**Drilling the Ivrea-Verbano zonE (DIVE): Diving into the pillars of the Earth's continental crust**

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**Abstract**

The Ivrea-Verbano Zone (IVZ) in the Italian Alps is one of the most complete and best studied archetype of a continental crust–upper mantle section on Earth. Recent evidence illustrates that the IVZ is an exceptional archive of trans-crustal continental magmatism documenting lower crustal processes of magma emplacement, crystallisation and crustal assimilation, and of the development of near-surface magmatism, including evidence for protracted super-eruptions during the Permian period. A defining feature of the IVZ is that the available geophysical evidence points to the surficial (< 3 km) presence of high-velocity, high-density rocks that compose the "Bird's Head" of the Ivrea Geophysical Body. The IVZ provides a truly unique natural laboratory to fundamentally advance our understanding of the continental lower crust and the crust–mantle transition zone ("the pillars of the Earth"). The International Continental Drilling Program (ICDP) recently funded the DIVE project for conducting a comprehensive drilling mission in the IVZ. Drilling two 1-km deep holes into the IVZ at strategic locations will provide an unrivalled opportunity to link geophysical and geological data via core observations, downhole logging, microbiological sampling, and hydrological studies. This will address long-standing fundamental questions on the architecture and chemical fingerprints of the continental lithosphere and unravel the nature and origin of major volatile cycles including carbon, along with studies on the extent and diversity of the subsurface biosphere and its relation to the carbon budget.

**Biosketch**

Mattia Pistone was awarded a BSc in Geological Sciences at Università G. D’Annunzio in Chieti and MSc in Geodynamics, Geophysics, and Volcanology at University of Rome La Sapienza (Italy). He obtained a PhD in Earth Science at ETH-Zurich (Switzerland) after completing research in multiphase magma rheology. He conducted postdoctoral research on magma mixing at the University of Bristol (UK) and on magma differentiation in the Western Aleutians at the National Museum of Natural History of the Smithsonian Institution (Washington, DC, USA). He was a Maître Assistant (lecturer) at the University of Lausanne (Switzerland) where he explored fluid transport in the Ivrea-Verbano Zone. He is currently Assistant Professor in Petrology and Volcanology and director of MAGMA MIA Lab at the University of Georgia (USA). He is one of the six PIs of DIVE project, and an enthusiastic researcher who uses a combination of experimental, analytical, and field-based approaches to investigate multiphase magma mechanics, eruption dynamics, and volatile cycles in the Earth’s interior.