

TITLE: Magma matters: modelling multi-phase reactive transports in igneous systems

ABSTRACT: Several of the grand challenges in geosciences today are intimately linked with our understanding of igneous processes – from the local to the planetary scale, from the deep interior to the shallow crust, and from the early solar system to the present day. Different aspects of igneous systems are known from petrological and geochemical experiments, the geological record, and geophysical imaging. However, connecting these lines of evidence to predictively model magma transport from source to surface remains challenging. Igneous systems involve transport and reactions of solid, liquid, and gas phases of diverse composition. Igneous reactive transports occupy a wide range of time and length scales and span solid-dominated porous to liquid-dominated suspension flow regimes. I will present recent advances in model building that have helped overcome some of these challenges and will discuss some lessons learnt from recent model applications.

