



GESELLSCHAFT DEUTSCHER CHEMIKER



ICCCM

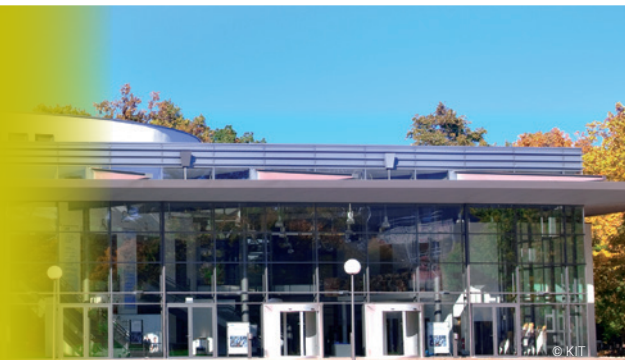
Fachgruppe Bauchemie
Chemistry of Construction Materials Division

4th International Conference on the Chemistry of Construction Materials

September 26 - 28, 2022
Karlsruhe, Germany



www.gdch.de/icccm2022



▶ AIM OF THE CONFERENCE

The conference aims at providing an inspiring forum for scientists from university, research facilities and industry to present results, to discuss and to focus on the forthcoming challenges.

Interdisciplinary presentations in all fields of construction materials science will show the many different perspectives of the topic.

▶ SCIENTIFIC COMMITTEE

F. Dehn	Karlsruhe/DE
A. Gerdes	Karlsruhe/DE
D. Hebel	Karlsruhe/DE
S. Kawashima	New York/US
K. Malaga	Stockholm/SE
A. Manalo	Toowoomba/AU
J. Moon	Seoul/KR
J. Plank	Garching/DE
N. Schröter	Frankfurt/DE
D. Stephan	Berlin/DE
S. Wache	Trostberg/DE
F. Winnefeld	Dübendorf/CH
R. Zurbruggen	Beinwill/CH

Monday, September 26, 2022

Karlsruhe University of Applied Sciences, Building B, Room B418

13:00

–

16:30

WORKSHOP I

Building Information Modeling (BIM)

Prof. Dr.-Ing. Matthias Urmersbach, Karlsruhe University of Applied Sciences

Program:

**Change in construction process due to digitalisation
The role of materials in context of BIM**

Price: Participants € 130; Students € 35

Booking required (limited number of participants)

KIT Campus North, Building 330, Room 156a

13:00

–

16:30

WORKSHOP II

Transformation in the Construction Sector

Prof. Dr. Andreas Gerdes, KIT Karlsruhe
Prof. Dr. Katarina Malaga, RICE Institute, Stockholm

Program:

Challenges and Chances for the Construction Chemistry

Price: Participants € 150; Students € 30

Booking required (limited number of participants)

KIT Campus South, Chemistry Building 30.41, Lecture Hall 4

WORKSHOP III

Innovation – What does the future hold for construction chemistry

Prof. Dr. Andreas Gerdes, KIT Karlsruhe
Dr. Christoph Hahner, DAW SE, München

Program:

Anticipate to innovate - how to be one step ahead

Price: Participants € 100; Students € 25

Booking required (limited number of participants)

KIT Campus South, Chemistry Building 30.41, Lecture Hall 4

17:00

GENERAL ASSEMBLY

of the GDCh Division of the Chemistry of Construction Materials

**MITGLIEDERVERSAMMLUNG
der Fachgruppe Bauchemie**

Tagesordnung wird noch bekanntgegeben.

19:00

GET-TOGETHER at Südwerk Karlsruhe

Tuesday, September 27, 2022

*Audimax*9:00 **OPENING**

Thomas Hirth, Vice-President of the KIT

9:10 **WELCOME AND ORGANIZATIONAL DETAILS**

Andreas Gerdes

Invited Speaker Session*Chair: A. Gerdes*9:30 **Circular Construction – the city as a future material storage**D. Hebel, Karlsruhe/DE10:00 **Roadmap to climate neutrality for Swedish cement and concrete industries – different scenarios**K. Malaga, Stockholm/SE*Foyer*

10:30 START OF POSTER SESSON & COFFEE BREAK

*Audimax***Sustainable construction materials***Chair: F. Winnefeld*11:20 **A study on environmental, economic, and mechanical performance of geopolymer mortars**R. Firdous, Berlin/DE11:40 **Influence of SiO₂/Na₂O ratio of sodium silicate solutions forming geopolymers by reaction with aluminium orthophosphate**S. Partschefeld, Weimar/DE12:00 **Influence of the nature of the sulfate carrier on the dissolution kinetics of alite during the early hydration of a Portland cement-rich CSA blend**J.J. Wolf, Erlangen/DE12:20 **Principles of fast-setting mortars and concretes**R. Zurbruggen, Beinwill/CH

12:40 LUNCH BREAK

Tuesday, September 27, 2022

Foyer

10:30 START OF POSTER SESSON & COFFEE BREAK

*Chemistry Building 30.41 Lecture Hall 4***Admixtures and additives***Chair: F. Dehn*11:20 **Influence of silane structures on the performance of mass hydrophobic treatments**J. Süßmuth, Karlsruhe/DE11:40 **EPEG and GPEG – A New Generation of PCE Superplasticizers**L. Lei, Garching/DE12:00 **Behavior of Different PCE Superplasticizers in Calcined Clay Blended Cements**R. Li, Garching/DE12:20 **Effect of the Portland Cement Quality on the Rheology of LC³ Binders Containing Superplasticizers**A.-S. Dönmez, München/DE

12:40 LUNCH BREAK

Tuesday, September 27, 2022

Audimax

Sustainable construction materials

Chair: J. Plank

- 13:40 **Carbonated wollastonite as supplementary cementitious material**
F. Winnefeld, Dübendorf/CH
- 14:00 **Role of metakaolin and limestone substitution in the microstructure of ternary binders of Portland cement, calcium aluminate cement and calcium sulphate**
E. Qoku, Freiberg/DE
- 14:20 **New insights into the influence of alkalis on the reaction kinetics of triclinic C_3S**
D. Wagner, Erlangen/DE
- 14:40 **Reactive magnesia binder for construction applications**
A. German, Dübendorf/CH
- 15:00 **Identification of an amorphous magnesium silicate (AMS) phase in alkali activated materials (AAMs)**
H. Sreenivasan, Oulu/FI
- 15:20 COFFEE BREAK

Audimax

Sustainable construction materials

Chair: F. Winnefeld

- 15:50 **Poultry feather waste as bio-based cross-linking additive for EPDM rubber**
O. Weichold, Aachen/DE
- 16:10 **Silicic acid ester as impregnation of carbon yarn for mineral textile reinforced concrete systems**
M. Lenting, Münster/DE
- 16:30 **Waste straw and its composite as building insulation material**
A. Koh, Eindhoven/NL
- 16:50 **Development and Field Testing of an Energy Harvesting Floor Based on Piezoelectric Ceramics**
C. Schiefer, Garching/DE
- 18:00 **ZKM Special Exhibition:**
John Sanborn – Between Order and Entropy
- 19:30 **CONFERENCE DINNER**

Tuesday, September 27, 2022

Chemistry Building 30.41 Lecture Hall 4

Admixtures and additives

Chair: D. Stephan

- 13:40 **Increased reaction rate of alite by addition of CAH_{10}**
F. Becker, Erlangen/DE
- 14:00 **Controlled ettringite precipitation in OPC systems for tailored rheological and microstructural development**
C. Jakob, Erlangen/DE
- 14:20 **Phase development during early hydration of OPC with increased sulfate content and organic additives**
I. Kirchberger, Erlangen/DE
- 14:40 **Acceleration of ettringite binders based on ye'elimite and anhydrite by Li_2CO_3 and poly(vinyl)alcohol (PVA / PVOH)**
D. Jansen, Erlangen/DE
- 15:00 **Nano-sized Mechanochemical Syngenite as an Alternative Activator for Different Anhydrites**
C. Schiefer, Garching/DE
- 15:20 COFFEE BREAK

Chemistry Building 30.41 Lecture Hall 4

Admixtures and additives

Chair: D. Stephan

- 15:50 **Chain-coupled Cellulose Ethers as Water Retention Additives in Construction Materials**
J. Neubauer, Walsrode/DE
- 16:10 **Interaction of low molecular weight organics with hydrated cement phases**
R. E. Guidone, Karlsruhe/DE
- 16:30 **Kinetics and hardness evolution of CAC hydration upon polyvinyl alcohol addition**
P. Rost, Erlangen/DE
- 16:50 **Synergistic interaction between PVA and Magnesium phosphate cement**
A. Viani, Prague/CZ
- 18:00 **ZKM Special Exhibition:**
John Sanborn – Between Order and Entropy
- 19:30 **CONFERENCE DINNER**

Wednesday, September 28, 2022

Audimax

Invited Speaker Session

*Chair: A. Gerdes*8:45 **Particulate filled polymer coating for longevity of infrastructure**A. Manalo, Toowoomba/AU9:15 **In-situ calcite precipitation for CO₂ consumption in cement-based composites**J. Moon, Seoul/KR9:45 **Understanding the role of admixtures on the structural build-up of fresh cement pastes**S. Kawashima, New York/US10:15 **AWARD CEREMONY HANS-KUEHL MEDAILLE & YOUNG RESEARCHERS**

10:45 POSTER SESSION AND COFFEE BREAK

Audimax

Admixtures and additives

*Chair: J. Plank*11:20 **Hydration reactions of C₃A polymorphs synthesized via a new "large-scale" lab protocol**D. D. Axthammer, Garching/DE11:40 **Influence of the Ca/Si ratio on the formation of hydroxyl-ellestadite and anhydrite II in the system CaO-SiO₂-SO₃-H₂O during autoclaving**T. Hirsch, Berlin/DE12:00 **Mechanochemical activation of basic oxygen furnace slag**J. Zepper, Eindhoven/NL12:20 **Cool coatings - application of core-shell latex particles in functional coatings**A. van Herk, Eindhoven/NL

12:40 LUNCH BREAK

Wednesday, September 28, 2022

10:45 POSTER SESSION AND COFFEE BREAK

Chemistry Building 30.41 Lecture Hall 4

Performance and durability

*Chair: F. Winnefeld*11:20 **Aluminium, alkali and iron binding by C-S-H**B. Lothenbach, Dübendorf/CH11:40 **Hydration and crystallization of Portland cement at 100 °C**M. Voigt, Berlin/DE12:00 **Accelerated carbonation of slag-rich blends under different relative humidity conditions**S. Rahmon, Leeds/GB12:20 **Comparison of short-term length change measurements and sorption isotherms for various cementitious materials**M. Wahab, Freiberg/DE

12:40 LUNCH BREAK

Wednesday, September 28, 2022

Audimax

Digitalization in construction chemistry

Chair: D. Stephan

- 13:40 **Comparison of superplasticizers for 3D printing**
R. Santos Alferes Filho, Eindhoven/NL
- 14:00 **Design of a reduced-CO₂ mixture for 3D printing purposes using recycled glass powder**
N. van Hierden, Eindhoven/NL
- 14:20 **Development of a cement additive based on two- and three-layer silicates for 3D printing of Portland cement**
P. Brumm, Freiberg/DE
- 14:40 **Development of 3D Printable Concrete from sustainable secondary raw materials: The first industrial case from Finland**
G. Das, Turku/FI
- 15:00 N.N.
- 15:20 COFFEE BREAK

Audimax

Polymers in Civil engineering

Chair: F. Dehn

- 15:50 **Interaction between biopolymers and cement-based materials**
A. Ghahremaninezhad, Miami/US
- 16:10 **Development of Biopolymer-based Compounds containing Cellulose from Wastepaper as Construction Material**
F. Weitenhagen, Aachen/DE

Audimax

- 16:30 **POSTER AWARD**
Chair: A. Gerdes
- 17:10 **Closure**

Wednesday, September 28, 2022

Chemistry Building 30.41 Lecture Hall 4

Performance and durability

Chair: R. Zurbriggen

- 13:40 **Using a combined CT scan / Scanning Electron Microscope (SEM/EDX) protocol to appraise and better understand alkali-silica reaction (ASR) induced expansion and deterioration in concrete**
L. Sanchez, Ottawa/CA
- 14:00 **Investigations of Alkali-Silica Reaction Products using Raman spectroscopy**
D. Hoehnel, Berlin/DE
- 14:20 **Internal sulfate attack on concrete – a case study from homes in Inishowen, Northwest Donegal, Ireland**
A. Leemann, Dübendorf/CH
- 14:40 **The Durability of Celitement-based Concretes**
A. Zimmermann, Karlsruhe/DE
- 15:00 **Celitement – Characterization of the C-S-H Binder**
D. Hinder, Karlsruhe/DE
- 15:20 COFFEE BREAK

Chemistry Building 30.41 Lecture Hall 4

Performance and durability

Chair: A. Gerdes

- 15:50 **Carbonation of hydrated cement paste: The influence of different carbonation treatments on phase formation and reactivity**
I. Teune, Eindhoven/NL
- 16:10 **Durability evaluation of calcined clay additive in concrete pipe under corrosive environment in semi-arid region of Morocco**
A. Ejbouh, Kenitra/MA

Audimax

- 16:30 **POSTER AWARD**
Chair: A. Gerdes
- 17:10 **Closure**

LIST OF POSTERS

Admixtures and additives

- Pa001 **Kinetics and hardness evolution of CAC hydration upon polyvinyl alcohol addition**
P. Rost, Erlangen/DE, F. Götz-Neunhoeffler, Erlangen/DE, J. Goergens, Erlangen/DE
- Pa002 **Application of Acrylic latexes for Magnesium phosphate cement**
L. Zárbybnická, Prague/CZ, J. Machotová, Pardubice/CZ, P. Mácová, Prague/CZ, A. Viani, Prague/CZ
- Pa003 **The effect of innovative synthetic acrylic latexes on concrete properties**
L. Zárbybnická, Prague/CZ, R. Ševčík, Prague/CZ, J. Pokorný, České Budějovice/CZ, J. Machotová, Pardubice/CZ, J. Šál, České Budějovice/CZ, A. Viani, Prague/CZ
- Pa004 **Cement Paste Rheology of Phosphate Containing Comb Copolymer Dispersants**
O. Rindle, Garching/DE, T. Gädt, München/DE

Polymers in civil engineering

- Pb001 **A new alkali-activated geopolymer for sewer lining**
P. Ariyadasa, Toowoomba, Queensland/AU, A. Manalo, Toowoomba, Queensland/AU, V. Aravinthan, Toowoomba, Queensland/AU, W. Lokuge, Toowoomba, Queensland/AU, A. Gerdes, Karlsruhe/DE

Sustainable construction materials

- Pc001 **Identification of an amorphous magnesium silicate (AMS) phase in alkali activated materials (AAMs)**
H. Sreenivasan, Oulu/FI, E. Adesanya, Oulu/FI, H. Niu, Oulu/FI, P. Perumal, Oulu/FI, W. Cao, Oulu/FI, J. L. Provis, Sheffield/GB, M. Illikainen, Oulu/FI, P. Kinnunen, Oulu/FI
- Pc002 **The analysis of hydration reaction of Portland limestone cement using thermodynamic modelling**
J. Lee, Seoul/KR, J. Moon, Seoul/KR
- Pc003 **Effect of particle size reduction on crystallographic properties of clinkers**
H. Kang, Seoul/KR, J. Moon, Seoul/KR

LIST OF POSTERS

- Pc004 **Calcium chelating agent on setting and strength development of fly ash-based cementless binder**
D. Jeon, Seoul/KR, Y. Woo Sung, Ulsan/KR, S. Haemin, Ulsan/KR, S. Sungwon, Ulsan/KR, O. Jae Eun, Ulsan/KR
- Pc005 **Understanding the role of Zn in calcium-aluminosilicate glasses resembling blast furnace slags**
S. Mingione, Dübendorf/CH, M. T. Pedersen, Dübendorf/CH, F. Winnefeld, Dübendorf/CH, F. Montagnaro, Naples/IT, B. Lothenbach, Dübendorf/CH
- Pc006 **Synthesis of metakaolin-like aluminosilicates via sol-gel process and Pechini method**
A. Tatal, Weimar/DE, S. Partschefeld, Weimar/DE, A. Osburg, Weimar/DE
- Pc007 **The Analysis of C-(A)-S-H by X-ray diffraction**
K. Mesecke, Greifswald/DE, L. N. Warr, Greifswald/DE, W. Malorny, Wismar/DE

Digitalization in construction chemistry

- Pd001 **Evaluating the ion diffusivity of cement-based materials using X-ray computed tomography-based random walk simulation**
J. Pae, Seoul/KR, J. Rim, Seoul/KR, J. Moon, Seoul/KR
- Pd002 **Development of a Digital Twin to Predict Degradation of Cementitious Materials**
A. Mahmood, Karlsruhe/DE, P. Thissen, Karlsruhe/DE, C. Neuhaus, Karlsruhe/DE, M. Vogel, Karlsruhe/DE, V. Kvitsel, Karlsruhe/DE, F. Dehn, Karlsruhe/DE

Performance and durability

- Pe001 **A contribution towards the understanding of the swelling mechanism of concrete affected by the "so-called alkali-carbonate reaction (ACR)"**
C. Trottier, Ottawa/CN, L. F. M. Sanchez, Ottawa/CA, A. Leemann, Dübendorf/CH

Monday, September 26, 2022

19:00

Get-together

Südwerk
Bürgerzentrum Südstadt
Henriette-Obermüller-Straße 10
76137 Karlsruhe
Germany



Included in registration fee
(booking required upon registration)

Tuesday, September 27, 2022

19:30

Conference Dinner

ZKM
Zentrum für Kunst und Medien
Lorenzstraße 19
76135 Karlsruhe, Germany



Included in registration fee
(booking required upon registration)

Thursday, September 29, 2022

Welcome to the fan-shaped city Karlsruhe – culture and city experience with a mediterranean flair.

See www.karlsruhe-erleben.de/en for sights, recreation, excursions and more.

You may also join a Baden-Baden city tour
www.baden-baden.com/en/city-tours.

Booking required upon registration onsite.

Karlsruhe Institute of Technologie (KIT), Karlsruhe**CONFERENCE (Campus South)****Audimax**

Straße am Forum 1, and
Chemistry Building 30.41, Lecture Hall 4
Campus South
Fritz-Haber-Weg 2–6
76131 Karlsruhe, Germany
www.kit.edu/campusplan

General Assembly

Campus South
Chemistry Building 30.41, Lecture Hall 4
Fritz-Haber-Weg 2–6
76131 Karlsruhe, Germany

WORKSHOPS**Workshop 1**

BIM
Hochschule Karlsruhe
University of Applied Sciences
Moltkestraße 30
76133 Karlsruhe, Germany
Building B, Room B418
www.h-ka.de

Workshop 2

Transformation in the Construction Sector
KIT Campus North
Building 330, Room 156a
Hermann-von-Helmholtz-Platz 1
76344 Eggenstein-Leopoldshafen, Germany

Workshop 3

Innovation
KIT Campus South
Chemistry Building 30.41, Lecture Hall 4
Fritz-Haber-Weg 2–6
76131 Karlsruhe, Germany

* These positions include 19% VAT.

GENERAL INFORMATION

REGISTRATION

Please register online no later than **August 15, 2022**.

www.gdch.de/ICCCM2022

GESELLSCHAFT DEUTSCHER CHEMIKER e.V.

Event Team/ICCCM 2022

P.O.Box 90 04 40

D-60444 Frankfurt am Main

Phone: +49 69 7917-366

E-Mail: tg@gdch.de

Internet: www.gdch.de

All tickets and congress papers will be handed to the participants upon check-in at the registration desk.

The book of abstracts will only be available as a digital version. Participants are requested to wear their congress badges at all times for identification and admittance to the conference rooms.

Upon online registration, payment by credit card or direct debit (only with German bank account) or bank transfer is possible. The invoice will be sent to you automatically.

GESELLSCHAFT DEUTSCHER CHEMIKER e. V.

Deutsche Bank AG, Frankfurt am Main

IBAN DE36 5007 0010 0096 6416 01

BIC DEUTDEFFXXX

Code 5201 37/ICCCM 2022

INFORMATION FOR AUTHORS

Lectures

For your presentation we provide a PC (windows) and a data beamer.

Poster

Last-Minute-Posters can still be submitted online until **August 10th, 2022**

www.gdch.de/ICCCM2022

The poster session will take place in the foyer of the Audimax, Straße am Forum 1.

The best posters will be awarded by Deutsche Bauchemie e.V..

Poster format: Portrait A0 (height: 118.9 cm, width: 84.1 cm)

GENERAL INFORMATION

REGISTRATION FEES^{*)}

GDCh-member and member of EuChemS-member societies	€ 300,-
Member, unemployed or retired	€ 150,-
Non-member	€ 350,-
Student ** (GDCh-member and member of EuChemS-member societies)	€ 60,-
Student** Non-member	€ 70,-
Gold member (with over 50 years of GDCh membership)	free of charge
Accompanying person	€ 80,-

*) The registration fees are not liable to value added tax (tax exemption additional § 4 Nr. 22a UStG.)

***) valid Student required

CANCELLATION

Written cancellations received on or before **August 15, 2022** will be refunded less a 25,- Euro administration fee. After that date the full amount of the invoice has to be paid. Requests for refund will not be accepted; however, registration may be transferred to another member of your organisation. In this case, please send a note to GDCh, Event Team.

If the meeting is cancelled for whatever reason, fees paid will be refunded. Further recourse is excluded.

BEVERAGES

Coffee, tea and soft drinks will be provided for free during the breaks.

LUNCH

Lunch will be served in the Mensa. Price per person per day € 10,- (booking required).

▶ TRAVEL

By car

Motorway A5 exit Karlsruhe-Durlach, continue towards Karlsruhe. Follow the four-lane road (Durlacher Allee), then turn to the right (Adenauerring). After a short distance you reach the main entrance on the left

www.kit.edu/kit/english/campus_south_car.php

By planeAirport Stuttgart

Take S2, S3 or U6 to Stuttgart main station, then change to a train to Karlsruhe main station.

Airport Frankfurt

The long-distance train station is in close proximity of the airport. Airport Karlsruhe/Baden-Baden (Baden-Airpark)

The buses available at Karlsruhe/Baden-Baden Airport will take you to the train stations of Rastatt or Baden-Baden.

The Baden-Airpark-Express line will take you to Karlsruhe main station.

By train

From Karlsruhe main station take Tram 2 direction Wolfartsweier, S7 or S8 direction Tullastraße or S4 direction Heilbronn/Öhringen. Deutsche Bahn (DB): <http://reiseauskunft.bahn.de/bin/query.exe/en>

“Deutsche Bahn” offers attractive conditions for travelling to GDCh events. Further information can be found on the following link www.gdch.de/bahn

By Public transportation

The campus south is located in the city center of Karlsruhe and can easily be reached by public transport.

The exact times of departure are available on the website of the Karlsruher Verkehrsverbund (stop “Durlacher Tor/KIT-Campus Süd”).

www.kvv.de/en

▶ ACCOMMODATION

Rooms are reserved in various hotels throughout the city. Reservations can be made using the following link

www.karlsruhe-tourismus.de/ICCCM-2022

or contact:

Tourist-Information Karlsruhe

Kaiserstraße 72 - 74

76133 Karlsruhe

Phone +49 721 602 997 580

touristinfo@karlsruhe-tourismus.de

www.karlsruhe-tourismus.de

The customers will be held accountable for non-occupancy of reserved rooms.

▶ INFORMATION BEFORE AND AFTER THE CONFERENCE

GESELLSCHAFT DEUTSCHER CHEMIKER e.V.

Claudia Birkner - Event Team

P. O. Box 90 04 40

60444 Frankfurt am Main

Varrentrappstr. 40-42

60486 Frankfurt am Main

Telefon: +49 69 7917-366

E-Mail: tg@gdch.de

Internet: www.gdch.de

INFORMATION AND REGISTRATION

▶ DURING THE CONFERENCE

The conference office will be located in the foyer of the Audimax. Straße am Forum 1

Opening hours:

Tuesday, September 27, 2022 8:00 – 17:00

Wednesday, September 28, 2022 8:00 – 17:00

Phone: +49 69 7917-366

Fax: +49 69 7917-1366

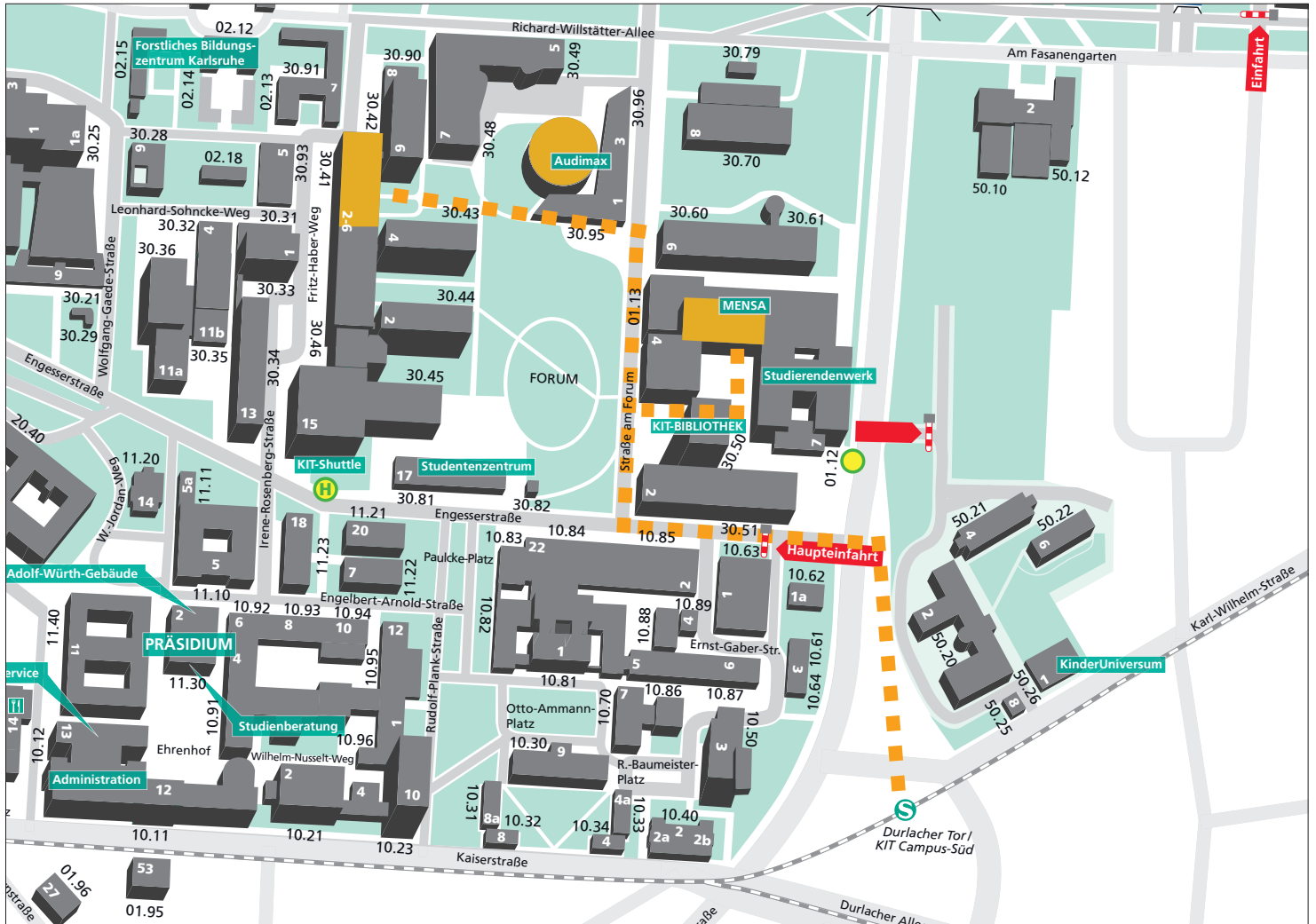
▶ DEADLINES

August 15, 2022

Personal registration

August 15, 2022

Cancellation of participation



Map data © OpenStreetMap contributors, CC-BY-SA

SPONSORS



C3 PROZESS- UND
ANALYSETECHNIK

