

「Towards highly crystalline polyimides by hydrothermal synthesis」

Miriam M. Unterlass (University of Konstanz · Germany)

Miriam studied chemistry, process engineering and materials science in Würzburg (Germany), Southampton (United Kingdom) and Lyon (France). Between 2009 and 2011 she pursued her PhD at the Max Planck Institute of Colloids and Interfaces, Potsdam-Golm (Germany). She then moved to the École Supérieure de Physique et de Chimie Industrielles (ESPCI) in Paris (France) as postdoctoral fellow in the group of Ludwik Leibler. In 2013 she joined the Technische Universität Wien (TU Wien) in Vienna (Austria), as independent research group leader. In September 2018 Miriam received her habilitation (*venia docendi*) in *materials chemistry*, and became tenured assistant professor in 2019. Committed to seeing her research being implemented, Miriam co-founded her first company, UGP materials, in 2017 and acts as CSO there. Since 2018, Miriam is also an Adjunct Principal Investigator at the Research Centre for Molecular Medicine of the Austrian Academy of Sciences (CeMM) in Vienna (Austria). In June 2021, Miriam joined the University of Konstanz (Germany) as full professor of solid state chemistry.



Miriam's research interests revolve around **compounds rich in aromatic and heterocyclic functions for either materials or biological applications, or both**. A particular focus in the Unterlass Lab are non-classical synthesis of advanced organic materials especially *via* and **hydrothermal synthesis** and **solid-state reactions** of preorganized precursor crystals. The materials the group works on range from small molecules,[1-3] linear high-performance polymers (HPPs),[4-7] covalent organic frameworks (COFs) and networks,[8] and inorganic-organic hybrids,[9] – all typically rich in aromatics and heterocyclics. We study these materials with a broad range of state-of-the-art solid-state characterization techniques. Aside developing and studying non-classical syntheses, the Unterlass Lab has a profound interest in crystallinity in organic solids, including crystal engineering, crystal growth, crystal structure analysis, and crystal morphology analysis.

Miriam is a passionate lecturer teaching several courses in solid-state chemistry, materials chemistry, and nanoscience, both at BSc and MSc level (see course overview). Miriam's teaching has been awarded with several prizes. She and the entire team strongly value public outreach, especially when it comes to explaining natural science to lay people and motivating children and adolescents for a scientific careers.

RESEARCHER PROFILES:

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RESEARCH KEYWORDS:

- **Synthetic method development** | hydrothermal synthesis, solid-state synthesis, geomimetics, cyclocondensations, aqueous processing of organic materials, microwave-assisted synthesis, high-throughput synthesis
- **Organic materials** | N-heterocycle-based materials, aromatic polymers, organic dyes, organic materials for energy applications, covalent-organic frameworks, anisotropic organic particles
- **Organic solid-state chemistry** | crystal engineering, co-crystals, organic salts, intermolecular interactions (H-bonding, π -stacking) in organic solids, crystalline polymers, liquid crystals, crystal growth, powder and single-crystal X-ray diffraction, crystal morphology
- **Hybrid materials & composites** | inorganic-organic hybrid materials, polymer-reinforced composites, green synthesis of hybrids
- **Chemical biology** | fluorescent dyes, cell labelling, biologically active small molecules

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