



Ph.D. position on the rheology of planetary ice and tectonics of icy moons (vacancy number 72085)

We seek a candidate to fill a Ph.D. position in the Department of Earth Sciences at Utrecht University.

Project title:

The role of grain size in the rheology of planetary ice

Project description:

The icy surfaces and inferred internal structures of icy planets and moons of our solar system show a remarkable diversity, and form an important basis for comparative planetary research. Various thermophysical modeling studies have already been performed, aiming to understand composition, structure, origin and evolution of the icy planets and moons, including conditions for life. Large-scale dynamic processes (e.g., convection) are implied for the solid interiors of the icy bodies, so the models critically depend on the rheological descriptions implemented to describe the flow of ice.

One aspect of ice rheology that has received increased attention of late is the role of grain (crystal) size and its evolution during deformation. Extensive work on solid state flow of rocks has shown that quantitative understanding of such grain size evolution is essential if laboratory derived rheological laws are to be reliably extrapolated to natural (extreme) conditions. This also applies to the case of ice, but has not been accounted for to date.

The objectives of the project are:

- a) to develop a state-of-the art microphysical model for water ice including microstructural evolution and multiple creep mechanisms,
- b) to test this model against data that are to be obtained from laboratory deformation experiments on ice, to be performed by the Ph.D. student in collaboration with co-workers at MIT/Cambridge MA and USGS/Menlo-Park CA, U.S.A., and
- c) to assess the large scale implications of the results by building the obtained mechanism-based description into numerical models of tectonic processes on icy moons, with particular focus on tidal deformation of planetary moons, in collaboration with researchers from Delft University of Technology.

Funding for this project is provided by the Netherlands Organization for Scientific Research, through the Dutch National User Support Programme Space Research.

Qualifications:

We are looking for a highly motivated individual with a strong background and excellent communication skills. The candidate has a broad interest in Earth materials research in a laboratorial setting. The candidate is familiar with numerical modeling, preferably but not necessarily in the context of rheological modeling. Proficiency in at least one modern programming language is a requirement. The candidate holds a recent M.Sc. or equivalent degree in Geology, Geophysics, Materials Science, Solid State Physics, or a related field.

Terms of employment:

We offer a full-time Ph.D. position for 4 years, with gross monthly salary starting at € 1956,- in the first year to € 2502,- in the last year of appointment. We also offer a pension scheme, a collective health insurance and flexible employment conditions. Conditions are based on the Collective Employment Agreement of the Dutch Universities and are supplemented with a holiday allowance of 8% per year and a year-end bonus of 3%.



Further details:

The project will be carried out within the Experimental Rock Deformation group at Utrecht University's Institute of Earth Sciences, in collaboration with researchers at MIT and USGS in the U.S.A and at Delft University of Technology. For further details, please contact dr. Hans de Bresser at j.h.p.debresser@geo.uu.nl.

You may also wish to visit the website of the Institute of Earth Sciences:

<http://www.geo.uu.nl/ivau>.

How to apply:

Applications, including a curriculum vitae, a statement of your research interests, and the names and addresses of 2 referees, must be sent to

Faculty of Geosciences - Personnel Department

PO Box 80115

3508 TC Utrecht, The Netherlands

or submitted by e-mail to: peno@geo.uu.nl.

Please, mention where you originally saw our advertisement and quote vacancy number 72085 in all communications.

The position is open until filled. Earliest starting date: November 1, 2007