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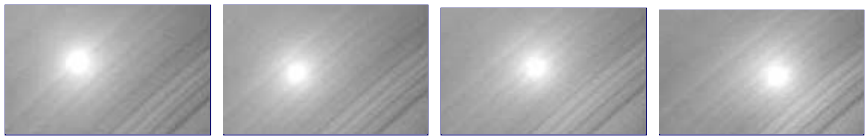
Update: What Is the Moving Light in Saturn's Rings? Answer: Opposition Effect.



Mysterious moving light changes position from one Saturn ring band on far left in image W00016503 to a further ring band in far right image W00016506, on July 23, 2006. Is it a "sundog" where sunlight reflects off icy, dusty rings? All Cassini-Huygens spacecraft images courtesy NASA/JPL/Space Science Institute.

Update - Email from an employee at the Space Science Institute in Boulder, Colorado, on June 23, 2007:

"I enjoy visiting your Earthfiles website for news on topics one normally doesn't hear much about, and your reports to *Coast to Coast* which I listen to when I stay up late working on art projects or photographs. I like that you're keeping on top of the disappearing bees situation.

About your recent Earthfiles report, *What Is the Moving Light in Saturn's Rings? A Sundog?* The bright spots in the four images are not a sundog. It's called the 'opposition effect' and is seen in the rings whenever Cassini is looking in the *exact same direction* as the sunlight. It's due to sunlight illuminating everything face-on (what astronomers call 'zero phase angle') and therefore, no shadows exist.

I work at the Space Science Institute, doing most of the image processing for the Cassini cameras in one of the groups."

Editor's Note: Space Science Institute: "The *opposition effect* exists because of two contributing factors. One is due to the fact that the shadows of ring particles directly opposite the Sun from Cassini–the region of opposition–fall completely behind the particles as seen from the spacecraft. These shadows are thus not visible to the spacecraft: all ring particle surfaces visible to Cassini are in sunlight and therefore bright. Away from the region of opposition, the ring particle shadows become more visible to Cassini and the scene become less bright. The surge in brightness falls off in a circular fringe around that point.

"Another contributing factor to the opposition surge is an optical phenomenon called “coherent backscatter.” Here, the electromagnetic signal from the rays of scattered sunlight, making their way back to the spacecraft, is enhanced near the region of opposition because, instead of canceling, the electric and magnetic fields comprising the scattered radiation fluctuate in unison.

The July 23, 2006, images were taken in visible light with the Cassini spacecraft wide-angle camera at a distance of approximately 262,000 kilometers (163,000 miles) from Saturn. Image scale in the radial, or outward from Saturn, direction is 13 kilometers (8 miles) per pixel."

June 20, 2007 Pasadena, California - A year ago on July 23, 2006, the Cassini-Huygens spacecraft orbiting Saturn took a series of images of the rings that were received back on earth at the Jet Propulsion Laboratory (JPL) in Pasadena, California, on July 24,

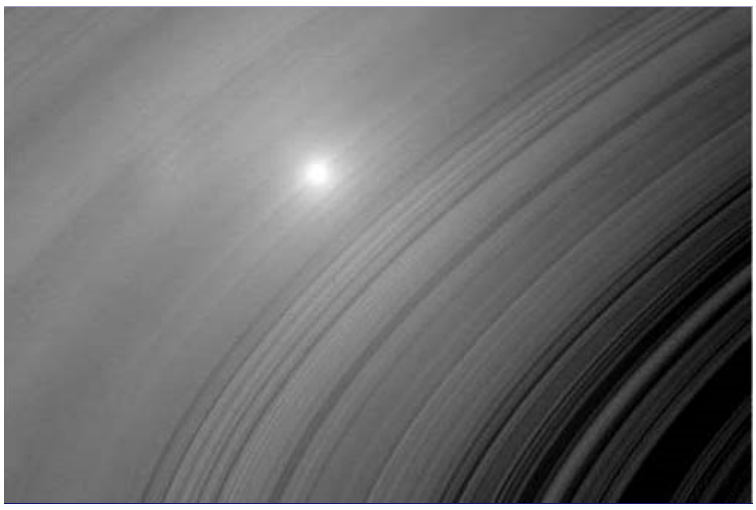
2006.

Here is the page of raw images: **http://saturn.jpl.nasa.gov/multimedia/images/raw/raw-images-list.cfm?StartRow=33&cacheQ=1&browseLatest=0&storedQ=1442726**

http://saturn.jpl.nasa.gov/multimedia/images/raw/raw-images-list.cfm?StartRow=33&cacheQ=1&browseLatest=0&storedQ=1442726

Enlargements of the Four Frames Showing Light Moving Along Saturn's Rings

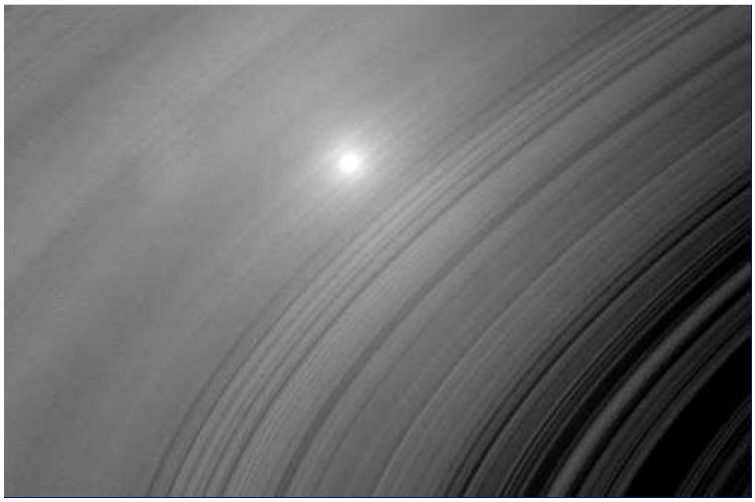
The four images are numbered in sequence and I have arranged them in order below. You can clearly see the light changes position from one ring band in image W00016503 to a further ring band in image W00016506. The NASA/JPL text states that the images were "taken on July 23, 2006, and received on Earth July 24, 2006. The camera was pointing toward SATURN-RINGS at approximately 209,976 kilometers (130,500 miles) away, and the image was taken using the CL1 and CL2 filters. This image has not been validated or calibrated. A validated/calibrated image will be archived with the NASA Planetary Data System in 2007."



On July 23, 2006, the Cassini-Huygens spacecraft camera was focused on Saturn's rings.

Four images showed a bright spot in the rings. All images courtesy NASA/JPL/Space Science Institute.

2) W0016504



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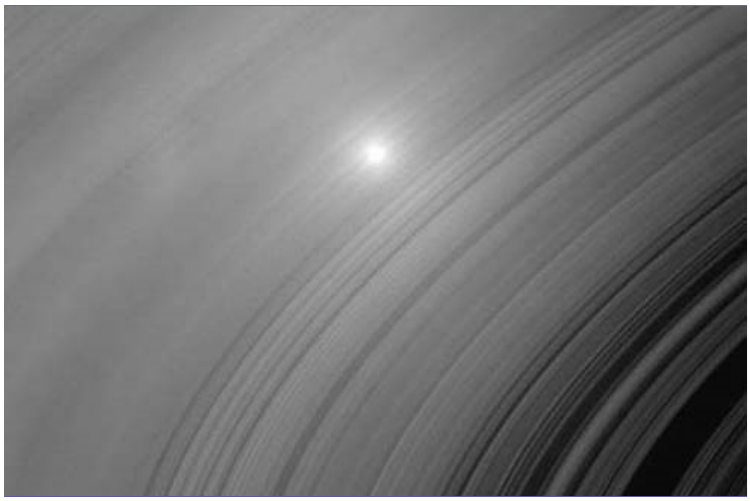

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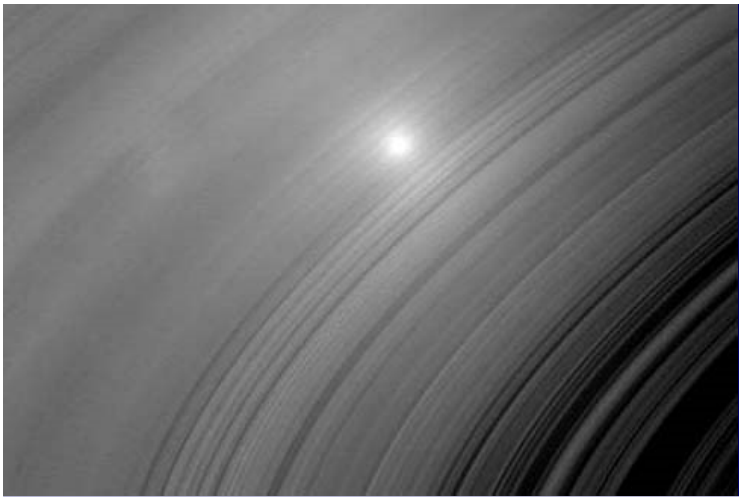

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• 01/06/2007 — Liquid Methane Lakes on Saturn's Titan Moon

• 12/19/2006 — First Stars - Or First Black Holes - in Universe?
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• 01/14/2005 — Updated - Cassini/Huygen's First Look At Titan's Surface
• 11/25/2004 — Closest Look At Mysterious Titan from Cassini Spacecraft
• 06/18/2004 — German Scientist Werner von Braun Anticipated Terrorists, Asteroids and ETs on American "Enemy's List"
• 06/11/2004 — Cassini Spacecraft Will Rendezvous with Saturn July 1, 2004
• 04/21/2004 — At the X-Conference, Former Naval Intelligence Officer, C. B. Scott Jones
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• 10/07/2002 — Large Kuiper Belt Planetoid Found Beyond Pluto
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Websites:Cassini-Huygens Raw Images: http://saturn.jpl.nasa.gov/multimedia/images/raw/raw-images-details.cfm?feiImageID=80086

European Space Agency (ESA): http://www.esa.int/SPECIALS/Cassini-Huygens/index.html

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