

Interiors of Enceladus and Other Icy Saturnian Moons

G. SCHUBERT^{1,2}, J. D. ANDERSON³

¹*Department of Earth and Space Sciences, University of California,
Los Angeles, CA 90095-1567, USA*

²*Institute of Geophysics and Planetary Physics, University of California,
Los Angeles, CA 90095-1567, USA*

³*Jet Propulsion Laboratory, California Institute of Technology,
Pasadena, CA 91109-8099, USA*

Cassini observations are used to infer the internal structures of Enceladus and other icy Saturnian satellites. Models of Enceladus are constrained mainly by its density and shape, as determined by analyses of Cassini orbital, radio Doppler, and image data. Observations of ongoing endogenic activity on Enceladus also constrain its internal structure. Models of other Saturnian moons are based on new density values from analyses of Cassini Radio Science data. In the case of Rhea, radio Doppler data from a close flyby of the satellite have provided the degree 2 coefficients of the moon's gravitational field in addition to its mass. Images of Rhea and other icy Saturnian moons contribute qualitative constraints on the interiors of the satellites. The Saturnian icy satellites are a diverse group of moons with interiors that range from an undifferentiated primordial mixture of ice and rock to a fully differentiated (ice from rock) structure in the case of Enceladus.