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

For further information, please contact:
Svenja Schützner
Ph: +49 (0) 234 - 32 29051
E-Mail: Svenja.Schuetzner@rub.de

LOCATION

IBZ - Beckmanns Hof – Ruhr University Bochum
Universitätsstraße 150 – 44801 Bochum, Germany

www.rub.de/for1498

MEMBERS OF DFG FOR 1498

RUB RUHR-UNIVERSITÄT BOCHUM
Institute for Building Materials

RUB RUHR-UNIVERSITÄT BOCHUM
Institute for Structural Mechanics

BAM Bundesanstalt für Materialforschung und -prüfung
Federal Institute for Materials Research and Testing

Bauhaus-Universität Weimar
F.A. Finger-Institute for Building Materials

Institute of Concrete Structures and Building Materials

DFG FOR 1498
Coordinator: Univ.-Prof. Dr.-Ing. R. Breitenbücher
Institute for Building Materials, Ruhr University Bochum, Germany

Organization Office
Building IC/6/181 | Universitätsstraße 150 | D-44801 Bochum
Ph: +49 (0)234 32-29051 | **Fax:** +49 (0)234 32-14149
E-Mail: Svenja.Schuetzner@rub.de
www.rub.de/for1498

DFG FOR 1498

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

INTERNATIONAL WORKSHOP

COMPUTATIONAL MODELING OF ALKALI-SILICA REACTION

RUHR-UNIVERSITY BOCHUM

9. APRIL 2014

RUHR-UNIVERSITÄT BOCHUM

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 though computational models.

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

WORKSHOP – 9. APRIL 2014

PROGRAM – 10:00 - 16:30

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

14:30 *Coffee Break*

15:00 **A micromechanical model for ASR anisotropy**
Dr. L. Charpin[1], Prof. A. Ehrlacher[2]
[1]Espace Innovation et recherche du groupe (EDF R&D), France, [2]Laboratoire 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