



Short Course "Deformation and Anisotropy" – March 14-18, 2016
Field trip to Cap de Creus – March 18-20, 2016

Program

Monday - 14 March

9-12h & 14h-17h: Lectures 1 - 2 (AT): Introduction. Ductile deformation mechanisms (Dislocation glide / Dislocation creep / Diffusion creep / Grain boundary sliding / Twinning): Physical basis, microstructures & flow laws

Tuesday - 15 March

9h-12h Practical 1 (DM/AT): Calculating flow laws from experimental data (Creep and constant displacement rates experiments) + if time construction of strength envelopes

14h-15h30 – Lecture 3 (DM): How to observe microstructures at small scale : SEM – TEM – EBSD – Orientation mapping in TEM

15h30 – 16h : Visit of the Montpellier EBSD system

16h-18h: Practical 2 (DM/AT) – Treating EBSD data to analyze textures and microstructures

Wednesday – 16 March

9-12h & 14h-17h Lectures 4 & 5 (NDP): Principles of fault and earthquake mechanics;

Deformation mechanisms and processes during rupture propagation: insights from natural and experimental faults:

- Shear localisation and thermally activated weakening mechanisms
- Frictional sliding vs. viscous flow behaviour
- Implications for the earthquake energy budget

Thursday – 17 March

9h-12h : Lecture 6 (DM) – Elasticity and Seismic Properties

Elasticity – how to measure & to calculate

Monocrystal – Polycrystal

Thermo-elasticity – thermal expansion - compressibility

Seismic properties

14h-15h30: Practical 3 (DM/AT): Calculating seismic properties for polycrystalline rocks

16h-17h30 : Lecture 7 (AT): Which parameters control texture evolution? How does this translates into seismic anisotropy in the mantle?

Friday – 18 March

9h-12h: Practical 4 (AT): Interpreting seismic anisotropy data in terms of flow – Case study: continental rifts

14h-15h30: Lecture 8 (AT): *Shear zones : strain localization*

16h : Departure by bus to Cadaquès, Spain

Saturday – 19 March

Field work : Shear zones in the metasedimentary sequence of Cap de Creus

Sunday – 20 March

Morning: Field work : Shear zones in the Rosas granodiorite

Noon : Bus departs to Montpellier; those who leave from Barcelona (evening flights) deposited at Figueras train station at ca. 14h.