

Time Variable Phenomena in Jovian and Saturnian Atmospheres

Padma A. Yanamandra-Fisher and Glenn S. Orton

NASA/Jet Propulsion Laboratory, Pasadena, CA, U.S.A.

Temporal evolution and morphology of various phenomena in the Jovian and Saturnian atmospheres have been recorded regularly since 1985 by our group in support of various NASA missions. These observations were acquired primarily at NASA/Infrared Telescope Facility (IRTF) from 1 - 24 microns. Some of the programs that we have supported are: World Jupiter Day (1982); Comet Shoemaker-Levy 9 collision with Jupiter (1994); Earth-Saturn Ring Plane Crossings (1995); Galileo primary and extended mission (1995 - 2001); anticipated support of Cassini mission (1995 - present).

Over the course of the past fifteen years, we have determined the temperature profiles of the troposphere and stratosphere of Jupiter over a Jovian year; followed the evolution and dissipation of various discrete features such as 5-micron Jovian hot spots; changes of the Great Red Spot; collision of white ovals, to highlight a few of the time-variable features we have observed.

Our focus for the next few years is on the changes occurring in the atmosphere of Saturn, with Cassini spacecraft en route Saturn, and spacecraft orbit insertion scheduled for July 2004. Since the 1995 Earth-Saturn Ring plane crossing, the southern hemisphere of is available for earth-based observing and has provided us with a large imaging and spectroscopic database which will allow us to provide a reference model for Cassini data.

As a result of the gigabytes of data, its breadth and depth, we have a secondary focus: to develop/employ intelligent data mining and management techniques to develop insightful physical models and timely dissemination of data and results.