Seminars of geology

Department of Earth Sciences - Torino

Contact: geoseminar.dst@unito.it

Wednesday 27 March 2024

4pm (Rome time) - Aula Pognante, *Dip. di Scienze della Terra, Torino*

Or via webex at this LINK

Brittle-viscous deformation cycles in the continental crust

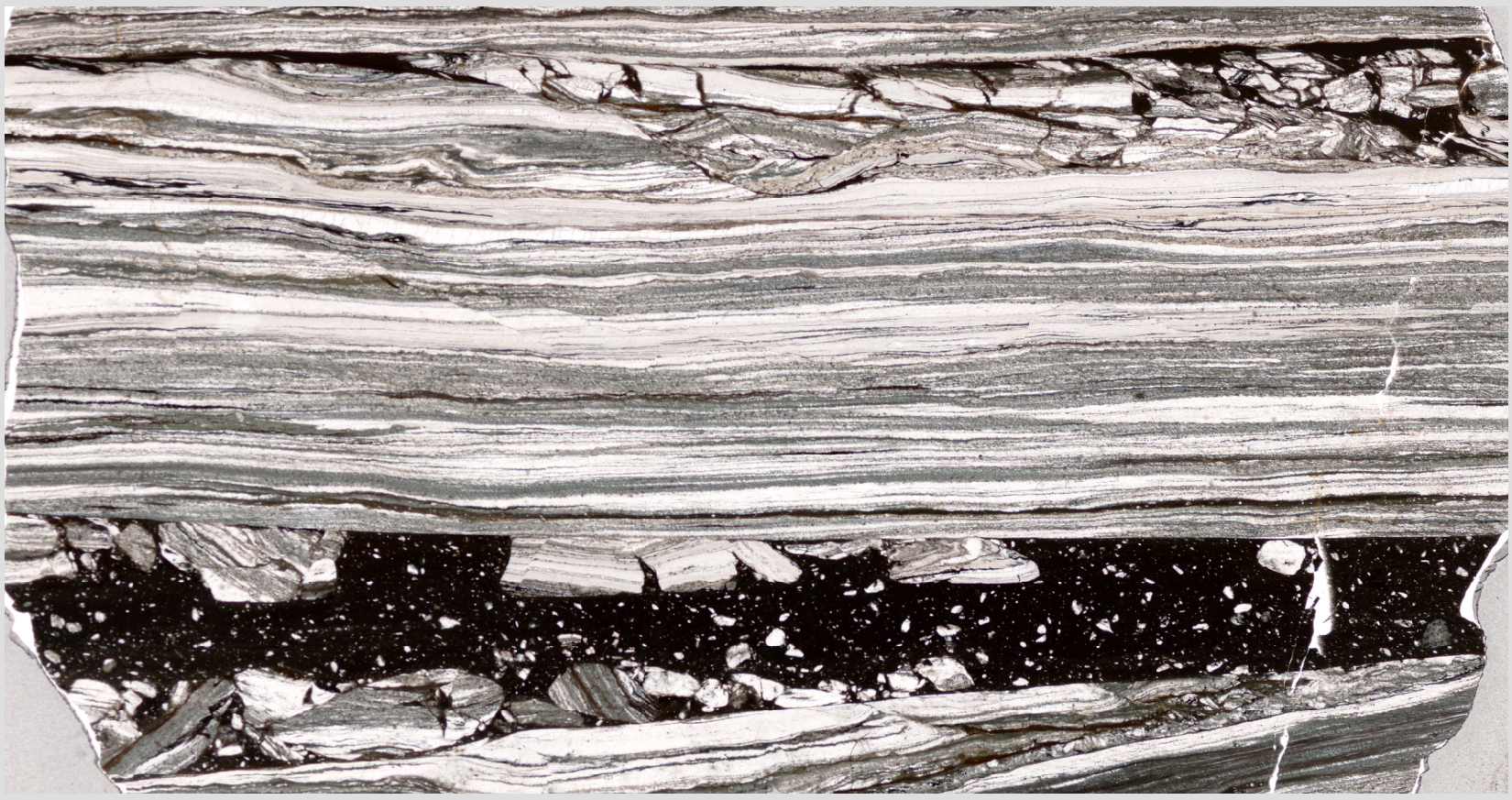
Luca Menegon

University of Oslo

The Research Council of Norway

Seismic and geodetic observational networks at active faults and plate boundaries illuminate an increasingly complete spectrum of fault slip behaviors that include aseismic continuous creep and episodic earthquake slip, but intermediate between these end-members are transient episodic slow slip events and tectonic tremor. This complex range of fault slip behaviors is rooted in the mixed frictional-viscous rheology of many heterogeneous faults and shear zones, where episodic frictional slip in strong volumes of rocks is coupled with viscous creep within weaker, ductile shear zones.

This seminar will explore the coupling between frictional and viscous deformation in two faults representative of (1) the fluid-assisted faulting at the base of the seismogenic crust, and (2) the fluid-absent faulting in the lower continental crust. The target structures are synkinematic vein systems in case (1) and the association of pseudotachylytes (frictional melt produced during coseismic slip) and mylonites (formed during aseismic viscous creep in ductile shear zones) for case (2) (shown in figure). I will present field and microstructural observations from two outstanding natural laboratories in northern Norway and reconcile the results with the geophysical observations of current seismicity along major faults and plate boundaries.



The Speaker

Luca Menegon is Full Professor of Geology at the Njord Centre, Department of Geosciences, University of Oslo. His research investigates the brittle deformation and the viscous flow of solid rocks in the Earth's lithosphere. He combines field observations with high-resolution microstructural analysis with electron- and X-ray imaging techniques.