

Patterns & Dynamics of Crystallization in Biology, Geology and Materials Science

Crystallization phenomena are fundamental in biology, geology and materials science and their elaborate control forms an important prerequisite for many industrial processes including the fabrication of construction materials, dental ceramics and many more. Recent advances in analytical methods have significantly broadened our understanding of classical and non-classical crystallization mechanisms leading to intricate patterns evolving due to physicochemical constraints and/or specific interactions with structure- and process-directing matrices.

This workshop is dedicated to state-of-the-art research addressing complex patterns in biological, geological and synthetic crystallization as well as the structural dynamics of their formation and transformation. The scope includes, but is not limited to, the characterization, modelling and manipulation of (bio)mineral structures as well as the translation of fundamental biological and geological concepts of crystal nucleation, growth and assembly into artificial precipitation systems.

Registration

Deadline for registration: March 3rd, 2023

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Participation is free of charge, but registration required

Organization

Anna Schenk is professor of Physical Chemistry IV at the University of Bayreuth and was a member of the Young Academy of the Bavarian Academy of Sciences and Humanities from 2019 to 2022.

BAVARIAN ACADEMY OF SCIENCES AND HUMANITIES

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BAdW

Patterns & Dynamics of Crystallization in Biology, Geology and Materials Science

WORKSHOP

6/3/23

Junges
Kolleg

BAYERISCHE
AKADEMIE
DER
WISSENSCHAFTEN

Programme

9.30 **Registration and Coffee**

9.50 **Welcome**
ANNA SCHENK
(University Bayreuth)

Patterns of biological crystallization

10.00 **Phase-field modeling of mineral morphogenesis in molluscan nacre**
LÁSZLÓ GRANASY
(Hungarian Academy of Sciences, HU)

10.30 **Non-classical fractal twinning in foraminiferal calcite related to fibrous crystal growth in gel media**
WOLFGANG W. SCHMAHL
(LMU Munich)

11.00 **Manipulating the growth and form of biogenic minerals**
IGOR ZLOTNIKOV
(B CUBE Dresden)

11.30 **Coffee break**

11.45 **Microalgae – Biomineralization fundamentals and mineral-organic interactions in a changing environment**
ANNE JANTSCHKE
(JGU Mainz)

12.15 **A new biomarker: mineral and biopolymer organization patterns in bacterial EPS-hydrogel calcite composites**
ERIKA GRIESSHABER
(LMU Munich)

12.45 **Poster flash talks**

13.15 **Lunch and posters**

Crystallization templated by biogenic matrices – *in vivo* and *in vitro*

14.30 **Bone mineralization revisited** (online presentation)
PETER FRATZL
(M.P.I. of Colloids and Interfaces)

15.00 **Taking advantage of native crystallinity in polysaccharide fibers and its understanding for the development of bioinspired materials**
ANAYANCY OSORIO
(University of Freiburg)

15.30 **Guiding crystallization with phages**
DIRK ROTHENSTEIN
(University of Stuttgart)

16.00 **Coffee break**

Crystallization concepts inspired from biology

16.30 **Bioinspired mineralization**
HELMUT CÖLFEN
(University of Konstanz)

17.00 **Mesocrystals: building up crystals from nanoparticles**
ELENA STURM
(LMU Munich)

17.30 **From solutes to solids with complex crystallography: clues for biomineralization**
STEPHAN WOLF
(FAU Erlangen-Nürnberg)

18.00 **Concluding remarks**
ANNA SCHENK

19.00 **Workshop dinner**