



# Structure and Dynamics of the Earth's Deep Mantle

Colloque en anglais, organisé avec Guillaume FIQUET  
le mardi 13 et le mercredi 14 novembre 2012

Tuesday, November 13th

9h00-9h05 Introduction: Barbara ROMANOWICZ, *Collège de France*

## Session 1 - Imaging the present seismic structure of the mantle

Chair: Eleonore STUTZMANN, *IPG, Paris*

- 9h05-9h40 Nathan SIMMONS, *Livermore National Laboratory (USA)*  
GyPSuM: A Joint Seismic-geodynamic Tomographic Image of the Mantle with Minimal Compositional Heterogeneity
- 9h40-10h15 Ved LEKIC, *University of Maryland (USA)*  
Cluster Analysis of Global Lower Mantle Tomography: a New Class of Structure and Implications for Chemical Heterogeneity
- 10h15-10h45 Coffee Break

## Session 2 - Deformation in the deep mantle

Chair: Sébastien MERKEL, *Université de Lille*

- 10h45-11h20 Patrick CORDIER, *Université de Lille*  
Deformation of Mantle Minerals
- 11h20-11h55 Michael KENDALL, *Bristol University (UK)*  
Deformation in the Lowermost Mantle: Linking Seismic Anisotropy, Mineral Physics and Geodynamics
- 11h55-12h30 John BRODHOLT, *University College London (UK)*  
Defects, Diffusion and Deformation in D
- 12h30-14h00 Lunch

## Session 3 - Deep mantle dynamics, past and present

Chair: Nicolas COLTICE, *ENS, Lyon*

- 14h00-14h35 Paul TACKLEY, *ETH, Zurich (Suisse)*  
Predicting the Thermo-chemical Structure, Dynamics and Evolution of the Deep Mantle Using Spherical Convection Simulations
- 14h35-15h10 Stephane LABROSSE, *ENS, Lyon*  
The Role of Deep Mantle melt in the Thermal Evolution of the Earth
- 15h10-15h45 Bernard SCHUBERTH, *University of Munich (Allemagne)*  
Synthetic Seismograms for a Synthetic Earth - Computing 3-D Wavefields for Mantle Circulations Models to Test Geodynamic Hypotheses Directly against Seismic Observations
- 15h45-16h15 Coffee Break

## Session 4 - Constraints on structure and composition

Chair: Edouard KAMINSKI, *IPG, Paris*

- 16h15-16h50 Motohiko MURAKAMI, *Tohoku University (Japan)*  
Chemical Composition of the Lower Mantle: Constraints from Elasticity
- 16h50-17h25 Jan MATAS, *ENS, Lyon*  
New Ways of Constraining Seismic Attenuation in the Deep Mantle
- 17h30-19h00 **Poster Session**

Wednesday, November 14th

## Session 5 - Phase transitions in the lower mantle?

Chair: Julien SIEBERT, *IPG, UPMC, Paris*

- 9h30-10h05 Dan SHIM, *Arizona State University (USA)*  
Phase Transitions in the Lowermost Mantle
- 10h05-10h40 Christine THOMAS, *University of Muenster (Germany)*  
Seismic Structures in the Deep Mantle: are they due to a Mineral Phase Change?
- 10h40-11h15 Coffee Break

## Session 6 - Small scale structure and melting

Chair: Sébastien CHEVROT, *Toulouse*

- 11h15-11h50 Sebastian ROST, *University of Leeds (UK)*  
Seismic Constraints on Earth's Small-scale Structure
- 11h50-12h25 Denis ANDRAULT, *LMV, Clermont Ferrand*  
Does Partial Melting Occur today in the D-layer?  
What would happen to the Liquids?
- 12h25-14h00 Lunch

## Session 7 - Early Mantle

Chair: Pierre CARTIGNY, *IPG, Paris*

- 14h00-14h35 Maud BOYET, *LMV, Clermont-Ferrand*  
Early Mantle Dynamics seen by the Isotope Signature of Archean Samples
- 14h35-15h10 Matt JACKSON, *Boston University*  
Formation of Mantle Domains in the Hadean and Archaean:  
Evidence for Deep Mantle Preservation in Oceanic Lavas
- 15h10-15h45 Manuel MOREIRA, *IPG, Paris*  
Early Mantle Differentiation and Preservation of Primordial Reservoirs
- 15h45-16h15 Coffee Break

## Session 8 - Volcanism and the deep mantle

Chair: Eric DEBAYLE, *ENS Lyon*

- 16h15-16h50 Cinzia FARNETANI, *IPG, Paris*  
Hawaii and other Pacific Hotspots: what do they tell us about the Deep Mantle
- 16h50-17h25 Marianne GREFF, *IPG, Paris*  
Surface Volcanism Data since 400 Ma as a Constraint of Mantle Dynamic and Principal Inertia Axis
- 17h30 - 18h30 **Panel Discussion**  
Chair: Guillaume FIQUET, UPMC  
James BADRO, *IPG, Paris*  
Anne DAVAILLE, Jeannot TRAMPERT, Yanick RICARD