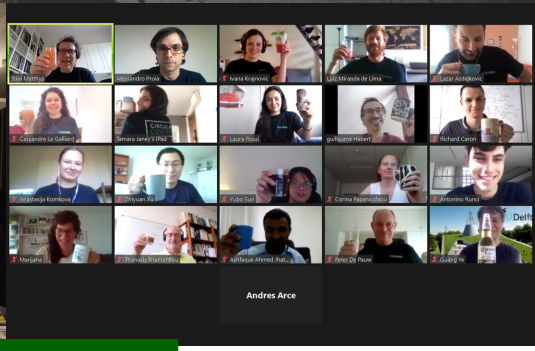


DuRSAAM

The PhD Training Network on Durable, Reliable and Sustainable Structures with Alkali-Activated Materials

Inside the Issue



NEWS

- DuRSAAM has participated in Science is Wonderful! 2020, online exhibition organised by European Commission from 22 to 24 September 2020
- Ongoing research and collaboration among ESRs
- List of first publications by our researcher fellows is available

EVENTS

Reporting on previous events organised at Karlsruhe Institute of Technology (KIT) and online.

Learn about our upcoming event the midterm DuRSAAM workshop on Geopolymer concrete from 28 to 29 of April 2021, in conjunction with the Microdurability Conference organised by TU Delft in The Hague.

DURSAAM DURING PANDEMIC

Breakout of the Covid-19 pandemic has affected the plans and actions, but the research and dissemination activities have continued. Project meeting 4, Entrepreneurial Workshop, Training Course and also the next project events have been successfully organised through online platform. Hopefully, the situation will go back to normal soon so that secondments and live meetings can take place.

ABOUT DURSAAM

DuRSAAM is a collaborative PhD framework creating a critical mass of experts skilled in innovative alkali-activated material (AAM) for concrete, as a key enabling technology for a sustainable and resilient built environment. AAM technology presents a new generation of materials, ideally conceived to respond to the need for more efficient, durable, eco-friendly and reliable construction, and utilizing by-product resources as raw materials.

For more details, please check the DuRSAAM Newsletter Issue 1 from October 2019.

What is the role of DuRSAAM for a sustainable future?

DuRSAAM aims to diffuse the knowledge of AAMs throughout Europe!

The network sponsors 13 PhD projects divided in different categories

Computer simulation → AAMs → Fire resistance → Applications

Environmental impact study → Computer simulation

Did you know that the production of 1 m³ of AAM-concrete

- Saves 525 kg of natural resources
- Saves 245 kg CO₂ emission
- Uses 136 kg of recycled aggregates
- Avoids 70 kg of waste disposal

“With DuRSAAM, we can expect a greener future for your houses and our cities, providing to the next generations the same level of convenience of our daily-life combined with a more sustainable planet!”

DuRSAAM Marie Curie Innovative Training Network
PhD Training Network on Durable, Reliable and Sustainable Structures with Alkali-Activated Materials

SCIENCE IS WONDERFUL!

European Research and Innovation Days

22-24 September 2020



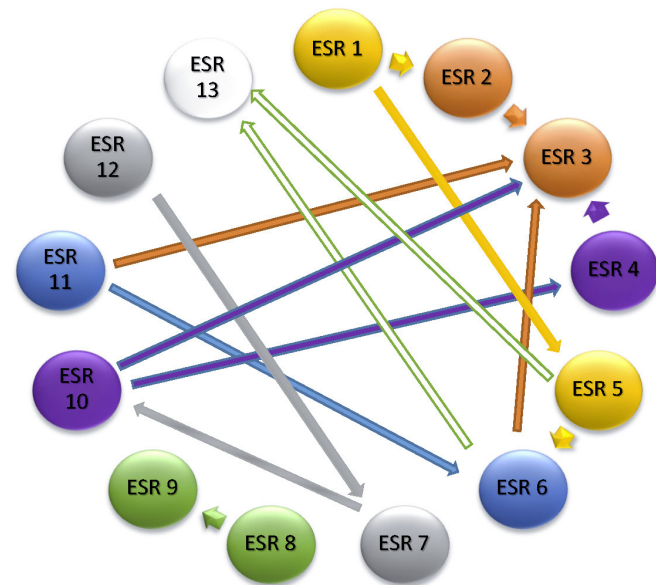
DuRSAAM project had the great opportunity to participate to the European Research and Innovation Days event *Science is Wonderful!* organised through online platform due to the COVID-19 crisis. ERSs participated actively to the events presenting the potentiality of Alkali-Activated Materials through public posters placed at the virtual booth in the online pavilion for the visitors (left), video presentation for children, quizzes opened to citizens and stakeholder presentations, ERSs had some very successful presentations and interesting discussions with visitors. The impressions of all participants were very positive.

COLLABORATION MAP

The collaboration scheme is presented (right). Different colors make distinction between partner universities.

The ESR that has the most developed cooperation network is Luiz Miranda (ESR 3). His collaborations with Laura Rossi (ESR 4), Lazar Azdejkovic (ESR 6) and Andres Arce (ESR 11) provide complementary data on chemical characterisation for AAM mix designs developed at University of Patras and Karlsruhe Institute of Technology.

Anastasija Komkova (ESR 13) provides very important inputs for the Life Cycle Assessment of particular mix designs developed within the project (ESR 5 and ESR 6). Other collaborations are planned and shown at the diagram (e.g. Richard Caron (ESR10) and Cassandre Le Galliard (ESR7) on Carbonation of AAMs). PhDs are encouraged to cooperate between each other in order to achieve interdisciplinarity in finding optimal solutions for demanding research tasks.



LIST OF RECENT PUBLICATIONS

First publications from our ESR fellows are published and available now. Antonino Runci has participated in RILEM 3rd Spring Convention and Conference organised this year in Guimaraes. Another significant conference participation was by our fellow Luiz Lima at RILEM Cement and Concrete Science Conference. Apart from the publications listed below, there is much more yet to come in the future.

- Runci, A., Serdar, M., Provis, J. Chloride-induced corrosion of steel embedded in alkali-activated materials: state of the art, Proceedings title: Symposium on Doctoral Studies in Civil Engineering 2019
- Runci, A., Serdar, M., Comparison of chloride-induced corrosion of steel in cement and alkali-activated fly ash mortars, RILEM 3rd Spring Convention and Conference 2020, Guimaraes
- Jhatial, A., Serdar, M., Ye, G., Review on concrete under combined environmental actions and possibilities for application to alkali activated materials, Proceedings title: Symposium on Doctoral Studies in Civil Engineering 2020, University of Zagreb
- Runci, A., Serdar, M., Corrosion potential of steel embedded in alkali-activated slag, Proceedings title: Symposium on Doctoral Studies in Civil Engineering 2020, University of Zagreb
- Lima, L., Provis, J., Ye, G., Investigation of early-stage processes of alkali-activated synthetic low calcium, 40th RILEM Cement and Concrete Science Conference 2020

“

Worldwide, 4.1 billion tons of cement are manufactured per year translating into 8% of all human-derived CO₂ emissions.

”

RESEARCH TRAINING COURSE - AAM TECHNOLOGY AND PM3

Research Training Course on "AAM Technology and Project Meeting 3" were organised at Karlsruhe Institute of Technology from 27 till 31 of January 2020.



The "AAM Technology" course has covered both basic and up-to date topics related to Portland cement and Alkali-Activated Materials for a audience with different background.

- Prof. John Provis from University of Sheffield had covered basics of Portland cement and alternative binders technology, testing methods and procedures, characterisation and standardisation of cementitious materials.
- Prof. Guang Ye from TU Delft has focused on shrinkage and modelling of AAMs and Portland cement pastes.
- Prof. Frank Dehn from KIT has held a lecture on the mechanical characteristics of AAMs and Fiber Reinforced Concrete topics.

Accompanying the theoretical lectures, laboratory demonstrations and workshops were organised.

Finally all guests of KIT that had attended the course or meetings during this quite intensive but joyful week, have participated in a guided tour through Materials Testing and Research Laboratory at Karlsruhe Institute of Technology. The event organisation and program was managed flawlessly by KIT, setting up high standards for the next host institution.

All appointed ESR's and supervisors have participated in the Project Meeting 3, meeting for the first time all together. During the first day of PM3, ESR council session took place, dissemination plan was adopted and the PhD seminar was conducted.

The second day of PM3 was dedicated to mid-term report and meeting with European Commission officer.



RESEARCH TRAINING COURSE - "DURABILITY-SUSTAINABILITY-LCA"

Research Training Course on "Durability-Sustainability-LCA" has been performed through online platform during the pandemic crisis from 14 till 16 of September 2020.

The lectures have covered the principal issue of durability in the construction field with practical examples.

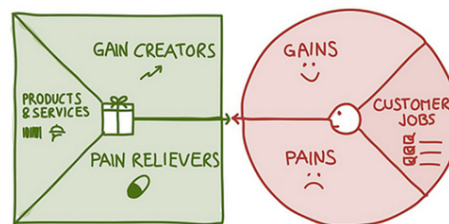
- Prof. Stijn Matthys from University of Ghent has introduced the course and the main issues concerning the design and casting.
- Prof. Geert De Schutter from University of Ghent has held a lecture about early durability connected to volume stability, chemical attack and freezing/thawing effect.
- Assist. Prof. Marijana Serdar from University of Zagreb has focused on reinforced durability and the impact of substitute cementitious materials.

The further lectures have covered the principal issue of sustainability and circular economy in the construction field.

- Prof. Guillaume Habert from ETH has spoken about the meaning and the impact of a sustainable development and the strategic instrument of Life-Cycle-Analysis (LCA) to measure the environmental impact of industry, the theoretical lecture was accompanied by a simulated LCA quantification.
- Dr. Birgitte Holt Andersen from Cware has introduced the topic of circular and liner economy and the possible benefit for the construction industry.

In the second **Entrepreneurial Workshop**, Prof. Stijn Matthys and Mrs. Jolien Coenraets from University of Ghent presented the identification of key exploitable results (KERs) and the main milestones of starting a new company.

The aim of the workshop was to stimulate students to think beyond their own research and select the potential high results as an input for the chain production.



"A KER is an important input to policy and standardization, further research, education or civil society."

In the Expert talk, **Mr. Lars Cuyvers** (Aurubis AG Group) showed the matured experience of valorization of different slags produces during the refining process of copper as potential potential precursors in alkali-activated and blended cements. The presentation showed many examples of application of pre-casted elements in different environments.

NEXT EVENTS

Project meeting 5

The Project Meeting 5 has been planned online on 3rd and 5th of November 2020. ESR council is scheduled right before the Project meeting 5 while the supervisory board meeting will take place during the second day of the event.

Project meeting 6 and the Midterm Workshop

The project meeting 6 is scheduled for 27th of April 2021, hosted by TU Delft.

The Midterm Workshop will take place as a "special session on geopolymers concrete" of the Microdurability2020 Conference, the 28th and 29th of April 2021 in The Hague (NL).

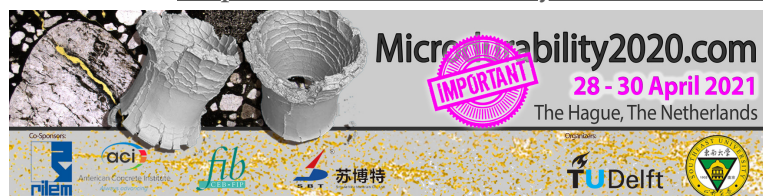
The 4th International RILEM Conference

Microstructure Related Durability of Cementitious Composites

28-31st April 2021, Hague, Netherlands

The Microdurability2020 Conference was introduced by the Microdurability webinar that was held on 12th and 13th of October with some remarkable keynote lectures and very interesting presentations on selected papers. It was a great introduction to the upcoming conference, that will hopefully take place live, the way it was originally planned.

For more information about the conference and paper submission, please visit the official website of the conference: <https://www.microdurability2020.com/99721>



OUR PARTNERS

The team holds a unique focus on: (1) today's concerns of users and engineers that the durability and sustainability of AAM concrete is yet insufficiently quantified; and (2) provision of an AAM technology for rehabilitation of structures to meet the growing demand for renovation, to be developed in parallel with AAM for new concrete structures.

STAY TUNED

For more information and News about DuRSAAM visit our webpage, and follow us on social medias and YouTube channel.



<https://www.linkedin.com/company/dursaam-itn/>



<https://www.youtube.com/watch?v=qP-cvcX2Xxs>



Follow us on Twitter @Du_RSAAM

<https://dursaam.ugent.be/>

*This issue of the newsletter is brought to you by PhD fellows:
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