

Vern



From Andrea Schweitzer: Two More Moons for Pluto

Several scientists in Boulder at the Southwest Research Institute are involved in this discovery. Andrea

Two More Moons Discovered Orbiting Pluto

By Robert Roy Britt
Senior Science Writer

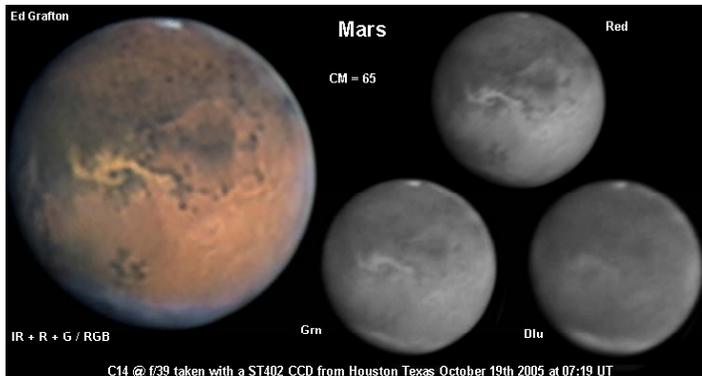
posted: 31 October 2005 01:01 pm ET

Two small moons have been discovered orbiting Pluto, bringing the planet's retinue of known satellites to three and leaving scientist to wonder how it could be.

The newfound moons orbit about 27,000 miles (44,000 kilometers) from Pluto, more than twice as far as Charon, Pluto's other satellite. They are 5,000 times dimmer than Charon. Full story is at:

http://www.space.com/scienceastronomy/051031_pluto_moons.html

Mars Dust Storm, October 2005



Ed Grafton, Houston TX



Roland Christen, Rockford IL, 10-28-05

Why Halloween is an Astronomical Holiday

See:
http://science.nasa.gov/headlines/y2005/27oct_halloween.htm?friend

Best Looks

| | |
|---------|---|
| Moon | Difficult by Mercury in SW 11/3; By Venus 11/5 by Mars 11/14; Near Saturn 11/21 and 22 by Jupiter and Spica 11/28 |
| Mercury | Difficult in SW at dusk 1 st week |
| Venus | SW at dusk |
| Mars | Opposition 11/7. On meridian at midnight |
| Jupiter | In SE predawn last week of month |
| Saturn | In E predawn. Quadrature on 11/3 |
| Uranus | In Aquarius, evenings |
| Neptune | In Capricornus, evenings |

Leonid meteors are obscured by moonlight.

From: Dan Laszlo
 2001 S Shields St Building H
 Fort Collins CO 80526

TO:

Dan Laszlo and Mike Prochoda Dust by Mare Erythraeum



2005 Oct 25 0211 MDT C14 Afocal 10mm TMB
Supermono

Dan Laszlo Dust Storm by Solis Lacus



2005 October 16 18" Newt /12mm Cemax/CP4500

Dan Laszlo Note Rift in N Polar Hood



2005 Oct 26 18" Newt/10mmTMB SM /Nikon CP4500

Some Links for Mars Updates and Images

<http://groups.yahoo.com/group/marsobservers/messages>
Registration Required

Astromart Gallery

<http://www.buytelescopes.com/gallery/gallery.asp?sg=1>

Milt Aupperle

<http://www.outcastsoft.com/AstroImages/AstroIndex.html>

Chip Gentry

<https://webspace.utexas.edu/gentryml/www/astro.html>

Ed Grafton

<http://www.ghg.net/egrafton/>

Damian Peach

<http://www.damianpeach.com/>

www.skyandtelescope.com

www.spaceweather.com

Mars Maps

<http://ralphaeschliman.com/id20.htm>

<http://astrogeology.usgs.gov/Gallery/MapsAndGlobes/mars.html>