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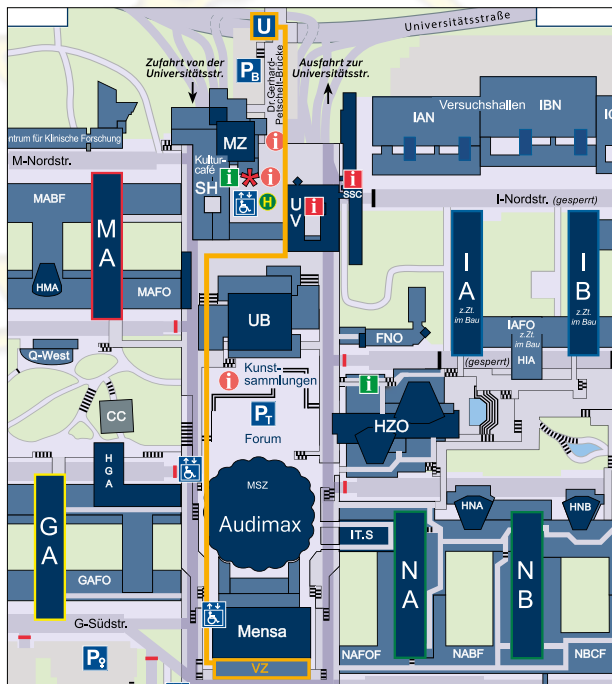
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## LOCATION



Veranstaltungszentrum (VZ) – Room 1  
Ruhr-Universität Bochum  
Universitätsstraße 150, 44801 Bochum, Germany

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



## SFB COORDINATOR

Prof. Dr. Günther Meschke



## PROJECT LEADERS

### Faculty of Civil and Environmental Engineering

Prof. Dr. R. Breitenbücher\* (*Mechanics of Materials*)  
Dr.-Ing. S. Freitag (*Structural Mechanics*)  
Prof. Dr. K. Hackl (*Mechanics of Materials*)  
Prof. Dr. M. König\* (*Computing in Engineering*)  
Dr.-Ing. A. Lavasan (*Foundation Engineering, Soil & Rock Mechanics*)  
Prof. Dr. P. Mark (*Concrete Structures*)  
Prof. Dr. G. Meschke\* (*Structural Mechanics*)  
Prof. Dr. T. Nestorović (*Mechanics of Adaptive Systems*)  
Prof. Dr. T. Schanz (*Foundation Engineering, Soil & Rock Mechanics*)  
Dr.-Ing. B. Schöber (*Tunneling and Construction Management*)  
Prof. Dr. M. Thewes\* (*Tunneling and Construction Management*)  
  
Prof. Dr. H. Steeb (*Continuum Mechanics - University of Stuttgart*)

### Faculty of Mechanical Engineering

Dr.-Ing. A. Röttger (*Materials Technology*)  
Prof. Dr. W. Theisen (*Materials Technology*)

### Faculty of Geosciences

Prof. Dr. M. Alber (*Engineering Geology & Rock Engineering*)  
Prof. Dr. W. Friederich (*Geophysics*)

\* Members of the Executive Board

RUHR UNIVERSITY BOCHUM

SFB 837 - Interaction Modeling in Mechanized Tunneling

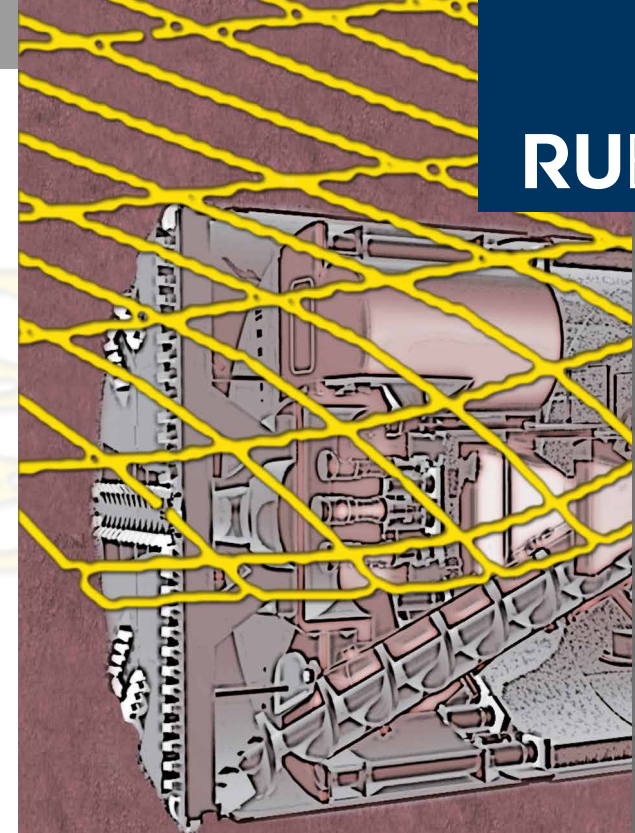
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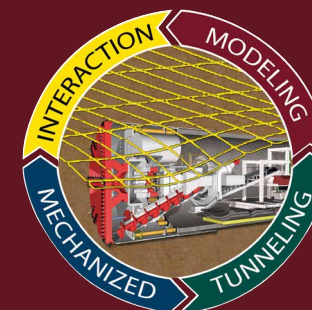


RUHR UNIVERSITY BOCHUM

COLLABORATIVE RESEARCH CENTER 837  
– WORKSHOP –

MONITORING AND SENSING IN  
UNDERGROUND ENGINEERING

FEBRUARY 24<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.



## MONITORING AND SENSING IN UNDERGROUND ENGINEERING

Current research and engineering practice substantially rely on theoretical assumptions regarding any analyses conducted in the field of tunneling. Today, numerical models are more sophisticated than ever and enable engineers to even simulate complicated interactions between the tunnel boring machine (TBM), soil, grouting materials and the lining. Although in good agreement with theoretical assumptions and results reported in



## MONITORING AND SENSING IN UNDERGROUND ENGINEERING

literature a verification and consequently a critical review is difficult due to a lack of real project data.

Although the total amount of data is increasing, it is mostly related to the TBM only and therefore not sufficient for a holistic assessment of theoretical models. To facilitate a more general view on interaction mechanisms, comprehensive data regarding the tunnel lining, grouting materials, the soil and the effect of tunneling on its environment are important.

The workshop's main goal is to introduce new monitoring and sensing techniques to generate the required data as well as to introduce up-to-date methods of pre and post processing and to present current tunneling projects with exemplary application of such.

### WORKSHOP PROGRAM – FEBRUARY 24<sup>TH</sup>, 2017

Veranstaltungszentrum – Room 1 – 10:00 - 17:30

#### Opening

Prof. Dr.-Ing. habil. Peter Mark  
(Ruhr-Universität Bochum, Germany)

#### Smart-Sensing Technologies with Application to Tunnelling

Prof. Dr. Eleni Chatzi  
(Eidgenössische Technische Hochschule Zürich, Switzerland)

#### Adaptive Measurement Campaigns for Geotechnical Applications

Raoul Hölter, M. Sc.; Mahmoud Qarmout, M. Sc.  
(Ruhr-Universität Bochum, Germany)

#### Distributed Fibre Optic Sensing in Tunneling

Dr. Nicky de Battista  
(Centre for Smart Infrastructure and Construction, University of Cambridge, England)

Lunch

### WORKSHOP PROGRAM – FEBRUARY 24<sup>TH</sup>, 2017

Veranstaltungszentrum – Room 1 – 10:00 - 17:30

#### Monitoring the Segmental Lining of the L9 Metro in Barcelona

Prof. Climent Molins  
(Universitat Politècnica de Catalunya BarcelonaTech, Spain)

#### Monitoring of TBM-Soil Interaction

Prof. Dr. Adam Bezuijen  
(Universiteit Gent, Belgium)

#### Ein Monitoringkonzept für den Abwasserkanal Emscher – Monitoring Concept for the „Emscher“ Sewage Tunnel

Dr.-Ing. Dieter Lehnen<sup>1</sup>; Dr.-Ing. Felix Nagel<sup>1</sup>;  
Dipl.-Ing. Carsten Machentanz<sup>2</sup>  
(ZPP Ingenieure GmbH<sup>1</sup>, Germany; Emschergenossenschaft Lippeverband<sup>2</sup>, Germany)

Coffee break

#### Fibreoptic Sensing Techniques in Underground Engineering

Christina Barbosa, M. Sc.  
(Hottinger Baldwin Messtechnik, Portugal)

#### Vibration Monitoring for Subsurface Structures

Prof. Dr.-Ing. Dieter Heiland  
(Baudynamik Heiland & Mistler GmbH, Germany)



## REGISTRATION AND FEES

The admission is free of charge.

Please register online: [sfb837.sd.rub.de](http://sfb837.sd.rub.de)

An invoice and accommodation recommendation will be provided after registration.