



**CREEP Final Workshop**  
**Les Houches (F), 27 January - 1 February 2019**

**Provisional Program**

**Sunday 27 January**

15h-18h: Arrival and installation (No arrival possible before 15h – Ecole des Houches closed!)  
19h30: Dinner

**Monday 28 January: Rheology of the (lithospheric and convecting) mantle 1**

8h45-9h: Opening – ITN CREEP – A. Tommasi, Geosciences Montpellier

9h00-10h00: Lars Hansen (Univ. Oxford, UK) - Main achievements and burning issues on the rheology of the upper mantle

10h15-12h15: CREEP ESR presentations (20 minutes + 10 minutes discussion):

M. Thieme (Géosciences Montpellier, F) - Viscous and frictional strength of the lithospheric mantle: insights from deformation experiments

L. Mameri (Géosciences Montpellier, F) - On the role of frozen olivine texture in the formation of linear belts of intraplate seismicity

G. Gerardi (FAST Orsay, F) - On the dynamics of subduction and the effect of subduction zones on mantle convection

N. Sgrevia (FAST Orsay, F) - Scale-dependent brittle-ductile rheology: insights from laboratory experiments

12h30: Lunch

17h15-18h15: S. Merkel – Phase transitions in the mantle

18h15-19h15: CREEP ESR presentations (20 minutes + 10 minutes discussion):

J. Schierjott (ETH, CH) - Influence of grain size evolution on regional and global scale numerical models: Can we better explain transform fault initiation & Large Low Shear Velocity Provinces development?

A. Pisconti (Univ. Munster, D) - Constraining the style of anisotropy and mineralogy in the lowermost mantle using a single seismic path

**Tuesday 29 January: Rheology of the (lithospheric and convecting) mantle 2**

9h-10h: Patrick Cordier (Univ.Lille, F) – Rheology of mantle minerals: constraints from atomistic and dislocation dynamics models

10h-10h30: Fanny Garel (Géosciences Montpellier, F) - Insights from geodynamical models using a single parameterization for dislocation glide and creep : The lithosphere-asthenosphere boundary

10h30-12h15: Discussion session: "Mantle rheology: flow laws producers vs. users"

12h30: Lunch

17h15-19h30: 2-minute poster presentations followed by poster session (Posters stay on the whole workshop)



### **Wednesday 30 January: Faults rheology and dynamics**

9h-10h: Einat Aharonov (Hebrew Univ Jerusalem) - A physical model of rock friction: from rate and state to the brittle-ductile transition

10h15-12h15: CREEP ESR presentations (20 minutes + 10 minutes discussion):

G. Pozzi (Univ. Durham, UK) - From cataclasis to viscous flow: the coseismic weakening of carbonate-hosted faults

G. Meyer (UCL, UK) - Fault reactivation at the brittle-ductile transition

S. Preuss (ETH, CH) - How faults grow (a)seismically into complex networks

E. Van Rijnsingen (Univ. Roma Tre, I) - Subduction Interface Roughness and Megathrust Earthquakes: Insights from Natural Data and Analogue Models

12h30: Lunch

17h15-18h15: Chris Marone (Penn State Univ., USA) – Friction laws for the spectrum of fault slip modes: from slow earthquakes to elastodynamic rupture

18h15-19h30 : Discussion session: "Open issues on fault rheology"

### **Thursday 31 January: Faults, fractures, and "applied" rheology**

9h-10h: Claudia Trepmann (Munich Univ, D): Coseismic loading and postseismic relaxation below the seismogenic zone recorded by mylonites from the DAV shear zone, Eastern Alps

10h15-12h15: CREEP ESR presentations (20 minutes + 10 minutes discussion):

T. Loriaux (Univ. Bristol , UK) - Fracture characterization: From a wave-cut platform to a geothermal reservoir

B. Montesinos (Univ. Mainz, D) - Simulating fluid injection and crack propagation in complex rheologies

W. Zhou (Univ. Utrecht, NL) - Seismic velocity and signal signatures of the Groningen gas field

L. Ding (Univ. Mainz, D) - Rheology and deformation of glass under extreme conditions

12h30: Lunch

17h15-18h15: Janos Urai (Aachen Univ., D): Hysteresis in rheology and fluid flow in rock salt: from experiment to application

18h15-19h15: CREEP ESR presentations (20 minutes + 10 minutes discussion):

C. Sinn (Univ. Utrecht, NL) - Effects of Plastic Deformation on the Transport Properties of Rocksalt

P. Prasse (Univ. Bristol , UK) - Seismic anisotropy in deforming salt

### **Friday 1st February: Feedbacks between melts and deformation**

9h00-10h00: Boris Kaus (Univ. Mainz, D) - Progress and challenges in modelling the magmatic system from mantle to atmosphere

10h00-11h00: Wenlu Zhu (Univ. Maryland, USA) - Permeability and 3-Dimensional Melt Distribution of Partially Molten Mantle Rocks

11h00-11h30: M. Thielmann (Bayerisches Geoinstitut, DE) - Deforming two-phase media: From Topology to Rheology

11h30-12h15: Final discussion

12h30: Lunch & Departure



**Posters (list to be completed):**

- J. Asplet (Univ. Bristol , UK) - Resolving discrepant shear wave splitting as a probe of lowermost mantle anisotropy
- N. Cerpa (Geosciences Montpellier, F) - Overriding plate surface deformation after a change in convergence velocity
- J. Chen (Univ. Utrecht, NL) - Microphysical modeling of fault friction
- K. Cheng (ETH, CH) - Cratons on Venus in global thermochemical convection models
- E. David (UCL, UK) - Micromechanics of deformation in antigorite
- A. Gulcher (ETH, CH) - Effects of composition-dependent rheology on mantle mixing
- M. Jefferd (UCL, UK) - The temperature dependence of time-dependent sandstone deformation
- M.A. Lopez-Sanchez (Geosciences Montpellier, F) - Preliminary results on magnesium (AZ31) in situ annealing experiments in the SEM-EBSD
- G. Reuber (Univ. Mainz, DE) - Constraining the dynamics of the present-day Alps with 3D geodynamic models (Model version 0.2)
- N. Riel (Univ. Mainz, DE) - Modelling reactive melt flow in deep crustal hot zone: the role of melt:rock ratio
- L. Rummel (Univ. Mainz, DE) - Insights into the compositional evolution of crustal magmatic systems investigated by coupled petrological-geodynamical models
- M. Saki (Univ. Munster, D) - Investigating deformation above the transition zone using underside reflections
- C. Thoraval (Geosciences Montpellier, F)