

Department of Geology
COLLEGE OF ARTS & SCIENCES

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 2, 2009

The Department of Geology is pleased to offer the following research project for the summer of 2009. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

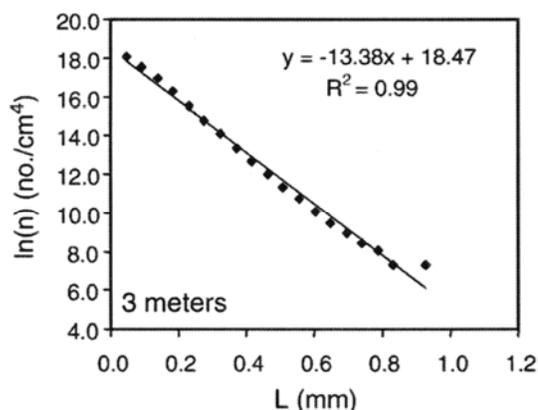
CALCULATION OF MAGMA RESIDENCE TIME AT THE KILAUEA VOLCANO, HAWAII

Professor Attila Kilinc
Department of Geology
Phone: 513-556-5967
Fax: 513-556-6931
e-mail: Attila.Kilinc@uc.edu

PROJECT DESCRIPTION

Activity of the Kilauea volcano in Hawaii started in 1983 and continues today. It is an excellent natural laboratory for scientists interested in volcanic processes. For example, it provides a unique research opportunity to compare the calculated magma residence time based on crystal size distribution (CSD) theory with the time interval between two successive eruptions.

This research project involves learning how to use the Image Analysis System and measuring the dimensions of plagioclase crystals. The student researcher will be shown how to operate the equipment and make measurements. Once the measurements are collected, 2-D measurements will be converted to 3-D and logarithm of number of crystals per given size range per volume ($\ln(n)$) will be plotted against the length (L) of crystals. This usually results in a linear plot as shown below:



where L is the length of plagioclase crystal, G is the crystal growth rate (10^{-10} cm/sec) and τ is the magma residence time.

Hypothesis to be tested: If plagioclase crystal growth is related to magma residence time, then calculated magma residence time should be identical to the period between two consecutive eruptions.