

## Low-Energy Plasma Populations in Saturn's Inner Magnetosphere and Rings

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During the initial Cassini insertion orbit, the Cassini Plasma Spectrometer (CAPS) made observations of the suprathermal ( $< 1$  keV) and thermal (down to  $\sim 1$  eV) plasma environments of Saturn's inner magnetosphere and rings. Measurements of suprathermal N<sup>+</sup> ions from L  $\sim 9$  down to 3.5 are indicative of the existence of a local icy satellite or E-ring source of a nitrogen-bearing compound such as NH<sub>3</sub>. It is less likely that the ions are formed from neutrals transported inward from Titan, while ions created near Titan's orbit can be ruled out. In addition to nitrogen, water group ions including H<sub>3</sub>O<sup>+</sup> are observed over the same broad range of energies and radial distances. During Cassini's closest approach to Saturn we observed O<sub>2</sub><sup>+</sup> and O<sup>+</sup> ions over the A and B rings. Analysis shows that these data are consistent with an O<sub>2</sub> atmosphere produced by photolysis of water ice in the rings.

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