Marie Curie
Innovative Training Network

PhD Training Network on
Durable, **R**eliable and **S**ustainable Structures
with **A**lkali-**A**ctivated **M**aterials

DuRSAAM

Free Online Training Course on "Structural Application of Alkali-Activated Concrete"

17-20 January 2022

Online course

UNIVERSITEIT GENT · TU Delft · KIT Karlsruhe Institute of Technology · The University Of Sheffield. · University of Zagreb · University of Patras · ETH Zürich

Contents

What to expect

This is a 4-days course, formatted as an online interactive training school. The course gives excellent exposure to the use of alkali-activated concrete for structural applications.

The course "Structural Application of Alkali-Activated Concrete" is open to PhD students, practising engineers and interested people who are dealing with the design of concrete structures, and are interested in the application of more eco-friendly structures made of alkali-activated concrete.

The course provides a sound introduction to alkali-activated materials, discusses its application for new concrete structures as well as for strengthening existing structures. During the course several practical cases will be discussed, including insights by practitioners. Structural behaviour will be further illustrated by lab testing cases.

The course will be organised as a fully online event supported by an electronic teaching platform. The course schedules dynamic teaching sessions where the teaching team will interact with students through quizzes, Q&A and round table discussion. At the end of the course, an evaluation test will allow participants to test themselves on the new knowledge acquired. For this purpose, dedicated off-line working sessions are scheduled as well to allow students to look into the course material.

We look forward to welcoming you at this course,

Prof. Thanasis Triantafillou
Scientific course coordinator

Programme

Day 1: Introduction to Alkali-Activated Materials (AAMs)	
Date:	17 January 2022
Location:	Zoom through the electronic teaching platform

*8:45**	*Virtual room will be open for test session of the online teaching environment*
9:00 – 9:40	**Session 1 – Alkali-activated binders, mix design and microstructure of alkali-activated concrete** Luiz Miranda de Lima Junior, Richard Caron, Zhiyuan Xu and Yubo Sun
9:40 – 10:00	Polling (short quiz)
10:00 – 10:15	*Break – 'Random coffee break-out session'*
10:15 – 10:55	**Session 2 – Life cycle assessment, service life and durability** Anastasija Komkova, Tamara Chidiac and Andres Arce
10:55 – 11:15	Polling (short quiz)
11:15 – 11:30	*Break - 'Random coffee break-out session'*
11:30 – 12:10	**Session 3 – Durability** Cassandre Le Galliard, Antonino Runci, Richard Caron and Olivera Bukvic
12:10 – 12:30	Polling (short quiz)
12:30 – 13:30	*Lunch break*
13:30 – 16:30	Round table discussion on issues of AAM relevant to structural applications Prof. John Provis and Prof. Guang Ye

* Central European Time

Day 2: Alkali-activated concrete for new structures	
Date:	18 January 2022
Location:	Zoom through the electronic teaching platform

*8:45**	*Virtual room will be open for test session of the online teaching environment*
9:00 – 9:40	**Session 4 – Development of structural applications and some main challenges in the design of AAM** Prof. Stijn Matthys and Laura Rossi
9:40 – 10:00	Polling (short quiz)
10:00 – 10:15	*Break – 'Random coffee break-out session'*
10:15 – 10:55	**Session 5 - AAM in precast industry** Dr. Olivier Remy - Leviat
10:55 – 11:15	Polling (short quiz)
11:15 – 11:30	*Break - 'Random coffee break-out session'*
11:30 – 12:10	**Session 6 – Recent demonstrations in BeNe - URBCON** Prof. Stijn Matthys and Prof. Guang Ye
12:10 – 12:30	Polling (short quiz)
12:30 – 13:30	*Lunch break*
13:30 – 16:30	Work off-line to look into the course material and prepare for the self-test (for those who want a certficate)

* Central European Time

Day 3: Alkali-activated materials for strengthening of existing structures	
Date:	19 January 2022
Location:	Zoom through the electronic teaching platform

*8:45**	*Virtual room will be open for test session of the online teaching environment*
9:00 – 9:40	**Session 7 – Strengthening and seismic retrofitting with advanced materials** Dr. Michael Karantzikis - ENKA SA & ENKA TECHNOLOGIES
9:40 – 10:00	Polling (short quiz)
10:00 – 10:15	*Break – 'Random coffee break-out session'*
10:15 – 10:55	**Session 8 - Strengthening of existing structures** Prof. Catherine (Corina) Papanicolaou and Ivana Krajnovic
10:55 – 11:15	Polling (short quiz)
11:15 – 11:30	*Break - 'Random coffee break-out session'*
11:30 – 12:10	**Session 9 – Seismic retrofitting of existing structures** Prof. Thanasis Triantafillou and Lazar Azdejkovic
12:10 – 12:30	Polling (short quiz)
12:30 – 13:30	*Lunch break*
13:30 – 16:30	Failure load test on structural element - highlights as presented by researchers performing these tests

Day 4: AAM structural concrete implementation - talk by practitioners	
Date:	20 January 2022
Location:	Zoom through the electronic teaching platform

*8:45**	*Virtual room will be open for test session of the online teaching environment*
9:00 – 9:40	**Session 10 – Opportunities to enhance the utilisation of iron and steel slags** Dr. Craig Heidrich – HBM Group Pty Ltd
9:40 – 10:00	Polling (short quiz)
10:00 – 10:15	*Break – 'Random coffee break-out session'*
10:15 – 10:55	**Session 11 – Technical insights of AAM production and recycling** Dr. Eldho Choorackal - CRH
10:55 – 11:15	Polling (short quiz)
11:15 – 11:30	*Break - 'Random coffee break-out session'*
11:30 – 12:10	**Session 12 – Practical experiences with AAM concrete in precast and ready-mix concrete plant** Dr. Wouter Crijns - ResourceFull
12:10 – 12:30	Polling (short quiz)
12:30 – 13:30	*Lunch break*
13:30 – 16:30	Short wrap-up session Work off-line to look into the course material and prepare for the self-test (for those who want a certficate)

* Central European Time

Teachers

Prof. Thanasis Triantafillou- University of Patras
Scientific course coordinator
Thanasis Triantafillou is professor & Head in the Department of Civil Engineering and Director of the Structural Materials Laboratory. His main research interests are focused in the application of advanced structural materials in structures, with emphasis in the field of strengthening/retrofitting of concrete, masonry and timber structures.

Prof. Stijn Matthys - Ghent University
DuRSAAM action coordinator
Stijn Matthys is full professor on renovation of civil structures at Ghent University, Magnel-Vandepitte Laboratory for Structural Engineering and Building Materials, furthermore he is manager of the Ghent University DuraBUILDmaterials knowledge cluster. His expertise relates to structural renovation of civil structures, fibre reinforced polymer (FRP) reinforcement, structural behaviour of concrete structures, damage diagnostics and monitoring, and technologies for durable building materials and techniques.

Prof. Catherine (Corina) Papanicolaou – University of Patras
Corina Papanicolaou is professor at the University of Patras. Her main research interests are focused on experimental mechanics of structural materials (e.g. high- or special-performance concrete and lightweight concrete) under normal environmental conditions but also under detrimental ones, such as fire, on the mechanical behaviour of inorganic matrix composites and on the optimum design of advanced prefabrication systems.

Prof. John Provis - University of Sheffield
Professor of Cement Materials Science and Engineering and Head of the Engineering Graduate School of University of Sheffield, Deputy Chair of RILEM Technical Committee 283-CAM, an invited TAC Expert of RILEM, a Voting Member of committees of BSI, ASTM and ACI, Associate Editor of the leading journals Cement and Concrete Research and Materials and Structures, and Speciality Chief Editor for the Structural Materials section of Frontiers in Materials.

Prof. Guang Ye - Delft University of Technology
Associate professor in the Section of Materials and Environment of TUDelft, chair of the research group of Concrete Modelling and Materials Behavior, author/co-author of 300 journal/conference papers, editor/co-editor of 8 conference proceedings and Chapter contribution of 6 books, member of several RILEM Technical Committees like TC-ICC, TC-ATC, TC-SHC and TC-SAP, TC-DTA and *fib* committee of 8.10 and 8.12.

Teacher assistants - DuRSAAM Early Stage Researchers

Yubo Sun

Zhiyuan Xu

Luiz Miranda

Laura Rossi

Ivana Krajnovic

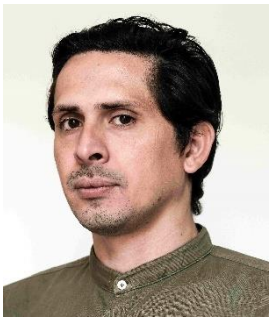
Lazar Azdejkovic

Cassandre Le Galliard

Antonino Runci

Olivera Bukvic

Richard Caron



Andres Arce

Tamara Chidiac

Anastasija Komkova

Invited speakers

Dr. Olivier Remy – Leviat
Olivier Remy is currently supporting the digital transformation process of Leviat – a CRH company. Leviat unites the expertise, skills, and resources of CRH's construction accessories companies in a single global organization. Across CRH he worked on numerous innovation and R&D activities, all contributing to make the construction industry more sustainable. His academic background was focused on the use of Textile Reinforced Mortars in Stay in Place Structural Formwork solutions.

Dr. Michael Karantzikis - ENKA SA & ENKA TECHNOLOGIES
MSc Structural Engineer with expertise in seismic, structural and composite technologies. Experienced manager in structural technologies, such as seismic isolation, damping and composites business development in Europe and the Middle East. Experience in structural strengthening construction projects. Numerous publications in journals and international conferences. Owner of ENKA (www.enka.com.gr) and ENKA TECHNOLOGIES (www.enkatechnologies.com.gr).

Dr. Wouter Crijns - ResourceFull
Wouter Crijns is a material science engineer and managing director at ResourceFull (https://www.resourcefull.eu/).
ResourceFull offers a cement alternative based on the use of secondary resources, eliminating the dependency of primary raw materials and offering a far more ecological alternative to the construction industry.

Dr. Eldho Chooracka l - CRH
Eldho Chooracka l is a laboratory specialist at the CRH Innovation Centre for Sustainable Construction. He is involved with the development of geopolymer concrete, alternative binders and low-clinker concrete for the CRH-operating companies. Before joining CRH in 2020, he did his PhD in Civil and Environmental Engineering from the Politecnico di Torino, Italy. His research interests include development of low-carbon concrete and supplementary cementitious materials.

Dr. Craig Heidrich - HBM Group Pty Ltd
Craig Heidrich is the Managing Director of HBM Group, a company with 26 years of experience in providing professional industry association management services and strategic management support, focusing on industry advocacy, RD&D management, policy development and membership support. Craig's company has lead the 'circular economy' revolution in Australia before the term was coined! – leading the charge towards the effective utilisation of industry by-products and recoverable mineral resources.

Registration

To enrol please fill in the registration form. **The closing date for registration is January 9, 2022.**

The course is free of charge.

For more information, please contact Alessandro Proia (Alessandro.Proia@ugent.be).

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