" Microstructural evolution during HT deformation: advances in the characterization techniques and consequences to physical properties "

Montpellier, France
30 March – 1 April 2014: Conference
2-3 April: 2-day MTEX open source & free texture analysis training workshop

This meeting, organized in the framework of the ESF project MicroDIce, aims to present a multi-scale view of our present understanding of the processes controlling plasticity and recrystallization at high temperature in geomaterials (ice and rocks). Recent advances in electron microscopy (*e.g.* HR-SEM-EBSD) allow characterization of the microstructure in complex multi-phase materials from the nanometre to the centimetre scale. Associated with *in-situ* experiments digital image correlation (DIC), these techniques provide a multi-scale tracking of the deformation field and the associated microstructural evolution. Diffraction pattern cross-correlation techniques in high-resolution EBSD analysis allow accessing the statistical distribution of defects (e.g. dislocations, disclinations), their crystallography and measurement of local lattice rotations of 1/100°. These high-resolution quantitative microstructural methods provide an increasingly sound physical basis for the analysis of heterogeneous polycrystalline behaviour. Our knowledge of processes like recrystallization, where localization of the deformation within grains or along grain boundaries are key factors, greatly benefit from these new developments. On the other hand, a sound understanding of the evolution of microstructures and textures during deformation is also essential for the characterization of the strain-dependence of the rheological behaviour of ice, rocks, and other crystalline materials. Physical properties, like seismic anisotropy caused by strain-induced crystal preferred orientations, can be used to bridge scales from the laboratory or hand-specimen to the planetary applications, as the study of flow or fracturing in glaciers or convection in the deep Earth. In glaciers, for instance, changes in seismic anisotropy due to the evolution of texture with changing deformation conditions may be used for remote monitoring, via seismology of the deformation.

PRELIMINARY PROGRAM & INVITED SPEAKERS

Day 1: *Microstructure, Texture and Evolution*
Evolution of microstructures and textures during deformation and recrystallization. **Martyn Drury** (Univ. Utrecht, Nederlands)
In-situ micro-macro tracking of the deformation field. **Michel Bornert** (Univ. Paris-Est, France)
Modelling evolving microstructures. **Albert Griera** (Univ. Autonoma de Barcelona, Spain)

Day 2: *High resolution study of microstructures*
High Resolution EBSD. **Claire Maurice** (Ecole de Mines de St. Etienne, France)
Characterization of the dislocation content of EBSD maps. **John Wheeler** (Univ. Liverpool, UK)

Day 3: *Rheology: consequences of microstructure and texture evolution to large-scale flow*
Non-stationary rheology and changing microstructure. **Brian Evans** (MIT, USA)
Impact of texture-induced anisotropy on glaciers flow. **Fabien Gillet-Chaulet** (Grenoble, France)

VENUE

The conference will take place in Montpellier, at the CNRS conference hall, which is located 15 mn walking (or bus connection) from a tramway station. Plan and direction (http://www.cnrs.fr/languedoc-roussillon/09com-presen-deleg/09-6-plan/Plan%20acces%20CNRS%20nouveau%20logo.pdf)

REGISTRATION DEADLINE & FEES

Registration for the conference (30 March-1st April) must be done online (https://www.azur-colloque.fr/DR13/AzurInscription) => Micro-DICE

EXTENDED *Deadline :* February 25, 2015.

Registration Fees
Senior researchers 100 €
PhD & Post-docs 50 €

The registration fees include the conference material, coffee breaks, lunches, and the welcome reception. **N.B.** payment of the registration fee is required before any abstracts can be accepted.

***Important*: The MTEX training workshop is limited to *30 participants*. Inscriptions must be done by email to David.Mainprice@gm.univ-montp2.fr. The inscription for the 2-day training workshop will only be valid if you are registered for the 3-day conference. Further details about MTEX can be found at http://mtex-toolbox.github.io**

DAY 1	**Lecture** Introduction to Crystallography and Diffraction	**Lecture** Introduction to EBSD *Visit to Geosciences Montpellier EBSD facility*	**Lecture** Introduction MATLAB & MTEX	**PC Exercise** Pole-figures, Orientation Distribution Function (ODF)	**PC Exercise** Practical project using participant data
DAY 2	**Lecture** Grain modelling with MTEX, EBSD data analysis towards fabric analysis	**Lecture** Anisotropic physical properties	**Lecture** Physical property calculations of elasticity rank tensors using EBSD data and pole figure data with MTEX	**PC Exercise** Practical project using participant data	**PC Exercise** Practical project using participant data

ABSTRACTS

One-page long abstracts should be sent as Word files by email to David.Mainprice@gm.univ-montp2.fr. Please indicate the presentation preference (**oral** or **poster)** in the email.

The EXTENDED deadline for abstracts submission is February 25, 2015.