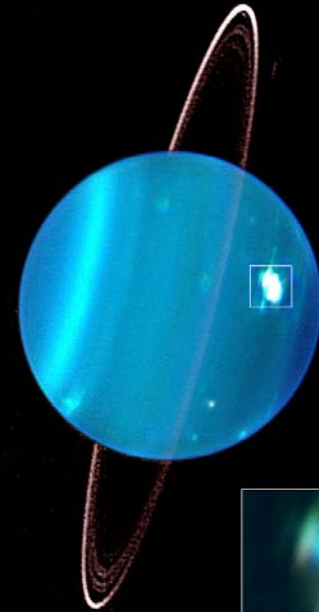
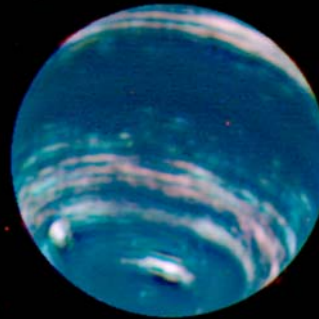
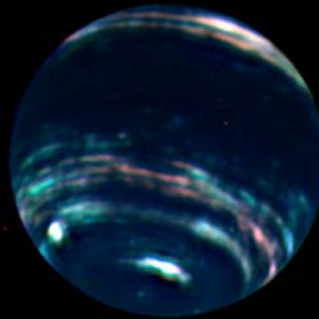


Research on Outer-Planet Atmospheres at SSEC

Science Team: Larry Sromovsky and Pat Fry

Planets: Jupiter, Neptune, Uranus



Research: Atmospheric circulation
Seasonal response
Dynamics of circulation features
Vertical cloud structure and composition

Techniques: Spectroscopy, Imaging, in situ observations, cloud tracking, radiation transfer modeling

Sources Hubble Space Telescope, Cassini, New Horizons
Ground based telescopes (Keck and IRTF).
Archived data from Voyager & Galileo missions.

2008: A Year of Planetary Proposal Success

Planetary Astronomy Program (3-year grant, accepted, top rated)

Planetary Atmospheres Program (3-year grant, accepted)

Jupiter Data Analysis Program (3-year grant, accepted)

Hubble Space Telescope Cycle 17 Program (1-year grant, after May 09 HST repair)

NASA IRTF observing time (spectroscopic observations completed)

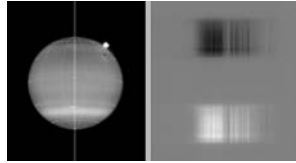
SSEC is the leading Wisconsin center for Hubble observing:



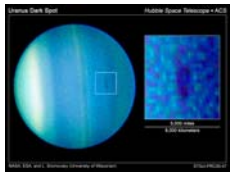
In the last three observing cycles, 12 HST proposals were submitted from Wisconsin investigators (all institutions).

Only 3 were awarded HST observing time, all from the SSEC Outer Planet Team (100% approval rate, 100% of Wisconsin-led HST observing).

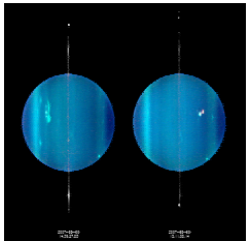
SSEC 2009 Outer Planet Publications:



Sromovsky, L.A. and Fry, P.M. 2008. The methane abundance and structure of Uranus' cloud bands inferred from spatially resolved 2006 Keck grism spectra. *Icarus* **193**, 252-266.

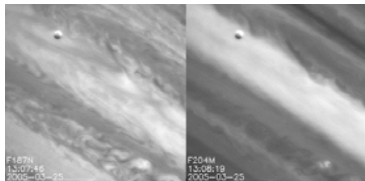


Hammel, H. B., Sromovsky, L.A., Fry, P.M., Rages, K.A., de Pater, I., and van Dam, M. 2009. The Dark Spot in the Atmosphere of Uranus in 2006: Discovery, Description, and Dynamical Simulations. *Icarus*, **210**, 257-271.

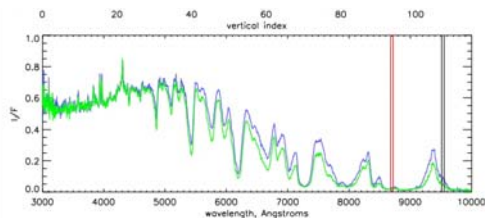


Sromovsky, L.A., and Fry, Hammel, H. B., Fry, P.M., de Pater, I., Rages, K.A. and Showalter, M.R. 2009. Uranus at equinox: Cloud morphology and dynamics. *Icarus* (in press)

Publications in preparation:



Sromovsky, L.A. and Fry, P.M. 2009. Jupiter's low latitude cloud structure inferred from 2005 NICMOS observations. To be submitted to *Icarus*.



Sromovsky, L.A. and Fry, P.M. 2009. Latitudinal variations in Uranus cloud structure as constrained by 2002 STIS spectra. To be submitted to *Icarus*.

2008 Press release on Uranus equinox observations.



HOME PAGE PREVIOUS NEWS



New images yield clues to seasons of Uranus

Oct. 13, 2008

by Terry Devitt

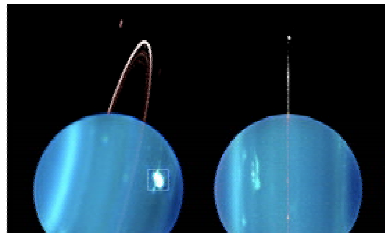
With an 84-year orbit around the sun, it has an opportunity to observe the change of seasons on Uranus some 19 times farther from the sun than Earth.

But in 2007, the planet reached equinox, the point in time where the sun is directly over the planet's equator and what little sunlight the planet gets is distributed evenly over its northern and southern hemispheres, giving scientists their best opportunity to

New Images Yield Clues To Seasons of Uranus

(13 October 2008) With an 84-year orbit around the sun, it isn't often that planetary scientists have an opportunity to observe the change of seasons on Uranus some 19 times farther from the sun than the Earth.

But in 2007, the planet reached equinox, the point in time where the sun is directly over the planet's equator and what little sunlight the planet gets is distributed evenly over its northern and southern hemispheres, giving scientists their best opportunity to probe the seasonal dynamics of the ringed planet.



PRESS RELEASE

Date Released: Monday, October 13, 2008

Source: [University of Wisconsin-Madison](http://www.wisc.edu)

New Images Yield Clues to Seasons of Uranus

ITHACA, N.Y. - With an 84-



SUN & MOON	MI
Data shown for Waukegan, IL	
	Sun
RISE	7:08 AM
SET	4:18 PM

THE MAGAZINE WELCOME TO ASTRONOMY COLUMNISTS SUBSCRIPTIONS

News

Print this page E-mail this page to a friend

New images yield clues to seasons of Uranus

Scientists seized their chance in 2007 to capture the first detailed images of the planet's features.

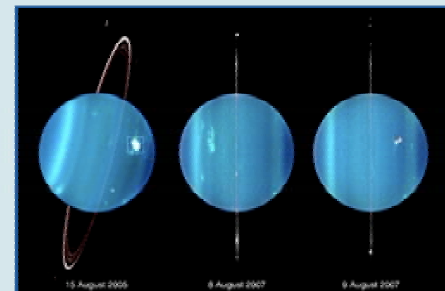
Provided by the Div. of Planetary Sciences

The 40th annual meeting of the Division for Planetary Sciences of the American Astronomical Society is going on in Ithaca, New York, until October 15. Visit Astronomy.com/News for regular updates like this one from the conference.

With an 84-year orbit around the Sun, it isn't often that planetary scientists have an opportunity to observe the change of seasons on Uranus, a planet some 19 times farther from the Sun than Earth.

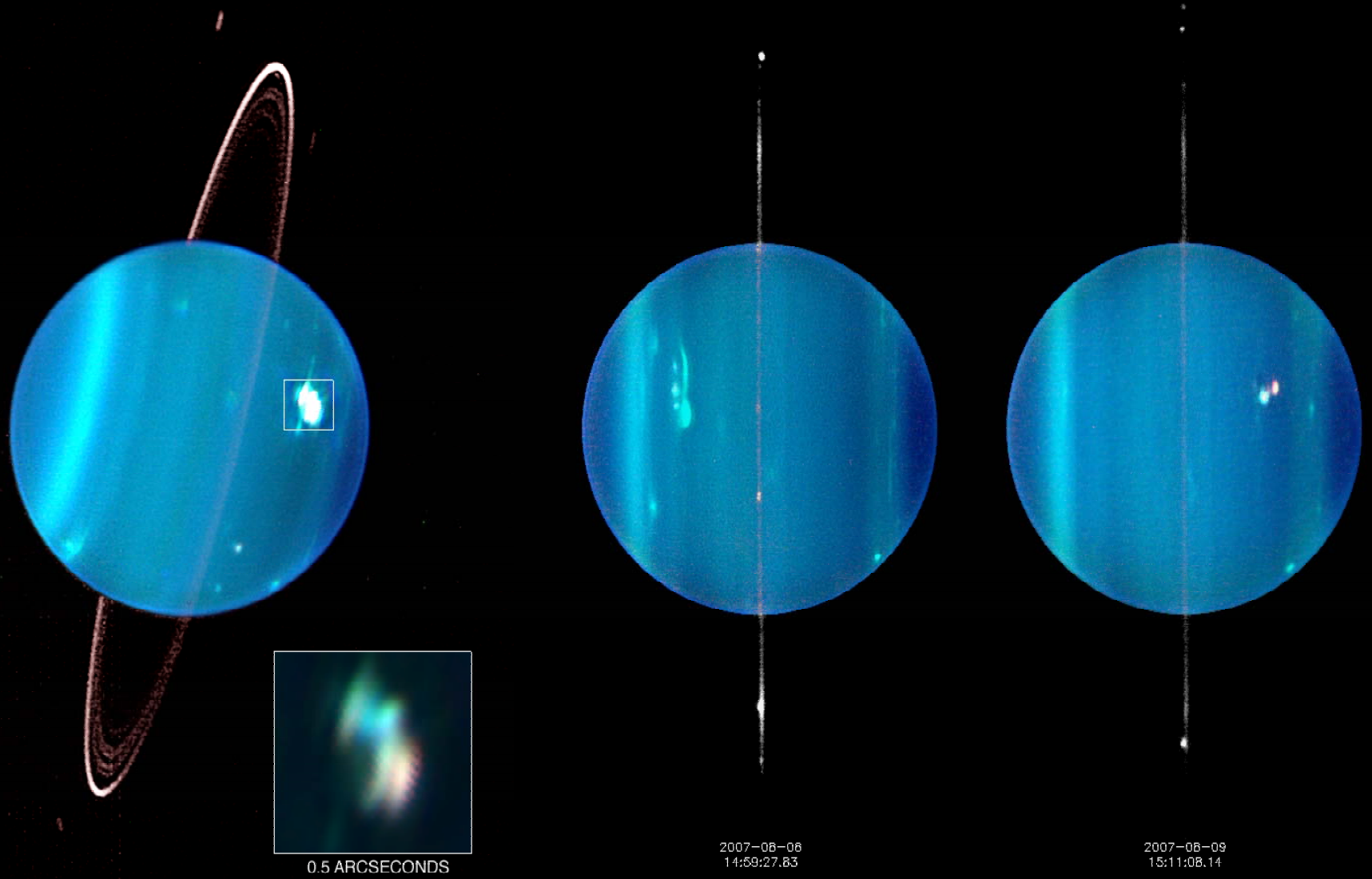
But in 2007, the planet reached equinox, the point in time where the Sun is directly over the planet's equator and what little sunlight the planet gets is distributed evenly over its northern and southern hemispheres. This situation gave scientists their best opportunity to probe the seasonal dynamics of the ringed planet.

Speaking at the American Astronomical



Near-infrared images from the Keck II telescope show the planet Uranus in 2005 (left), with the rings at an angle of 8 degrees, and at equinox in 2007 (right pair), with the planet's ring system edge-on. In all images, the south pole is at the left and the equator is directly below the rings. Courtesy of University of Wisconsin-Madison [\[View Larger Image\]](#)

Keck observations of Uranus



2005

2007