

# Investigating Near-Equinox Atmospheric Change on Uranus

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Scientific Category: SOLAR SYSTEM

Scientific Keywords: GIANT PLANETS, PLANETARY ATMOSPHERES, VARIABILITY, CHEMICAL ABUNDANCES

Instruments: WFPC2, NICMOS

Proprietary Period: 12

Orbit Request	Prime	Parallel
Cycle 16	7	0

## Abstract

Uranus is approaching its 7 December 2007 equinox, when we will be able to observe the entire northern hemisphere for the first time with modern cameras. The large seasonal phase shift expected from its long radiative time constant implies that it should now exhibit nearly maximal hemispheric contrast, and should be in the process of reversing. Many changes already observed, such as the development of the first visible-wavelength dark spot, discovered in Cycle 15, and the fading of the south polar cap may be indicative of the expected reversal. We propose a detailed characterization of Uranus' current seasonal response with a 7-orbit program consisting of 1 orbit of NICMOS imaging of cloud bands and 6 orbits of WFPC2 imaging using both broadband and narrow-band filters capable of tracking dark and bright discrete cloud features. Filters between 0.467 and 1.87 microns will provide vertical sensing depths scanning through the pressure range where the putative methane and deeper H<sub>2</sub>S clouds might plausibly exist and provide strong constraints on their contributions and parent gas mixing ratios. These observations have unique combinations of spectral range and resolution with needed temporal and spatial resolution not available from groundbased observations. Only HST is capable of investigating the Uranus dark spot.

**Investigators:**

	Investigator	Institution	Country
PI	Dr. Lawrence Sromovsky	University of Wisconsin - Madison	USA/WI
CoI	Dr. Heidi B. Hammel	Space Science Institute	USA/CO
CoI	Dr. Kathy Rages	SETI Institute	USA/CA

Number of investigators: 3

**Target Summary:**

Target	RA	Dec	Magnitude
URANUS			V = 5.7

**Observing Summary:**

Target	Config Mode and Spectral Elements	Flags	Orbits
URANUS	WFPC2 Imaging F467M	DUP	6 (1x6)
	WFPC2 Imaging F547M		
	WFPC2 Imaging FQCH4N15		
	WFPC2 Imaging F658N		
	WFPC2 Imaging F673N		
	WFPC2 Imaging F791W		
	WFPC2 Imaging F850LP		
	WFPC2 Imaging FQCH4P15		
URANUS	NIC1 Imaging F095N	DUP	1
	NIC1 Imaging F097N		
	NIC1 Imaging F108N		
	NIC1 Imaging F160W		
	NIC1 Imaging F170M		
	NIC2 Imaging F187N		

Total prime orbits: 7