

**Galileo's Sear Infrared Mapping Spectrometer (NIMS) Science Observation Designs for Io**

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The Galileo spacecraft will arrive at Jupiter in December 1995. One of the primary objectives of the Galileo mission is to investigate the nature of Io's volcanism. NIMS is a remote sensing instrument aboard Galileo which combines imaging and spectral capabilities and will be used to map the composition and temperature of Io's surface and plumes. The NIMS science observing plan for Io and selected observation designs will be presented, focussing on the Io closest approach observations which will take place on December 8, 1995. NIMS has the unique capability to image and obtain spectral data simultaneously and is the first instrument of its kind to be flown in a planetary mission. The spectral range of NIMS is from 0.7 to 5.2 microns, which spans two regions: surface reflected light and emitted thermal radiation. NIMS will investigate both the surface mineralogy and the temperature of Io's features, as well as search for selected atmospheric species. The main NIMS science objectives at Io include: (i) determining the composition of the surface units 50 km or larger in one hemisphere (centered on the Prometheus region); (ii) determining the composition of selected surface units less than 10 km in size; (iii) characterizing the composition and temperature of flows and plumes; (iv) setting limits on the density of atmospheric SO<sub>2</sub>; (v) measuring cooling of hot spots during eclipses; (vi) mapping changes in surface composition and temperature with time,

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