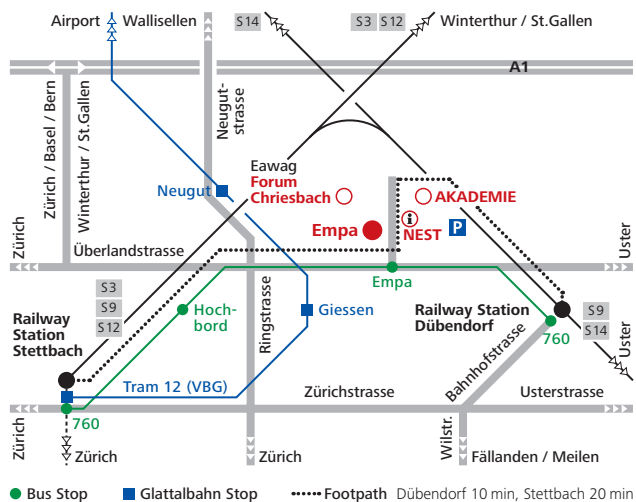


## EMPA – MATERIALS AND TECHNOLOGIES FOR A SUSTAINABLE FUTURE

As an interdisciplinary research institute of the ETH Domain, Empa, the Swiss Federal Laboratories for Materials Science and Technology, conducts cutting-edge materials and technology research. Empa's R&D activities focus on meeting the requirements of industry and the needs of society, and thus link applications-oriented research with the practical implementation of new ideas. As a result, Empa is capable of providing its partners with customized services and solutions that not only enhance their innovative edge and competitiveness, but also help to improve the quality of life for the public at large.

### DIRECTIONS



### GENERAL INFORMATION

Organization Empa – Nanocem  
Location Empa, Dübendorf  
Überlandstrasse 129  
AKADEMIE  
Costs CHF 350.– (for two days incl. dinner)  
CHF 250.– (speakers and PhD students)

Registration [www.empa-akademie.ch/cash](http://www.empa-akademie.ch/cash)

Registration deadline March 30, 2018

Abstract submission December 22, 2017

Cancellation For cancellations after March 30, 2018, 50% of the fee will be charged. In case of non appearance we will charge the full fee. A replacement will be accepted anytime.

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How to get here Please do use public transport. There is only very limited parking available.

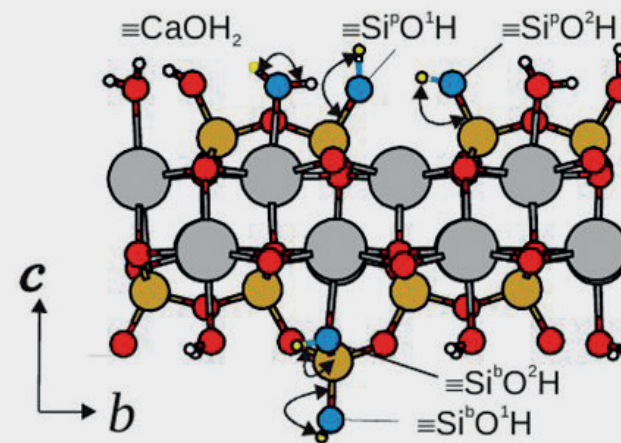
[www.empa.ch](http://www.empa.ch)

nanocem

Empa  
Akademie

### 2<sup>nd</sup> WORKSHOP

## Calcium-Silicate Hydrates Containing Aluminium: C-A-S-H II



Empa, Dübendorf, Switzerland  
April 23 – 24, 2018

Online registration:  
[www.empa-akademie.ch/cash](http://www.empa-akademie.ch/cash)

## SCOPE AND BACKGROUND

The production of cement is responsible for 5–8% of global man-made CO<sub>2</sub>. The replacement of Portland cement by supplementary cementitious materials (SCM) offers the highest potential to reduce these CO<sub>2</sub> emissions. The industrial application of SCMs based materials is hindered by the fact that novel, low-CO<sub>2</sub> cementitious materials have different chemical composition and will form other hydrates than Portland cements, where Ca-rich calcium silicate hydrates (C-S-H) are precipitated. In the presence of silica rich SCMs, such as silica fume, fly ash or blast furnace slag, (C-S-H) with a low Ca/Si ratio is the most important hydrate that forms.

In this workshop, co-organised by Empa and Nanocem, the results of different studies carried out during the last years on the properties of C-S-H will be discussed. The work presented includes the results of experimental investigations of the influence of varying Ca/Si ratios, the presence of aluminum, alkalis or anions on the solubility, structure, and composition of synthetic C(-A)-S-H gel and on paste samples. Other presentations will focus on thermodynamic modeling of C-S-H and on atomistic simulations of the structural information and surface properties.

## TARGET AUDIENCE

Academic and industrial researchers who are interested in the properties of calcium silicate hydrates. Experimentalists and thermodynamic and atomistic modellers.

## PRESENTATIONS AND POSTERS

- 1 page abstract until **December 22, 2017** for presentation or poster to [alessio.digiacom@empa.ch](mailto:alessio.digiacom@empa.ch)
- **January 31, 2018** notification of acceptance of presentations or posters.

## PROGRAM

### Monday, April 23, 2018

#### Topic: Experimental investigations

- Uptake of aluminium, alkali and other ions by C-S-H
- Influence of temperature
- Effect of synthesis methods
- [synthetic C-S-H](#) ⇔ C-S-H in Portland cements

#### Topic: Molecular and mesoscopic modelling

- Structure of C-S-H
- Molecular modelling of C-(A)-S-H + CH
- Al-uptake in C-S-H

### Tuesday, April 24, 2018

#### Topic: Geochemical modelling

- Structure of C-S-H
- Solid solution models for C-(A)-S-H
- Surface complexation models for C-(A)-S-H
- Ion uptake
- Heat capacity

#### Topic: Precipitation kinetic

- Oversaturation
- Foreign ions

## ORGANISING COMMITTEE

Barbara Lothenbach, Empa  
Christophe Labbez, Université de Bourgogne  
Dmitrii Kulik, PSI  
Jørgen Skibsted, Aarhus University  
Karen Scrivener, EPFL  
Paul Bowen, EPFL

## REGISTRATION INFORMATION

Participants may register until **March 30, 2018**.

For registration and further information please go to: [www.empa-akademie.ch/cash](http://www.empa-akademie.ch/cash)

After enrolment you will receive a confirmation by email including a pdf of your invoice.

## FEES AND PAYMENT

A fee of CHF 350.– is payable to cover lunch, refreshments and printed course materials.

For speakers and PhD students the fee is reduced to CHF 250.–. Payment should be made in advance upon receipt of invoice.

## CANCELLATION

For cancellations after **March 30, 2018**, 50% of the fee will be charged. In case of non appearance we will charge the full fee.

A replacement will be accepted.

## ACCOMMODATION

Overnight accommodation can be arranged at Hotel Sonnentel for the special Empa-rate of CHF 130.– or at Hotel Zwiback for CHF 120.– for a single room, including breakfast. Please arrange your room directly with Hotel Sonnentel or Hotel Zwiback:

<https://sorellhotels.com/en/sonnentel/duebendorf>

or [www.zwiback.ch](http://www.zwiback.ch)

Please only book your room through the mentioned links and mention that you participate at the “Empa CASH-Workshop”.

This offer is valid until **March 30, 2018**.

## LANGUAGE

The workshop will be in English.