

MACROMOLECULAR COLLOQUIUM FREIBURG 26 – 28 FEBRUARY 2020

WEDNESDAY, 26 FEBRUARY 2020

Registration desk opens at 11 a.m.

14:00 Opening Remarks

PRASAD SHASTRI (University of Freiburg, Germany)
Meeting Chair
Director of the Institute for Macromolecular Chemistry, University of Freiburg

SESSION 1 Sponsored by LyondellBasell Polymerization Catalysis and Sustainability

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Advancing Possible

Chair: Michael Buchmeiser (University of Stuttgart, Germany)

14:15 LYONDELLBASELL LECTURE

GEOFFREY W. COATES (Cornell University New York, USA)
New Polymers from Old Monomers: Advances Enabled through Catalyst Design and Discovery

15:00 ERIK LICHT (LyondellBasell, Germany)

Polyolefin Success Story Enabled by Science and Innovation. Beginning – Way Up – Closing the Loop

15:20 STEFAN MECKING (University of Konstanz, Germany)

Toward Non-Persistent Polyethylene-Like Materials

15:40 CHRISTIAN FRIEDRICH (University of Freiburg, Germany)

Non-linear Viscoelasticity of Multimodal PE Blends and Flow Induced Crystallization

16:00 COFFEE BREAK

Chair: Erik Licht (LyondellBasell, Germany)

16:40 MICHAEL BUCHMEISER (University of Stuttgart, Germany)

Functional Precision Polymers

17:00 NICO BRUNS (University of Strathclyde Glasgow, United Kingdom)

Marrying Enzyme Engineering with Polymer Chemistry for Biocatalytic ATRP

17:20 ANDREAS GREINER (University of Bayreuth, Germany)

New Biobased Polycarbonates – Candidates for a Novel Class of Sustainable Engineering Plastics?

17:40 CHRISTIAN LAFORSCH (University of Bayreuth, Germany)

Microplastics in the Environment

18:00 THOMAS SPECK (University of Freiburg, Germany)

When Two Worlds Collide - Macromolecular Chemistry Meets Biology: the Development of Novel Bioinspired Materials Systems

18:30 GET TOGETHER (Foyer)

THURSDAY, 27 FEBRUARY 2020

SESSION 2
Soft Matter Science and Engineering

Chair: Holger Frey (Johannes Gutenberg University Mainz)

- 9:00 OLLI IKKALA (Aalto University, Finland)
Associative Learning with Soft Matter
- 9:40 CHRISTOPH WEDER (University of Fribourg, Switzerland)
Stimuli-responsive Supramolecular Polymers
- 10:00 ULRICH SCHUBERT (Friedrich Schiller University Jena, Germany)
Tailormade Polymers and Nanoparticles for Applications in Nanomedicine

10:20 INTRODUCTION OF POSTERS

Chair: Holger Frey (Johannes Gutenberg University Mainz)

- 1 M. HECHENBICHLER (University of Potsdam), M. Gradzielski, A. Laschewsky, A. Prause
Self-Assembly of Thermoresponsive Block Copolymers with Varying Chemical Structure and Architecture
- 2 A. HUPPERTSBERG (Max Planck Institute for Polymer Research Mainz), L. Kaps, N. Choteschovsky, D. Schuppan, L. Nuhn
Squarogels – pH-Degradable Nanogels Based on Squaric Ester Amide Precursor Block Copolymers
- 3 J. M. KOHN (Humboldt-Universität zu Berlin), S. Arias, H. G. Börner
Chasing Mussels and Getting Closer: About a Modular Strategy to Artificial Mussel-Glue Polymers and On-Demand Cohesion Control
- 4 U. LAPPAN (Leibniz Institute of Polymer Research Dresden), C. Rau, C. Naas, U. Scheler
Segmental Dynamics of Spin-Labeled Polyacid Chain Segments in Polyelectrolyte Multilayers Studied by Electron Paramagnetic Resonance (EPR) Spectroscopy
- 5 L. HUSSMANN (RWTH Aachen University), K. Kleemann, A. Pich
Stimuli-Responsive Degradable Poly(N-vinyl lactams) by Radical Ring Opening Polymerization
- 6 P. ACKER (University of Freiburg), L. Rzesny, C. Marchiori, M. Araujo, B. Esser
 π -Conjugated Redox Polymers as Electrode Materials for Organic Batteries
- 7 B. SPIEGELBERG (Leibniz Institute for Catalysis Rostock), B. Stadler, S. Hinze, S. Tin, J. G. de Vries
Polyesters as New Resource for the Production of Polyethers
- 8 H. A. CHRIST (TU Braunschweig), Y. Bourgat, K. Beier, S. Brose, A. M. Heidrich, F. Li, H. Menzel
Nanofiber Production from Photoreactive Biotinylated Chitosan with Integrated Photocrosslinking under Environmentally Controlled Conditions

- 9 J. MOLL (University of Hamburg), A.T. Neffe
Polydepsipeptides: Differences in Synthesis and Purification Properties of Morpholine-2,5-dione Monomers
- 10 L. WIEDENHOEFT (Friedrich-Schiller University Jena), M. M. A. H. El-Leithy, M. Ulbricht, F. H. Schacher
Poly(2-acrylamidoglycolic acid): a Polyelectrolyte with High Metal Chelation Capability
- 11 B. REIS (Leibniz Institute of Polymer Research Dresden), D. Vehlow, L. Wirth, B. Urban, D. Kuckling, A. Grab, E. A. Cavalcanti-Adam, K. S. Lips, M. Müller
Up- and Downloading Bone Healing Drugs at Thermoresponsive Polyelectrolyte Complex Coatings
- 12 S. CHOUDHURY (Chemnitz University of Technology), S. Zhu, M. Sommer
Hierarchical, 3D, Nitrogen-doped Porous Carbons via Phase Inversion for High Performance Supercapacitors
- 00 INDUSTRY PRESENTATION: POSTNOVA ANALYTICS GmbH
- 13 A. GRUBER (Freie Universität Berlin), D. Işık , A. A. Joshi, B. B. Fontanezi, Ch. Böttcher, M. Schäfer-Korting, S. Hedtrich, D. Klinger
A Versatile Synthetic Platform for Amphiphilic Nanogels with Tunable Hydrophobicity
- 14 M. MATHIEU (University of Potsdam), M. Schwieters, U. Glebe, A. Böker
Transmembrane Protein-Polymer Conjugates for the Generation of Nano-Thin Membranes
- 15 T. KAISER (Johannes Gutenberg University Mainz), T. Johann, H. Frey
Variation of the Degree of Branching of Hyperbranched Polyether Polyols by Copolymerization of Glycidol with Substituted Analogues
- 16 S. KIRCHHECKER (Leibniz Institute for Catalysis Rostock), B. Stadler, A. Brandt, A. Kux, H. Beck, J. G. de Vries
Unexpected Properties of Bio-based Polyester Polyols for Adhesives Applications
- 17 J. MERNA (University of Chemistry and Technology Prague), O. Kotyza, K. Nunvářová, R. Mundil, A. Sokolohorskyj, S. Hermanová
Strategies for Introducing Functionality to Chain-Walking Polyolefins
- 18 Z. WANG (TU Dresden), H. Qi, R. Dong, X. Feng
Control of Conformational Effect in Layered Two-Dimensional Conjugated Metal-Organic Frameworks
- 19 D. MOATSOU (Karlsruhe Institute of Technology), D. Barther
Sequence-Controlled Polymers via Ring-Opening Metathesis Polymerization
- 20 D. IŞIK (Freie Universität Berlin), A. A. Joshi, F. Rancan, A. Klossek, E. Rühl, S. Hedtrich, D. Klinger
Sulfoxide-Functionalized Nanogels to Mimic Skin Penetration Enhancing Properties of DMSO
- 21 T. HAUBOLD (Fraunhofer IFAM, University of Bremen), L. Puchot, A. Trejo-Machin, P. Verge, K. Koschek
Phosphorous-Based Flame Retardants as Building Block for Bio-Based Benzoxazine Monomers
- 22 P. WEIDMANN (University of Hamburg), R. Meyer, I. Smirnova, G. A. Luinstra
Synthesis of Lignin Containing Resorcinol Formaldehyde Aerogels with Tailored Pores Structure by Investigating Catalyst Type and Concentration

- 23 S. PARK (TU Dresden), Z. Liao, H. Qi, R. Dong, X. Feng
Surfactant-Assisted On-Water Synthesis of Layer-Stacked Boronate Ester Two-Dimensional Polymer Single Crystals
- 24 O. DOLYNCHUK (Martin Luther University Halle-Wittenberg), M. Tariq, T. Thurn-Albrecht
Substrate Induced Prefreezing in Polymer Crystallization: Theory and Quantitative Analysis of Experimental Results

11:35 COFFEE AND POSTERS (Sponsored by Wiley)



Chair: Günter Reiter (University of Freiburg)

- 12:30 HANS-WERNER SCHMIDT (University of Bayreuth, Germany)
Supramolecular Nanofibers: Current Capabilities and Future Perspectives

- 12:50 WALTER RICHTERING (RWTH Aachen, Germany)
Microgels: Macromolecules or Colloids?

13:15 LUNCH BREAK

Chair: Jörg Tiller (TU Dortmund University, Germany)

- 15:00 BELA IVAN (Eötvös Loránd University, Budapest, Hungary)
Polymer Conetworks as an Unique Nanostructured Material Platform with Disordered Bicontinuous, Mutually Nanoconfined Morphology: The Freiburg Connection

- 15:20 MICHAEL SOMMER (Chemnitz University of Technology, Germany)
Polymers Feel the Force: Tuning Mechanochromic Behaviour of Spiropyran-Functionalized Polymers by Steric and Electronic Effects

- 15:40 JÖRG KRESSLER (Martin Luther University Halle-Wittenberg, Germany)
Crystallization and Electronic Conductivity of Poly(sulphur nitride) - An Old Polymer with New Challenges

- 16:00 GÜNTER REITER (University of Freiburg, Germany)
Entropy in Stock in Non-equilibrated Polymer Melts: Translating Molecular Relaxations into Lifting Macroscopic Weights

16:20 COFFEE BREAK

Chair: Michael Sommer (Chemnitz University of Technology, Germany)

- 17:00 SABINE LUDWIGS (University of Stuttgart, Germany)
Bioinspired Multiresponsive Polymer Films

- 17:20 JAN-GEORG ROSENBOOM (Massachusetts Institute of Technology, USA)
Cyclic Polymers for a Circular Economy

- 17:40 JÖRG TILLER (TU Dortmund University, Germany)
Poly(2-oxazoline)s with Biofunctional End Groups as Polymeric Enzyme Inhibitors

- 18:00 RAINER HAAG (Freie Universität Berlin, Germany)
Synthesis and Biomedical Applications of Dendritic Polyanions
- 18:20 JÜRGEN RÜHE (University of Freiburg, Germany)
Tailor-made Surfaces for the Generation of Novel Bioinspired Metamaterials
- 18:40 End of the Session
- 19:30 **DINNER (Mensa Rempartstrasse) Doors open 19:15**
(Champagne Reception sponsored by Plastics Europe)



FRIDAY, 28 FEBRUARY 2020

Chair: Sabine Ludwigs (University of Stuttgart, Germany)

- 9:00 IAN KINLOCH (University of Manchester, United Kingdom)
Graphene- and Carbon Nanotube- Polymer Composites: From Fundamental Micromechanics to Bulk Properties
- 9:30 ANDREAS WALTHER (University of Freiburg, Germany)
Hierarchical Design of Mechanical Properties in Adaptive Bioinspired Nanocomposites
- 9:50 KAY SAALWÄCHTER (Martin Luther University Halle-Wittenberg, Germany)
New (Macro)molecular Facets of an Old Problem: What Controls the Morphology of Semicrystalline Polymers
- 10:10 HOLGER FREY (Johannes Gutenberg University Mainz, Germany)
Building Bridges by Blending: How to Transform AB Block-Copolymers into Tough Nanostructured Materials

10:30 INTRODUCTION OF POSTERS

Chair: Sabine Ludwigs (University of Stuttgart, Germany)

- 1 S. BRAUN (RWTH Aachen University), G. Dilarri, L. Novaes, H. Ferreira, F. Jakob, U. Schwaneberg, A. Pich
Protecting Plants with Supramolecular Crosslinked Microgels
- 2 T. LAUSTER (University of Bayreuth), M. Retsch
Chitosan/Silica Composite Material for Radiative Daytime Cooling: Broadband Optical Characterization
- 3 P. WALTHER (University of Stuttgart), F. Markus, A. Balint, S. Naumann
N-Heterocyclic Olefins and Their Application for Anionic and Zwitterionic Ring-Opening Polymerization of Epoxides
- 4 P. VERKOYEN (Johannes Gutenberg University Mainz), H. Frey
Controlled Polymerization of Long-Chain Alkyl Glycidyl Ethers and Ethylene Oxide: A Simple Approach to Block Copolymers with Precisely Tunable Amphiphilic Properties

- 5 K. WAIBEL (Karlsruhe Institute of Technology), M. A. R. Meier
Synthesis of Uniform Star-Shaped Polymers
- 6 M. LUKSIN (Hamm-Lippstadt University of Applied Science), P. Frank, U. Jonas, S. Fuchs
Novel Flame Retardant Concepts for Styrenic Polymers
- 7 N. HAUCK (Leibniz Institute of Polymer Research Dresden), Y. Xu, Y. Zhang, J. Thiele
Processing of Fast-Gelling Hydrogel Systems in Droplet Microfluidics by Picoinjection
- 8 M. LALLEMANG (University of Freiburg), J. Dengler, A. Kolberg, Th. Hugel, B. N. Balzer
Self-healing of Bioinspired Catechol-Based Monolayer Coatings Investigated by Atomic Force Microscopy
- 9 J. MARTIN (University of Potsdam), U. Glebe, X. Dai, A. Böker
Creating (multiple) Connections Between Natural and Synthetic Polymers: Sortase-Mediated Ligation to Form Protein-Polymer Conjugates
- 10 D. DAUBIAN (University of Basel), J. Gaitzsch, W. Meier
Efficient Synthesis and Complex Self-Assembly of the Amphiphilic PEO-b-PEHOx Polymers into Multicompartment Micelles, Pseudo-Vesicles and Yolk/Shell Nanoparticles
- 11 E. ESEN (Karlsruhe Institute of Technology), M. A. R. Meier
Modification of Starch via the Biginelli Multicomponent Reaction
- 12 H. STRITTMATTER (Fraunhofer IGB Straubing), P. Stockmann, C. Falcke, M. Iwanow, M. Wölbing, V. Siebe
(+)-3-Carene: A Versatile Precursor for High Performance Bio-Polyamides
- 00 INDUSTRY PRESENTATION: TOSOH BIOSCIENCE
- 13 A. SCHWEIGERDT (Freie Universität Berlin), D. Stöbener, M. Weinhart
Bulk vs. Surface Phase Transition of Thermoresponsive Hydrogels – Mechanistic Insights into Cell Adhesion and Cell Sheet Detachment
- 14 J. KREDEL (TU Darmstadt and Saarland University), M. Gallei
Synthesis of Fluorine-Containing Core-Shell Particles for the Preparation of Functional Opal and Inverse Opal Architectures
- 15 A. MARKOVINA (Johannes Gutenberg University Mainz), K. Johann, M. Barz
Molecular Polymer Brushes for Pretargeted Nuclear Imaging and Therapy: Labeling Polypept(o)ides by In Vivo Click Chemistry
- 16 C. M. GEISELHART (Karlsruhe Institute of Technology), H. Mutlu, Ch. Barner-Kowollik
Orthogonal Light-Induced Folding of Multicomponent Reaction Polymers
- 17 H. ALTMANN (University of Stuttgart), M. Clauss, S. König, E. Frick-Delattre, C. Koopmans, A. Wolf, Ch. Guertler, S. Naumann, M. R. Buchmeiser
Synthesis of Linear Poly(Oxazolidin-2-one)s by Cooperative Catalysis Based on N-Heterocyclic Carbenes and Simple Lewis Acids
- 18 A. HOFFMANN (University of Ulm), M. Usselman, A. J. C. Kuehne
Melt-Processable Polyacrylonitrile Carbon Precursors
- 19 M. MAENNEL (Leibniz Institute of Polymer Research Dresden), N. Weigel, J. Thiele
Higher-Order Emulsions Formation by Combining 3D-Printed Materials that Are Dissimilar in Their Wettability

- 20 J. N. BLEICH (Swiss Federal Institute of Technology Lausanne), M. M. Marcinek, H. A. Klok
Mechanochemical Activation at Interfaces Driven by Swelling of Polymer Brushes
- 21 J. WINDBIEL (Karlsruhe Institute of Technology), M. A. R. Meier
Synthesis and Copolymerization of Biginelli-Polycondensates
- 22 C. MALACRIDA (University of Stuttgart), D. Neusser, S. Ludwigs
Electroactive Polymers, Exploring Conductivity Behaviors and Doping Methods
- 23 P. B. V. SCHOLTEN (University of Fribourg), A. Manfrin, M. Lütolf, Ch. Weder, N. Bruns
Light-Responsive Polymersomes as a Delivery System for Organoids on a Chip

11:45 **COFFEE AND POSTERS (sponsored by Clariant)**



12:45 **LUNCH BREAK**

SESSION 3 SPONSORED BY BASF SE
3D Printing

Chair: Andreas Walther (University of Freiburg)



- 13:30 **BASF LECTURE**
HAYDEN TAYLOR (University of California, Berkeley, USA)
Computed Axial Lithography for Volumetric Additive Manufacturing with Photopolymers
- 14:15 KLAUS STOLL (BASF SE, Germany)
Forward AM, towards the Industrial Use of 3D Printing
- 14:35 BASTIAN RAPP (University of Freiburg, Germany)
3D Printing of High-Performance Materials
- 14:55 GABRIELE GOTTSCHALK-GAUDIG (3M, Germany)
Additive Manufacturing @ 3M
- 15:15 CARLOS CARVALHO (EnvisionTec, Germany)
Thermoplastic Materials in 3D Printing for Biomedical Applications
- 15:35 PRASAD SHASTRI (University of Freiburg, Germany)
3D Bioprinting
- 15:55 **POSTER AWARDS donated by WILEY**
- 16:10 **Closing Remarks**
ROLF MÜLHAUPT
Meeting Chair
Director of the Institute for Macromolecular Chemistry, University of Freiburg
- 16:20 End of the Colloquium