

Coordinated Cassini and Earth-based Observations of Saturn's Aurora During the 2013 Opposition

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Abstract

During April and May, 2013, coordinated observations of Saturn's aurora were made by the Cassini spacecraft and several Earth-based telescopes. Here we report on the measurements, geometry and timing of these observations and introduce additional presentations of the results.

The observations were made between April 18-23, April 29, May 7 and May 16-22. To the greatest extent possible, times were selected to allow simultaneous observations from Cassini and from Earth. While the Earth-based telescopes had a view of Saturn's north pole, Cassini made observations of both the north and south poles. This permits stereo studies of auroral structure when Cassini viewed the northern hemisphere and investigations of conjugate aurora when Cassini viewed the southern hemisphere.

The Cassini remote sensing measurements were made primarily by the Ultraviolet Imaging Spectrometer (UVIS) and the Visible and Infrared Mapping Spectrometer (VIMS) although the Imaging Science Subsystem (ISS) also collected data.

In situ measurements of the magnetosphere were also the magnetometer, the Radio and Plasma Wave Science (RPWS) instrument and the Magnetospheric Imaging Instrument (MIMI.) During this campaign the spacecraft was typically between 10 and 23 Saturn radii from the planet, at latitudes up to 61 degrees and in the late afternoon to dusk side of the magnetosphere.

Earth-based observations were made in the ultraviolet by the Hubble Space Telescope's Advanced Camera for Survey and in the infrared by the Keck observatory and Infrared Telescope Facility and by the European Southern Observatory's Very Large Telescope.