

Dear Friends,

Polymer Chemistry (Royal Society of Chemistry), in the Year 2021 has named three Indian Polymer Chemists, viz., Prof. Priyadarsi De (IISER, Kolkata), Prof. Suhrit Ghosh (IACS, Kolkata), and Prof. Manikam Jayakannan (IISER, Pune), as “PIONEERING INVESTIGATORS 2021” in their recent issue of the journal (copy attached) (DOI: 10.1039/d1py90028e).

This is very commendable. They join Dr Bhoje Gowd and Dr Raja Shanmugam who were also so named similarly in the year 2019! (“Pioneering Investigators 2019” by Polymer Chemistry, 2019, 10, 2896-3905 (Royal Society for Chemistry) (<https://doi.org/10.1039/C9PY90078K>)).

All the three Indian Polymer Chemists named this year are product of the Indian Institute of Science (IISc), Bangalore.

Coincidentally, Prof. Priyadarsi De (IISER, Kolkata), Prof. Suhrit Ghosh (IACS, Kolkata), and Prof. Manikam Jayakannan (IISER, Pune) are recipients of Prof. K. Kishore Memorial Award instituted by the Society for Polymer Science, India, in different years! (Please see: <http://www.spsi.co.in/files/kawards.php>.)

This is both important, commendable and worth sharing.

Very happy to share this information and

Very Happy to be part of the Society for Polymer Science, India.

Best wishes and regards,

C.V. Avadhani (with inputs from Dr. S. Sivaram)



Pioneering investigators 2021

Cite this: DOI: 10.1039/d1py90028e Holger Frey ^a and Emily Pentzer ^b

DOI: 10.1039/d1py90028e

rsc.li/polymers

This collection gathers the very best work from mid-career researchers who have firmly established themselves in the field of polymer chemistry and continuously publish creative, innovative work. The 2021 *Polymer Chemistry* pioneering investigators were individually nominated by members of the journal Editorial and Advisory Boards, and previous pioneering investigators, in recognition of their achievements as pioneers of the field. The diversity of the research topics highlighted by these contributions illustrates the broad impact of polymer chemistry across science and engineering.

We were overwhelmed by the positive response we received to our invitation to contribute to this collection. We received almost 90% immediate acceptance of our invitation to publish in this volume, despite the Covid-19 pandemic leading to the shut down of laboratories and limited access to some resources.

During their mid-career, many researchers choose to redefine the long-term objectives of their research programs, to establish challenging and high-risk topics as well as more extensive research programs covering a whole sub-field of importance. When the pressure and insecurity of the first career stage has waned, one has more freedom to define research directions and get immersed in new ventures. In this respect, this collection can also be understood as a kind of

“seismograph” for current topics and emerging future trends.

This is particularly interesting because in the last decade numerous new challenges have come into focus in the polymer sciences, which are increasingly shaping our field, as are also reflected in this collection. Undoubtedly, increasing awareness of limited fossil resources and the plastic waste issue play an increasing role for polymer scientists.

The large number of excellent articles compiled in this collection shine light on the vast field of polymer science and span from catalytic polymer synthesis to controlled radical polymerization to optoelectronic materials and so on. Here, we highlight a handful of topics in this collection that represent current and future directions:

- *Bio-based monomers and components.* Starting compounds based on biorenewable sources are of increasing significance. This is expressed by the minireviews of Li and Tao on biorenewable cyclic lysine (DOI: 10.1039/D0PY01387K), as well as Della Monica and Kleij on terpene monomers (DOI: 10.1039/D0PY00817F). As this field evolves, the connection between bio-based and “sustainable” materials must be delineated.

- *Gradient and sequence-defined polymers.* Techniques that enable the study and increasing precision control of copolymers can be exploited to generate perfectly sequence-defined structures. This is reflected in the work by Zhu *et al.* with palindromic sequence-defined polymers (DOI: 10.1039/D0PY01088J), and

Colombani *et al.*'s study on copolymer composition profiles and their ionization to weak polyelectrolytes (DOI: 10.1039/D0PY01059F). In addition, perfectly monodisperse block copolymers are studied by Petkau-Milroy, Palmans *et al.* with respect to their self-assembly in water (DOI: 10.1039/D0PY01161D).

- *“Smart”, responsive polymers.* Responsive polymers continue to play an important role in controlling materials properties. In this context Klinger *et al.* describe thermo- and oxidation-sensitive polymethacrylates based on sulfoxide groups (DOI: 10.1039/D0PY01321H).

- *Polymer-based nanoparticles.* Self-assembly of polymers into “unusual” structures are the focus of several articles. D'Agosto, Lansalot *et al.* report on a surfactant-free emulsion polymerization (DOI: 10.1039/D0PY01266A). 2D-lenticular aggregates are prepared by solution self-assembly of PNIPAM-based amphiphilic block copolymers, as presented by Semsarilar and coworkers (DOI: 10.1039/D0PY01193B). Quintieri and Gröschel take a look at “naked micelles” as well-defined polymer nanoparticles (DOI: 10.1039/D0PY01408G). Further, anisotropic polymer nanoplatelets and the effect of chain defects on such structures are studied by Wurm and coworkers (DOI: 10.1039/D0PY01352H), and Paulusse and coworkers propose reactive single-chain polymer nanoparticles as a versatile platform towards protein mimicry (DOI: 10.1039/D0PY00922A). Conjugated polymer-based nano-objects are reviewed by Choi *et al.* (DOI: 10.1039/D0PY01389G).

^aJohannes Gutenberg University Mainz, Germany.

E-mail: hfrey@uni-mainz.de

^bTexas A&M University, College Station, USA.

E-mail: emilypentzer@tamu.edu

- *Covalent bond exchange, adaptable networks and self-healing*. Smulders and coauthors turn to molecular exchange dynamics in polyimine networks (DOI: 10.1039/D0PY01555E), and Shipp *et al.* demonstrate dynamic covalent exchange of anhydride moieties in poly(thioether anhydrides) (DOI: 10.1039/D0PY01267J).

- *Polymer-systems for medical purposes*. Polymers play an increasingly important role in the interface between synthetic and natural materials. Nguyen and Lai review the use of stimuli-responsive polymers for ocular disease treatment (DOI: 10.1039/D0PY00919A), and Tian and coauthors report the use of hyperbranched polymers for synergistic cancer chemotherapy (DOI: 10.1039/D0PY00862A).

We hope our readers appreciate the excellent contributions from mid-career researchers from across the world that are compiled in this collection. The inspiration from reading these articles may not only come from the results reported, but also from the researchers' perseverance and dedication to moving the field of polymer chemistry forward during a period of great uncertainty. We hope you enjoy reading the many excellent contributions in this collection!

Reviews:

- Poly(ϵ -lysine) and its derivatives *via* ring-opening polymerization of biorenewable cyclic lysine
- Advancing the stimuli response of polymer-based drug delivery systems for ocular disease treatment
- Bioinspired structural color nanocomposites with healable capability
- Recent development in halogen-bonding-catalyzed living radical polymerization
- From terpenes to sustainable and functional polymers
- Recent advances in the development and applications of nonconventional luminescent polymers
- A comprehensive review of the structures and properties of ionic polymeric materials

Perspectives:

- Direct formation of nano-objects *via in situ* self-assembly of conjugated polymers

• Pairing Suzuki–Miyaura cross-coupling and catalyst transfer polymerization

Communications:

- A shish-kebab-like supramolecular polymer and its light-responsive self-assembly into nanofibers
- Confined supramolecular polymers in water with exceptional stability, photoluminescence and chiroptical properties
- Mechanism and application of surface-initiated ATRP in the presence of a Zn⁰ plate
- Substituent effects in iniferter photopolymerization: can bond homolysis be enhanced by electronics?
- Catalyst free removal of trithiocarbonate RAFT CTAs from poly(vinylpyridine)s using tris(trimethylsilyl)silane and light
- Easily readable palindromic sequence-defined polymers built by cascade thiol-maleimide Michael couplings
- Cationic amphiphilic alternating copolymers with tunable morphology
- Crosslinked metallo-polyelectrolytes with enhanced flexibility and dimensional stability for anion-exchange membranes

Articles:

- Naked micelles: well-defined polymer nanoparticles from photo-cleavable block copolymer micelles
- Organocatalytic ring-opening polymerization of thionolactones: anything O can do, S can do better
- Preparation of well-defined 2D-lenticular aggregates by self-assembly of PNIPAM-*b*-PVDF amphiphilic diblock copolymers in solution
- Amphiphilic random and random block terpolymers with PEG, octadecyl, and oleyl pendants for controlled crystallization and microphase separation
- Hierarchical self-assembly of miktoarm star copolymers with pathway complexity
- The effect of polarity on the molecular exchange dynamics in imine-based covalent adaptable networks
- Advanced spectroscopy, microscopy, diffraction and thermal analysis of polyamide adhesives and prediction of their functional properties with solid-state NMR spectroscopy

• A pyridinium-pended conjugated polyelectrolyte for efficient photocatalytic hydrogen evolution and organic solar cells

- Solution size variation of linear and dendritic bis-MPA analogs using DOSY-¹H NMR
- Stereoselective polymerization of *rac*-lactide catalyzed by zwitterionic calcium complexes
- Effect of backbone and end-group regioisomerism on thermomechanical properties of vanillin-based polyurethane networks
- Clarification of the effects of topological isomers on the mechanical strength of comb polyurethane
- Controlled ring-opening polymerization of *N*-(3-*tert*-butoxy-3-oxopropyl) glycine derived *N*-carboxyanhydrides towards well-defined peptoid-based polyacids
- An AIE-driven fluorescent polysaccharide polymersome as an enzyme-responsive FRET nanoprobe to study the real-time delivery aspects in live cells
- Expanding the thiol-X toolbox: photoinitiation and materials application of the acid-catalyzed thiol-ene (ACT) reaction
- Organocatalyzed closed-loop chemical recycling of thermo-compressed films of poly(ethylene furanoate)
- Temperature-mediated molecular ladder self-assembly employing Diels–Alder cycloaddition
- Thermo- and oxidation-sensitive poly(meth)acrylates based on alkyl sulfides: dual-responsive homopolymers from one functional group
- Guaiazulene revisited: a new material for green-processed optoelectronics
- Gradient and asymmetric copolymers: the role of the copolymer composition profile in the ionization of weak polyelectrolytes
- Dynamic covalent exchange in poly(thioether anhydrides)
- Investigations into CTA-differentiation-involving polymerization of fluorinated monomers: exploitation of experimental variances in fine-tuning of molecular weights
- Poly(vinyl acetate-*co*-ethylene) particles prepared by surfactant-free emul-

sion polymerization in the presence of a hydrophilic RAFT/MADIX macromolecular chain transfer agent

- Defect engineering of polyethylene-like polyphosphoesters: solid-state NMR characterization and surface chemistry of anisotropic polymer nanoplatelets

- Core hyper-cross-linked star polymers from block polymer micelle precursors

- Effects of crystallinity and dispersity on the self-assembly behavior of block co-oligomers in water

- DFT-calculation-assisted prediction of the copolymerization between cyclic ketene acetals and traditional vinyl monomers

- Exploring the difference of bonding strength between silver(I) and chalcogenides in block copolymer systems

- Semifluorinated, kinked polyarylenes *via* direct arylation polycondensation

- Insight into the synthesis of *N*-methylated polypeptides

- Time-dependent covalent network formation in extrudable hydrogels

- Functional polyimides based on diamine containing diarylethylene moieties and their photochromic mechanism studies

- Pentafluorophenyl-based single-chain polymer nanoparticles as a versatile platform towards protein mimicry

- Catechol-functionalized sequence-defined glycomacromolecules as covalent inhibitors of bacterial adhesion

- Identifying competitive tin- or metal-free catalyst combinations to tailor polyurethane prepolymer and network properties

- A dual drug-based hyperbranched polymer with methotrexate and chlorambucil moieties for synergistic cancer chemotherapy

- Kinetics and mechanisms of polycondensation reactions between aryl halides and bisphenol A

- Impacts of performing electrolysis during organocatalyzed atom transfer radical polymerization

- Sequential and alternating RAFT single unit monomer insertion: model trimers as the guide for discrete oligomer synthesis

- Optimization of ring-opening metathesis polymerization (ROMP) under physiologically relevant conditions

Holger Frey, *Polymer Chemistry*
Associate Editor



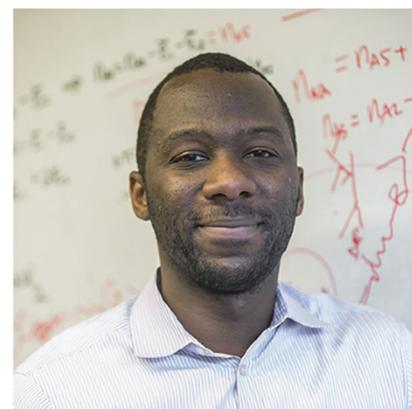
Emily Pentzer, *Polymer Chemistry*
Associate Editor



Hiroharu Ajiro

Hiroharu Ajiro received his PhD degree in 2004 from Nagoya

University under the direction of Prof. Yoshio Okamoto. In 2004–2005, he was a Postdoctoral Associate under the direction of Prof. Geoffrey W. Coates at Cornell University. He joined the Center for Advanced Medical Engineering and Informatics at Osaka University as a Specially Appointed Lecturer in 2006, and was promoted to a Specially Appointed Associate Professor in 2011, under the direction of Prof. Mitsuru Akashi. He moved to Nara Institute of Science and Technology in 2015 as an Associate Professor to start his laboratory as a PI, and he was promoted to Professor in 2019. His interest lies in the creation of novel functional polymers, based on monomer synthesis, structural control of polymers and polymer–polymer interactions.



Christopher Alabi

Christopher Alabi received his B.S. in Chemistry and B.E. in Chemical Engineering from New York University and Stevens Institute of Technology in 2004. He obtained a graduate degree at Caltech with Dr Mark Davis and was an NIH Postdoctoral Fellow with Dr Langer and Dr Anderson from 2009 to 2013. Chris Alabi joined Cornell CBE in 2013 and was promoted to Associate Professor with Indefinite Tenure in 2019. Research in the Alabi lab seeks to understand how the sequence and structure of a macromolecule affect its properties with an eye towards engineering sustainable materials and biomolecular therapeutics.



Trisha L. Andrew

Trisha L. Andrew is a Professor of Chemistry and Chemical Engineering at the University of Massachusetts Amherst. She directs the Wearable Electronics Lab, a multi-disciplinary research team that produces garment-integrated technologies using chemical vapor deposition, a process that effects polymerization and deposition of molecular semiconductors from the vapor phase onto any desired surface. Trisha started her career as an Assistant Professor of Chemistry and Electrical Engineering at the University of Wisconsin-Madison, after receiving her Ph.D. from MIT in 2011. She is a David and Lucile Packard Foundation Fellow, a National Academy of Sciences Kavli Fellow, an Air Force Young Investigator, an ARPA-E Investigator, and a L'Oréal USA For Women in Science Fellow, and was named as one of Forbes magazine's "30 Under 30" innovators in energy.



Matthias Barz

Dr Matthias Barz studied chemistry at the Johannes Gutenberg-University (JGU) Mainz (Germany) and the Seoul National University (South Korea), and received a

diploma degree in chemistry in 2006 and a PhD in polymer chemistry in 2009 (Prof. R. Zentel). Afterwards, he worked in the laboratories of Maria J. Vicent at the CIPF and T. Kirchhausen at Boston Children's Hospital, Harvard Medical School. In 2013, he became an independent junior research group leader at the JGU and established polypept(o)ides as functional biomaterials. Since 2020, he has been a full professor in biotherapeutic delivery at the LACDR, Leiden University. Matthias Barz has published more than 100 research papers, commentaries, reviews, book chapters and patents. For his independent research he has received numerous awards, including the prestigious Dozentenpreis (FCI) and the Hermann Schnell Scholarship (GDCH), and he was named an ACS PMSE Young Investigator in 2018.



Edmondo M. Benetti

Dr Edmondo M. Benetti graduated in chemistry from the University of Padova (Italy), and carried out his PhD at the University of Twente (The Netherlands), working in the Department of Materials Science and Technology of Polymers (2009). He joined the Department of Materials at ETH in 2009 as a PostDoc (ETH fellow) working in the groups of Prof. Nicholas D. Spencer and Prof. Marcus Textor. Since 2014 he has been a senior scientist and group leader, coordinating the activities of the Polymer Surfaces Group, which is now active between the Department of Materials at ETH Zürich and the Swiss Federal Laboratories for Materials Science and

Technology (Empa). His research interests focus on controlled polymerizations applied to interfaces, and the fabrication and physicochemical characterization of synthetic biointerfaces.



Weifeng Bu

Weifeng Bu received his B.S. and Ph.D. degrees from Jilin University in 1999 and 2004, respectively. In 2005, he went to The University of Hong Kong as a research assistant. Then he worked at National Institute for Materials Science (NIMS) in Japan (2006 and 2007) as a postdoctoral fellow and at The University of Tokyo as a Japan Society for the Promotion of Science (JSPS) fellow (2008 and 2009). In 2009, he joined the School of Chemistry and Chemical Engineering at Lanzhou University as a full professor. His scientific interests include the self-assembly and functions of polymer-inorganic composites.



Mao Chen

Mao Chen obtained his B.S. and Ph.D. at Wuhan University (2006,

2011) under the direction of Prof. Aiwen Lei and Prof. Xumu Zhang. From 2012, Mao worked as a Postdoc at MIT with Prof. Stephen L. Buchwald and Prof. Jeremiah A. Johnson, successively, and was promoted to research scientist in 2016. Subsequently, Mao started his independent research in the Department of Macromolecular Science, State Key Laboratory of Molecular Engineering of Polymers at Fudan University. He has received an Overseas Talent Program of China Award, a Thieme Chemistry Journals Award, and a Dow Innovation Challenge Award. His primary research interests include development of creative polymerization methods and cutting-edge technologies toward controlled synthesis of polymers, and engineering of high-performance polymers to solve challenges at the interface of energy, the environment and intelligent manufacturing.



Tae-Lim Choi

Tae-Lim Choi was born in Seoul in 1977. He obtained his BS from KAIST in 1999, and his PhD from Caltech under the supervision of Bob Grubbs, in 2003. Then he moved to UC Berkeley as a post-doc researcher

under the guidance of Jean Fréchet until 2004. He came back to S. Korea and worked at Cheil Industries, Samsung, for four years. In 2008, he started his independent career as an assistant professor in the Department of Chemistry, Seoul National University. He was promoted to full professor in 2017. His research interest is mainly in synthesis, focusing on developing new methods (living, cascade or diversity-oriented polymerizations *etc.*) to synthesize various macromolecules and understanding their mechanisms. Recently, his focus has moved to applying these synthetic tools in the self-assembly of conjugated polymers to prepare various semiconducting nanostructures. Since 2013, he has served as an editor of *Journal of Polymer Science*. He is a member of the Young Korean Academy of Science and Technology.



Olivier Colombani

Olivier Colombani received a PhD in polymer chemistry from Université Pierre et Marie Curie (France) in 2003. He worked as a post-doctoral fellow at Universität Bayreuth (Germany, 2004–2005) and at the Centre of Nuclear Energy (CEA, France, 2005–2006). In 2006, he was appointed assistant pro-

fessor at Le Mans Université (France). His research interests focus on the synthesis and self-assembly of polymers in solution. In this field, he aims to control the exchange dynamics and morphology of supramolecular structures at the nanoscale *via* a fine control of the chemical structure of the polymers at the molecular scale.



Priyadarsi De

Dr Priyadarsi De is a Professor in the Department of Chemical Sciences at Indian Institute of Science Education and Research Kolkata (IISER Kolkata), India. He received his Ph.D. degree from Indian Institute of Science, India. After his post-doctoral studies at UMASS Lowell (2002–2006) and Southern Methodist University (2007–2008), he worked at PhaseRx Inc. Seattle for fifteen months before joining IISER Kolkata in November 2009. His research group at IISER Kolkata mostly works on controlled synthesis of bio-inspired macromolecular architectures from naturally occurring amino acids and fatty acid based renewable resources for various applications. Currently, he is an Advisory Board member of *Polymer Chemistry* (Royal Society of Chemistry, September 2015–present) and an Associate Editor of *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry* (Taylor & Francis Group, April 2019–present).



Marianne 'Marion' Gaborieau

Marion Gaborieau is a polymer scientist and spectroscopist. Her PhD work, funded by industry at the Max Planck Institute for Polymer Research (MPIP, Mainz, Germany), was devoted to the characterisation of the structure and dynamics of polyacrylics for paints and adhesives by solid-state NMR spectroscopy. She currently holds a senior research lectureship in the School of Science at Western Sydney University, Australia. Her research is devoted to the characterisation of complex industrial polymeric materials, especially in the solid state. Her projects include adhesives, membranes for water purification, agro-materials such as starch and cellulose for bioplastics or paper coatings, as well as foods. Characterisation methods include solid-state NMR spectroscopy to shed light on the functional properties of materials.



Suhrit Ghosh

Suhrit Ghosh was born in India in 1976. He did a PhD with Professor S. Ramakrishnan at IISc Bangalore, India, during 2000–2005. Subsequently, he worked as a postdoctoral Research Associate with Professor S. Thayumanavan at the University of Massachusetts, Amherst, USA. He then worked as a Humboldt Postdoctoral Fellow with Professor F. Würthner at the University of Würzburg, Germany. In 2008, he returned to India and was appointed as an Assistant Professor at IACS, Kolkata, where he is currently a Senior Professor in the School of Applied and Interdisciplinary Sciences. His research interests include structure and function in the supramolecular assembly of π -systems and macromolecules. He currently serves as an Associate Editor of *RSC Advances* and an Editorial Advisory Board member of *Macromolecules*.



Atsushi Goto

Atsushi Goto is a professor and a Provost's Chair professor at Nanyang Technological University (NTU), Singapore. He received his PhD (2001) from Kyoto University, Japan, and was appointed as an instructor (2001), an assistant professor (2002), and an associate professor (2010) at Kyoto University. He moved to NTU and was appointed as an associate professor (2015) and a professor (2020). His research interests are polymer chemistry and polymer materials, particularly relating to controlled synthesis of polymers. He has published >110 peer-reviewed papers in inter-

national journals with >7200 citations (h-index of 41) and filed >50 patents. He has received a Shimadzu-SNIC Industry Award (2020), a Singapore NRF Investigatorship Award 2018 (2018), a Photopolymer Science and Technology Best Paper Award (2018), and so on. He is an Advisory Board member for *Polymer Chemistry*.



Scott M. Grayson

Scott M. Grayson is the Joseph H. Boyer Professor of Chemistry at Tulane University. He has completed a number of projects related to polymer applications, including a new "click" chemistry route to prepare cyclic polymers and a new calibration standard for mass spectrometry with bis-MPA dendrimers. He is currently working on a linear bis-MPA polymer that is virtually identical to bis-MPA dendrimers, though with a purely linear architecture.



Matthew Green

Prof. Matthew Green joined the faculty at Arizona State University in

Chemical Engineering in 2014 after completing a Ph.D. in Chemical Engineering in 2011 at Virginia Tech with Prof. Timothy Long and a postdoc at the University of Delaware in the Chemical and Biomolecular Engineering Department with Prof. Thomas Epps, III and Prof. Millicent Sullivan. His training as a synthetic polymer chemist and chemical engineer positions his research group at the critical intersection of the disciplines of health, the environment, and advanced materials. His laboratory is integrating macromolecular design with controlled synthesis techniques to produce hierarchical and multifunctional materials with particular interest in the interplay between electrostatic interactions and microstructure, inter-phase interactions, thermomechanical properties, and transport. These features can be used to tune the material properties for applications ranging from membranes for water purification or CO₂ capture to polymeric nanocomposites.



André Gröschel

André Gröschel studied chemistry at the University of Bayreuth and graduated in 2012, working on hierarchical self-assembly of block copolymers. From 2013 to 2015, he joined the Department of Applied Physics at Aalto University in Helsinki, pursuing his postdoc on biomimetic nanocomposites and photonic materials. In

2016, he received an endowed junior professorship in Physical Chemistry at the University of Duisburg-Essen, and in 2017, he started an Emmy Noether research group. In 2020, he was appointed as a Professor in the Institute of Physical Chemistry at the University of Münster, where his group is currently located at the Center for Soft Nanoscience (SoN). He has published over 60 papers, several reviews and three book chapters. His research interests comprise self-assembly of block copolymers, electron tomography, multicompartiment materials and Janus and topographic nanoparticles.



Fei Huang

Fei Huang received his BS degree in Chemistry from Peking University in 2000 and gained his PhD degree in Materials Science from South China University of Technology in 2005 under the supervision of Prof. Yong Cao. After postdoctoral work at University of Washington with Prof. Alex K.-Y. Jen, he began his academic career in 2009 as a full professor at South China University of Technology, and he is now the associate director of the State Key Laboratory of Luminescent Materials and Devices. His main interests are in the fields of organic functional materials and devices for optoelectronics.



Laura Hartmann

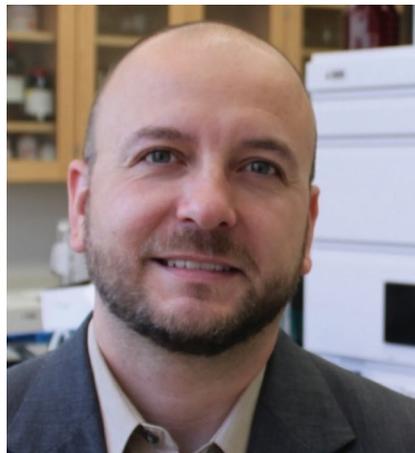
Laura Hartmann finished her PhD under the supervision of Hans Börner and Markus Antonietti at the Max Planck Institute of Colloids and Interfaces in 2007. Thereafter, she worked as a Research Fellow at Stanford University. In 2009 she started her independent Emmy Noether research group within the Department for Biomolecular Systems headed by Peter Seeberger. Since July 2014 she holds the chair for Macromolecular Chemistry at the Heinrich-Heine-University Düsseldorf. Her research is focused on combining solid phase and polymer synthesis to obtain monodisperse, sequence-defined polymers. In particular, she is interested in glycopolymers and glycomaterials for use in biotechnology and biomedicine.



Manickam Jayakannan

Manickam Jayakannan is a professor at the Department of Chemistry, Indian Institute of Science Education and

Research, Pune (IISER-Pune). He received his Bachelors and Masters degrees in chemistry from Madurai Kamaraj University and his Ph.D. from Indian Institute of Science (Professor S. Ramakrishnan's group), India. After completing his post-doctoral work at Eindhoven University of Technology, The Netherlands (Prof. Rene A. J. Janssen's group), he returned to India and had a short stint as a polymer scientist at JFWTC-GE Global Research in Bangalore. He began his career as a scientist at CSIR-NIIST Trivandrum and then he moved to IISER-Pune to embark on the journey of establishing the new academic institute. Currently he is continuing as a professor in the same institute and he has published close to 100 papers. His group has contributed to the development of L-amino acid based functional polymers, PCL block copolymers and polysaccharide nano-carriers as therapeutics for cancer and in the treatment of infectious diseases.



Justin Kennemur

Justin G. Kennemur grew up in Virginia and earned a B.S. degree in chemistry at Radford University. After working for three years as an analytical polymer chemist at Polymer Solutions Incorporated in Blacksburg, VA, he attended graduate school at North Carolina State University and earned a Ph.D. in polymer chemistry under the guidance of Bruce M. Novak. After a post-doctoral appointment co-advised by Marc A. Hillmyer and Frank S. Bates at the University of Minnesota, he began his

appointment as an Assistant Professor in the Department of Chemistry and Biochemistry at Florida State University in Fall of 2014 and was promoted to Associate Professor with tenure in Fall of 2020. His recognitions include the NSF CAREER Award, 2018 PMSE Young Investigator, 2018 *Polymer Chemistry* Emerging Investigator, and the 2017–18 FSU Undergraduate Teaching Award.



Matt Kiesewetter

Matt Kiesewetter was born in 1982 in Normal, IL. His initial training was in classic physical organic chemistry with Professor Cheryl D. Stevenson at Illinois State University (ISU). He received his B. S. in chemistry, *summa cum laude*, from ISU in 2004. He conducted his graduate research in catalysis under the advisement of Professor Robert M. Waymouth and Dr James L. Hedrick (IBM) at Stanford University where he was a NSF Graduate Research Fellow. After a Ruth L. Kirschstein Postdoctoral Fellowship (NIH) with Prof. Tim Swager at MIT, he joined the faculty at the University of Rhode Island (URI) in 2013. Promoted in 2018, he is currently an Associate Professor of Chemistry. His current research interests are in homogeneous catalysis, supramolecular interactions, polymerization chemistry and pollinator conservation. His awards include a CAREER Award from the NSF (2016), an ACS Polymeric Materials Science and Engineering (PMSE) Young Investigator

Award (2017), and a Graduate Mentoring Award (2017) and Research Excellence Award (2016) from URI.



Arjan Kleij

Arjan W. Kleij has been an independent ICIQ group leader and ICREA fellow in Tarragona (Spain) since 2006 after finishing two postdoctoral (Madrid & Amsterdam) and two industrial appointments (Avantium Technologies & Hexion Specialty Chemicals). Among his main interests is the use of renewable feedstocks such as CO₂ and terpenes in the creation of more complex and functional polymers through catalysis engineering, thereby creating new types of polyesters and polycarbonates with functional diversity for potential use in material development.



Christopher Kloxin

Chris Kloxin received a PhD in Chemical Engineering at North Carolina

State University and did his post-doctoral work at the University of Colorado, Boulder under the guidance of Christopher Bowman. In 2014, he joined the faculty at the University of Delaware as an Assistant Professor in the Departments of Materials Science and Engineering and Chemical and Biomolecular Engineering, and he was promoted to Associate Professor in 2020. Major research efforts in his group are the synthesis and characterization of polymer networks and nature-inspired polymeric assemblies.



Daniel Klinger

Daniel Klinger is a Junior Professor at Freie Universität Berlin (FUB) where he is developing new synthetic strategies for functional polymer nanomaterials. Daniel obtained his PhD at the Max Planck Institute for Polymer Research under the guidance of Prof. K. Landfester and then joined the University of California as a post-doctoral researcher with Prof. C. J. Hawker. Here, he combined his existing experience in the fields of stimuli-responsive materials and colloidal chemistry with surfactant-directed block copolymer self-assembly in nanoparticles. Now, at FU Berlin, his most recent work focuses on stimuli-respon-

sive polymers as new building blocks for functional nanomaterials, (amphiphilic) nanogels for drug delivery and catalytic applications, as well as controlling shape and morphology in phase-separated block copolymer nanoparticles.



Dominik Konkolewicz

Dominik Konkolewicz earned his Ph.D. from the University of Sydney, advised by Prof. Sébastien Perrier, focusing on experimental and theoretical tools for highly branched polymers. Subsequently, he did post-doctoral work at Carnegie Mellon University from 2011 to 2014, advised by Prof. Krzysztof Matyjaszewski, where he studied synthetic and mechanistic aspects of ATRP. In August 2014, he joined Miami University in Oxford, OH as an Assistant Professor of Organic Chemistry. In 2019 he was promoted to Associate Professor. His research group consists of both graduate and undergraduate researchers working in the fields of organic chemistry, polymer chemistry, materials science and biohybrid materials. His team focuses on mechanism and funda-

mental science driven discoveries in the fields of dynamic and responsive polymers, as well as biohybrid materials.



Jui-Yang Lai

Dr Jui-Yang Lai received his Ph.D. from the Department of Chemical Engineering, National Tsing Hua University, Taiwan. Since 2014, he has been a Full Professor at Chang Gung University, Taiwan. Dr Lai's primary research activities are centered on the design and development of functional biomaterials, either from natural or synthetic sources, for ophthalmic use, particularly in tissue engineering, drug delivery, and nanomedicine. His major research projects involve ocular biocompatibility assessment, corneal/retinal cell construct fabrication, topical/intraocular pharmaceutical dosage formulation, and metallic/carbon-based nanotherapeutics evaluation. Dr Lai has published more than 100 scientific papers (3000 citations, h-index = 32) and filed numerous patent applications. He actively participates in the peer review process for scientific publications (over 800 manuscripts) and also serves as a member of the Editorial Board for several scholarly journals.



Muriel Lansalot

Muriel Lansalot obtained her PhD from the University Pierre and Marie Curie (Paris, France) in 1999. After post-doctoral fellowships at the Aix-Marseille University and at the University of New South Wales in Sydney, she moved to Lyon in 2003 to work in the joint unit between the CNRS and the bioMérieux company, first as a post-doctoral fellow and then as a CNRS researcher. In 2008, she joined the Chemistry, Catalysis, Polymers and Processes group (C2P2, Lyon), where her research interests focus on the synthesis of various kinds of polymer and organic/inorganic colloids *via* free radical polymerization and RDRP techniques (including PISA). Her current studies also deal with photopolymerization in dispersed media, synthesis of degradable particles and self-healing polymer films. Since 2018 she has served as an Advisory Board member for *Polymer Chemistry*.



Catherine Lefay

Dr Catherine Lefay completed her PhD in polymer chemistry in 2006 under the supervision of Professor Bernadette Charleux at the University Pierre and Marie Curie (Paris, France). She then joined the group of Professor Christopher Barner-Kowollik (CAMD, University of New South Wales, Sydney, Australia) as a postdoctoral researcher. In 2007, she returned to France and started working as a lecturer at Aix-Marseille University (AMU, Marseilles, France). Her research currently focuses on the synthesis of (bio)degradable polymers, antimicrobial materials and controlled radical polymerization.



Bo Liu

Bo Liu received his Ph.D. degree from Changchun Institute of Applied Chemistry, Chinese Academy of Sciences under the supervision of Professor Dongmei Cui. His Ph.D. thesis was “Rare-earth metal complexes: synthesis and their catalytic activity”. In 2010, he joined Prof. Jean-François Carpentier’s group as a post-doctoral researcher supported by the European Frame Program—Marie Curie Fellowship, studying alkaline-earth metal chemistry. In 2013, he went back to Changchun Institute of Applied Chemistry and was appointed as an associate professor. In December 2019, he was promoted to Professor. His current research interests focus on sequence controlled

coordination polymerization. He has published more than 40 papers in *J. Am. Chem. Soc.*, *Angew. Chem.*, *Int. Ed.*, *Mater. Horiz.*, *ACS Catalysis*, *Macromolecules*, *Chem. – Eur. J.*, etc., and has applied for 8 patents. In 2018, he was granted “the innovation award of rubber science and technology, China”.



Garret Miyake

Garret Miyake grew up in Canby, Oregon and earned his B.S. at Pacific University. He performed his Ph.D. studies with Eugene Chen at Colorado State University before conducting postdoctoral research with Robert Grubbs at the California Institute of Technology. He is currently an Associate Professor of Chemistry at Colorado State University. The Miyake group has research interests in the fields of photoredox catalysis, organo-catalyzed atom-transfer radical polymerization, and the synthesis of block copolymers that self-assemble into photonic crystals. He has been awarded the Sloan Research Fellowship, the Cottrell Scholar Award, the Camille Dreyfus Teacher-Scholar Award, and the American Chemical Society’s Division of Polymer Chemistry Mark Young Scholar Award.



Vincent Monteil

Vincent Monteil obtained his Ph.D. from the University of Lyon in 2002 under the supervision of Roger Spitz and Christophe Boisson where he worked on catalytic copolymerization of ethylene and butadiene. He subsequently moved to the group of Stefan Mecking (University of Freiburg then Constance) as a postdoctoral researcher working on catalytic polymerizations in water. In 2005, he returned to Lyon as a CNRS Research Associate in the Laboratory of Chemistry, Catalysis, Polymers and Processes. He became CNRS Research Director in 2017. His research interests deal with the use of catalysis in polymer synthesis, the synthesis of polyolefins by catalytic and/or radical polymerization,

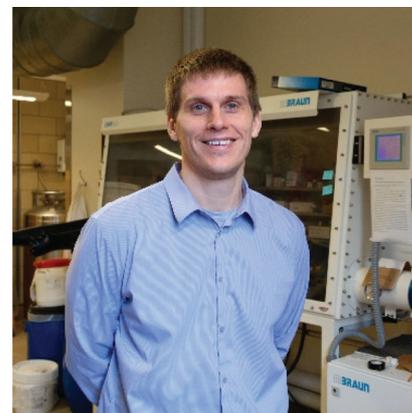
and more recently with the chemical recycling of polymers (catalytic depolymerization).



Alshakim Nelson

Alshakim Nelson is an Associate Professor in the Department of Chemistry at the University of Washington. He received his PhD in organic chemistry from UCLA in 2004 and then was a NIH postdoctoral fellow at the California Institute of Technology. Dr Nelson joined the IBM Almaden Research Center in 2005 as a Research Staff Member where he focused on the synthesis of nanomaterial building blocks that enabled large area nanomanufacturing *via* self-assembly. In 2015, Dr Nelson joined the faculty at the UW,

where his research group focuses on the synthesis, characterization, and processing of stimuli-responsive polymers and biomaterials for 3D printing.



Kevin Noonan

Kevin Noonan is a Canadian-born chemist who completed his PhD and postdoc work at UBC and Cornell. He joined the Department of Chemistry at Carnegie Mellon in 2011 where he is currently an Associate Professor. His research interests are broadly centred around the design and synthesis of new molecules and polymers. He has been exploring different methods to prepare well-defined conjugated polymers, with an emphasis on understanding the impact of sequence control along the polymer backbone. In addition, he is synthesizing new classes of cationic polymers derived from heavier main-group elements (*e.g.* phosphorus).



Jos Paulusse

Jos M. J. Paulusse graduated from Eindhoven University of Technology in 2002, after which he obtained his PhD degree under the supervision of Prof. Rint P. Sijbesma and Prof. Bert Meijer on the reversible mechanochemistry of coordination polymers in 2006. He worked as a postdoctoral fellow under the guidance of Prof. Craig J. Hawker at UC Santa Barbara, California. Subsequently, he joined Wageningen University as an Assistant Professor in 2009, investigating the surface modification of inorganic (nano)materials. He continued his career at the University of Twente in 2012 as an Assistant Professor and later as an Associate Professor in the Department of Biomolecular Nanotechnology. He is co-founder of SpectriS-dot, which commercializes fluorescent silicon quantum dots. His research interests focus on the development of nanomaterials for applications in therapeutics delivery and targeted imaging, in particular well-defined, size-con-

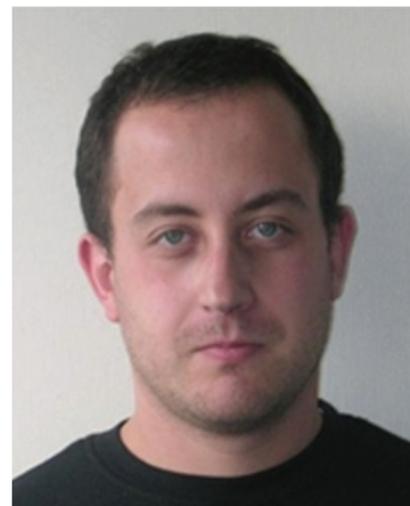
trolled polymer nanoparticles and silicon-based nanoparticles for hyperpolarization MRI.



Jon Pokorski

Professor Pokorski began his career by earning his B.S. in biochemistry from UCLA, while working in private industry designing biomedical devices. Dr Pokorski received his PhD in chemistry from Northwestern University, where he designed peptidomimetics for use in medical diagnostics and therapeutics. Dr Pokorski then moved to The Scripps Research Institute as a postdoctoral fellow, where he engineered viral nanoparticles as drug-delivery systems. Pokorski's laboratory at UCSD works to bridge chemical synthesis, molecular biology, and materials science to make new materials for biomedical applications. The Pokorski lab is particularly interested in marrying protein and polymer science to generate materials for drug delivery and immunotherapy. Pokorski's research is funded through

grants from the NIH, NSF, and ACS. He has been awarded several prestigious awards, including an ACS PRF New Investigator Award and an NIH Pathway to Independence Award. Pokorski currently serves as an IRG lead for the UC San Diego MRSEC.



Jean-Marie Raquez

Prof. Jean-Marie Raquez, senior FRS-FNRS research associate, is the head of the Laboratory of Polymer and Composite Materials (LPCM) at University of Mons in Belgium (see <http://smpc2017.blue-horizon.be/> for details) and scientific leader at the applied research center Materia Nova in Belgium. The main research areas range from controlled and catalyzed polymerization reactions to the production of high performance nanocomposites/nanohybrids *via* reactive processing, *e.g.* reactive extrusion, with a special emphasis on biobased plastics with key properties including shape-memory polymers and self-healing materials. He is author of about 170 peer-reviewed publications, 11 patents, and 6 book chapters.



Nicole Sampson

Nicole S. Sampson received her education and training as a chemist and chemical biologist from Harvey Mudd College (BS), the University of California-Berkeley (PhD), and Harvard University (postdoctoral fellow). She is currently Distinguished Professor of Chemistry and Dean of the College of Arts and Sciences at Stony Brook University. She is a Fellow of the American Chemical Society. Her research interests include the design of chemical probes of mammalian fertilization and exploiting metabolic pathways that enable survival of *Mycobacterium tuberculosis* for drug discovery. Her work with polymers in fertilization led to the development of new methodology for the synthesis of alternating copolymers by ring-opening metathesis polymerization from 1-substituted cyclobutenes and unstrained cycloalkenes.



Haritz Sardon

Haritz Sardon received his Ph.D. in 2011 at the University of Basque Country under the supervision of Prof. Lourdes Irusta and Prof. M. J. Fernandez-Berridi before joining the group of Dr James Hedrick at the IBM-Almaden Research Center, USA, as a post-doc. In 2014, Haritz returned to Spain with a Ministry grant and joined the POLYMAT institute as a junior group leader before starting his independent research career as an Associate Professor at the University of Basque Country in 2017. He has published over 100 articles and his group intends to design the plastics of the future by implementing scalable and environmentally benign plastic recycling approaches and designing new polymers with not only competitive mechanical properties but also consideration of their end-of-life assessment.



Mona Semsarilar

Mona Semsarilar earned her Ph.D. from the University of Sydney in 2010 under the supervision of Prof. S. Perrier. She then moved to the University of Sheffield (UK) to work on polymerization induced self-assembly (PISA) under the supervision of Prof. S. Armes (FRS). In 2015 she was recruited by the French

national research organization (CNRS) as a research scientist based in the European Institute of Membranes (IEM) in Montpellier (France). In 2019, she received her habilitation from the University of Montpellier. Her research focuses on using synthetic chemistry to tailor molecular design and controlled self-assembly to prepare porous materials for membrane applications.



Myungeun Seo

Myungeun Seo is a polymer chemist interested in controlled polymer synthesis, polymer/small molecule self-assembly, and porous polymers for environmental and energy applications. He received his Ph.D. from the Department of Chemistry at KAIST (Korea Advanced Institute of Science and Technology) under the supervision of Prof. Sang Youl Kim (2008). He spent one year as a post-doctoral fellow in the same group and then moved to Prof. Marc A. Hillmyer's group at the University of Minnesota (2009–2013). He started his own career in 2013 at KAIST, and is now an associate professor in the Department of Chemistry. He is one of the editors of *Macromolecular Research*, and also serves *Macromolecules* and *Chemical Physics Reviews* as a member of the Editorial Advisory Boards.



Devon A. Shipp

Prof. Devon A. Shipp completed a B. Sc. (Hons) in chemistry (1993), and then a Ph.D. (1998) at the University of Melbourne (Australia). He then accepted the Bayer Postdoctoral Research Fellowship at Carnegie Mellon University (Pittsburgh, Pennsylvania) with Prof. Kris Matyjaszewski. In 1999, he began his independent research career at Clarkson University in northern New York State where he is currently a full Professor in the Department of Chemistry & Biomolecular Science and Director of Clarkson's Center for Advanced Materials Processing. His research group focuses on new polymer chemistries, particularly radical polymerizations, shape-memory polymers, self-healing polymers, polymer nanocomposites and degradable polymers for bio-related applications. He was a Fulbright Scholar in Slovenia in 2015, hosted by the Slovenian National Institute of Chemistry and the Faculty

of Chemistry and Chemical Technology at the University of Ljubljana. His website URL is: <http://www.clarkson.edu/people/devon-shipp>.



Maarten Smulders

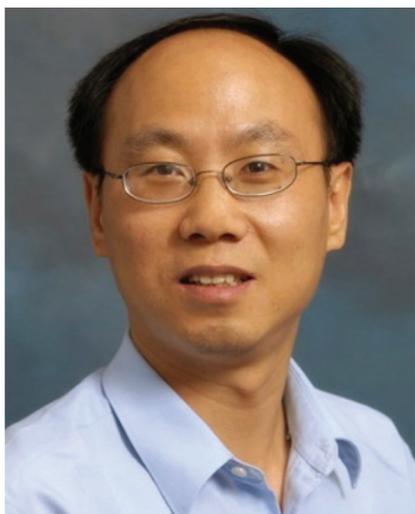
Maarten Smulders received his PhD degree from the Eindhoven University of Technology (NL) in 2009, for research under supervision of Prof. Bert Meijer. After postdoctoral positions at the University of Cambridge (UK) and University of Twente (NL), he started his independent career in 2013 as assistant professor at Wageningen University (NL), where he became associate professor in 2019. His main research interests are in the development of responsive polymer coatings, and in the creation of new (design strategies for) functional covalent adaptable networks (CANs). In the latter area, he achieves control over CAN design by amplifying the control over molecular components and

exchange processes to the macroscopic, material level.



Michael Sommer

Michael Sommer is Professor for Polymer Chemistry at Chemnitz University of Technology (CUT), where he is currently Managing Director of the Institute for Chemistry. Michael studied chemistry at the Universidad de Granada, Spain, and the University of Bayreuth, Germany. With a PhD from Bayreuth in Macromolecular Chemistry, in 2009 he went to Cambridge, UK, for a two year postdoctoral stay with W. T. S. Huck. In 2012 he returned to Freiburg, Germany, to work on his habilitation between 2012 and 2016. Since 2017 he has been a full professor at CUT. His research interests encompass all kinds of conjugated polymers and materials for energy conversion and storage, functional membranes and smart materials.



Chuanbing Tang

Dr Chuanbing Tang received his B.S. from Nanjing University, and his M.S. and Ph.D. from Carnegie Mellon University, and did his postdoctoral research at the University of California Santa Barbara. Currently he is a distinguished professor at the University of South Carolina. His research interests focus on organic polymer synthesis, biobased polymers, metallopolymers, and polymers for biomedical and energy applications. He is a recipient of the Presidential Early Career Award for Scientists and Engineers, South Carolina Governor's Young Scientist Award, and an NSF Career Award. He is a Fellow of the Royal Society of Chemistry, an ACS POLY Fellow, and a Kavli Fellow of the National Academy of Sciences. He is an editor of *Polymer* and an Advisory Board member of major polymer jour-

nals. He has edited one book, and published over 150 papers and 15 patents.



Youhua Tao

Prof. Youhua Tao received his Ph.D. in polymer chemistry in 2008 from the Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, under the direction of Professor Xianhong Wang. After postdoctoral stays (2008–2013) with Professor Masami Kamigaito (Nagoya University, Japan) and Professor Christopher N. Bowman (University of Colorado at Boulder, USA), he accepted a full professor appointment at the Changchun Institute of Applied Chemistry, Chinese Academy of Sciences. His research focuses on sustainable and recyclable polymers, and organocatalytic ring-opening polymerization.



Takaya Terashima

Takaya Terashima was born in Japan (1978) and received his B.S. (2002), M.S. (2004) and Ph.D. degrees (2007) from Kyoto University under the direction of Professor Mitsuo Sawamoto. He joined the faculty of the Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University in 2007 as an assistant professor and was promoted to associate professor in 2018. He also worked at Eindhoven University of Technology as a visiting researcher (2009–2010). He received the Inoue Research Award for Young Scientists (2009), the Award for Encouragement of Research in Polymer Science (2012) from SPSJ, the CSJ Special Lecture Award for Young Scientists (2012), the PJ ZEON Award for Outstanding Papers in Polymer Journal 2016 (2016) and The Young Scientists' Prize from The Commendation for Science and Technology by the Minister of

Education, Culture, Sports, Science and Technology (2016). His research interests are precision polymer synthesis, controlled self-assembly systems, and functional polymer materials.



Wei Tian

Wei Tian completed his PhD in Polymer Materials at Northwestern Polytechnical University in 2009 under the supervision of Professor Xiaodong Fan. He pursued his research work on Polymer Chemistry as a post-doctoral researcher at the same university till 2010. Following academic appointments at Northwestern Polytechnical University, he joined the Department of Industrial and Systems Engineering at The Hong Kong Polytechnic University as a Research Associate. He came back to Northwestern Polytechnical University

in 2011, and became a full professor in 2014. His scientific interests focus on hyperbranched polymers and supramolecular self-assembly.



Frederik Wurm

Frederik R. Wurm is currently leading the group “Sustainable Polymer Chemistry” at the Universiteit Twente (UT, Enschede, the Netherlands). The group designs materials with molecular-defined functions for degradable polymers and nanocarriers for agricultural or biomedical applications and especially phosphorus-based polymers. He received his Ph.D. in 2009 (Johannes Gutenberg-Universität Mainz, Germany). After a two year stay at École Polytechnique Fédérale de Lausanne (Switzerland) as a Humboldt fellow, he joined the Max Planck Institute for Polymer Research (Mainz, Germany) and finished his habilitation in macromolecular chemistry in 2016. In August

2020, he was appointed as a full professor at UT.



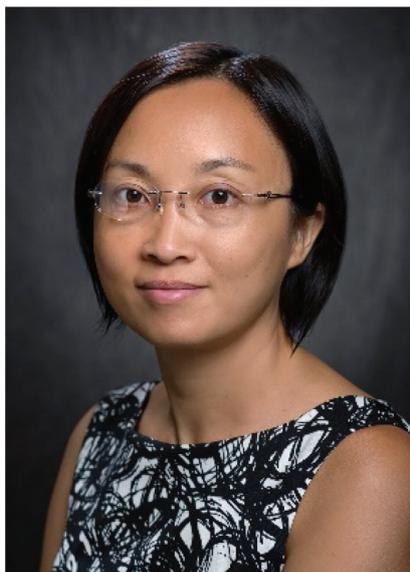
Huaping Xu

Huaping Xu received his Bachelors degree in 2001 and his Ph.D. degree in 2006 from Jilin University, China, under the supervision of Prof. Xi Zhang. In 2006, he joined Prof. David N. Reinhoudt and Prof. Jurriaan Huskens's group at University of Twente, the Netherlands as a post-doc. Since July 2008, he has worked in the Department of Chemistry, Tsinghua University, China. He was promoted to full professor in 2014. In 2014, he received the Natural Science Fund for Outstanding Young Scholars from NSFC. He is an Associate Editor of *ACS Biomaterials Science & Engineering*. His current research is focused on selenium/tellurium-containing polymers.



Jiangtao Xu

Dr Jiangtao Xu is an ARC Future Fellow and Senior Lecturer in the School of Chemical Engineering at UNSW Sydney. He is currently leading a research group in the Centre for Advanced Macromolecular Design (CAMD) and Australian Centre for Nanomedicine (ACN), with a research focus on green and precision polymer synthesis using state-of-the-art polymerization techniques and organic chemistry tools. He has more than 100 peer-reviewed publications in high-impact journals, over 6000 citations and an H-index of 44. His research areas of interest are green chemistry and sustainable polymer synthesis, precision polymer synthesis, advanced polymer materials for nanomedicine and bioengineering applications.



Donghui Zhang

Donghui Zhang is a Professor of Chemistry at the Louisiana State University (LSU). She obtained a B.S. degree in Chemistry from Peking University (1998) and a Ph.D. in Organometallic Chemistry from Dartmouth College (2003), and conducted postdoctoral research on the synthesis and characterization of sustainable polymers at University of Minnesota. She joined LSU in 2007 after a stint as research faculty at New Mexico State University. Her research interests include polymerization method development, synthesis and investigation of the structure–property relationship of biomimetic and bioderived polymers and high precision macromolecules. She

enjoys outdoor activities and spending time with her family and friends.



Zhengbiao Zhang

Zhengbiao Zhang received his BS degree in 2000 and his PhD degree in 2007 from Soochow University under the supervision of Professor Xiulin Zhu. Since 2000, he has worked as an Assistant Professor (2000), Lecturer (2003), Associate Professor (2009) and Professor (2013, current position) at Soochow University. His Postdoctoral Fellowship was in the Department of Chemical and Biomolecular Engineering of the National University of Singapore in 2007–2008 (one year) under the supervision of Professor E. T. Kang. In 2012–2013, he was appointed as a Visiting Scholar for one year in Professor

Stephen Z. D. Cheng's group, Department of Polymer Science and Engineering, The University of Akron. In June–August 2015, he worked as a Visiting Professor with Professor Masami Kamigaito in the Graduate School of Engineering, Department of Applied Chemistry, Nagoya University. His current research interests include the precision synthesis of polymers with well-defined molecular weight, architecture, tacticity and sequence; structure/property (function) relationships of precision polymers; recyclable and biomimetic polymers; and design and synthesis of functional polymers.

Yongfeng Zhou completed his B.Sc. and M.Sc. degrees in Chemistry at Harbin Institute of Technology. In 2005, he obtained his Ph.D. degree in Polymer Chemistry and Physics at Shanghai Jiao Tong University under the supervision of Prof. Deyue Yan. Then, he joined the same university as an associate professor to start his independent research career. In 2010, he was promoted to a full professor there. His current research interests include the controllable synthesis, self-assembly, computer simulation and cytomimetic application of amphiphilic hyperbranched polymers or alternating copolymers.

Jintao Zhu received his Ph.D. degree from Changchun Institute of Applied Chemistry, Chinese Academy of Sciences. He then worked as a postdoctoral research fellow at the University of Alberta and the University of Massachusetts Amherst. Since 2009, he has been appointed as a professor at the School of Chemistry and Chemical Engineering, HUST. Dr Zhu is serving as an editor of *Macromolecular Research*. His current interests involve self-assembled polymers and nanoparticles for responsive nanophotonics, healing materials, memory devices, and immunotherapy. Dr Zhu is a Fellow of the Royal Society of Chemistry (2020), and a recipient of the China National Fund for Distinguished Young Scholars (2015), and a Chinese Chemical Society Youth Award (2013).



Yongfeng Zhou



Jintao Zhu



Pioneering investigators 2019

Cite this: *Polym. Chem.*, 2019, **10**, 2896

Emily Pentzer ^a and Holger Frey ^b

DOI: 10.1039/c9py90078k

rsc.li/polymers

Polymer Chemistry is proud to present this second edition themed issue, celebrating the work of mid-career investigators who have established themselves in the field of polymer chemistry. Many of the researchers whose work is included in this Pioneering Investigators issue have previously been recognized as “emerging investigators” in the field in a past issue of *Polymer Chemistry* (<http://bit.ly/2011Emerging>, <http://bit.ly/2015Emerging>, <http://bit.ly/2018Emerging>).

This special issue includes 4 reviews and 29 original research manuscripts, including authors from 12 different countries and 31 different institutions. This special issue of *Polymer Chemistry* showcases leading research directions in relevant current areas of polymer science and demonstrates the enabling character of current polymer research at the interface with the biological sciences, surface science, photophysics and supramolecular chemistry. The creative and innovative research advancements reported here highlight the widespread impact of polymer chemistry research: from new polymerization techniques (e.g. DOI: 10.1039/C8PY01417E and DOI: 10.1039/C8PY01556B), to the tailored release of bioactive small molecules (e.g. DOI: 10.1039/C9PY00354A, DOI: 10.1039/

C8PY01539B and DOI: 10.1039/C9PY00157C), to fundamental understanding of how chemical structure dictates self-assembly and bulk properties (e.g. DOI: 10.1039/C8PY01463A, DOI: 10.1039/C9PY00162J and DOI: 10.1039/C9PY00250B). We celebrate and praise the continued and ongoing contributions of the authors assembled in this volume to the field of polymer chemistry and thank them for their contributions to this special issue. We hope you enjoy reading the pioneering contributions of this *Polymer Chemistry* special issue!

Reviews:

- Functional protein materials: beyond elastomeric and structural proteins

- Polymer brush interfaces for protein biosensing prepared by surface-initiated controlled radical polymerization

- Recent advances in colloidal nanocomposite design *via* heterogeneous polymerization techniques

- Layer-by-layer assembly nanofilms to control cell functions

Communications:

- Improved malleability of mini-emulsion-based vitrimers through *in situ* generation of carboxylate surfactants

- Ring-opening metathesis polymerization-induced self-assembly (ROMPISA) of a cisplatin analogue for high drug-loaded nanoparticles

- Self-amplified depolymerization of oligo(thiourethanes) for the release of COS/H₂S

- Site-specific conjugation of anti-freeze proteins onto polymer-stabilized nanoparticles

- Integration of metal-free ring-opening metathesis polymerization and organocatalyzed ring-opening polymerization through a bifunctional initiator

- A fluorescent pillarene coordination polymer

Articles

- Cooperative supramolecular polymerization of phosphorescent alkynyl-gold(i)-isocyanide complexes

- Tuning photosensitized singlet oxygen production from microgels synthesized by polymerization in aqueous dispersed media

- Structure and luminescence properties of supramolecular polymers of amphiphilic aromatic thioether-peptide conjugates in water

- Topochemical polymerization of hierarchically ordered diacetylene monomers within the block copolymer domains

- Shape modulation of squaramide-based supramolecular polymer nanoparticles

- Spatial control of the topography of photo-sensitive block copolymer thin films

- Self-assembly of oppositely charged polyelectrolyte block copolymers containing short thermoresponsive blocks

- Ferulic acid-based reactive core-shell latex by seeded emulsion polymerization

- Transformation of polyethylene into a vitrimer by nitroxide radical coupling of a bis-dioxaborolane

- Selective or living organopolymerization of a six-five bicyclic lactone to produce fully recyclable polyesters

^aDepartment of Chemistry, Case Western Reserve University, 10900 Euclid Ave, Cleveland, OH, 44106, USA. E-mail: ehp24@case.edu

^bInstitute of Organic Chemistry, Johannes Gutenberg University Mainz, Duesbergweg 10–14, D-55128, Germany. E-mail: hfrey@uni-mainz.de

- Transition metal-free thiol–yne click polymerization toward *Z*-stereoregular poly(vinylene sulfide)s
- The effect of chain architecture on the phase behavior of A_4B_4 miktoarm block copolymers
- Design and synthesis of a dual imageable theranostic platinum prodrug for efficient cancer therapy
- Precision design of vinyl amine and vinyl alcohol-based copolymers *via* cobalt-mediated radical polymerization
- Understanding the ring-opening polymerisation of dioxolanones
- Metal–organic insertion light initiated radical (MILRad) polymerization: photo-initiated radical polymerization of vinyl polar monomers with various palladium diimine catalysts
- Synthesis and crystallization behavior of regioregular-*block*-regiorandom poly(3-hexylthiophene) copolymers
- Evolution of diverse higher-order membrane structures of block copolymer vesicles
- Polyampholytic graft copolymers based on polydehydroalanine (PDha) – synthesis, solution behavior and application as dispersants for carbon nanotubes
- Hierarchical patterns with sub-20 nm pattern fidelity *via* block copolymer self-assembly and soft nanotransfer printing
- Surface modification of self-assembled isoporous polymer membranes for pressure-dependent high-resolution separation
- Mechanically robust photodegradable gelatin hydrogels for 3D cell culture and *in situ* mechanical modification



Emily Pentzer, *Polymer Chemistry*
Associate Editor



Pol Besenius was born in Luxembourg in 1981 and studied chemistry at the Vienna University of Technology in Austria, and at the University of Strathclyde in Glasgow, Scotland. He received his PhD from the same institution in 2008, under the supervision of Prof. Peter Cormack and Prof. David C. Sherrington FRS, in collaboration with Prof. Sijbren Otto and Prof. Jeremy K. M. Sanders FRS at the University of Cambridge. As a Marie-Curie Fellow, Pol undertook postdoctoral studies at the Eindhoven University of Technology with Dr Anja Palmans and Prof. E. W. “Bert” Meijer. In 2011, Pol moved to the University of Münster to set up an independent research group at the Organic Chemistry Institute, supported by a Liebig Fellowship. He was also elected as young fellow to the North Rhine-Westphalian Academy of Sciences and Arts. In 2015, he took up a Professorship at the Institute of Organic Chemistry at the University of Mainz. His research interests include macromolecular chemistry, self-assembly in water and on surfaces, and responsive supramolecular materials.

Biographies of contributors



Joona Bang received his B.S. degree in Chemical Engineering from Seoul National University in 1999. He received his Ph.D. degree from the University of Minnesota in 2004 on block copolymer physics. Then, he worked as a post-doctoral fellow at the University of California, Santa Barbara. Since 2006, he has been at Korea University as a Professor. His research interests focus on the synthesis and characterization of well-defined functional copolymers having non-linear architectures, such as stars and bottlebrushes, using living free radical polymerization, and surface modification of quantum dots for enhanced stability and improved performance in a variety of light emitting applications.



Holger Frey, *Polymer Chemistry*
Associate Editor



Idriss Blakey graduated from the Queensland University of Technology,

Australia, in 2001 with a PhD in chemistry under the supervision of Prof. Graeme George. He worked as a research scientist at an Australian start-up company, Polymerat (Now Anteo Technologies), before taking a postdoctoral role at the University of Queensland (UQ) in 2003. While at the UQ, he has been awarded a Queensland Government Smart State Fellowship, an Australian Research Council Future Fellowship and a UQ Vice Chancellor's Research and Teaching Fellowship. His research interests include the synthesis of polymers and understanding how their interfacial and physical properties influence performance in applications such as photolithography, biomedical imaging and self-assembly.



Andrew J. Boydston began studying chemistry as an undergraduate at the University of Oregon under the guidance of Professor Michael M. Haley. His research focused on the synthesis and study of dehydrobenzoannulenes. After completing BS and MS degrees, he began doctoral research at the University of Texas at Austin. While being co-advised by Professor Christopher W. Bielawski and Professor C. Grant Willson, Andrew completed his thesis research focused on the synthesis and applications of annulated bis(imidazolium) chromophores in 2007. He then took an NIH postdoctoral position at the California Institute of Technology under the mentorship of Professor Robert H. Grubbs. There, he developed new catalysts and methods for the synthesis of cyclic polymers. He returned to the Pacific Northwest as an Assistant

Professor of Chemistry at the University of Washington in 2010 and was promoted to Associate Professor with tenure in 2016. In 2018, he moved to the University of Wisconsin as the Yamamoto Family Professor of Chemistry, where he also holds affiliate appointments in the Department of Chemical and Biological Engineering and Department of Materials Science and Engineering. His research group currently focuses on developments in the areas of polymer synthesis, mechanochemical transduction, and additive manufacturing (3D printing).



Sylvain Caillol was born in 1974 in Sète, France. He received his M.Sc. degree in Chemistry from the Engineering School of Chemistry of Montpellier. Then, he received his PhD degree in 2001 from the University of Bordeaux. Subsequently, he joined the company Rhodia. Later, after being promoted to Department Manager, he headed the Polymer Research Department in the Research Center of Aubervilliers. In 2007 he joined the CNRS at the Institute Charles Gerhardt of the University of Montpellier where he started a new research topic dedicated to green chemistry and speciality polymers. He is a co-author of more than 150 articles, patents and book chapters and is a member of the Editorial Boards of *European Polymer Journal* and *Green Materials*. He is Chairman of the "Oleochemistry, Molecule and Polymer Science" division of the European Federation of Lipids. He won the Innovative Techniques for Environment award in 2010 and the Green Materials Prize in 2018.



Luis M. Campos is an Associate Professor in the Department of Chemistry at Columbia University. He was born in Guadalajara, Mexico, and moved at the age of 11 to Los Angeles, California. He received a B.Sc. degree in Chemistry from CSU Dominguez Hills in 2001, and a Ph.D. from the Department of Chemistry & Biochemistry at UCLA in 2006 working under the supervision of M. A. Garcia-Garibay and K. N. Houk. At UCLA, he was awarded the NSF Predoctoral Fellowship, the Paul & Daisy Soros Fellowship, and the Saul & Silvia Winstein Award for his graduate research in solid-state photochemistry. Switching to materials chemistry, he went to UCSB as a UC President's Postdoctoral Fellow to work under the supervision of C. J. Hawker at the Materials Research Laboratory. At Columbia, his group's research interests lie in polymer chemistry, self-assembly, and organic electronic materials. To date, he has co-authored over 80 articles and 12 patents; and he has received various awards, including the ACS Arthur C. Cope Scholar Award, ONR Young Investigator Award, NSF CAREER Award, 3 M Non-Tenured Faculty Award, I-APS Young Faculty Award, the *Journal of Physical Organic Chemistry* Award for Early Excellence, and the Polymers Young Investigator Award. In addition to these research accolades, Luis has been recognized for his pedagogical contributions by the Cottrell Scholar Award, Columbia University Presidential Teaching Award, and the Camille Dreyfus Teacher-Scholar Award.



Eugene Y.-X. Chen came to the United States for graduate studies from China in 1991 and received his Ph.D. degree from the University of Massachusetts, Amherst, in 1995, under the direction of late Professors James Chien and Marvin Rausch. After a postdoctoral stint at Northwestern University with Professor Tobin Marks, he joined The Dow Chemical Company in late 1997, where he was promoted from Sr. Research Chemist to Project Leader. He moved to Colorado State University in August 2000, where currently he is the John K. Stille Endowed Chair in Chemistry and the Millennial Professor of Polymer Science & Sustainability. His research interests encompass broadly the areas of polymer science, green and sustainable chemistry, and catalysis.



Antoine Debuigne is a permanent researcher of the National Fund for Scientific Research (FNRS) at the University of Liege, Belgium. He obtained his Ph.D. from the University of Liege in 2004 under the supervision of Prof. Robert Jérôme in the Center for Education and Research on

Macromolecules (CERM). After graduation, he was a postdoctoral fellow in the group of Prof. Michael K. Georges at the University of Toronto and developed controlled radical polymerization methods under emulsion conditions. In 2006, he returned to Liege as a FNRS Postdoctoral Researcher and was promoted to a FNRS Research Associate in 2010 at the CERM. His research interests deal with macromolecular engineering essentially based on radical chemistry and emulsion polymerization.



Jianzhong Du received his PhD in chemistry in 2004 from the Institute of Chemistry, Chinese Academy of Sciences. Then, he worked as a research fellow at the University of Sheffield (2004–2008), the University of Cambridge and the University of Warwick (2008–2010). He was an Alexander von Humboldt fellow in Germany (2006). He was appointed as an ‘Eastern Scholar’ professor at Tongji University in Shanghai in 2009, and an adjunct Professor in Shanghai Tenth People’s Hospital in 2015. Currently, he is Head of Department of Polymeric Materials, Tongji University. His research interests focus on the synthesis and application of smart and functional polymers and polymer vesicles. He has wide research interests in the interdisciplinary bridging between polymer science, nanomedicine, and materials science, such as controlled drug delivery, gene delivery, antibacterial materials, theranostic vesicles, the treatment of diabetes, *etc.* Since 2003, he has published 65 papers as the corresponding author and 14 papers as the first author

in *Chem. Soc. Rev.*, *Prog. Polym. Sci.*, *J. Am. Chem. Soc.*, *Angew. Chem.*, *Adv. Mater.*, *Chem. Sci.*, *ACS Nano*, *Nano Lett.*, *ACS Macro Lett.*, *Polym. Chem.*, *Macromolecules*, *Biomacromolecules*, *etc.* He received the National Award for the Progress in the Science and Technology in 2016 and the Innovative Research Article Award for Basic Research in Polymer Science, Chinese Chemical Society in 2017. He is a fellow of the Royal Society of Chemistry (FRSC), a member of the *Biomacromolecules* Editorial Advisory Board, and a Committee Member of the Division of Polymer Science, Chinese Chemical Society.



Nathan C. Gianneschi received his B.Sc (Hons) at the University of Adelaide, Australia, in 1999. In 2005 he completed his Ph.D at Northwestern University. Following a Dow Chemical postdoctoral fellowship at The Scripps Research Institute, in 2008 he began his independent career at the University of California, San Diego, where, until June 2017, he was a Teddy Traylor Scholar and a Professor of Chemistry & Biochemistry, NanoEngineering and Materials Science & Engineering. In July 2017, Nathan moved his research group to Northwestern University where he is currently a Jacob & Rosaline Cohn Professor of Chemistry, Materials Science & Engineering, and Biomedical Engineering. The Gianneschi group takes an interdisciplinary approach to nanomaterials research with a focus on multifunctional materials with interests that include biomedical applications, programmed interactions with bio-

molecules and cells, and basic research into nanoscale materials design, synthesis and characterization. For this work, he has been awarded the NIH Director's New Innovator Award, the NIH Director's Transformative Research Award and the White House's highest honor for young scientists and engineers with a Presidential Early Career Award for Scientists and Engineers. Nathan was awarded a Dreyfus Foundation Fellowship, and is a Kavli Fellow of the National Academy of Sciences, a Fellow of the Royal Society of Chemistry, and an Alfred P. Sloan Foundation Fellow.



Matthew I. Gibson holds a personal chair joint between the Department of Chemistry and the Medical School at the University of Warwick, UK. He obtained his undergraduate degree (2003) and PhD (2007) from the University of Durham, UK, working with Prof. Neil Cameron. After a postdoc at EPFL with Prof. Harm-Anton Klok, Matt was appointed at Warwick in 2009 and promoted to Full Professor in 2016. Matt holds an ERC starting grant and has won several awards including the MacroGroup Young researchers medal, the Dextra medal for Carbohydrate Science, the PAT young talent prize and the 2018 *Macromolecules/Biomacromolecules* Young Investigator Prize. Matt's research addresses health-care challenges including pathogen detection/neutralisation and new technologies for the storage and transport of biologics using a combination of polymer and glyco-science.



E. Bhoje Gowd was born in Kummara Nagepalli, Anantapur district, Andhra Pradesh. He received his B.Sc. and M.Sc. (Tech) in Polymer Science and Technology from Sri Krishnadevaraya University, Anantapur, Andhra Pradesh, and his Ph.D. from the University of Pune, Pune (work carried out at CSIR-National Chemical Laboratory under the guidance of Dr C. Ramesh). He worked as a post-doctoral fellow in Prof. Kohji Tashiro's group at the Toyota Technological Institute, Nagoya, Japan, and as an Alexander von Humboldt Fellow in Prof. Manfred Stamm's group at the Leibniz Institute of Polymer Research, Dresden, Germany. After a short stay at the Indian Institute of Science, Bangalore, as a Centenary post-doctoral fellow in Prof. S. Ramakrishnan's group, he joined the National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, as a DST-SERB Ramanujan Fellow. In 2011, he accepted the Senior Scientist position at CSIR-NIIST. He was awarded an IUSSTF research fellowship by Indo-US Science and Technology Forum in 2014 (Stony Brook University, Stony Brook, NY, USA) and the Raman Research Fellowship by CSIR, Government of India, in 2018 (National Tsing Hua University, Hsinchu, Taiwan). He was the recipient of the Materials Research Society of India (MRSI) Medal in 2016 and the Professor Kaushal Kishore Memorial Award of The Society for Polymer Science, India (SPSI) in 2018. He has authored more than 50 publications in peer-reviewed journals, edited a book and contributed to 4 book chapters. He has been invited

to deliver talks at different forums from countries like Japan, USA, Italy, France, Germany, China, and Taiwan. His research interests are in the areas of polymer self-assembly, nanostructured materials, polymorphic phase transitions in semicrystalline polymers, polymer/inorganic hybrid nanocomposites, polymer-solvent complexes and biodegradable polymers.



Tijana Z. Grove received her Ph.D. degree from Iowa State University and postdoctoral training from Yale University. She established a nationally and internationally recognized research program at the intersection of chemistry, materials science, and biotechnology while a faculty member in the Virginia Tech Chemistry Department from 2011 to 2019. Currently, Tijana is the principal and founder of Zarkovic Grove Consulting, LLC, specializing in nanoscience, analytical, materials, and protein chemistry.



Eva Harth is a Professor of Chemistry at the University of Houston, Texas. She previously held positions as Assistant

and Associate Professor at Vanderbilt University after conducting postdoctoral research at the IBM Almaden Research Center and a PhD from the MPI of Polymer Research in Mainz, Germany. Her research group is interested in new polymerization methodologies and novel materials for biomedical applications. The recent discovery of the Metal-organic Light Initiated Radical (MILRad) polymerization is a current focus and she explores the merging of insertion and radical polymerization techniques.



June Huh received his B.S. (1990) and M. S. (1992) degrees in Fiber and Polymer Science from Seoul National University and his Ph.D. (1998) in theoretical polymer physics from the University of Groningen, the Netherlands. He was a postdoctoral research fellow at the University of Pittsburgh and has worked at Seoul National University, Yonsei University, and Korea University as a research professor. Since 2018, he has been an Associate Professor of the Department of Chemical and Biological Engineering at Korea University. June has a speciality in the theoretical and computational modeling for various soft matter systems, such as polymer amphiphiles, proteins, and nanoparticles. His recent interest focuses on developing

force fields for polymeric molecules in a coarse-grained description.



Marleen Kamperman is interested in the biologically-inspired synthesis of polymers and nanostructured surfaces with controlled adhesive and mechanical properties. She received her PhD in Materials Science & Engineering from Cornell University, Ithaca, NY, where she worked in the group of Prof. Wiesner on the development of ordered mesoporous high-temperature ceramics using block copolymers. From 2008 to 2010, she was a postdoctoral researcher in the Functional Surfaces group of Prof. Arzt at INM – Leibniz Institute for New Materials in Saarbrücken, Germany, where she worked on the development of bio-inspired responsive adhesive systems. She started her group 'Bioinspired Functional Polymers' at Wageningen University in the Physical Chemistry and Soft Matter department in September 2010. In 2015, she became a member of the Dutch Young Academy. In 2018 she was appointed Full Professor in Polymer Science at the University of Groningen. In the new research group that she established in Groningen she combines her experience in polymer science and material development with her interest in bio-inspiration. In 2018 she was awarded the

Van Marumpenning from the Royal Netherlands Chemistry Society.



Andrea M. Kasko is a Professor in the Department of Bioengineering at UC Los Angeles. She received her B.S. in Chemistry from the University of Michigan in 1997, her M.S.E. in Macromolecular Science Engineering from Case Western Reserve University in 1999 (working with Professor Virgil Percec), and her PhD in Polymer Science at the University of Akron in 2004 (working with Professor Coleen Pugh). After two years of post-doctoral research sponsored by the Howard Hughes Medical Institute working with Professor Kristi Anseth at the University of Colorado, Boulder, Andrea joined the Bioengineering Department at UCLA in 2006. She currently serves as Vice Chair of the ACS Division of Polymer Chemistry. In recognition of the creative nature of her work, Andrea received the NIH Director's New Innovator Award. Andrea leads a multi-disciplinary research program focusing on the synthesis and characterization of novel polymeric materials for use in biomedical, drug delivery and tissue engineering applications, and biomimetic materials, including glycomimetics, lignin-derived materials, antimicrobial peptides, and their conjugates.



Roxanne E. Kieltyka received her BSc in Materials Chemistry from the University of Toronto (Toronto, Canada) in 2003. She then joined the group of Hanadi Sleiman at McGill University (Montreal, Canada) to work on the development of novel platinum-based complexes for the targeting of G-quadruplexes as an anticancer strategy. After receiving her PhD in 2009, she became a postdoctoral researcher in the group of Bert Meijer at the Eindhoven University of Technology (Eindhoven, the Netherlands) in the area of supramolecular materials. Since 2013, Roxanne is an Assistant Professor within the Supramolecular and Biomaterials Chemistry group at Leiden University (Leiden, the Netherlands). In 2018 she was named one of the Talented 12 by Chemical and Engineering News (C&EN). Her research focuses on the development of supramolecular biomaterials, ranging from studying their self-assembly to engineering applications in the healthcare area.



Bumjoon J. Kim has been a Professor in the Department of Chemical and Biomolecular Engineering at KAIST since 2008, where he is appointed as the

KAIST Endowed Chair Professor. He completed his doctorate under the guidance of Prof. Edward Kramer at UCSB. Then, he worked with Prof. Jean Fréchet at UC Berkeley. His research interests include the development of block copolymer-based functional materials, including shape-tunable particles, colorimetric sensors, and the design of new electroactive polymers for all-polymer solar cells with high stability. He has guided 22 Ph.D. theses. He was appointed as the Ewon Assistant Professor at KAIST (2010–2013). Also, he received the KAIST Academic Excellence Award (2015) and the Shimgye Science Award (2017), and he was selected as the 2013 Young Scientist by the World Economic Forum (DAVOS Forum). He currently serves as an editorial advisory board member of *Macromolecules*, *ACS Macro Letters*, *Chemistry of Materials* (ACS), *J. Mater. Chem. A* (RSC) and *BMC Energy* (Springer Nature).



Harm-Anton Klok studied chemical technology at the University of Twente (Enschede, the Netherlands) and received his Ph.D. from the University of Ulm (Germany, M. Möller). After postdoctoral research at the University of Twente (D. N. Reinhoudt) and the University of Illinois at Urbana-Champaign (USA, S. I. Stupp), he joined the Max Planck Institute for Polymer Research (Germany, K. Müllen). He was appointed to the faculty of EPFL in 2002. His research interests include polymer surface and interface science, polymer nanomedicine and polymer synthesis and functionalization.



John B. Matson received his undergraduate degree majoring in Chemistry and German in 2004 at Washington University in St Louis, carrying out undergraduate research with Professor Karen Wooley. He then moved to Caltech to pursue a PhD in the area of polymer synthesis with Professor Bob Grubbs. He graduated in 2009 and moved to Northwestern University, where he was an NIH-funded postdoctoral scholar working on peptide-based biomaterials with Professor Sam Stupp. In 2012 he began his independent career at Virginia Tech in the Department of Chemistry, where he was promoted to Associate Professor in 2018. He has received a number of awards, including the NSF CAREER Award and the Camille Dreyfus Teacher-Scholar Award. His group focuses on macromolecular and supramolecular chemistry with applications in biology, medicine, and sustainability.



Michiya Matsusaki received his Ph.D. degree in 2003 under the direction of Prof. Mitsuru Akashi from Kagoshima University. He started his academic career as a Postdoctoral fellow at Osaka

University from 2003 to 2005. During this period, he was a visiting scientist at the Prof. Carl A. K. Borrebaeck laboratory in 2004 at Lund University. In 2006, he joined the Department of Applied Chemistry in the Graduate School of Engineering at Osaka University, Japan, as an Assistant Professor. He was promoted to Associate Professor in 2015. He is a JST-PRESTO researcher (concurrent position) from 2008 to 2011 and 2015 to present. He has received 16 awards. He has published 130 peer-reviewed papers (3500 citations, *h*-index = 34). He is an Editorial Board Member of *PLoS ONE* and *Scientific Reports*. His research interests are functional polymers and biomaterials for biomedical and tissue engineering applications.



Damien Montarnal obtained his PhD from ESPCI ParisTech, France, in 2011, where he worked on supramolecular self-healing materials and initiated the concept of vitrimers under the supervision of L. Leibler and F. Tournilhac. He subsequently moved to UC Santa Barbara as a postdoctoral researcher with Craig Hawker, Edward Kramer and Glenn Fredrickson, working on block copolymer self-assembly. Damien is currently a CNRS research scientist in the Laboratory of Chemistry, Catalysis, Polymers and Processes at the University of Lyon. His research interests encompass all polymer materials in which supramolecular interactions or reversible chemistry can modulate

the structure, dynamics or physical properties.



Renaud Nicolay is Professor at ESPCI Paris where he is leading the research group “Chemistry and Macromolecular Design” within the laboratory “Molecular, Macromolecular Chemistry and Materials”. His research focuses on dynamic covalent chemistry and aims at developing new synthetic methodologies, as well as designing responsive formulations, vitrimers and structured materials. In this context, radical polymerization is a tool of choice to prepare functional polymers while controlling their topology. The introduction of dynamic chemical bonds in these systems gives access to materials that combine recyclability with superior mechanical, thermal and chemical resistance, as well as to materials and formulations whose connectivity and flow properties can be modulated by various stimuli.



Anjun Qin received his BS and PhD degrees from Shanxi University and the

Institute of Chemistry, Chinese Academy of Sciences, in 1999 and 2004, respectively. He did his postdoctoral research at the Hong Kong University of Science & Technology and Zhejiang University in 2005–2008. He joined Zhejiang University as an Associate Professor in 2008 and moved to South China University of Technology with promotion to Full Professor in 2013. His current research interests include the development of new polymerizations based on triple-bond building blocks and constructions of organic/polymeric functional materials for high-tech applications.



Megan L. Robertson received her Ph.D. in Chemical Engineering from the University of California, Berkeley, and obtained experience as a Postdoctoral Research Associate at the University of Minnesota and Senior Scientist at Rohm and Haas, before joining the faculty of the Department of Chemical and Biomolecular Engineering at the University of Houston in the Fall of 2010. Megan’s research interests include advanced polymer synthesis and characterization methods, nanostructured and microstructured polymers, self-assembly processes, and thermodynamics of multicomponent materials. Her group is currently working in five areas of emphasis: (1) sustainable and biodegradable polymers derived from renewable resources, (2) advanced materials for wind energy, (3) structure and dynamics of block copolymer micelles, (4) pH-responsive,

antifouling polymer brushes, and (5) multicomponent and multiphase polymer blends.



Maud Save graduated with a M.Sc from the University of Bordeaux where she was introduced to polymer science in the research laboratory of Prof. Michel Fontanille. After completing her PhD in ring opening polymerization of cyclic esters with Prof. Alain Soum at the University of Bordeaux (2000), she worked as a Postdoctoral Researcher in the group of Steven P. Armes at Sussex University (UK). In 2002 she joined the group of Prof. Bernadette Charleux in Paris at the Université Pierre et Marie Curie as a CNRS Junior researcher where she developed research on controlled radical polymerizations and emulsion polymerizations. She participated in the pioneering research on the PISA (polymerization-induced self-assembly) process implemented in emulsion polymerizations. Then, in 2008, she moved to the IPREM laboratory at the University of Pau and Pays de l'Adour (France) and was promoted to full Senior Researcher by CNRS in 2015. Her research focuses on the synthesis and characterization of functional polymeric colloids and stimuli-responsive microgels using free or controlled radical polymerization in dispersed media. She also leads projects on polymers/emulsifiers from renewable resources.



Felix H. Schacher studied chemistry at the Universities of Bayreuth (Germany) and Lund (Sweden) and obtained his diploma in 2006. After his PhD under the supervision of Axel H. E. Müller in 2009, he joined the group of Ian Manners at the University of Bristol as a DAAD postdoctoral fellow. In 2010 he was appointed as a Junior Professor at the Friedrich-Schiller-Universität Jena and became a Full Professor at this institution in 2015. He has been awarded the Dr-Hermann-Schnell-Fellowship of the GDCh in 2013. His scientific interests include controlled/living polymerization techniques, block copolymers, polyelectrolytes, and polyampholytes – all in the context of using (directed) self-assembly processes for material design in the fields of membranes, hybrid materials, and biomedicine.



Michael P. Shaver, FRSC, is a Professor of Polymer Science in the School of Materials at the University of Manchester where he leads initiatives in

sustainable polymers, plastics and materials for the School and for the Henry Royce Institute, the UK's national materials science centre. Following a PhD in his native Canada from the University of British Columbia and an NSERC Post-Doctoral Fellowship at Imperial College London, he began his independent research career at the University of Prince Edward Island before moving to Scotland in 2012 where he was a Chancellor's Fellow, Reader and Professor of Polymer Chemistry. He leads the Green Materials Laboratory on the development of sustainable materials, including new motifs for renewable, degradable and chemically recyclable materials. His work ranges from fundamental projects rooted in monomer design to working with industrial partners in plastic packaging, medical diagnostics and sustainable materials. He was the inaugural Editor-in-Chief of the international journal *Green Materials* before his current role as Editor of the *European Polymer Journal*. He has been recognised with >80 invited lectures, the MacroGroup Young Polymer Scientist award (2015), the Young Academy of Scotland (2014–2018), a Fellowship in the RSC (2018) and two Canada Foundation for Innovation Leadership Awards (2010, 2012).



Raja Shunmugam received his bachelor's degree in 1994 and master's degree in 1996 from V. O. C. College, Manonmaniam Sundaranar University,

Tamil Nadu. He received his Ph.D. from the Indian Institute of Technology Madras under the guidance of Professor R. Dhamodharan. He then joined Professor Gregory N. Tew's laboratory in the Polymer Science and Engineering Department at the University of Massachusetts, Amherst, as a post-doctoral research associate from 2003 to August 2008. From September 2008 to 2013, he was an Assistant Professor in the Department of Chemical Sciences at the IISER-Kolkata. From January 2014 to September 2018, he was an Associate Professor in the Department of Chemical Sciences at the IISER-Kolkata. He was the Head of Department from February 2014 to March 2016. From October 2018 onwards, he is a full Professor in the Department of Chemical Sciences. He was a recipient of the prestigious Ramanujan Fellowship from the Department of Science and Technology, Government of India. He received a Joint Runner-Up award in the 6th National Award for Technology Innovation under the Polymeric Materials category, 20 January 2016, for his arsenic sensing work. He also received a Joint Winner Award in the 7th National Award for Technology Innovation under the Polymeric Materials category, 1 March 2017, for developing sensors for nerve agents. In 2018, again his group received a Joint Runner-Up award in the National Award for Technology Innovation under the Polymeric Materials category for developing new polymers for drug delivery applications.



Stuart C. Thickett is a Senior Lecturer in Chemistry at the University of Tasmania.

He received his PhD from the University of Sydney in 2008 under the supervision of Professor Robert Gilbert in the area of emulsion polymerization kinetics and mechanism. He has held post-doctoral positions at the University of Toronto and the University of Sydney, working in the areas of polymer nanoparticle and polymer thin film design. In 2012 he joined the Centre for Advanced Macromolecular Design (CAMD) at UNSW as a Vice-Chancellor's Research Fellow, and was appointed Lecturer at the University of Tasmania in 2015. Stuart's research interests primarily focus on the physical chemistry of soft matter, namely polymer nanoparticles, colloids and interfaces, where he utilizes advanced polymerization techniques for the design of new materials. Stuart has published 49 journal articles in his career to date and presented his work at over 70 national and international conferences.



Ling-Shu Wan received his BS and PhD degrees from Nanjing Tech University and Zhejiang University, in 2002 and 2007, respectively. He joined Zhejiang University in 2007 and was promoted to Full Professor in 2015. He visited the University of Chicago in 2012–2013. His current research interests include isoporous separation membranes and polymer surface and interface science.



Ying-Wei Yang received his degrees (BSc in 2000 and PhD in 2005) from Nankai University, and gained postdoctoral training at Arizona State University (with John Chaput), UCLA (with Sir Fraser Stoddart), and UC Irvine (with Zhibin Guan) from 2005 to 2010. He became an Associate Professor of Chemistry at Jilin University in 2011, and was promoted to Full Professor in 2014. He has published over 140 peer-reviewed scientific papers. His research centers on organic supramolecular chemistry, multifunctional hybrid materials, and stimuli-responsive polymers. He was named one of the world's most Highly Cited Researchers for 2017 by Clarivate Analytics, and one of the 2017 Chinese Most Cited Researchers by Elsevier.