WORKSHOP INFORMATION

**CHARGE**

Participation in the Workshop is free of charge.

**REGISTRATION**

For registration, please use the online registration form at: [www.rub.de/for1498](http://www.rub.de/for1498).

Availability of seats is limited. Therefore, early registration is recommended.

For further information, please contact:

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**LOCATION**

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Universitätsstraße 150 – 44801 Bochum, Germany

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MEMBERS OF DFG FOR 1498

**DFG FOR 1498**

ALKALI-SILICA REACTION (ASR)
IN CONCRETE STRUCTURES DUE TO SIMULTANEOUS CYCLIC LOADING AND EXTERNAL SUPPLY OF ALKALI

**INUITIONAL WORKSHOP**

**COMPUTATIONAL MODELING OF ALKALI-SILICA REACTION**

**RUHR-UNIVERSITY BOCHUM**

**9. APRIL 2014**

**DFG FOR 1498**

Coordinator: Univ.-Prof. Dr.-Ing. R. Breitenbücher
Institute for Building Materials, Ruhr University Bochum, Germany

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PROJECT DESCRIPTION

The Alkali-Silica-Reaction (ASR) is the leading cause for long-term deterioration of concrete structures. ASR results in an expansion of a gel in and in the vicinity of aggregates, which eventually may lead to severe cracking and to loss of structural integrity. ASR induced deterioration is, even after decades of scientific investigation, still subject to intensive research since not all questions are resolved by now. An example is the effect of combined external loading in association with external alkali supply, which considerably promotes ASR in concrete structures such as road pavements or offshore wind energy facilities. The objectives of the collaborative DFG project FOR 1498, since its start in October 2011, is to investigate the effects of the ASR in concrete structures caused by simultaneous cyclic loading and external supply of alkali by means of experimental, numerical and analytical methods. These methods constitute the basis for the development of computational models to simulate ASR action under complex scenarios and to predict the durability and integrity of ASR affected concrete structures.

WORKSHOP: COMPUTATIONAL MODELING OF ALKALI-SILICA REACTION

The workshop aims to bring together experts to debate and discuss the state of the art and recent advances in computational modeling of alkali transport and ASR induced damage in concrete. The topics of discussion in the workshop will encompass various modeling strategies ranging from micromechanics based models, meso-scale models to macroscopic phenomenological approaches including new paradigms in scale-bridging techniques, multi-physics models and multi-level methods. Experimental aspects in computational modeling such as calibration and validation will also be discussed. The workshop should serve as a platform for the exchange of ideas and constructive criticisms thus advancing our understanding of ASR especially tough computational models.

WORKSHOP – 9. APRIL 2014

PROGRAM – 10:00 - 16:30

10:00 Opening
Prof. G. Meschke
Ruhr University Bochum, Germany

10:10 Introduction to the ASR research group: DFG FOR 1498
Prof. R. Breitenbücher
Ruhr University Bochum, Germany

10:30 Macro- and meso-scale modelling of ASR in cement based materials
Prof. D. Gawin
Technical University of Łódź, Poland

11:15 Meso-scale modeling of ASR-damage supported by experiments
Prof. E. Schlangen
Delft University of Technology, The Netherlands

12:00 Lunch

13:00 Multilevel modeling of transport in intact, micro-cracked and fracturing porous materials: Application to ASR in Concrete
J. J. Timothy, MSc., N. N. Minh, MSc.,
Prof. G. Meschke
Ruhr University Bochum, Germany

13:45 Concrete deterioration due to ASR: A multiscale damage model based on analytical homogenization
R. Esposito1, MSc., Prof. M. A. N. Hendriks2
1Norwegian University of Science and Technology, Norway, 2Delft University of Technology, The Netherlands

14:30 Coffee Break

15:00 A micromechanical model for ASR anisotropy
Dr. L. Charpin1, Prof. A. Ehrlacher2
1Espace Innovation et recherche du groupe (EDF R&D), France, 2Laboratoire Navier, Université Paris-Est (UPE), France

15:45 Transport process and chemical reaction in siliceous rock particle at the beginning of ASR
Dipl. Chem. C. Jehn, Prof. F. Schmidt-Döhl,
TU Hamburg-Harburg, Germany

16:30 Closing
Prof. G. Meschke
Ruhr University Bochum, Germany