
Introduction:

The Cassini Visual and Infrared Mapping Spectrometer (VIMS) is an imaging spectrometer on the Cassini spacecraft that covers the spectral range of 0.35-5.2 μm in 352 spectral channels, a nominal instantaneous field of view of 0.5 mrad and an image format of 64x64 pixels. It has completed its first 6 months in orbit around Saturn. During that time it has made extensive observations of Saturn’s rings, its icy satellites, in particular Phoebe and Iapetus, and had 1 distant and 2 close flybys of Titan.

Results:

Results for the flyby of Phoebe show that its surface is dominated by water ice and bound water, but it has significant amounts of ferrous-iron-bearing silicates, CO₂ as liquid or gaseous inclusions in minerals, organics, CN compounds and several as yet unidentified compounds. Phoebe’s surface composition is consistent with other outer solar system objects.

Results for Iapetus show the presence of water ice, bound water, CO₂ complexed in a similar fashion as on Phoebe, organics and several as yet unidentified surface components.

Saturn’s rings are seen by VIMS to be composed of almost pure water ice with small amounts of contamination/coloration that seem to be more abundant in the inner portion of Saturn’s rings and in the ring gaps. VIMS has detected radial structure in the composition of Saturn’s rings all the way down to the roughly 2-km resolution limit of the data obtained during Saturn Orbit Insertion (SOI).

Titan is shown to have strong atmospheric fluorescence at 3.3 μm due to methane, a variegated surface of roughly a factor of 2 in albedo contrast that seems mostly due to textural differences rather than compositional differences, and definite evidence of topography and geologic structures.

All of these results and more will be discussed.