wavelengths, the upper atmospheric levels of Jupiter are sounded between 5 and 70 mbar (Kim et al, Icarus, 1991). At this spatial resolution, the South polar haze appears to be non-uniform, and spatial structures in the polar haze are observed, corotating with Jupiter.

A comparison will be made with images obtained one month later with NSFCAM on IRTF. These images are obtained during the nights of April 25 and 28. A global longitudinal survey has been obtained, at selected wavelengths between 1 and 5 micron. Morphological studies of the polar haze, in particular, can be made from these images, both in North and South polar regions. From the observations of each night, cylindrical mosaics can be built and cloud tracking will allow us to study the differential rotation of Jupiter at several wavelengths in the infrared.

13.06

HST Spectra of Jupiter and Saturn: Characteristics of Stratospheric and Tropospheric hazes.

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Observations of Jupiter (May 1992-July 1993) and Saturn (December 1992) were made by the *HST* Faint Object Spectrograph (FOS) (1800-3300Å) and the Goddard High Resolution Spectrograph (GHRS) (1600-1850Å). The planetary spectra sample the equatorial central meridian, equatorial limb, and (Saturn only) the north pole.

The FOS spectra were processed to remove background grating scatter and to account properly for effects due to spherical aberration in the *HST* primary optics. The planetary spectra were ratioed to *HST* spectra of the solar analog 16 Cyg B over the spectral range 1600-3300Å. *HST* images at 3360Å are used to derive limb-to-limb absolute reflectivity scans, I/F, for both Jupiter and Saturn.

The absolute reflectivity ratios are compared to vertically inhomogeneous models of the planetary atmospheres to determine abundances of minor and trace species therein. Both Jupiter and Saturn show the influence of acetylene and phosphine absorption below 2300Å. Only Jupiter shows features due to ammonia. Preliminary models of these data were discussed by Caldwell *et al.* (1993, BAAS **25**, 1027).

In this paper we will concentrate on the vertical distribution and optical characteristics of the hazes in these atmospheres. The wavelength dependent models at FOS wavelengths are most sensitive to aerosol parameters (*e.g.*, particle size distribution, refractive index) and gas concentrations. The geometry dependent models of limb-to-limb reflectivity characteristics are most sensitive to particulate phase functions. Simultaneous utilization of both types of models are used to optimize our understanding of these atmospheres.

13.07

Jovian seismology: influence of the troposphere thermal signature and seismological diagnosis

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In order to correctly interpret the seismological measurements recorded after the cometary impact on Jupiter, we have examined the following points:
1) The Jovian oscillation spectrum taking into account the planetary troposphere and stratosphere has been calculated for the first time. Direct numerical computations of planetary eigenfrequency pattern have been carried out for the fundamental modes and for non radial modes with radial order up to 20 and degree up to 30. The differences of the oscillation frequencies due to the addition of the tropospheric and the stratospheric levels strongly depend on the upper boundary condition. However, the corrections are simple functions of the eigenfrequency and the degree of the mode. These results are necessary for accurately interpreting the future seismological observations of Jupiter and Saturn.
2) The propagation of acoustic waves in the Jovian troposphere has been revisited, in order to estimate their thermal signature. The relation between this signature and the wave velocity depends strongly on the wave frequency and on the level of detection.
3) Different interior structure models of Jupiter have been compared with the help of seismology. We have considered two groups of models: first, models based on different equation of state of hydrogen, and second, models with different descriptions of the mechanism of energy transport (fully adiabatic models and models with a radiative window). Our results show it is possible to test the giant planets interiors with the help of future seismological data, depending on the accuracy of the determination of the eigenfrequencies and on the degrees of the observed modes.

13.08

Saturn's Mesospheric Temperature from 28 Sgr Occultations

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A full ensemble of immersion/emersion lightcurves from the occultation of 28 Sgr by Saturn in 1989 has been analyzed. From an accurate determination of the Saturn center of figure using fiducial ring features, the center is known *a priori* to within a few km. Thus we retrieve not only atmospheric temperatures but also absolute radial positions of the measurements with high accuracy. From the 11 best-calibrated lightcurves, we infer a mean temperature of 135 ± 5 K on a level surface corresponding to an equatorial radius of 60963 ± 3 km. The pressure corresponding to this level (isothermal fit) is 1.7 μbar. Saturn-centered latitudes ranging from $-14.20°$ to $+6.25°$ were probed. To fit the actual shape of the planet, we assumed that it was rotating on cylinders with the observed differential flow field as derived from cloud motions. There is considerable "topography" (several $\times$ 10 km) in the level surfaces over the range of latitudes probed, and this effect is included in the model. The self-consistencies of the inferred level-surface radii at half flux for each of the stations provide support for the differentially-rotating model. Two of the stations, CTIO and Las Campanas, observed immersion through C-ring features. The features thus acted as a fiducial grating superimposed over the atmospheric modulation at these stations. Model lightcurves computed on the basis of the adopted mean temperature and center-of-figure solution agree very well with the data from these stations.

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13.09

A Lower Isentropic, Iso-Potential Vorticity Model for the Deep Saturn Thermocline

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A simple conceptual model for the zonal winds of the outer planets is proposed, with particular attention to the deep thermal structure of Saturn. A dynamic upper layer of well-mixed potential vorticity is assumed, with a static stability exponentially decreasing with height above a windless, isentropic interior. The schematic character of the geostrophically balanced potential temperature field is