Principal Investigator: G. Jeffrey Taylor, University of Hawai‘i

This grant originally had four major tasks, all of which were addressed to varying extents during the course of the research:

- Measure the fractal dimensions of lava flows as a function of topography, substrate, and rheology.
- The nature of lava tube systems and their relation to flow fields.
- A quantitative assessment of lava flow dynamics in light of the fractal nature of lava flow margins.
- Development and application of a new remote sensing tool based on fractal properties.

During the course of the research, the project expanded to include the projects listed below. This work was also funded in part by the National Science Foundation through a graduate fellowship to Rachel Friedman.

- A comparison of what we can learn from remote sensing studies of lava flow morphology and from studies of samples of lava flows.
- Study of a terrestrial analog of the nakhlites, one of the groups of meteorites from Mars.
- Study of the textures of Hawaiian basalts as an aid in understanding the dynamics (flow rates, inflation rates, thermal history) of flow interiors.

In addition, during the first year an educational task was included. This entailed development and writing of a teacher’s guide and activity set to accompany the lunar sample disk when it is sent to schools. This resulted in publication of EP-306, referenced below.

Publications

Publications in refereed journals


Educational publication

Abstracts and extended abstracts


**Future publications**

NASA Grant 3684 will be acknowledged in future publications now in preparation. These will deal with Theo’s flow (the martian meteorite analog), Hawaiian basalts, lava tube formation, and computer modeling of lava flows with explicit attention paid to the shapes of the margins. Although other support contributed to these studies, NASA support was essential.

**Inventions**

No inventions were created during the course of this work.