

## Saturn Approach Phase Science

Starting in January, 2004, six months prior to Saturn orbit insertion, the Cassini approach science mission phase began. Between January 10-30, 2004, the Cassini spacecraft was oriented in order to measure the solar wind upstream of Saturn's magnetosphere while the Hubble Space Telescope (HST) made observations of Saturn's ultraviolet aurora. Cassini solar wind ion measurements by the Cassini Plasma Spectrometer (CAPS) were largely continuous and interrupted only by occasional downlinks of data to Earth. A series of five Hubble Space Telescope (HST) orbits on 8 January 2004 provided measurements of the longitude variations of the auroral emissions most of a Saturn rotation, while single orbit observations on 12 other days were obtained to compare the auroral activity with varying solar wind conditions. Cassini also made measurements of energetic particle flux, local plasma waves and auroral radio emissions from Saturn. These observations were summarized in a set of papers published in Nature in February, 2005.

### References

Clarke, J. T., J-C. Gérard, Denis Grodent, S. Wannawichian, Jacques Gustin, J. Connerney, F. Crary et al. "Morphological differences between Saturn's ultraviolet aurorae and those of Earth and Jupiter." Nature 433, no. 7027 (2005): 717.

Crary, Frank J., John T. Clarke, Michele K. Dougherty, P. G. Hanlon, K. C. Hansen, John T. Steinberg, B. L. Barraclough et al. "Solar wind dynamic pressure and electric field as the main factors controlling Saturn's aurorae." Nature 433, no. 7027 (2005): 720.

Kurth, William S., Donald A. Gurnett, John T. Clarke, Philippe Zarka, Michael D. Desch, Michael L. Kaiser, Baptiste Cecconi et al. "An Earth-like correspondence between Saturn's auroral features and radio emission." Nature 433, no. 7027 (2005): 722.