

MAKRO2024 Polymers for a Sustainable Future

Biennial Meeting of the Macromolecular Division of the GDCh

MONDAY, SEPTEMBER 16TH 2024

9:00 - 9:30 Registration
 9:30 - 9:40 Opening

LECTURE SESSION I

9:40 - 10:20 PL1 Katja Loos
 University of Groningen – NL
Unleashing the Potential of Enzymes for Green Furan-Based Polymer Synthesis

10:20 - 11:00 PL2 Heleen Goorissen
 Avantium – NL
Sustainable Industrialization of FDCA, the Building Block for PEF

11:00 - 11:30 **Coffee break**

Parallel Session A.1 *Polymer Electronics*

11:30 - 12:10 IL1 Sabine Ludwigs
 University of Stuttgart
Adaptive Mixed Conducting Polymer Films for Opto-electronic and Switchable Devices

12:10 - 12:30 OC1 David Magri
 University of Malta – MT
Polymeric Fluorescent Logic Gates

12:30 - 12:50 OC2 Ningwei Sun
 IPF Dresden
N-Heterocyclic Carbene as Robust and Conductive Linkages to Couple Gold Nanoparticles and Conductive Polymers

12:50 - 13:10 OC3 Albrecht Waentig
 TU Dresden
Sulfur and Polysulfide Confinement in Electron-Deficient Two-Dimensional Poly(arylene vinylene)s for High-Performance Lithium-Sulfur Batteries

Parallel Session A.2 *Sustainable Polymers*

11:30 - 12:10 IL2 Rupert Schnell
 Evonik, Hanau
Macromolecules Contribute to Sustainability

12:10 - 12:30 OC4 Alexander Böker
 IAP Potsdam
The Fusion of Biology and Materials Science - Promises for a More Sustainable World?

12:30 - 12:50 OC5 Guillaume Delaittre
 University of Wuppertal
Oleanolic Acid-Based Polymers

12:50 - 13:10 OC6 Lukas Zeininger
 MPI KG Potsdam
Shape-morphing of Droplets with Programmable Transience Using Interface Chemistry

13:10 - 13:45 **Lunch**
13:45 - 14:45 Poster Session 1 – odd numbers

Parallel Session B.1		<i>Plastic Waste</i>
14:45 - 15:15	IL3	Ina Vollmer University of Utrecht – NL <i>Chemical Valorization of Plastic Waste</i>
15:15 - 15:35	OC7	Gerhard Heinzmann Postnova Analytics GmbH, Landsberg am Lech <i>Hyphenation of Field-Flow Fractionation and Raman Microscopy for the Analysis of Submicroplastics</i>
15:35 - 15:55	OC8	Andreas F. Thünemann BAM Berlin <i>Nanoplastics Aqueous Dispersions as Polymer Reference Materials for a Sustainable Future</i>
15:55 - 16:15	OC9	Adrià Roig Ghent University – BE <i>Vanillin Polyimine Dynamic Networks: A Pathway to Recyclable, Reversible and Malleable Adhesives</i>

Parallel Session B.2		<i>Self-Assembled Structures</i>
14:45 - 15:15	IL4	Nico Burns TU Darmstadt <i>Synthesis of Artificial Cells and Engineering of the Surface of Living Cells by Biocatalytic Radical Polymerizations</i>
15:15 - 15:35	OC10	Susanne Boye IPF Dresden <i>Beyond Size – How AF4 with Multidetector can Contribute to a Better Understanding of Polymeric Vesicles</i>
15:35 - 15:55	OC11	Lutz Nuhn Julius-Maximilians-University Würzburg <i>PH-responsive Intracellular Self-assembly and Immunodrug Delivery by 2-Propionic-3-methylmaleic Anhydride-based Block Copolymers</i>
15:55 - 16:15	OC12	Felix Plamper TU Freiberg <i>Shifting Polymeric Micelles from/into Kinetically-Trapped Nonequilibrium States</i>
16:15 - 16:45		Coffee break
16:45 - 18:45		Welcome by TU Dresden vice-rector Prof. Angela Rösen-Wolff Award Session: Raimund Stadler Herrmann, Staudinger Prize and Schnell Grant
18:45 - 19:45		Get-together with Drinks and Snacks

TUESDAY, SEPTEMBER 17TH 2024

LECTURE SESSION II

9:00 - 9:40	PL3	Stefan Mecking University of Konstanz – DE <i>Chemically Recyclable and Degradable Polyethylene-Like Polyesters sourced from Natural Oils or Waste</i>
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9:40 - 10:20 PL4 Eckhard Wenz
Covestro Deutschland AG, Leverkusen – DE
Sustainability and Circularity of Technical Thermoplastic Polymers in Industrial Life Cycles

10:20 - 10:40 **Coffee break**

Parallel Session C.1 *Biobased Polymers*

10:40 - 11:10 IL5 Meike Nicole Leiske
University of Bayreuth
Amino-acid-derived Polymers

11:10 - 11:30 OC13 Sanjam Chandna
FU Berlin
Lignin-based Biomaterials for Biomedical and Agricultural Applications

11:30 - 11:50 OC14 Anika Kaufmann
IPF Dresden
High-resolution DLP 3D Printing with Lignin-based Resins

11:50 - 12:10 OC15 Tilmann J. Neubert
HU Berlin
Two-Trick Peptide: Improving Resource and Recycling Strategies of Redox-Debondable Mussel-Inspired Adhesive Polymers for the Circular Economy

12:10 - 12:30 OC16 Tobias Robert
Fraunhofer WKI Braunschweig
Itaconic Acid as Versatile Building Block for Bio-based Polymers

Parallel Session C.2 *Green Chemistry*

10:40 - 11:10 IL6 Michael Meier
KIT Karlsruhe
New Cellulose Chemistry from a Sustainability Perspective: Renewability is not Enough

11:10 - 11:30 OC17 Quinn Besford
IPF Dresden
The Sweetest Polymer Nanoparticles: The use of Glycogen as a Sustainable Biomaterial in Nanomedicine

11:30 - 11:50 OC18 Gerrit Schaper
PTS Heidenau
Functional Biopolymers from Wood Waste: A Novel Approach for Valorisation of Wood Shavings

11:50 - 12:10 OC19 Jens Gaitzsch
IPF Dresden
Fine-Tuning Responsive Properties of Polyesters from Radical Ring-opening Polymerisation (RROP)

12:10 - 12:30 OC20 Hendryk Würfel
Friedrich-Schiller-University Jena
Green Chemistry in Action: All-Polysaccharide-based Hydrogels as Starting Point for Sustainable Technologies

12:30 - 13:15 **Lunch**

13:15 - 14:15 Poster Session 2 – even numbers

Parallel Session D.1 *Controlled Synthesis*

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| 14:15 - 14:45 | IL7 | Athina Anastasaki
ETH Zürich – CH
<i>Photocatalytic ATRP and RAFT depolymerization; Temporal Regulation at low Catalyst Loadings</i> |
| 14:45 - 15:05 | OC21 | Andrea Belluati
TU Darmstadt
<i>Self-decorating cells via surface-initiated enzymatic controlled radical polymerization</i> |
| 15:05 - 15:25 | OC22 | Daniel Klinger
FU Berlin
<i>Turning the defense mechanism of resistant bacteria against themselves: Bacteria-responsive polymer-conjugates of ciprofloxacin</i> |
| 15:25 - 15:45 | OC23 | Kevin Neumann
Radboud University – NL
<i>Closer Together: Polymeric Ylides as a New Class of Zwitterionic Polymers</i> |
| 15:45 - 16:05 | OC24 | Justus Friedrich Thümmeler
Martin Luther University Halle-Wittenberg
<i>Internal Single-Chain Nanoparticle Compartments as Catalysts for Polyester Recycling</i> |

Parallel Session D.2 *Gels*

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| 14:15 - 14:45 | IL8 | Andrij Pich
RWTH Aachen
<i>Multifunctional Biobased Aqueous Microgels</i> |
| 14:45 - 15:05 | OC25 | Axel T. Neffe
Helmholtz-Zentrum Geesthacht, Teltow
<i>Design and Application of Functional Gelatin-based Hydrogels</i> |
| 15:05 - 15:25 | OC26 | Kay Saalwächter
Martin Luther University Halle-Wittenberg
<i>Structures and Diffusion in Amphiphilic PEG-PCL Model Conetwork Gels</i> |
| 15:25 - 15:45 | OC27 | Dirk Kuckling
University Paderborn
<i>Gel-bounded Organo-catalyst for Continuously Driven Microfluidic Reactors</i> |
| 15:45 - 16:05 | OC28 | Joanne Zimmer
TU Darmstadt
<i>PNIPAM microgel-stabilized aqueous Pickering foams</i> |
| 16:05 - 16:35 | | Coffee break |
| 16:40 - 17:40 | | MAKRO General Meeting |
| 19:30 - 23:30 | | Conference Dinner
Evening input on “Climate protection” by Sebastian Seiffert |

WEDNESDAY, SEPTEMBER 18TH 2024
LECTURE SESSION III

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| 9:00 - 9:40 | PL5 | Filip Du Prez
Ghent University – BE
<i>Recycling the Unrecyclable: A Story about Reprocessable Thermosets and Debondable Adhesives</i> |
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9:40 - 10:20 PL6 Bernhard von Vacano
BASF SE, Ludwigshafen – DE
Make, Use, Recycle: The journey towards circular, sustainable polymers

10:20 - 10:40 **Coffee break**

Parallel Session E.1 *Polymers and Sustainability*

10:40 - 11:10 IL9 Sonja Herres-Pawlis
RWTH Aachen
Sustainable Polymerisation Catalysis with FAIR data

11:10 - 11:30 OC13 Linus Stegbauer
University Stuttgart
Photomodulation of the Mechanical Properties of Chitosan-based Thin Films Modified with an Azobenzene-Derivative

11:30 - 11:50 OC14 Sebastian Seiffert
Johannes Gutenberg-University Mainz
Energy-Autonomous Seawater Desalination by Thermo-Responsive Microgels

11:50 - 12:10 OC15 Robin Tannert
Zittau/Görlitz University of Applied Sciences
Effect of Monomer Purity On Vitriimer Processing Behavior

12:10 - 12:30 OC16 Andre Laschewsky
University Potsdam
Thermo-responsive Polymeric Amphiphiles as "Smart" Rheology Modifiers for Aqueous Solution and Microemulsions

Parallel Session E.2 *Polymers and Sustainability*

10:40 - 11:10 IL10 Katharina Landfester
MPI Polymerforschung Mainz
Cascade reactions in polymeric synthetic cells

11:10 - 11:30 OC17 Anja Marinow
Martin Luther University Halle-Wittenberg
Self-healing, Re-processable, Vitriimeric Poly(ionic liquid) Electrolytes

11:30 - 11:50 OC18 Felix Schacher
Friedrich-Schiller-University Jena
Light-responsive polymers – from polyphotoacids and -bases to photoswitches for optically tunable metasurfaces

11:50 - 12:10 OC19 André Gröschel
University of Bayreuth
Functional Polymer Cubosomes

12:10 - 12:30 OC20 Patrick Théato
KIT Karlsruhe
Post-Polymerization Modifications: Efficient Synthetic Tools in 2024?

12:30 - 12:45 Poster Prizes and Farewell

12:45 - 13:15 **Fare-well Snack**