



AWSFL008-DS3

NSF Award Abstract
- #0001827

**Collaborative Proposal: Mantle Inputs to the
Subduction Factory: Assessing
Scales of Spatial Variability along and across the
IBM Convergent Margin**

NSF Org OCE

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NSF Program 1620 MARINE GEOLOGY AND
GEOPHYSICS

Abstract

The objective of the project is to identify the mantle component in island arc volcanism by performing an across-arc study of magmatism in the southern Mariana Arc. The PIs propose to answer three principal questions using a field and laboratory study of submarine volcanoes in the Southern Seamount Province of the Mariana Arc. 1) Is the pattern of mantle depletion across the arc and the back-arc consistent with sequential melting of the mantle as it moves away from the back-arc spreading axis? 2) What is the inherent heterogeneity of the subarc mantle at scales of 10-60 km? 3) How are melts aggregated in arcs? They will answer these questions using a field program based on a high-resolution survey of two portions of the Southern Seamount Province, from the arc to the back-arc, using the Hawaii MR-1 towed vehicle; through detailed sampling of two traverses of the Province (including lavas and volcanoclastics); through characterization of the sampled materials petrographically and geochemically; and through interpretation of the data to identify the roles of along axis mantle heterogeneity.

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