The Bayerisches Geoinstitut at Bayreuth invites applications from junior as well as senior scientists to participate in experimental research in geoscience. Experiments under extreme conditions of pressure and/or temperature combined with an atomistic approach to properties and processes are central to most studies. The Geoinstitut is a center for the study of processes and material properties in the Earth and planetary interiors using advanced technologies.

The Geoinstitut consists of a group of scientific, technical and administrative staff under the leadership of Tomoo Katsura, Dan Frost and Hans Keppler. The following is a list of scientists actively involved in research at the Geoinstitut at the beginning of 2015.

Robert Arato (M.Sc. 2014, Budapest)
Oxy-barometer development for granitic magmas

Katherine Armstrong (M.Sc. 2014, Portland)
Oxidation state of the early mantle

Andreas Audétat (Ph.D. 1999, Zurich)
Geochemistry of melts and fluids, igneous petrology, ore deposits

Christopher Beyer (M.Sc. 2011, Münster)
Elastic and excess properties of silicate solid solutions

Stephan Blaha (M.Sc. 2011, Vienna)
Temperature dependence of dislocation creep rate of mantle minerals

Tiziana Boffa Ballaran (Ph.D. 1997, Pavia)
Solid solutions, cation ordering, HP/HT phase transitions in minerals

Caroline Bollinger (Ph.D 2013, Lille)
Deformation mechanisms in olivine at HP; TEM studies

Johannes Buchen (Dipl.-Min. 2013, Mainz)
Structure and elasticity of mantle minerals at HP/HT

Elena Bykova (M.Sc. 2010, Novosibirsk)
Crystallography at extreme conditions

Valerio Cerantola (M.Sc. 2012, Bayreuth)
The effect of pressure, temperature and oxygen fugacity on the stability of subducted carbonates

Thomas Chust (Dipl.-Geophys. 2009, München)
Computational thermodynamics and mantle convection

Jellie de Vries (Ph.D. 2012, Utrecht)
Geodynamical modelling of melting during planetary accretion

Dmitry Druzhbin (M.Sc. 2014, Novosibirsk)
Measurement of Si self-diffusion coefficients of high-pressure minerals as a function of water content

Leonid Dubrovinsky (Ph.D. 1986, Moscow)
Phase transformations, chemical reactions and crystallography at ultra-high P/T

Gregor Golabek (Ph.D. 2010, ETH Zürich)
Numerical modelling of Earth and planetary interiors

Ahmed El Goresy (Dr. rer. nat. 1961, Heidelberg)
Mineralogical and isotopic studies of meteorites; terrestrial impact craters

Robert Farla (Ph.D. 2011, Canberra)
Experimental studies on the rheological, electrical and seismological properties of mantle materials

Daniel Frost (Ph.D. 1996, Bristol)
Phase relations of the Earth's deep interior; thermo-dynamic properties of minerals, fluids at HP/HT

Haihao Guo (M.Sc. 2013, Hefei)
Fluid in upper magma chambers and in subduction zones

Florian Heidelbach (Ph.D. 1994, Berkeley)
Rock deformation experiments and textures

Rong Huang (M.Sc. 2014, Beijing)
Precise determination of phase transitions of mantle minerals by *in situ* X-ray diffraction

Sakin Jabarov (Ph.D. 2012, Baku)
Study of ferroelectric materials at high pressure

Steven Jacobsen (Ph.D. 2001, Boulder)
Experimental geophysics and geochemistry, influence of water on physical properties of Earth and planetary materials

Seth Jacobson (Ph.D. 2012, Boulder)
Numerical modeling of terrestrial planet formation, asteroid evolution and dynamics

Tomoo Katsura (Ph.D. 1991, Okayama)
Physics and chemistry of the Earth's interior; HP mineral physics

Takaaki Kawazoe (Ph.D. 2006, Tohoku)
Rheology of deep mantle minerals at HP; technical developments for multianvil experiments

Hans Keppler (Dr. rer. nat. 1988, Karlsruhe)
Experimental geochemistry and geophysics

Stefan Keyssner (Dr. rer. nat. 1992, Aachen)
Scientific administration

Eleonora Kulik (M. Sc. 2014, Moscow)
Synthesis of hard and tough materials using abundant oxides components on the Earth's surface

Ilya Kupenko (Dr. rer. nat. 2014, Bayreuth)
Studies of materials in laser-heated DACs by nuclear resonance methods

Alexander Kurnosov (Ph.D. 2004, Novosibirsk)
Structural features of volatile compounds at HP

Mickaël Laumonier (Ph.D. 2013, Orléans)
Melt concentration and segregation during ductile deformation of the mantle

Vera Laurenz (Dr. rer. nat. 2012, Bonn)
Experimental investigation of trace element partitioning between metal and silicates at HP/HT

Ananya Mallik (Ph.D. 2014, Houston)
Experimental geochemistry and petrology

Hauke Marquardt (Dr. rer. nat. 2009, Berlin)
Matter at conditions of Earth's deep interior: Elasticity, deformation, transport properties

Katharina Marquardt (Dr. rer. nat. 2010, Berlin)
Physics/chemistry of interfaces and grain boundaries

Matteo Masotta (Ph.D. 2012, Rome)
Experimental studies on sulfur speciation and gas exsolution in differentiated magmas

Catherine McCammon (Ph.D. 1984, Canberra)
Physics and chemistry of minerals

Nobuyoshi Miyajima (Ph.D. 1997, Hokkaido)
High pressure mineralogy, TEM studies

Bob Myhill (Ph.D. 2012, Cambridge)
Phase relations, melting, rheology of the Earth's mantle

Sergey Ovsyannikov (Ph.D. 2004, Ekaterinburg)
Phase transitions in oxide systems at HP/HT conditions

Anna Pakhomova (Ph.D. 2013, Saint Petersburg)
The influence of mantle rheology on the early differentiation of icy satellites

Sylvain Petitgirard (Ph.D. 2009, Lyon)
Partitioning experiments at HP/HT; core and planetary formation

Esther Posner (M.Sc. 2012, Tucson)
HP/HT diffusion experiments and simulations, chemical evolution of planetary cores

Anja Rosenthal (Ph.D. 2010, Canberra)
Phase and melting relations of the Earth's mantle

David Rubie (Ph.D. 1971, Leicester)
Physical and chemical processes of accretion; core formation and differentiation in planetary bodies

Kirsten Schulze (M.Sc. 2014, Kiel)
Structure and elasticity of mantle minerals at HP/HT

Svyatoslav Shcheka (Dr. rer. nat. 2006, Tübingen)
Carbon and noble gases in the Earth's mantle, diamond formation, thermal conductivity of mantle minerals

Lanlan Shi (M.Sc. 2014, Beijing)
Melting phase relations in the model hydrous peridotite systems under lower mantle conditions

Ryosuke Sinmyo (Ph.D. 2010, Tokyo)
Phase equilibria of lower mantle minerals at HP using laser heated diamond anvil cells

Fanny Sorbadère (Ph.D. 2013, Clermont-Ferrand)
Experimental studies on the distribution of Fe^{3+} in ocean ridge basalts at HP/HT

Gerd Steinle-Neumann (Ph.D. 2001, Ann Arbor)
Computational mineralogy, structure of Earth's interior

Vojtech Vlcek (M.Sc. 2011, Bayreuth)
Density functional theory and computations on solids and molecules

Fabian Wagle (M.Sc. Physics 2013, Bayreuth)
Computational studies on transport properties in solid and liquid metals

Nicolas Walte (Dr. rer. nat. 2005, Mainz)
Setup of a HP neutron facility at FRM II; experimental rock deformation

Lin Wang (M.Sc. 2014, Bayreuth)
Water dependence of dislocation creep rate of olivine

Takahiro Yoshioka (M.Sc. 2014, Kyoto)
Solubility of carbon in silicate melts and of hydrogen in mantle minerals

Daohan Zhang (M.Sc. 2014, Wuhan)
Porphyry Cu/Mo ore formation; melt and fluid inclusions in natural samples

The present scientific staff of the Geoinstitut are supported by 4 electronic/computer engineers/technicians, 2 sample preparation technicians, 3 chemistry-lab technicians, 5 machinists, 1 administrative officer and 3 secretaries.

The following equipment is available at the Bayerisches Geoinstitut:

I. High-pressure apparatus

- 15 MN/1500 tonne Kawai-type multianvil high-pressure apparatus (32 GPa, 2000 K)
- 6 x 8 MN/6x800 tonne independently acting-anvil press (25 GPa, 3000 K)
- 50 MN/5000 tonne multianvil press (25 GPa, 3000 K)
- 15 MN/1500 tonne multianvil press (25 GPa, 3000 K)
- 12 MN/1200 tonne multianvil press (25 GPa, 3000 K)
- 10 MN/1000 tonne multianvil press (25 GPa, 3000 K)
- 5 MN/500 tonne multianvil press (20 GPa, 3000 K)
- 5 MN/500 tonne press with a deformation DIA apparatus
- 4 piston-cylinder presses (4 GPa, 2100 K)
- Cold-seal vessels (700 MPa, 1100 K, H_2O), TZM vessels (300 MPa, 1400 K, gas), rapid-quench device
- Internally-heated autoclave (1 GPa, 1600 K)
- High-pressure gas loading apparatus for DAC

II. Structural and chemical analysis

- 1 X-ray powder diffractometer
- 1 X-ray powder micro-diffractometer
- 1 X-ray powder diffractometer with furnace and cryostat
- 2 automated single-crystal X-ray diffractometers
- High-brilliance X-ray system
- Single crystal X-ray diffraction with super-bright source
- 1 Mössbauer spectrometer (1.5 - 1300 K)
- 3 Mössbauer microspectrometers
- 2 FTIR spectrometers with IR microscope
- FEG transmission electron microscope (TEM), 200 kV analytical, with EDS and PEELS
- FEG scanning TEM, 80-200 kV analytical, with 4-SDDs EDS and post-column energy filter (EFTEM/EELS)
- FEG scanning electron microscope (SEM) with BSE detector, EDS, EBSD and CL
- Dual beam device, focused ion beam (FIB) and FEG SEM. *In situ* easy-lift manipulator, STEM and EDS detector, and beam deceleration option
- 3 Micro-Raman spectrometers with ultraviolet and visible lasers
- Tandem-multipass Fabry-Perot interferometer for Brillouin scattering spectroscopy
- JEOL JXA-8200 electron microprobe; fully-automated with 14 crystals, 5 spectrometer configuration, EDX, capability for light elements
- 193 nm Excimer Laser-Ablation ICP-MS
- ICP-AES sequential spectrometer
- Water content determination by Karl-Fischer titration
- GC/MS-MS for organic analyses
- Confocal 3D surface measurement system

III. *In situ* determination of properties

- Diamond anvil cells for powder and single crystal X-ray diffraction, Mössbauer, IR, Raman, optical spectroscopy, electrical resistivity measurements up to at least 100 GPa
- Facility for *in situ* hydrothermal studies in DAC
- Externally heated DACs for *in situ* studies at pressures to 100 GPa and 1200 K
- 1-atm furnaces to 1950 K, gas mixing to 1600 K, zirconia fO_2 probes
- 1-atm high-temperature creep apparatus
- Gigahertz ultrasonic interferometer with interface to resistance-heated diamond-anvil cells
- Heating stage for fluid inclusion studies
- Impedance/gain-phase analyser for electrical conduc-tivity studies
- Apparatus for *in situ* measurements of thermal diffusivity at high P and T
- Laser-heating facility for DAC
- Portable laser heating system for DAC

The Geoinstitut is provided with well equipped machine shops, an electronic workshop and sample preparation laboratories. It has also access to the university computer centre.

The Geoinstitut welcomes applications for visiting scientist positions. The duration of such positions can range from two weeks up to two years or more. Longer-term appointments are usually for 2.5 years with the possibility of extension up to a maximum of five years total. Decisions concerning long-term appointments are normally made three times per year, in January, May and September. Applications may be submitted at any time to the Director, at the address given below, and should consist of a *curriculum vitae*, list of publications, a short statement of research interests and details of three referees.

Other fellowships including AvH, DAAD, DFG, EU can be utilized at the Geoinstitut. The institute may give assistance in applications for such funding.

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Bayerisches Geoinstitut Bayreuth

BGI Bayerisches Geoinstitut

Visiting Scientist Program of the Bayerisches Forschungsinstitut für Experimentelle Geochemie und Geophysik

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