

GALILEO IMAGING RESULTS FOR IO

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The Galileo spacecraft has acquired distant observations of volcanically active Io since the summer of 1996. These images have revealed color changes associated with the volcanic activity, new topographic measurements, and other results. Eleven active volcanic plumes have been imaged on the limb of the satellite. Eclipse images (Io in Jupiter's shadow) have revealed high-temperature hot spots and colorful diffuse glows associated with Io's atmosphere and plumes. The new data suggests that Io's activity may be dominated by ultramafic volcanism, with dense and very hot lavas rich in magnesium, perhaps erupting from a deep magma ocean. But the observations also reveal great variety in the eruptive styles and landforms, and there are many mysteries. For example, we have few clues as to how the 5-15 km high mountains form, how some of the plumes can persist for decades, or about the detailed composition and structure of the crust and mantle. Three close encounters with Io are planned for October and November of 1999 and February of 2000, but there is a high probability of failures due to the intense radiation environment close to Jupiter. If one or more of these encounters are successful, the high-resolution observations may resolve some of the mysteries, and will probably provide many new puzzles.