

**Civil Engineering*****Expertise***

Rock and Soil Mechanics, Civil Engineering, Waste Management, Numerical Modeling, Tunneling and Mining, Hydrology, Induced Seismicity, Geothermal Energy, Borehole Measurements, Material Science, Process Engineering, Rock Mechanics Laboratory Testing

***Education***

Dr.-Ing. habil. für Geotechnik (Habilitation, Geotechnics), 2001  
Dr.-Ing. für Geotechnik (Ph.D., Geotechnics), 1989  
Dipl.-Ing. für Geotechnik, 1987  
Technische Universität Bergakademie Freiberg, Germany

***Professional Affiliations***

Member, Deutsche Gesellschaft für Geotechnik, Sektion Felsmechanik (ISRM NG Germany)

***Honors***

Kögler Award (For Outstanding Scientific Work in Geotechnics), 2001  
1st Prize, Annual Scientific Competition, Department of Geotechnics and Mining, Mining Academy of Freiberg, 1988

***Professional Experience***

2005 - Present

*Professor of Rock Mechanics  
Technical University Bergakademie Freiberg, Germany  
Itasca Consultants GmbH, Gelsenkirchen, Germany, Senior Consultant*

2005 - 2007

*Itasca Consultants GmbH, Büro Freiberg, Germany  
Manager, Senior Consultant*

1993 - 2005

*Itasca Consultants GmbH, Gelsenkirchen, Germany, Director*

1991 - 1992

*Itasca Consultants SA, Orleans, France, Project and Research Engineer*

1990 - 1992

*MeSy – GmbH, Bochum, Germany, Project and Research Engineer*

1989

*Scientific-Technical Centre of the SDAG Wismut, Chemnitz, Germany  
Project and Research Engineer*

1987 - 1989

*Technical University Bergakademie Freiberg, Geotechnical Institute,  
Germany, Staff Scientist*

***Project Experience***

*Geotechnical Consulting & Modeling:* Consulting with respect to the micro-mechanical behavior of materials (rock mechanics, aircraft- and automotive industry, processing engineering industry); the international Mt. Terri project (nuclear-waste-repository research project): stress-field evaluation, material parameter set, hydro-mechanical coupled modeling, development of new constitutive laws, interpretation of field and laboratory tests; radioactive-waste repositories (Asse, Morlsleben and Konrad, Germany) and potential radioactive waste sites (Switzerland, France and the Czech Republic); consulting and numerical simulations for granular flow problems in process

engineering, risk assessment and hazard evaluation for mass flow problems (avalanches, slopes, rockfalls); consulting and numerical modeling regarding the use of geogrids in civil engineering. Consulting for different underground mines in Germany, especially in relation to stability problems and dimensioning (salt, potash and ore mines), stability of rock masses and karst caves in Germany.

*Numerical Modeling/Analysis:* Three-dimensional dynamic hydro-mechanical coupled analysis of the soil-structure interaction for the magnetic-high-speed train system “Transrapid”; geotechnical consulting and numerical modeling for several civil engineering projects in Germany and the Czech Republic (foundations, slopes, surface excavations, trenches, dams, sheet piles, surface repositories); geotechnical consulting, stability analysis and dimensioning for several tunnel projects in Germany and Switzerland (Gotthard-Basis-Tunnel, Olpe-Tunnel, Tunnel Lütgendortmund, several railway tunnels for the connection between Stuttgart and Augsburg as well as between Lichtenfels and Erfurt, 4<sup>th</sup> tube of the Elbe-tunnel in Hamburg, Mt. Terri tunnel project, Freudenthal-tunnel); three-dimensional numerical stress-field modeling for radioactive repository sites and civil engineering projects in Germany and Switzerland; geotechnical consulting and numerical modeling for several mining projects (open-pit mines and underground mines in Germany, Spain, Switzerland and Czech Republic); numerical modeling of dynamic processes (nuclear explosions, earthquakes); numerical modeling of micromechanical problems for developing new materials; numerical simulations of blasting; fundamental geogrid research and applications

*Hydrological Consulting:* Hydrogeological consulting and numerical calculations for water reservoirs; reviewer for geomechanical, seismological, hydrological and mining problems for underground, radioactive waste disposal (Konrad-Mine in Germany).

*Software & Development:* Development of data evaluation procedures and computer programs for hydro-frac measurement results; software development and modifications of numerical codes in geomechanics (material models, grid generators).

*Research & Project Management:* Research projects in geomechanics (private or founded by the CEC or the German government); studies related to hot-dry-rock geothermal projects (Soulz-sous-Forets in France); fracture-mechanics laboratory testing and calculations; geophysical investigations and stability evaluations for near-surface cavities; installation of seismic monitoring systems, seismic signal processing, source parameter determination, location of seismic sources, and seismic hazard evaluation for mining-induced seismicity and micro-earthquakes; Project Manager for hydrofrac stress measurements and borehole permeability tests world-wide (France, Germany, Switzerland, Canada, Kenya, Great Britain, Hong Kong). Supervisor for several Ph.D. students.

*Reviews & Lectures:* Lecturer at Universities, Research Institutes and commercial seminars in France, Germany, Austria, China and Vietnam regarding the use of numerical methods in geomechanics and geotechnics (rock and soil mechanics, tunneling, mining, civil engineering) in general.