Saturn's Great White Storm (2010): Correlations between Clouds and Thermal Fields?

Momary, T. ; **Yanamandra-Fisher, P. A.** ; **Orton, G. S.** ; **Baines, K. H.** ; **Fletcher, L.** ; **Trinh, S.** ; **Delcroix, M.**

It is well known that convective storms occur regularly in Saturn's atmosphere, but giant storm outbreaks, known as Great White Spot (GWS) outbreaks, occur approximately every 29 years or once per Saturnian year, just past northern solstice. Including the recent GWS outbreak of December 2010, a total of six have occurred, and are considered to be related to the changing seasonal insolation, though their triggers are not yet known or what occurs below the clouds on smaller temporal and spatial timelines. Although not predictable, as evidenced by the current Northern Storm and observed by Cassini, the great storms start out with a violent outbreak, dredging up material from the deep atmosphere, which then is dispersed by the prevailing winds. The recent 2010 December GWS outbreak is an outlier, occurring at northern latitudes of approximately 35°N (the northern "Tornado Alley"), just past vernal equinox, almost a season early. It has rapidly encircled the planet in two months and is now in its mature phase, with discrete structure obvious at all longitudes at both mid-infrared and deep atmosphere (or 5-microns). Recent amateur observations indicate a link between lightning strikes, convective storm activity, GWS and spoke activity in the morning ansa (Delacroix et al., 2011). We shall explore correlations between the many visible/CCD observations from the amateur community, the albedo and thermal maps produced with data acquired from NASA/InfraRed Telescope Facility (IRTF)/NSFCAM2, a 1 - 5-micron imager, during the various phases of the 2010 - 2011 GWS. We will characterize changes in the local environs of the outbreak site at various epochs and compare with other locations on the planet. Delacroix, M., E. Kraaikamp and P. Yanamandra-Fisher,2011. First Ground Observations of Saturn's Spokes Around 2009 Equinox. EPSC/DPS, Nantes, France.

Publication: American Geophysical Union, Fall Meeting 2011, abstract id.P13C-1683

Pub Date: December 2011

Bibcode: 2011AGUFM.P13C1683M

Keywords: 5464 PLANETARY SCIENCES: SOLID SURFACE PLANETS / Remote sensing;
5704 PLANETARY SCIENCES: FLUID PLANETS / Atmospheres;
6275 PLANETARY SCIENCES: SOLAR SYSTEM OBJECTS / Saturn