2. SYMPOSIUM
ON SUSTAINABLE CONSTRUCTION

grow.build.repeat.

from breeding, cultivation, seeding, and harvesting of biological building materials

KIT Karlsruhe
Professorship of Sustainable Construction

Friday, 04. December 2020 | 09:00 – 18:00

Access to the live-stream and the virtual exhibition on 4 December 2020:

https://changelab.exchange

The symposium is also accessible via social media:
https://linktr.ee/sustainable_construction

virtual exhibition on changelab.exchange

Main parts of the symposium:

Keynote by Mitchell Joachim

Half-hour lectures by the speakers

Podium discussions with the speakers

Moderation: Prof. Dirk E. Hebel, KIT Karlsruhe
Conversation partner of Wacker Chemie AG:

Peter Summo	President WACKER POLYMERS
Dr. Theo Mayer	Vice President R&D and Innovation WACKER POLYMERS
Dr. Tobias Halbach	Head of Technology Management WACKER POLYMERS
Dr. Peter Jerschow	Head of Global Product Development Construction Silicones WACKER SILICONES

Detailed agenda on the next page...

KIT Karlsruher Institut für Technologie
FAKULTÄT FÜR ARCHITEKTUR
CHANGELAB! Wacker KIT Innovation Platform for pioneering sustainable construction

With the kind support of: WACKER

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Agenda

09.00	**Welcome** Peter Summo, President WACKER POLYMERS, Wacker Chemie AG Dirk E. Hebel, Dean of the Faculty for Architecture, KIT Karlsruhe
09.10	**Design Against Extinction – From biotech architecture to resilient cities** Mitchell Joachim, NYU New York University, Terreform ONE
09.40	**Thematic Introduction** Prof. Dirk E. Hebel, KIT Karlsruhe
09.50	**Architecture from Nature – Low-Tech Building with Earth, Bamboo and Timber** Prof. Eike Roswag-Klinge, TU Berlin
10.20	**Reuse instead of Recycling - multi-talent wood** Andrea Klinge, ZRS Architekten
10.50	Panel discussion with Prof. Eike Roswag-Klinge, Andrea Klinge and Mitchell Joachim
11.20	Break
11.35	**Concrete Solutions for liveable Cities** Prof. Dr. Henk Jonkers, TU Delft
12.05	**High-Performance Bamboo** Dr. Alireza Javadian, KIT Karlsruhe
12.35	**Lignin and Tannin-based Materials as renewable Building Materials** Prof. Dr. Marie-Pierre Laborie, University of Freiburg
13.05	Panel discussion with Prof. Dr. Henk Jonkers, Dr. Alireza Javadian and Prof. Dr. Marie-Pierre Laborie
13.35	Break
14.05	**Stampflehm – Baumaterial der Zukunft (Rammed Earth - Building Material of the Future)** Martin Rauch, Lehm Ton Erde Baukunst GmbH
14.35	**Vielfalt Strohballenkonstruktionen (Variety of Straw bale Constructions)** Werner Schmidt, Atelier Schmidt GmbH
15.05	Panel discussion with Martin Rauch and Werner Schmidt
15.35	Break
15.50	**Biomaterials and Automation: New Era for Future Architecture** Prof. Dr. Hanaa Dahy, University of Stuttgart
16.20	**Mycelium based Material Innovation** Diana Drewes, Haute Innovation
16.50	**Functional surface treatments of Building Materials with the fungus Aureobasidium** Dr. Michael Sailer, Xyhlo p/a Xylotrade
17.20	Panel discussion with Prof. Dr. Hanaa Dahy, Diana Drewes and Dr. Michael Sailer
17.50	Closing words

KEY-NOTE

Lectures and panel discussions will be held in English

Lectures and panel discussion will be held in German

A translation of the German contributions into English will be provided. We will announce the link in advance on changelab.exchange.

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Description

The symposium grow.build.repeat. presents pioneers of a future building industry and their visions, ideas, future-oriented research projects and first examples of application of bio-based building materials. The symposium offers the opportunity for joint discussion and exchange on this rapidly developing field of architecture.

Whether in the form of residual or waste materials from soil-bound agriculture or from other types of cultivation - for example in the form of bacteria or fungi - biological resources are available in manifold ways. As tempting as this prospect may be, the aim of the construction industry must be to use these materials in pure form in constructions without destroying natural cycles. Only in this way they can be returned to the biological cycle as a valuable source of raw materials after their utilisation phase and represent an antipole to the currently practised throw-away mentality of inseparable mixed waste. Not only new material concepts but also new (deconstruction) technologies play a decisive role. The construction industry must offer ecologically valuable and biologically safe solutions for socially relevant issues in the future.

Digital fabrication takes traditional materials out of their niche and helps them to reach new heights. Well-known properties of traditional materials such as ceramics or clay are intelligently used in 3D printing, for example.

The symposium is dedicated to the question of how we can use our natural resources responsebly in times of climate change and an increasingly glaring shortage of resources and pollution of our environment by non-biodegradable and artificially manipulated materials. Representatives of science and economy, research, practitioners, decision-makers of our democratic society as well as teachers and students are invited to discuss the future of construction in lectures and discussions and to actively participate in shaping it. Speakers will be Martin Rauch, Prof. Dr. Marie-Pierre Laborie, Dr. Henk Jonkers, Dr. Alireza Javadian, Werner Schmidt, Prof. Eike Roswag-Klinge, Andrea Klinge, Natascha Hempel, Jun. Prof. Dr. Hanaa Dahy, Diana Drewes and Dr. Michael Sailer.

The symposium will take place as part of the newly conceived innovation platform „ChangeLab – Wacker KIT Innovation Platform for Pioneering Sustainable Construction“, supported by Wacker Chemie AG. The event on December 04, 2020, is organized by the Professorship of Sustainable Construction of the KIT Faculty of Architecture Karlsruhe and is recognized as a further training course of the Baden-Württemberg Chamber of Architects with 4 hours (Recognition No.: 2020-151695-0001).

To receive a confirmation for the Baden-Württemberg Chamber of Architects, please register in advance on arch.kit.edu/aktuelles/grow-build-repeat.php. During the online event, a question will appear. The answer to this question can be sent to us by e-mail and serves as confirmation of the participation.

The event is being held with the kind support of Wacker Chemie AG.

More information also on nb.ieb.kit.edu and arch.kit.edu/aktuelles/grow-build-repeat.php

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Speaker information

Prof. Dr. Hanaa Dahy
Dr.-Ing. Arch. | University of Stuttgart | Director of BioMat Department (Bio-based Materials and Materials Cycles in Architecture) at Institute for Building Structures and Structural Design (ITKE)

Prof. Dr. Hanaa Dahy, born in Cairo, is a registered architect in Germany and in Egypt. After earning her PHD with excellence at the University of Stuttgart in 2014, Dahy established her (BioMat) department „Biomaterials and Material Cycles in Architecture" since 2016 at ITKE (Institute for Building Structures and Structural Design) in the Faculty of Architecture and Urban Planning at the University of Stuttgart.

She owns european and international patents, won diverse international prizes, leads multiple industrial projects and is a founding member of ArchIDA (Stuttgart Research Center for Architecture: Integrative Design and Adaptive Building) and is a PI (Principal Investigator) of the DFG- German federal funded Cluster of Excellence IntCDC: "Integrative Computational Design and Construction for Architecture".

Title of lecture: Biomaterials and Automation: New Era for Future Architecture

Diana Drewes
HAUTE INNOVATION – Future Agency for Material and Technology | Berlin

Diana Drewes has been working as a materials researcher and materials developer at the future agency Haute Innovation in Berlin. Her thematic main focus is the close linking of technology and biology, where the most far-reaching innovations are expected in the next few years. She has already developed several materials, some of which are based on fungal mycelium, completely free of chemicals and 100% degradable.

In her lectures she is presenting the latest material innovations on the basis of natural resources and explaining production processes by exploiting biological growth processes. Diana Drewes is co-author of the recently by Birkhauser in Switzerland published book „Materials in Progress".

Title of lecture: Mycelium based Material Innovation

Prof. Dirk E. Hebel
M. Arch. | KIT Karlsruhe | Professorship Sustainable Construction | Dean of the Department of Architecture

Prof. Dirk E. Hebel is professor of Sustainable Construction and the Dean of the Department of Architecture at the Karlsruhe Institute of Technology, KIT. He is also a Principal Investigator at the Future Cities Laboratory SEC Singapore. Prior to that, he was assistant professor of Architecture and Construction at ETH Zürich, Switzerland. He was also the founding scientific director of the Ethiopian Institute of Architecture, Building Construction and City Development in Addis Ababa, Ethiopia. He was as well guest professor at Syracuse University, guest lecturer at Princeton University, and Hans and Roger Strauch visiting critic at Cornell University.

He is the author of numerous book publications, lately Addis Ababa: A Manifesto on African Progress (2018, Ruby Press, with Felix Heisel, Marta Wisniewska and Sophie Nash), Cultivated Building Materials (2017, Birkhäuser, with Felix Heisel) and Building from Waste: Recovered Materials in Architecture and Construction (2014, Birkhäuser, with Marta H. Wisniewska and Felix Heisel).

Title of lecture: Thematic introduction

Dr. Alireza Javadian

M. Eng., M. BA., PhD, ETH Zürich | KIT Karlsruhe | Professorship Sustainable Construction

Alireza Javadian is a researcher at the Professorship Sustainable Construction of KIT Karlsruhe. Before he was a postdoctoral researcher at the Alternative Construction Material Group at the Future Cities Laboratory Singapore, a collaboration of the ETH Zurich and the National Research Foundation Singapore. His PhD research focused on alternative composite fiber materials as reinforcement systems in concrete applications.

He was the recipient of a Singapore A*STAR (Agency for Science, Technology and Research) scholarship (2007) to pursue his Master in Engineering at Nanyang Technological University NTU and conduct research on 'Effective High Temperature and Structural Reinforced Concrete Applications'. After his Master at NTU, he joined the National University of Singapore as a research assistant. Lately, he won the SAWIRIS SCHOLORSHIP Grant of ETH Zürich, a Swiss KTI project fund, and an ZUMTOBEL GROUP Award together with the bamboo research team in Singapore and Zürich.

Title of lecture: High-Performance Bamboo

Mitchell Joachim

Ph.D., Assoc. AIA | Associate Professor of Practice, NYU | Co-Founder, Terreform ONE

He is the Co-Founder of Terreform ONE and an Associate Professor of Practice at NYU. Formerly, he was an architect at the offices of Frank Gehry and I.M. Pei. He has been awarded a Fulbright Scholarship and fellowships with TED, Moshe Safdie, and Martin Society for Sustainability, MIT. He was chosen by Wired magazine for „The Smart List" and selected by Rolling Stone for "The 100 People Who Are Changing America".

Mitchell won many honours including; ARCHITECT R+D Award, AIA New York Urban Design Merit Award, 1st Place International Architecture Award, Victor Papanek Social Design Award, Zumtobel Group Award for Sustainability, History Channel Infiniti Award for City of the Future, and Time magazine's Best Invention with MIT Smart Cities Car. He's featured as "The NOW 99" in Dwell magazine and "50 Under 50 Innovators of the 21st Century" by Images Publishers. He co-authored three books, „XXL-XS: New Directions in Ecological Design", „Super Cells: Building with Biology" and „Global Design: Elsewhere Envisioned". His design work has been exhibited at MoMA and the Venice Biennale.

He earned: PhD at Massachusetts Institute of Technology, MAUD Harvard University, MArch Columbia University.

Title of lecture: Design Against Extinction – From biotech architecture to resilient cities

Prof. Dr. Henk Jonkers

Prof. PhD, Doctorate (M.Sc.) | Delft University of Technology, Faculty of Civil Engineering and Geosciences, Department of Materials & Environment, Microlab | Associate Professor

Prof. Dr. Henk Jonkers received his PhD in marine microbiology from the University of Groningen in 1999 and worked as a research associate at the Max Planck Institute for Marine Microbiology in Bremen until 2006. Since then he has been teaching as Associate Professor in the Sustainability Group in the Materials & Environment Department at the CEG Faculty of Delft University of Technology.

His research focuses the interactions between building materials/constructions and the living environment as well as the impact on functional and environmental performance over the entire life cycle. Research on bio-based high-performance building materials such as self-healing concrete and the development of building materials and structures with added environmental benefits through the integration of vegetation ecosystem functions are further key areas of his work.

Title of lecture: Concrete Solutions for liveable Cities

Andrea Klinge

Dipl.-Ing. | ZRS Architekten | Head of Research

Andrea Klinge, Dipl.-Ing. Architecture, M.Sc. Architecture, Energy & Sustainability, studied at the Technical University Berlin and London Metropolitan University and specialised in sustainable architecture.

Having previously worked in different architectural practices in London and Rome, Andrea joined ZRS Architekten Berlin in 2013 where she established the research department, leading the EU-research projects RE4 and [H]house. Her research focuses on the use of natural building materials in light of circular construction and an improved indoor environment quality and received a number of prices such as the Hans Sauer Award 2020 for circularity and a recognition at the Deutscher Holzbau Preis.

Due to her background as carpenter, Andrea works also practically to bring research results directly into application. She has implemented several small-scale projects constructed out of timber, earth or bamboo with students from different universities. In addition, she is a lecturer and is part of the classification committee for the creation of sample EPD's for earth building materials.

Title of lecture: Reuse instead of Recycling - wood as a multi-talent

Prof. Dr. Marie-Pierre Laborie

Prof. PhD | University of Freiburg | Chair of Forest Biomaterials

Prof. Dr. Marie-Pierre Laborie received her doctorate in 2002 in the field of wood science and forest products at Virginia Polytechnic and State University, USA. In 2008 she habilitated in materials and process engineering at the Grenoble Institute of Technology, France.

Prof. Dr. Marie-Pierre Laborie's basic and applied research aims to a better understanding of the structure and properties of natural materials such as wood and to transforming forest resources into improved wood-based products and innovative biomaterials. In particular, lignin, cellulosics and other natural polymers are used to develop new biobased materials and composites with tailor-made performance. In her laboratory at the University of Freiburg, her team has recently developed lignin-based adhesive systems and tannin-based foams.

Title of lecture: Lignin and Tannin-based Materials as renewable Building Materials

Martin Rauch

Mag. Art. | Founder & Managing Director Lehm Ton Erde Baukunst GmbH

Martin Rauch attended the technical school for ceramics and kiln construction in Stoob (Burgenland, Austria) from 1974-78 and the University of Applied Arts in Vienna from 1978-1983. Since 1990 he has planned, conceived and realised more than one hundred public and private rammed earth building projects on an international level. In 1999 he founded the company Lehm Ton Erde Baukunst GmbH; www.lehmtonerde.at.

In over three decades of theoretical and practical research, Martin Rauch has succeeded in significantly developing traditional rammed earth techniques and integrating them into modern architecture. He has received various awards, including the Holcim Award - Morocco in 2011 and the Reddot Design Award in 2012. Since 2010, he has been an honorary professor of the UNESCO chair „Earthen architecture, building cultures and sustainable development". Numerous publications including „Upscaling Earth - Material, Process, Catalyst" (2019) and „Gebaute Erde - Gestalten & Konstruieren mit Stampflehm" (2015) document his work.

Title of lecture: Stampflehm – Baumaterial der Zukunft (Rammed Earth - Building Material of the Future)

Prof. Eike Roswag-Klinge

Dipl.-Ing. Architekt BDA | ZRS Architekten | Initiator and director

Prof. Eike Roswag-Klinge is one of the initiators and directors of ZRS Architekten Ingenieure Berlin und the Chair of Natural Building Lab, Technische Universität Berlin. In his networks he is since 20 years researching on, teaching/learning, designing and building climate and resource adaptive, human architecture in different climate zones. The projects range from schools out of earth and bamboo in the global south, heritage rehabilitation, to housing, production buildings and schools out of timber, earth and natural fibre insulation in Europe. His research is focusing on climate and cultural adaptive architecture and low-tech building systems.

The work he is related with got awarded with the Aga Khan Award 2007, KAIROS Europäischer Kulturpreis 2015, Holcim Award 2011, Gold in Asia Pacific and others. www.nbl.berlin, www.zrs.berlin

Title of lecture: Architecture from Nature – Low-Tech Building with Earth, Bamboo and Timber

Dr. Michael Sailer

Dipl. Holzwirt | Scientific Director, Xylotrade B.V. | Senior researcher, Saxion University of Applied Sciences

Dr. Michael Sailer is a biologist and scientific director of the company Xylotrade. Since 1996 he is involved in developments of coatings of biological origin as part of his doctorate. The aim of this research was to extend the service life of wood for outdoor applications using an environmentally friendly natural oil treatment. During this research, an such a wood treatment was developed that is based entirely on natural substances and biological processes and uses a specific fungus to protect the wood.

In early 2016, Xyhlo Biofinish was ready for the market. Timber for the facade cladding of the first project (the health center „Da Costa" in Putten, Netherlands) was impregnated with linseed oil and treated with Xyhlo Biofinish. In the meantime, more than 30 projects have been completed, including the participation in the project „De Loskade in Groningen", in which the concept of „circular living products" is tested on the basis of reusable building components.

Title of lecture: Functional surface treatments of Building Materials with the fungus Aureobasidium

Werner Schmidt

Mag. Arch.| Atelier Werner Schmidt

Werner Schmidt is one of the most interesting contemporary swiss architects. After graduating from the University of Applied Arts in Vienna, he founded his own office in Graubünden. After realizing some unconventional projects, he gains international fame as an architect in the 2000s thanks to convincing buildings made of straw bales in Switzerland, Germany and South Tyrol.

Werner Schmidt stands for an architecture with alternative building techniques and natural materials. When planning his buildings, he always keeps the impact on the environment in mind, thus creating sustainable living spaces with a high quality of life.

Title of lecture: Vielfalt Strohballenkonstruktionen (Variety of Straw bale Constructions)