Will the real phenocryst please stand up?

Conveners:

Mike Dungan
University of Geneva, Switzerland, Michael.Dungan@terre.unige.ch

Fidel Costa
Ruhr-Universitat Bochum, Germany, Fidel.Costa-Rodriguez@ruhr-uni-bochum.de

Jon Davidson
University of Durham, UK, j.p.davidson@durham.ac.uk

Crystal-liquid segregation processes are the dominant controls on magma differentiation, but many erupted magmas contain solid phases that are complexly zoned and/or out of equilibrium with their host melts. Such crystals may signal disequilibrium related to polybaric evolution, magma mixing, crustal assimilation, prompt recycling of fractionation products from the same system (i.e., crystal mush entrainment), or some combination of these processes. In such cases, modeling of magma genesis and differentiation on the basis of whole-rock chemistry may be either highly compromised or rigorously supported, depending on the degree to which insights derived from solid phases are developed and integrated. An important challenge for igneous petrologists is to convert the information carried by a magma's 'crystal cargo' (including melt inclusions) into process-related and component-specific constraints on magma evolution. We encourage a wide diversity of contributions on this general topic for magmatic systems ranging in composition from dominantly mafic to highly evolved, including insights pertaining to magma dynamics, process rates, open- versus closed-system evolution, and crystal-liquid equilibria.