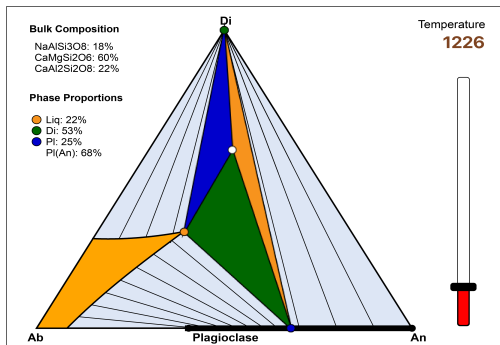


# Teaching Igneous Petrology: Online Tools for Working with Geochemical Data and Diagrams

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Learning the fundamentals of petrology can be a daunting task. The abstract and multidimensional world of phase diagrams and geochemical data can surprise and discourage undergraduate students, who come to a petrology course expecting volcanoes. Online tools have been developed to put interactivity into the static diagrams petrologists use to help understand igneous rocks and the processes that form them. These tools include: (1) binary and ternary interactive phase diagrams that can show equilibrium proportions of minerals



and melt for a mouse-selected bulk composition, (2) two- and three-component variation diagrams that let students choose both the data set and the oxides or elements plotted, (3) REE and Spider diagrams that let students choose the data set and the normalizing composition, (4) easy uploading of student-assembled data sets using comma-separated-variable (.csv) files, (5) mapping tools to display geochemical data that have latitude and longitude metadata on global, regional, or geologic maps. These tools have been created with HTML5, Javascript, and PHP to run on popular web browsers. They will be part of an Igneous and Metamorphic Rocks instructional website that also includes a periodic table designed for petrologists, a “rock library” of hand sample and thin section images, and links to videos, data repositories, and other online resources of petrologic interest. Short interactive learning modules that introduce important petrology topics and make use of the diagrams and tools will also be part of the website.

I am pleased to present this teaching-focused talk in a session honoring Mike Rhodes, a teacher extraordinaire, whose Volcanology course has mesmerized students of the Five Colleges for forty years.