

# Structure and Composition of the Earth's Interior (GEO4-1401)

Tentamen - Wednesday 6 November 2013  
09:00 - 11.30

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The numbers in () indicate the percentage for evaluation. No documents are allowed during the examination. Please write clearly and don't forget to indicate your name.

1. What is meant by an equation of state and what is their geophysical significance? Describe some equations of state which are used in Earth Sciences. (20 marks)
2. Why is it difficult to constrain the density structure of the Earth's interior? Why is it important to know the density distribution inside the Earth, and what methods have been used to map the Earth's density structure? (18 marks)
3. The D'' region is one of the most seismically complex regions of the Earth. Describe some of the seismic structures which are observed here, and speculate on what might cause them. (12 marks)
4. What constraints can we place on
  - (a) The fate of subducted slabs;
  - (b) The structure and location of mantle plumes; and
  - (c) The possible existence of a “primitive reservoir”inside the Earth's mantle? Your answer should draw upon the papers which we studied during the course, and include observations from seismology, geochemistry and geodynamics. (50 marks)

Good luck