

Microstructure of gas hydrates studied with innovative X-ray diffraction methods

One PhD position is available in the crystallography group of the Geoscience Center Göttingen (GZG) at the University of **Göttingen**. The position is granted in the framework of a collaborative project with the University of Mainz (Prof. Kersten) and ETH Zurich (Priv.Doiz.Dr. Saenger). The work will be done mainly at Göttingen with repeated campaigns of a few days at German (HASYLAB/DESY in Hamburg) and European synchrotron sources (SLS in Switzerland, ESRF in Grenoble).

Project description: Gas hydrates are crystalline compounds consisting of water cages filled with gas molecules like methane. They occur in large quantities in the sea floor or in permafrost regions and are of high interest as a consequence of their considerable environmental risk and their possible economic potential (see e.g. <http://www.gashydrate.de>). Our group is worldwide leading in studies of the crystallography/microstructure of these labile compounds. We use techniques like cryo-SEM (scanning electron microscopy) and X-ray diffraction for this purpose. In the last years we have developed synchrotron-based X-ray techniques to study the crystallite size distribution (CSD) of natural and synthetic gas hydrates which play a crucial role e.g. in understanding their mechanical and transport properties. These new techniques are complemented with X-ray micro-tomography as well as studies of their crystal growth and ripening processes. The specific task of the PhD student is the preparation of gas hydrates under conditions close to natural and the investigation of the microstructure mainly with cryo-SEM and various X-ray methods to quantitatively determine their CSD's and compare those with the CSD's of natural hydrates. Ultimate goal is a better understanding of the unusual and little understood seismic properties of natural gas hydrates for which the microstructure most likely provides the key.

The successful candidate will be working in an international team and have a chance to use cutting-edge tools of materials research - of interest far beyond their application to gas hydrates. The candidate is expected to have a good knowledge of tools in physical or chemical solid state research, material science, mineralogy or crystallography holding a good master/ diploma degree in any of the relevant fields. Particularly helpful will be some experience in X-ray diffraction techniques, X-ray tomography or material synthesis; computer skills are of importance too.

This announcement can also be found under "Jobs" in the following link: <http://kristall.uni-mki.gwdg.de/index.html>

The position is available for **three years** and the salary is defined according to the German E13 TV-L scale (67% of a full scientist position) - it will start as soon as an appropriate candidate is selected.

Please send your applications including a CV, a detailed and specific motivation letter, at least two names for possible references (e-mail and phone) and copies of certificates, preferably in electronic form (pdf-file) to

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Review of applications will start **on March 15** and continue until the position is filled.

We explicitly welcome applications from abroad. The Georg-August-University Göttingen is an equal opportunities employer and places particular emphasis on fostering career opportunities for female scientists and scholars. Qualified women are therefore strongly encouraged to apply. Disabled persons with equivalent aptitude for the position will be favored. The university ranks among the top research institutions in the country.