

Program

Micro-Nano Plastics in Water: Characterization, Cure and Prevention

**July 6-10, 2025
Davos, Switzerland**

Conference Chair

David Hunkeler, Aqua+Tech, Switzerland

Conference Co-Chairs

Nicholas Clesceri, Rensselaer Polytechnic Institute (Emeritus), USA

Albert Gray, USA

Franco Berruti, Western University, Canada



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The conference organizers gratefully acknowledge support from the U.S. National Science Foundation.



Sunday July 6, 2025

15:00 – 17:15	Conference check-in / Hang posters (Aspen Foyer) <i>Coffee available</i>
17:30 – 17:40	Welcome from Conference Chair: David Hunkeler
17:40 – 17:45	Introduction from ECI Conferences Committee Chair: Nick Clesceri
17:45 – 18:30	Keynote: The smallest among us: Microplastics, preterm birth and early human development Kjersti Aagaard, HCA Healthcare, HCA Research Institute and Boston Children's Hospital, USA
18:30 – 20:00	Apéro

NOTES

- *Technical and poster sessions will be in the Aspen Room.*
- *All meals, coffee breaks and Aperero will be in the Aspen Foyer.*
- *The gala dinner on Wednesday will be at the Restaurant Waldhuus (Mattastrasse 58, 7270 Davos).*
- *Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, watches) is **strictly prohibited** during the technical sessions, unless the author and ECI have granted prior permission.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 5 **minutes** for questions.*
- *Please do not smoke at any conference functions.*
- *Turn your cellular telephones to vibrate or off during technical sessions.*
- *After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.*

Monday, July 7, 2025

Breakfast on your own

Session 1: Policy and Health

Chair: Nick Clesceri

09:00 – 09:05 Introduction

09:05 – 09:45 **Invited: Rethinking Nanoplastics: A minute particle has an outsized presence in the human body**
Matthew Campen, University of New Mexico, USA

09:45 – 10:05 **Quantitative analysis and identification of micro and nanoplastics in the Hemisphere of a Human Brain**
Marcus Garcia, University of New Mexico, USA

10:05 – 10:25 **Environmental microplastics promote colon tumorigenesis via PIEZO1–Ca²⁺–ROS signaling and hypoxia-induced metastatic pathways**
(Remote Presentation)
Xiang Xue, University of New Mexico, USA

10:25 – 11:10 Coffee break and networking

Session 2: Characterization / Modeling

Session Chair: Al Gray

11:10 – 11:15 Introduction

11:15 – 11:55 **Invited: Macro-, micro- and nanoplastics: Sources and release**
Bernd Nowack, Empa, Switzerland

11:55 – 12:15 **Formation, molecular reorganization and radical reactivities of real-world micro and nanoplastics in water**
Julie Peller, Valparaiso University, USA

12:15 – 13:45 Lunch

13:45 – 14:30 Free time

Session 3: Characterization/Remediation

Chair: Franco Berruti

14:30 – 14:35 Introduction

14:35 – 14:55 **Microplastics in agroecosystems: Weathering behavior of polyethylene mulch films and their environmental implications**
Yoorae Noh, Michigan State University, USA

14:55 – 15:15 **Innovative microplastic remediation using high temperature plasma**
Edward VanDyne, Plastic 2 Green Inc., USA

15:15 – 16:00 Coffee Break and networking

Monday, July 7, 2025 (continued)

Session 4: Analytical Methods

Chair: Ralf Kaegi

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| 16:00 – 16:05 | Introduction |
| 16:05 – 16:45 | Invited: Representative and reliable quantitative analysis of microplastic particles and fibers down to 1 µm by automated Raman microspectroscopy
Natalia P. Ivleva, Institute of Water Chemistry (IWC), Technical University of Munich (TUM), Germany |
| 16:45 – 17:05 | Analysis of micro- and nanoplastics in commercial drinking water from Saxony-Anhalt
Hardik Vaghasiya, Martin Luther University Halle-Wittenberg, Germany |
| 17:05 – 18:05 | Documentary Screening: <i>Plastic People: The Hidden Crisis of Microplastics</i> |
| 18:05 – 18:35 | Discussion
Moderator: David Hunkeler |
| 18:35 – 20:05 | Apéro |

Tuesday, July 8, 2025

Session 3: Life Cycle Issues

Chair: Linda Wang

- 09:00 – 09:05 Introduction
- 09:05 – 09:45 **Invited: Quantifying impacts of microplastic emissions in Life Cycle Impact Assessment**
Maria Elena Corella Puertas, Technical University of Munich (TUM), Germany
- 09:45 – 10:05 **Microplastics in terrestrial Environments: Challenges for food waste management**
Mina Mohebbi, Middle Tennessee State University, USA

10:05 – 10:50 Coffee break and networking

Session 6: Surface Water and Groundwater

Session Chair: Julien Arnold

- 10:50 – 10:55 Introduction
- 10:55 – 11:35 **Invited: Removal of microplastics from water for beef cattle**
Ignacio Rintoul, CONICET-UNL, Argentina
- 11:35 – 11:55 **Plastics underground: Microplastic pollution in South African freshwater caves and associated biota**
Thendo Mutshekwa, Albany Museum, Rhodes University, South Africa
- 11:55 – 13:25 Lunch
- 13:25 – 14:10 Free time

Session 7: Mitigation and Recycle

Chair: Bernd Nowak

- 14:10 – 14:15 Introduction
- 14:15 – 14:55 **Invited: Destruction of PFAS in biosolids by pyrolysis and thermal oxidation**
Franco Berruti, Western University/ICFAR, Canada
- 14:55 – 15:15 **Assessment of microplastics abundance in roadside soils paved with plastic-modified asphalt: A field study**
Baolin Deng, University of Missouri, USA
- 15:15 – 16:00 Coffee Break and networking

Session 8: Assessment / Treatment

Chair: Mark Wiesner

- 16:00 – 16:05 Introduction
- 16:05 – 16:45 **Invited: Potential of scanning electron microscopy to quantify microplastic particles: Where are the size limits?**
Ralf Kaegi, EAWAG, Switzerland

Tuesday, July 8, 2025 (continued)

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| 16:45 – 17:05 | Assessing the removal of micro- and nanoplastics in variable drinking water treatment plant configurations
Megan Jamison, Ohio State University, USA |
| 17:05 – 17:25 | Evidence of photocatalytic degradation of polyethylene microplastics
Daniel Aragón, Universidad de Cantabria, Spain |
| 17:25 – 17:55 | Poster Previews |
| 17:55 – 19:25 | <u>Poster Session</u> with Apéro (Aspen Room) |

Wednesday, July 9, 2025

Session 9: Treatment

Chair: Al Gray

- 09:00 – 09:05 Introduction
- 09:05 – 09:45 **Invited: Low-pressure hydrothermal processing technologies for conversion of plastic waste to oils or fuels**
Linda Wang, Purdue University, USA
- 09:45 – 10:05 **Size-based ingestion of microspheres and microfibers by two freshwater mussel species (*Dreissena bugensis* and *Elliptio complanata*): Implications for removal of microplastic pollution**
Hannah Collins, University of Connecticut, USA
- 10:05 – 10:25 **Rapid capture of microplastics in continuous flow magnetophoretic systems**
Cristina González-Fernández, University of Cantabria, Spain
- 10:25 – 11:10 Coffee break and networking

Session 10: Personal Care Products

Session Chair: David Hunkeler

- 11:10 – 11:15 Introduction
- 11:15 – 11:35 **Women, wellness, and the planet: A sustainable skincare story by éméo**
Charlotte Julien, éméo SA, Switzerland
- 11:35 – 11:55 **Natural products are a key to beauty**
Ana Jezdimirovic, Bloom, Serbia
- 11:55 – 13:10 Lunch
- 13:30 Meet at Congress Center for departure to Sertig Valley
Bus will be in the parking lot outside of Entrance A on Talstrasse
- 13:30 – 18:30 Excursion to Sertig Valley
The Sertig Valley, a glacial side valley of Davos, was first inhabited in the mid-13th century by the German-speaking Walser people who migrated from Valais and established farming settlements in this challenging environment. It is now recognized as one of Switzerland's most protected regions because of its natural beauty and well-preserved Walser culture and architecture. At the top of the valley are three peaks – Mittaghorn, Plattenhorn and Ducan. We will have the opportunity to explore the valley, listen to alpenhorn musicians and have some refreshments at the Walserhuus Sertig.
- 19:30 – 21:30 Conference dinner (**Restaurant Waldhuus**)

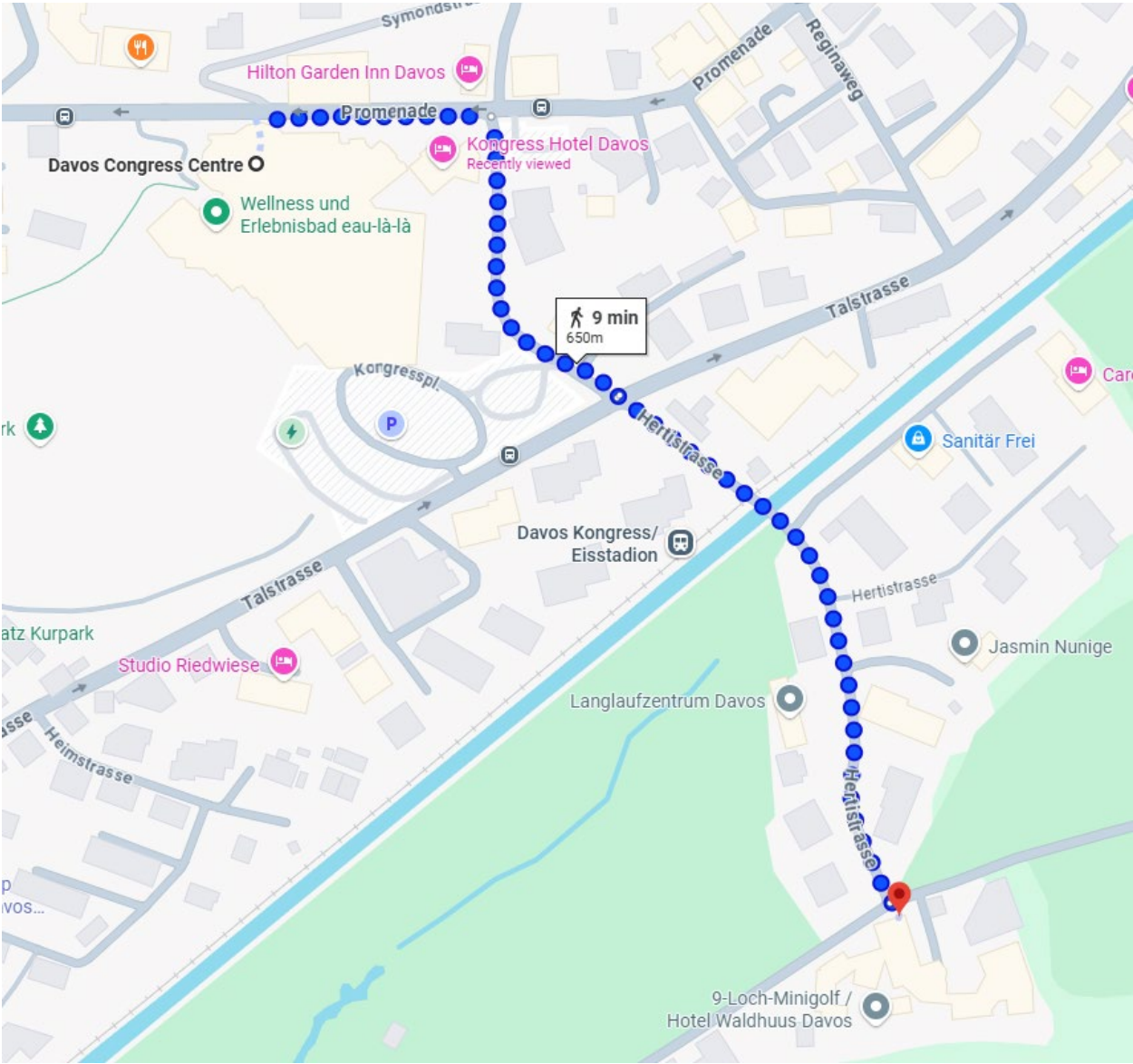
Thursday, July 10, 2025

Session 11: Science and Technology

Chair: Franco Berruti

09:00 – 09:05	Introduction
09:05 – 09:45	Invited: Mitigation of micro-nano plastics facilitated using microbial and nanophotonic degradation, and smart material designs Ashok Vaseashta, International Clean Water Institute, USA
09:45 – 10:05	Plastic waste removal options to minimize local introduction of micro-plastics in Antarctica Clara Alvarez Hernandez, British Antarctic Survey, UK
10:05 – 10:50	Coffee break and networking
10:50 – 11:35	Keynote: Predicting plastic fragmentation and additive release Mark Wiesner, Duke University, USA
11:35 – 12:00	Future Plans Facilitator: Al Gray
12:00 – 13:30	Lunch

Map to Conference Dinner at Hotel Waldhuus from Congress Center (Wednesday evening)



List of Posters

- 1. Integrated membrane and photocatalytic system for effective treatment of plastic pollutants in aquatic environments**
Angela Severino, University of Calabria, Italy
- 2. Microplastic fibers detection in laundry wastewater: An areal quantification based method**
Silvia Lupato, Politecnico di Torino, Italy
- 3. Microbubbles for microplastics removal in water**
Gurmeet Kaur, MicroBubbles GmbH, Germany
- 4. Revealing inefficiencies in sedimentation tanks: Evidence from monitoring particulate pollutant removal**
Mareike Loeffler, MicroBubbles GmbH, Germany
- 5. Enhanced microplastics removal using surface-modified magnetic nanoparticles**
Daniel Aragón, University of Cantabria, Italy
- 6. Removal of microplastics from water using liquid paraffin-induced aggregation**
Christina Davis, Valparaiso University, USA
- 7. Novel porous materials for micro- and nanoplastics analysis**
Monika Lelonek, SmartMembranes GmbH, Germany
- 8. Correlative spectroscopy and microscopy characterization of micro- and nanoplastics in drinking water**
George Sarau, Fraunhofer IKTS, Germany
- 9. Wood based biocoagulant**
David Hunkeler, AQUA+TECH Specialities SA, Switzerland
- 10. Plastic particles in pristine waters? Investigating microplastic pollution in natural springs of Southern Africa**
Thendo Mutshekwa, Rhodes University, South Africa
- 11. Microplastics in bottled water and soft drinks: An emerging concern for public health**
Monika Lelonek, SmartMembranes GmbH, Germany
- 12. Nanoplastic ecocoronas: An emerging hotspot for bacterial evolution**
Neethu Sainjan, University of Copenhagen, Denmark
- 13. Fate and Transport of Microplastics in wastewater treatment plants**
Sam Sherchan, Morgan State University, USA
- 14. Quantitative analysis and identification of micro and nanoplastics in the hemisphere of a human brain**
Marcus Garcia, University of New Mexico, USA
- 15. Do microplastics bioaccumulate in marine life, and are we ingesting them?**
Solaiman Hossain, Chulalongkorn University, Thailand
- 16. Mineralizing PFAS and capturing synthetic fluorine from biosolids using Thermal Treatment Technologies and Metal Additives**
Joshua Cullen, University of Western Ontario, Canada

17. Accelerated biodegradation of biodegradable plastic-derived microplastics in soil and aquatic environments: A comparative study with conventional plastics

Byoung-In Sang, Hanyang University, South Korea