

Using Adaptive Optics to Study Volcanism on Io

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Io, the innermost Galilean satellite, is the most volcanically active body in the Solar System. This is due to internal heating caused by tidal interactions of Io with Jupiter and Europa. Data taken by the Voyager and Galileo spacecrafts suggest that volcanism on Io could be dramatically different from that on Earth. Volcanic lava on earth is silica-rich, while Ionian volcanism is sulfur-rich. During four nights in May 2004, high angular resolution images of Io were taken with the adaptive optics system on the W.M. Keck II telescope using various infrared filters. After applying cosmetic data processing, these images were carefully analyzed. Hot spots were detected in L and M bands, but observations at shorter wavelengths (H and K) also show the presence of two bright, high temperature hot spots. Their positions were compared with observations taken during the last 8 years, by the Galileo spacecraft, to determine if these volcanoes had been previously recognized. Observations of these hot spots in multiple wavelengths made it possible to determine the temperature and area of the active regions of each hot spot. A comparison of these new hot spots with the activity of previously studied hot spots will also be presented.

Meghan Brennan is currently studying Planetary Science at the University of California, Santa Cruz. She transferred from Santa Rosa Junior College last year, where she was actively involved in the Earth and Space Sciences department. Meghan hopes to begin graduate school in the fall of 2005 in order to obtain a graduate degree in planetary sciences.

