



**Thursday 12 May 2022**

Onsite: h.16 - Aula Ruffini *Dipartimento di Scienze della Terra, Torino*

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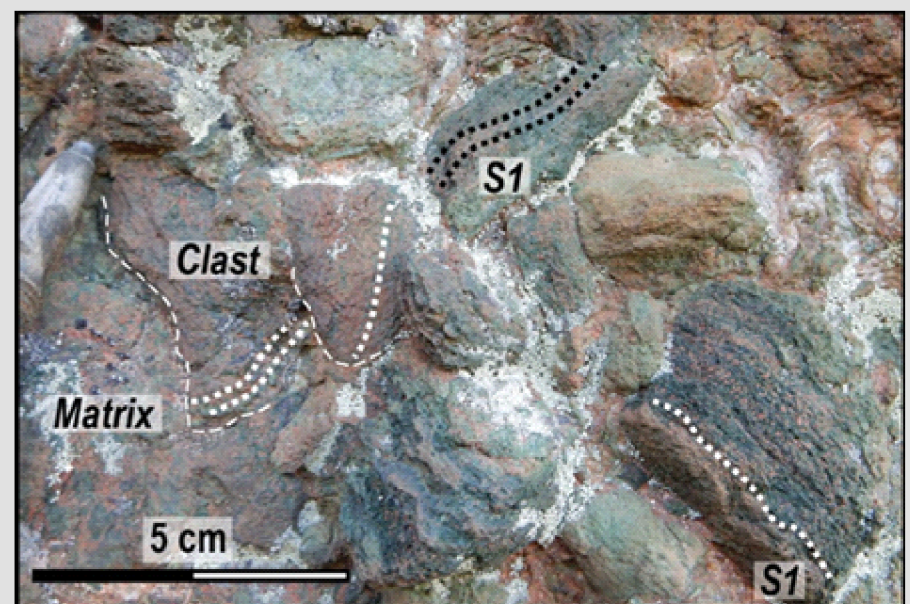
# The eclogitic breccias from Monviso: the unexpected witnesses of brittle deformation at 80 km depth

**Michele Locatelli**

*DISTAV, Università degli Studi di Genova*



The Monviso meta-ophiolite complex (Northern Italy, Western Alps) represents an almost intact fragment of Tethyan oceanic lithosphere metamorphosed at ~80 km depth (~2.6 GPa–550 °C, Alpine subduction). This slab fragment is cut at low angle by two major shear zones: the Lower and Intermediate Shear Zones (respectively: LSZ and ISZ). Here, in their talc and tremolite-rich serpentinite matrix, are embedded variously brecciated Fe-Ti and Mg-Al metagabbro blocks. The intact foliation of metagabbro clasts, cemented by unfoliated eclogitic matrices (paragenesis: omphacite ± garnet ± lawsonite), suggests their unusual, pristine brecciation at eclogite-facies conditions. Occurrence of successive generations of high-pressure veins and eclogitic matrices reveal multiple brittle events. Field, textural and petrographic observations on the breccia blocks, coupled with pseudosection modelling and geochemical data suggests that minerals of the first brecciation event (M1 matrix, ~2.7 GPa - 580 °C) crystallized in presence of fluids buffered by the surrounding metagabbro minerals. Instead, the M2 matrix (~2.4 GPa - 560 °C) composition suggests an incipient infiltration of external fluids, occurrence fully achieved by the third, ex-lawsonite rich M3 matrix (pointing to massive ingression of external, serpentinite-derived fluids). In this talk we will explore how the Monviso breccia blocks exhaustively recorded the stepwise development of major shear zones inside low-permeability eclogite-facies rocks, via progressive strain localization, permeability creation and increasing scale of fluid circulation.



## The Speaker

Michele is a postdoc researcher at the DISTAV department of the Università degli Studi di Genova. After the master at the university of Milano Bicocca he moved to Paris, where accomplished his PhD defending a thesis about the geological significance of the eclogitic breccias from the Monviso massif (Western Alps). Landed in Genova, he was involved in the PNRA project "LARK", dealing with the study of the geodynamic evolution of the Rennick Graben Fault system (Antarctica). He is also working on the geological mapping of the marine areas in front of Albenga and Genova (CARG project), with a focus on the reconstruction of the Cenozoic evolution of the Ligurian margin through the linkage between onshore and offshore structures.

