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[www.rub.de/sfb837](http://www.rub.de/sfb837)



## SFB COORDINATOR

Prof. Dr. Günther Meschke



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Prof. Dr. M. Thewes\* (*Tunneling and Construction Management*)

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Prof. Dr. W. Friederich (*Geophysics*)

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**RUHR UNIVERSITY BOCHUM**

**SFB 837 - Interaction Modeling in Mechanized Tunneling**

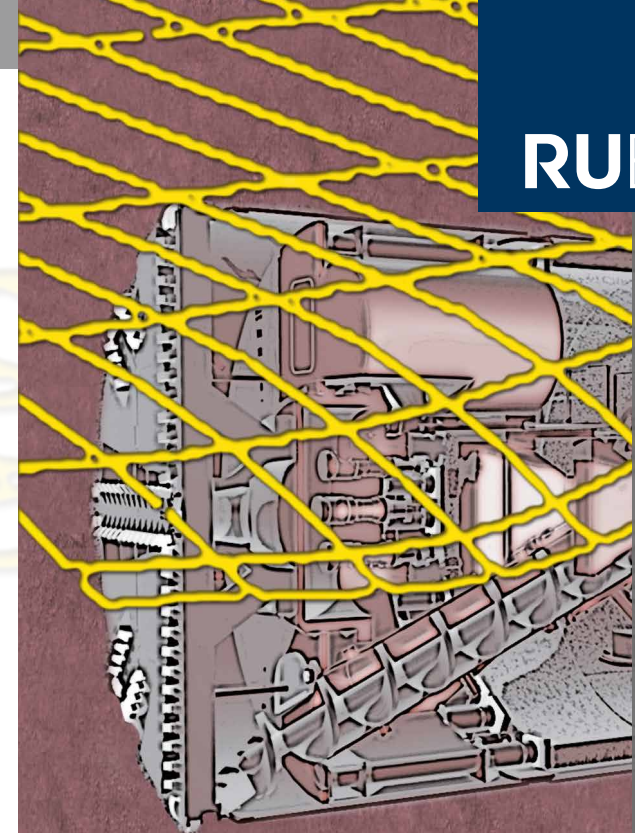
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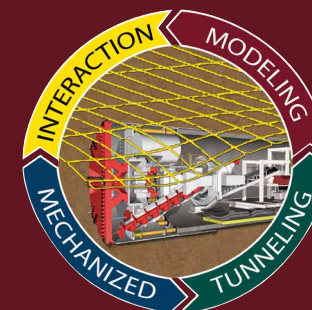


RUHR UNIVERSITY BOCHUM

COLLABORATIVE RESEARCH CENTER 837  
- WORKSHOP -

**STABILITY ANALYSIS IN  
GEOTECHNICAL PROBLEMS**

JULY 10<sup>TH</sup>, 2017



**INTERACTION MODELING  
MECHANIZED TUNNELING**

**DFG** Deutsche  
Forschungsgemeinschaft



## SFB 837 – PROJECT OBJECTIVES

Mechanized tunneling is an established flexible and efficient technology for the construction of underground infrastructure, characterized by a dynamic advancement of tunnel boring technologies, increasing diameters and a broadening range of applicability. This rapid development in association with the inherent heterogeneity of the ground poses new challenges to prognosis models.

Considering this background, the subject of the Collaborative Research Center SFB 837 “Interaction Models for Mechanized Tunneling” is the research and development of models, methods and design concepts, which, when adequately interlinked, can deal with the manifold complex interactions of the components and processes involved in mechanized tunneling.

Research within the four project areas of the SFB includes the ground exploration and modeling of the ground, the tunnel boring machine, the lining and annular gap grouting, and the interactions between tunneling and existing structures. Furthermore, the cutting, advancement and logistics processes will be represented using adequate models integrated by means of a consistent SFB-wide information management system.



## STABILITY ANALYSIS IN GEOTECHNICAL PROBLEMS

This workshop mainly aims to give an overview on the recent advances and new developments in stability analysis for geotechnical applications. The mostly referred solutions for determination of failure load such as limit equilibrium, limit load theorem of classical plasticity and upper and lower bound analyses based on finite element method will be discussed. The use of the classical as well as modern techniques to perform stability analysis for bench mark geotechnical applications including footing bearing capacity, slope and tunnel face stability analyses are in the main focus of this workshop.

### **WORKSHOP PROGRAM – JULY 10<sup>TH</sup>, 2017**

Building ID, Floor 04, Room 653 – 15:00 - 17:30

15:00 **Comparison of finite element limit analysis and strength reduction techniques**

Franz Tschuchnigg<sup>1</sup>, Helmut Schweiger<sup>1</sup> and Alessandra Paternes<sup>2</sup>

<sup>1</sup> Computational Geotechnics Group, Institute for Soil Mechanics and Foundation Engineering, Graz University of Technology, Graz, Austria,

<sup>2</sup> Università Politecnica delle Marche, Ancona, Italy



## STABILITY ANALYSIS IN GEOTECHNICAL PROBLEMS

### **WORKSHOP PROGRAM – JULY 10<sup>TH</sup>, 2017**

Building ID, Floor 04, Room 653 – 15:00 - 17:30

16:00 **Three dimensional analysis of tunnel face stability using FEM**

Christoph Schmüdderich and Tom Schanz

*Foundation Engineering, Soil and Rock Mechanics, Ruhr-Universität Bochum, Bochum, Germany*

16:30

**Application of KEM to bearing capacity and tunnel face stability**

Diethard König, Mahmoud Qarmout and Tom Schanz

*Foundation Engineering, Soil and Rock Mechanics, Ruhr-Universität Bochum, Bochum, Germany*

17:00

**Face stability analysis in mechanized tunneling: A novel FE approach based on incompatible modes and strong discontinuity kinematics**

Abdullah Alsahly<sup>1</sup>, Carlo Callari<sup>2</sup> and Günther Meschke<sup>1</sup>

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