



## Saturn on July 19, 2013

On the night of 19 to 20 July 2013 - during 21:27 and 21:42 UTC – a backlit mosaic of the rings (33 segments, a total of 323 individual images in different spectral regions) was taken by the wide-angle camera of the Cassini spacecraft. The Earth and our Moon are clearly visible below the rings of Saturn (the F, G and E rings are visible in the picture). This image is one of the few images that show the Earth together with another planet in the solar system<sup>1</sup>.

The scientific background of the images was the visualization of weak parts of Saturn's rings backlit by the sun. The angle between the camera of Cassini and the rings was about 20 degrees.

NASA made it a little PR campaign, because every person on Earth who could see Saturn in the sky at the recording time, was a part of the image even though the size of the Earth was only a part of a pixel in this image.

The distance between Saturn and Earth was about 1,444,380,000 kilometers or 9.66 astronomical units. The resulting light travel time of the image signals was about 80.2 minutes. The Cassini image was captured with RGB filters and shows natural colors. The distance of the space probe to Saturn was approximately 1.2 million kilometers. The focal length of the wide-angle camera is 200 mm and results in a resolution of 79 km per pixel on Saturn and 86,620 km per pixel on the Earth.

After reading the brief report of this planned image by the Oculum Newsletter from D. Fischer, we came up with the idea to image Saturn at the same time. At 21:30 UTC Saturn was still about 31 degrees above the horizon in Namibia while in Europe it was already below the horizon.

The terrestrial Saturn image was captured with the Celestron C14 of Onjala Lodge. The primary 4,000 mm focal length has been extended with a Baader Q-Turret Barlow lens to reach approximately 5,200 mm. Unfortunately the seeing was not perfect at this evening. We used a TIS DBK 21 single shot color video camera. The exposure time of the frames was 1/13 seconds and the videos (300 of 3,000 frames per video) were stacked with the software AviStack. The final processing was done with Adobe Photoshop CS 2.

The diameter of Saturn was only of 17.2 arcseconds. This results in a resolution of 7000 kilometers per arcsecond or nearly 1550 kilometers per pixel. Cassini itself has a length of 6.7 m and so it is just as big as 1/232,000 pixel.

2013 - W. Paech + F. Hofmann

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<sup>1</sup> [http://en.wikipedia.org/wiki/Family\\_Portrait\\_%28Voyager%29](http://en.wikipedia.org/wiki/Family_Portrait_%28Voyager%29)  
[http://www.nasa.gov/mission\\_pages/cassini/multimedia/gallery/pia08329.html](http://www.nasa.gov/mission_pages/cassini/multimedia/gallery/pia08329.html)