Dear participant to the GEO-DEEP9300 course 2021,

The GEO-DEEP course is approaching and we would like to give you some more information about the course, and what to prepare.

We would like each participant to prepare a small presentation of about 5 mn (max 4 slides) to introduce himself/herself and his/her PhD project at the beginning of the course. Please send the slides to Valerie Maupin before the start of the course.

Below is a list of reading material for GEO-DEEP9300, and a list of "methodologies" that are used by these papers to study the Earth's lithosphere and upper mantle. Each student will have to prepare a ~30 minute presentation about one of the methodologies, to be presented early in the week. We ask each student to send us a prioritized list of three methodologies which they would like to present. We will inform you about the methodology you have to present when we have received the preferences from all the students. This will serve as a starting point for discussion during the week. You may of course use other references than the core papers to prepare your presentation. In case you use in your PhD a methodology that is not listed here, and you would like to present it, feel free to propose it. We will consider if this is a useful addition to the classical methods.

Core papers

Afonso, J. C., M. Moorkamp, and J. Fullea (2016), Imaging the Lithosphere and Upper Mantle, in *Integrated Imaging of the Earth*, edited, pp. 191-218, John Wiley & Sons, Inc, doi:10.1002/9781118929063.ch10.

Cooper, C. M., M. S. Miller, and L. Moresi (2017), The structural evolution of the deep continental lithosphere, *Tectonophysics*, *695*, 100-121, doi:http://dx.doi.org/10.1016/j.tecto.2016.12.004.

Hawkesworth, C. J., P. A. Cawood, B. Dhuime, and T. I. S. Kemp (2017), Earth's Continental Lithosphere Through Time, Annu. Rev. Earth Planet. Sci., 45(1), 169-198, doi:10.1146/annurev-earth-063016-020525.

Kawakatsu, H., and H. Utada (2017), Seismic and Electrical Signatures of the Lithosphere–Asthenosphere System of the Normal Oceanic Mantle, *Annu. Rev. Earth Planet. Sci.*, *45*(1), 139-167, doi:10.1146/annurev-earth-063016-020319.

Parmentier, E. M. (2015), 7.08 - The Dynamics and Convective Evolution of the Upper Mantle A2 - Schubert, Gerald, in *Treatise on Geophysics (Second Edition)*, edited, pp. 319-337, Elsevier, Oxford, doi:10.1016/B978-0-444-53802-4.00131-7.

Rychert, C.A., Harmon N., Constable S., and Wang, S. (2020), The Nature of the Lithosphere-Asthenosphere Boundary, J. Geophys. Res., J. Geophys. Res.: Solid Earth, 125, e2018JB016463. Doi:10.1029/2018JB016463

Watts, A. B., S. J. Zhong, and J. Hunter (2013), The Behavior of the Lithosphere on Seismic to Geologic Timescales, Annu. Rev. Earth Planet. Sci., 41(1), 443-468, doi:10.1146/annurev-earth-042711-105457.

The articles can be downloaded from the website

https://www.clintconrad.no/classes_uio/GEO-DEEP9300_H21/GEO-DEEP9300.html

where we will post more information about the course later on.

Methodologies

Seismic Methods
- Surface wave tomography
- Body wave tomography
- Receiver functions
- Seismic Anisotropy
- Seismic Attenuation

Other geophysical methods
- Gravity anomalies
- Electromagnetic methods
- Challenges of seafloor observations
- Remote sensing (including GPS)
- Heat flow measurements

Geochemistry and Mineralogy
- Mineralogical constraints
- Geochemical constraints
- Rheological constraints

Modeling
- Mechanical Modeling: Viscous Deformation
- Mechanical Modeling: Elastic Deformation
- Mechanical Modeling: Brittle Deformation
- Thermal modeling

We look forward to see you in Oslo in November!

Oslo, October 5, 2021

Clint and Valérie