

POLY-CHAR [Auckland] 2023

by Jianyong Jin, *Conference Chair*

The **2023 Annual World Forum on Advanced Materials**, POLY-CHAR [Auckland] 2023, was held 22-26 January. The University of Auckland, New Zealand, hosted the event under the auspices of the POLY-CHAR Scientific Committee. This was an IUPAC-endorsed conference and sponsored by Groupe Nutriset (Platinum Sponsor), Netzsch (Workshop Sponsor), Anton Paar (Exhibitions Sponsor), 100% Pure New Zealand (Marketing Sponsor), with Photon Factory and the University of Auckland School of Chemical Sciences as Conference Sponsors.

After postponement from January 2021, POLY-CHAR [Auckland] 2023 was the first live conference to be hosted after the two purely digital events of POLY-CHAR [Venice] 2021 and POLY-CHAR [Halle-Siegen] 2022. The local organising committee chair, Prof. Jianyong Jin, reflected "it is really pleasing that offline conference has resumed. The POLY-CHAR regular attendees and newcomers are able to gather in-person after years of suspension during the pandemic." The scientific and organising committees of POLY-CHAR were extremely grateful for the participation of 178 scientists from 29 countries: a total of 7 plenary speakers, 15 showcase speakers, 27 keynote speakers, 43 oral speakers and 19 poster presenters. The four-day conference plus one-day pre-conference workshop covered nine technical themes ranging

from traditional polymer physics and characterisation, synthetic polymer chemistry, and biological functional polymers, to cutting edge research areas of polymers additive manufacturing (3D/4D printing), aggregation induced emission mechanisms, biomedical imaging, photovoltaic materials, porous polymers for separation membrane, and double network gels.

POLY-CHAR is a non-profit, non-governmental organisation fostering a friendly environment for sharing information, establishing student exchange, and strengthening international cooperation. The conference series provides an inclusive platform for scientists from all over the world working in the fields of materials science and, in particular, polymer characterization and polymer materials science and technology. POLY-CHAR is driven by ground-breaking polymer research from synthesis all the way to applications. An important goal of POLY-CHAR is offering a forum for PhD students and young researchers to create their own scientific networks and experience a vested scientific community. POLY-CHAR will always be committed to improving our world through education and distribution of knowledge.

POLY-CHAR has the tradition of a full-day pre-conference Short Course for PhD students and early-career polymer chemists. POLY-CHAR 2023 was no exception. On Sunday the 22nd of January, seven prestigious researchers delivered graduate-level tutorial presentations on the following topics:

- Thermal Analysis and Rheology in Polymer Additive Manufacturing – Natalie Rudolph (virtual)



Opening ceremony of POLY-CHAR 2023 in the Sir Owen G Glenn Building of the University of Auckland.

The iconic building stands as a place of convergence for business, academia and government, and through traditional Māori culture, it stands as symbolic links between manuhiri or visitors, students and staff, between the past and the present and the North and South Islands.



- What is Science? - Jean-Marc Saiter
- Polymer Crystallization and its Kinetics – Alejandro J. Müller
- Rheology and Thermal Characterization of Polymer Systems – Michael Hess
- Dynamic Light Scattering: Basics, Rules, and Application to Polymer Science – Sergej Filippov
- Thermodynamics of Polymer Solutions and Blends – Volker Abetz
- 3D printing with polymers – Domagoj Vrsaljko

On the morning of 23 January, POLY-CHAR 2023 officially began with a Māori welcoming ceremony called pōwhiri. The opening remark was delivered by the president of POLY-CHAR, Jean-Marc Saiter. Michael Hess gave an overview of IUPAC and polymer division activities. Obituaries for deceased colleagues and SciComm members were read during the opening ceremony: Melissa CHAN Chin Han, Raj Pal Singh and Dusan Berek were remembered. The first plenary presentation was given by Volker Abetz on the topic of polymer membranes and vitrimers, which set the stage for the engaging days to follow. The first day concluded with a welcome reception featuring New Zealand wine and beers.

Besides the intense technical programme, all delegates enjoyed a half-day conference excursion to explore the beautiful west coast of Auckland on Tuesday the 24th of January. The huge waves of the Tasman Sea and thousands of gannet birds nesting at Muriwai Beach were spellbinding.

On Tuesday evening, the POLY-CHAR scientific committee annual meeting was held at the historical Old Government House, which was completed in 1856 and played an important part in the government of New Zealand until 1865, when the capital was moved to Wellington. The international Scientific Committee of POLY-CHAR elected Ricardo Manríquez-González

(University of Guadalajara, Mexico) and Costas S. Patrickios (University of Cyprus) as new members.

Another key social event was the conference dinner at the Hilton Hotel on the Wednesday night of January 25th. Warm conversations, delicious food, music and a selection of New Zealand wines filled the unforgettable evening. Ralph Cooney delivered a banquet talk on New Zealand nature, science, history and economy.

At the closing ceremony on Thursday the 26th of January, outstanding researchers were honoured with POLY-CHAR awards, named in honour of three distinguished Nobel Laureates: The **Richard Robert Ernst Award** went to Marian A. GÓMEZ-FATOU Rodríguez, Instituto de Ciencia y Tecnología de Polímeros, CSIC, Madrid, Spain. The **Jean-Marie Lehn Award** was awarded to Domagoj VRSALJKO, University of Zagreb, Zagreb, Croatia. The **Pierre-Gilles de Gennes Award** was awarded to Melissa CHAN Chin Han, MARA University of Technology, Selangor, Malaysia.

Three **POLY-CHAR Awards for the best oral presentations from students and young scientists** were awarded: to Chris Bainbridge, The University of Auckland, Auckland, New Zealand, for the presentation entitled “RAFT-based networks as a 4D polymer platform”; to Patakorn Pilasen, Chulalongkorn University, Bangkok, Thailand for the presentation entitled “Thermoplastic starch vitrimer through thermoreversible Diels-Alder”; and to Kawaljit Kaur, University of Siegen, Siegen, Germany for the presentation entitled “Towards spatially targeted eradication of antimicrobial-resistant bacteria: Novel polymer-based antimicrobial photodynamic therapy.”

The **IUPAC Prizes for the best poster presentations**, including a one-year free membership to IUPAC, were awarded to Sebastian Balser, Goethe University Frankfurt, Frankfurt a.M., Germany, for the poster entitled “Preparation and characterization of highly conductive and biorepulsive Polypyrrole/Polyglycerol Surface Films”; to Pawel Grzybek, Silesian University

of Technology, Gliwice, Poland for the poster entitled “Alginate composite membrane filled with silver and nickel nanowires—characteristic and application in pervaporation dehydration of ethanol”; and to Patrick Imrie, The University of Auckland, Auckland, New Zealand for the poster entitled “Direct-ink-write 3D printing of “living” polymer hydrogels via type I photoinitiated RAFT polymerization.”

The **POLY-CHAR Awards for the best poster presentations from students and young scientists** were awarded to Lakshmi Mukundan, Indian Institute of Technology Kharagpur, Kharagpur, India for the poster entitled “Polycaprolactone encrusted bioactive glass antibiotic nanohybrid through drug mediated surface initiated polymerization: An overcoat approach for modulated burst release”; to Krishnendu Nath, Indian Institute of Technology Kharagpur, Kharagpur, India for the poster entitled “Facile preparation of light-weight biodegradable and electrically conductive polymer-based nanocomposites for superior electromagnetic interference shielding effectiveness”; and to Devon Bryant, The University of Auckland, Auckland, New Zealand for the poster entitled “Novel conducting polymer sensor for the detection and analysis of biothiols.”

This year, there have been additional **POLY-CHAR [Auckland] 2023 awards for the best poster presentation from students and young scientists, sponsored by The University of Auckland**, that were awarded to Liam van Mechelen, The University of Auckland, Auckland, New Zealand for the poster entitled “Harakeke Reinforced Furan Bio-Composites”; to Danny McDougall, The University of Auckland, Auckland, New Zealand for the poster entitled “What makes mussels stick?”; and to Mahdiah Ghofrani, Victoria University of Wellington, Lower Hutt, New Zealand for the poster entitled “Towards the methylation analysis of heparan sulfates”.

The approaching POLY-CHAR conference, “POLY-CHAR [Madrid] 2024: Polymers for our Future”, will take place in Madrid, Spain, 27-31 May 2024.

Sustainability and Inclusivity: An Interdisciplinary Conversation

by Liana Vaccari, Kristin A. Bennett, Ana Ferreras, Danniebelle N. Haase, Jennifer E. Lansford, A. Ester Sztejn, and Vivian U

No individual discipline alone can solve the issues of sustainability and inclusivity. These are complex interconnected problems with both physical and societal

implications around the globe. For the 2023 IUPAC Global Women's Breakfast (GWB) and in recognition of the International Year of Basic Science for Sustainable Development, the National Academies of Sciences, Engineering, and Medicine of the United States hosted on 14 February an interdisciplinary conversation to build connections across fields and share best practices in support of progress towards sustainability and equity, particularly for women. This event, coordinated by the National Academies' Board on International Scientific Organizations, consisted of a panel with representatives of four fields and U.S. National or Liaison Committees to IUPAC, the International Union of Pure and Applied Physics (IUPAP), the International Union for Crystallography (IUCr), and the International Union of Psychological Science (IUPsyS), moderated by Dr. Ester Sztejn.

Each panelist touched on what sustainability means for their field and related Sustainable Development Goals. Danniebelle Haase, Dow Chemical Company, spoke to her work supporting energy efficiency and considering environmental and health impacts across the lifecycle of products that improve quality of life as well as the contribution of chemistry to zero hunger, good health, and other environmental and health challenges. Similarly, Kristin Bennett, KB Science, addressed crystallography's contribution to drug discovery, work in clean energy, and water quality and sanitation. Jennifer Lansford, Duke University, highlighted the importance of psychology in good health, education, and understanding behavior and ramifications of climate action. Vivian U, University of California, Irvine, emphasized the importance of good health and well-being as well as gender parity for the strength of the field of physics while astrophysicists look to far-flung galaxies and black holes to understand how the phenomena evolved.

IUPAC has supported the GWB annually since 2019 and along with IUPAP participates in a cross-union effort on reducing the Gender Gap in Science. Every three years since 2002, IUPAP has held an International Conference on Women in Physics originating from the eponymous Working Group. IUPAC and IUCr have also recently established internal committees addressing equity and diversity. While there are common goals and challenges across these disciplines, the panel also discussed issues unique to each field and current efforts or best practices. For example, field work in certain disciplines can put women in vulnerable and isolated situations. For psychology, there is gender parity, if not a high proportion of women, but this has not meant that a) women are equally represented in