SEVENTH FRAMEWORK PROGRAMME

"Ideas"

European Research Council: Starting Grant

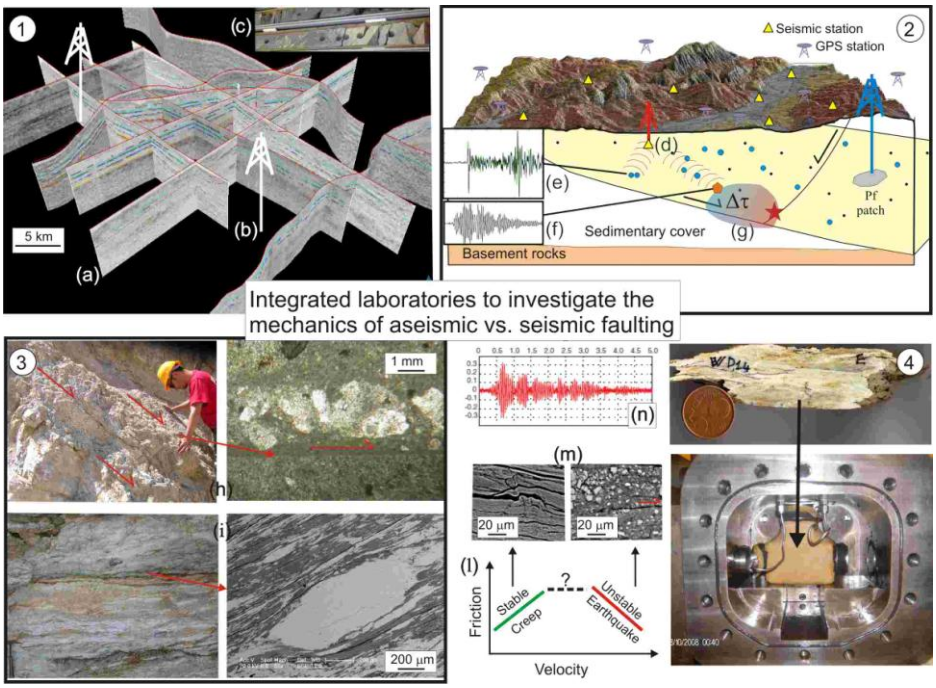
Project acronym: *GLASS*

Project full title: Inte**G**rated **L**aboratories to investigate the mechanics of **AS**eismic vs. **S**eismic faulting

Principal Investigator: Cristiano Collettini

Host Institution: Istituto Nazionale di Geofisica e Vulcanologia, Roma

Beneficiary: Università degli Studi di Perugia



The synoptic view highlights the multidisciplinary approach and the degree of integration that we are going to develop with GLASS. In the active portion of the test site subsurface geology (1) is constrained by seismic reflection profiles (a) and borehole data (b); rocks and fault rocks are sampled in deep boreholes (c) for microstructural studies and rock deformation experiments. The integration of subsurface geology with dense seismic and geodetic networks (2) is used to investigate the control exerted by lithology and fluid pressure on seismic behaviour, and to discriminate locked vs. creeping fault portions. The down-hole seismometers (d) are planned to complement the dense seismic network at the surface in order to record and precisely locate small earthquakes (decametric scale), repeaters (e) and low-frequency events (f). The influence of fault creep and low-frequency earthquakes on locked fault portion is evaluated by developing stress change models (g). Field studies (3) on exhumed faults that represent analogues of the active structures (2) are used to investigate the fault zone architecture and the long-term deformation processes that play a key-role in fault rheology, e.g. brittle and localized (h) vs. ductile and distributed (i). Rheology and fluid flow properties of fault zones are investigated in rock deformation experiments (4), on fault rocks collected in (1) and (3). Microstructures associated to stable vs. unstable sliding (i) are characterized and used to constrain the slip behaviour of the exhumed faults (3). Seismic transients (n) are recorded in lab and compared with high resolution seismic signals from the active area (e) and (f).