

AIMS² Research Project in MSEM

Research Duration: Fall 2017 – Spring 2018

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Title of Project: Closing the Bulk Metallic Glass Data Gap in the Supercooled Liquid Region

Goals and Objectives of the Project, Expectations and Outcomes

The purpose of the project is to measure the viscosity and shear modulus of bulk metallic glasses (BMG) in a previously inaccessible temperature range. This data is key to understanding the fundamental physics behind glass rheology as well as advancing fabrication methodologies.

Students will make BMG samples from scratch, process the BMG to make test samples, and test the samples to extract shear wave velocities and viscosity as a function of temperature. Students will learn about processing equipment and methods, including weighing, melting, forming techniques; X-ray and thermal characterization, ultrasonic shear-wave measurement, and measure viscosity using rapid discharge forming.

Participating students will need transportation to California Institute of Technology where the experiments will be conducted.