

### **Baldur – A cold caldera on Io**

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The deposit in some calderas on Jupiter's moon Io may originate from emplacement of fluid SO<sub>2</sub>. It has been hypothesized that Io's volatile transport includes both deposition from vapor and subsurface fluid transport of SO<sub>2</sub>. The subsurface fluids should reach the surface, producing a combination of solid deposit and gaseous escape. If this activity occurs at a caldera, then it could result in a characteristic surface deposit that is confined topographically. The size of the surface deposit may be in part controlled by the characteristics of the fluid outbursts on Io.

Baldur is a small, elongated caldera in the Chaac region on Io, approximately 30x4 kilometers in size. It is distinguished from most other Ionian calderas by a high albedo, white deposit that has a spectral signature of very pure SO<sub>2</sub>. It may be evidence for an outburst of subsurface fluid. Calderas having the characteristics of Baldur are rare in the available imaging and spectral datasets. This may be due in part to the paucity of data of high enough spatial resolution to detect the characteristic scale of fluid outbursts. Cryovolcanism, the eruption of materials that solidify at low temperatures, has been observed in action on Neptune's moon Triton, and evidence for prior activity has been seen on other icy moons in the outer solar system. Baldur appears to be the first evidence found for cryovolcanism occurring on Io.