



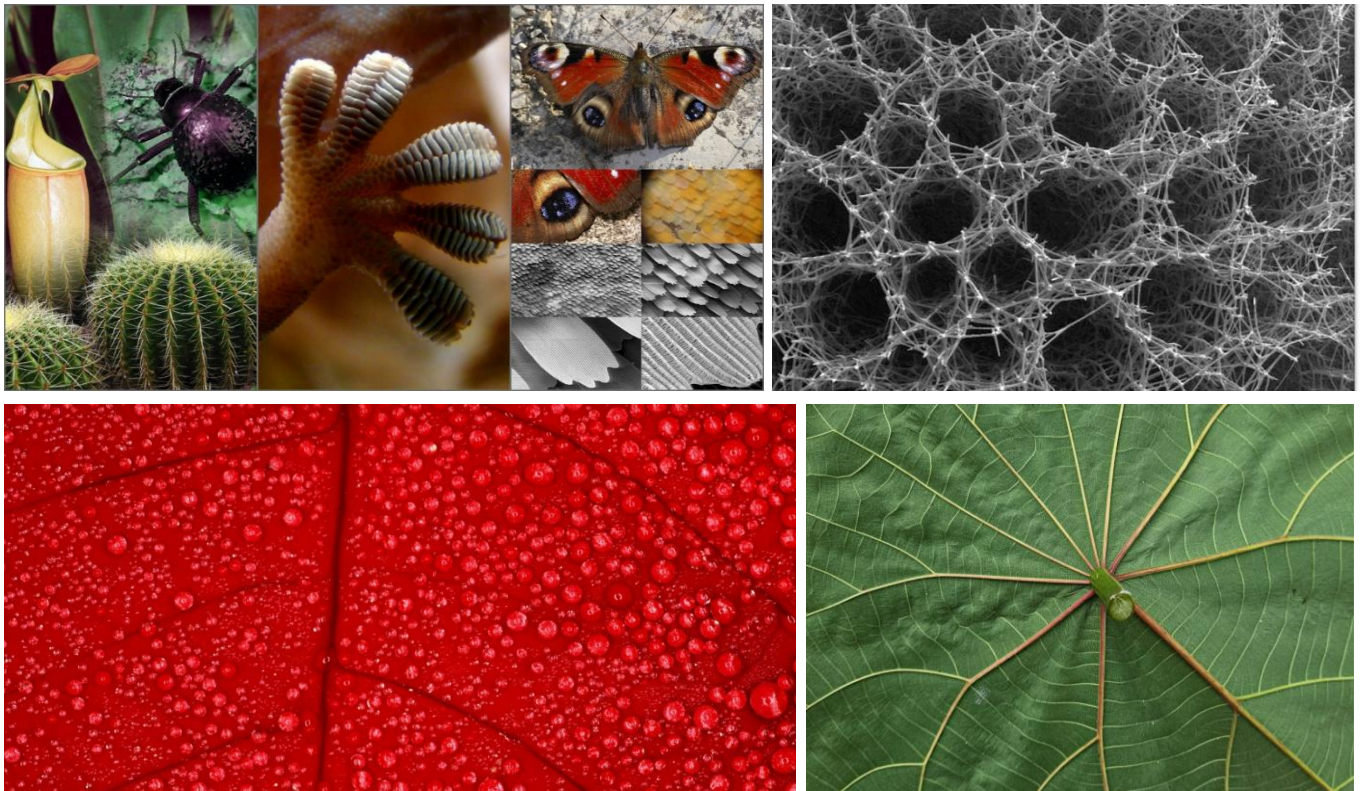
THE 4TH INTERNATIONAL CONFERENCE ON
Nature-Inspired Surface Engineering

NISE 2026

Aug 10–13, 2026



UNIVERSITY OF
TORONTO



<https://ameriscience.org/nise-2026/>



Materials Science & Engineering
UNIVERSITY OF TORONTO

Sponsors



Student Awards: There are 2 'Best Presentation Awards' for young investigators (Ph.D. students), each valued at **\$200**, and we extend our special thanks to MDPI for sponsoring these awards.

Partnering Journals



LANGMUIR



CAMPUS INFORMATION

Venue: Macleod Auditorium (MSB 2158), Medical Sciences Building (MSB), 1 King's College Circle, Toronto, ON M5S 1A8

Posters: C. David Naylor Student Commons, Medical Sciences Building (directly next to the Macleod auditorium)

Poster boards will be set up all day on Aug 11/12.

Emergency Contacts

Campus Safety (Emergency): 416-978-2222

Campus Safety (Non-emergency): 416-978-2323

Nearest hospitals: Toronto General Hospital (200 Elizabeth St.) and Mount Sinai Hospital (600 University Ave.) — both about a 5-minute walk via University Ave.

Wi-Fi Access

The University of Toronto buildings support **eduroam** wifi access, and attendees from an eduroam-participating institution can connect with their home credentials.

For others, UofT faculty or staff can grant access to the eduroam Visitor Access (eVA) guest Wi-Fi by visiting eva.eis.utoronto.ca from a computer connected to the UofT network, UTORvpn. On the eVA website they will find a phone number and a unique passcode that is updated daily. You may also see the passcode on departmental electronic signage.

To connect, text (SMS) the daily passcode to the specified phone number. You will then receive a return SMS message containing your temporary, unique username and password.

Select the Wi-Fi network “eduroam” on your device and login using the credentials you received via SMS message. Once complete, you will have Wi-Fi access on all three U of T campuses for the day. You will need to request new login credentials each day that you require access to the eVA guest Wi-Fi network.

NISE 2026 CONFERENCE ORGANIZATION

CONFERENCE CHAIR



Chang-Hwan Choi is a Professor in the Department of Mechanical Engineering at the Stevens Institute of Technology. He acquired his BS (1995) and MS (1997) in Mechanical & Aerospace Engineering from Seoul National University in Korea. He also earned his MS in Fluids, Thermal, and Chemical Processes from Brown University in 2002. Dr. Choi received his PhD in Mechanical Engineering from the University of California at Los Angeles (UCLA) in 2006, specializing in MEMS/Nanotechnology and minoring in Fluid Mechanics and Biomedical Engineering.

CONFERENCE CO-CHAIRS, Local Organizing Committee



Ben Hatton is a Professor in the Dept of Materials Science and Engineering at UofT. After his PhD (2005, UofT) in mesoporous self-assembly, he worked at the National Institute for Materials Science (NIMS; Tsukuba, Japan), Bell Labs (NJ, USA) and Harvard University (2007-2012). Prof. Hatton leads the **Bio-inspired Materials and Design** group, studying the surface properties of biomaterials and the relationship between surface microstructures, wetting, and microbial contamination. Also, smart/active material design using microfluidics (smart windows for buildings), and self-assembly of hierarchical structures.

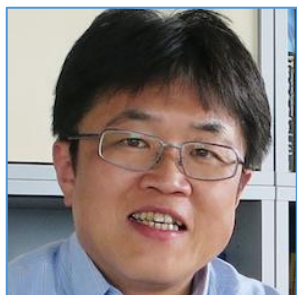


Sushanta Mitra is a Professor in the Department of Mechanical & Mechatronics Engineering and the Executive Director of the Waterloo Institute for Nanotechnology at the University of Waterloo. His research group advances fundamental and applied interfacial science, with notable contributions to understanding bacteria–surface interactions. He is also the inventor of liquid–liquid encapsulation (LLE) technology, a platform that has transformed how active ingredients can be protected and delivered through engineered functional shell layers.

LOCAL ORGANIZING COMMITTEE

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Prof. Sushanta Mitra, U. Waterloo
Prof. Eli Sone, UofT
Chelsea Nguyen, UofT
Kadence Chow, UofT
Akash Chowdhury, U. Waterloo

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Department of Atomic and Molecular Physics, Manipal Academy of Higher Education, India

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Faculty of Materials Science and Applied Chemistry, Riga Technical University, Latvia

[Xu Hou](#)

College of Chemistry and Chemical Engineering, Xiamen University, China

[Hui Hu](#)

Department of Aerospace Engineering, Iowa State University, USA

[Hoon Eui Jeong](#)

School of Mechanical, Aerospace and Nuclear Engineering, Ulsan National Institute of Science and Technology, S. Korea

[Sunghwan \(Sunny\) Jung](#)

Biological and Environmental Engineering, Cornell University, USA

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[Sushanta Mitra](#)

Waterloo Institute for Nanotechnology, University of
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[Tak-Sing Wong](#)

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Pennsylvania State University

[Myoung-Woon Moon](#)

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Seoul, S. Korea

[Peng Zhang](#)

School of Mechanical Engineering, Shanghai Jiao
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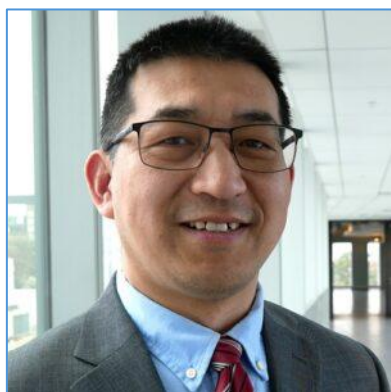
KEYNOTE SPEAKERS



Dimos Poulikakos

Department of Mechanical and Process Engineering, ETH Zurich, Switzerland

Professor Dimos Poulikakos holds the Chair of Thermodynamics at ETH Zurich, where in 1996 he founded the Laboratory of Thermodynamics in Emerging Technologies. He was a Member of the Research Commission of ETH (2001-2005). He served as the Vice President of Research of ETH Zurich in the period 2005-2007. Professor Poulikakos was the ETH director of the IBM-ETH Binnig-Rohrer Nanotechnology center, a unique private-public partnership in nanotechnology at the interface of basic research and future-oriented applications (2008-2011). He served as the Head of the Mechanical and Process Engineering Department at ETH Zurich (2011-2014). As of Feb 1, 2024, Prof. Poulikakos is an emeritus Professor of ETH Zurich.



Boxin Zhao

Department of Chemical Engineering Professor at the University of Waterloo, Canada

Dr. Boxin Zhao is a professor in the Department of Chemical Engineering Professor at the University of Waterloo, Canada, the Endowed Chair in Nanotechnology, and a fellow of the Canadian Academy of Engineering. He obtained his PhD in Chemical Engineering from McMaster University in 2004, worked as a postdoc at UCSB in 2005-2008. He established the Surface Science and Bionanomaterials Laboratory at Waterloo in 2008. His research interests include polymer nanotechnology, surface science, bioadhesion, bio-inspired materials hydrogels, soft materials and interface, soft robotic devices, and advanced manufacturing.

DAY 0 — MONDAY, AUGUST 10, 2026

Reception

16:30-18:00 Please join for a selection of ‘mocktails’ in the patio space outside **Macleod auditorium, Medical Sciences Building** (1 King's College Circle, Toronto, ON M5S 1A8)

DAY 1 — TUESDAY, AUGUST 11, 2026

Time	Speaker	Title
8:50–9:00	Welcome and Opening Remarks	
SESSION 1-1 — ANTI-X (ICING / BIOFOULING)		
Chair: Atsushi Hozumi		
9:00–9:45	Dimos Poulikakos (Keynote)	The physics of droplet freezing on nanoarchitected surfaces
9:45–10:00	Guojun Liu	Biomimetic Hydration-Stabilized Polymer Brush Interfaces for Ultra-Low Ice Adhesion
10:00–10:30	Anish Tuteja (Invited)	Novel Ice-Shedding Surfaces
10:30–10:45	Jinju Chen	Antibiofilm Efficacy of Bio-inspired Slippery Surfaces in Dynamic and Static Culture Conditions
10:45–11:15	COFFEE BREAK	
SESSION 1-2 — NATURE INSPIRED SEPARATIONS		
Chair: Glen McHale		
11:15–11:45	Xu Hou (Invited)	Bioinspired Multiscale Pore/Channel Systems
11:45–12:00	Cornelia G. Palivan	Controlled attachment of responsive nano-assemblies induces functionality on hybrid membrane surfaces
12:00–12:30	Lifeng Yan (Invited)	Biomimetic Reconstruction of Plant Cell Wall–Inspired All-Lignocellulosic Composite Membranes via Sustainable Protonic Ionic Liquid Processing
12:30–13:30	LUNCH (on your own)	
13:30–14:15	POSTER SESSION	
SESSION 1-3 — BIOMIMETIC APPLICATIONS		
Chair: Hyomin Lee		
14:15–14:45	Dong Woog Lee (Invited)	Biomimetic Catechol Binders as Interfacial Anchors in Batteries
14:45–15:00	Yimin A. Wu	Bioinspired cascade photocatalysis for upcycling plastics into vinegar under sunlight
15:00–15:30	Robin Ras (Invited)	Making and measuring the most slippery water-repellent surfaces
15:30–15:45	Jungki Ryu	Engineering Wettability to Control Gas Dynamics in Electrochemical Energy Devices
15:45–16:15	Akira Saito (Invited)	Optical diffusers inspired by Morpho butterfly's optical properties
16:15–16:35	COFFEE BREAK	
SESSION 1-4 — SELF-HEALABLE SURFACES		
Chair: Akira Saito		
16:35–17:05	Sepideh Khodaparast (Invited)	Taming Crystallisation for Regenerating Functional Epicuticular Interfaces
17:05–17:20	Atsushi Hozumi	Bio-inspired Transparent Superhydrophilic Coatings
17:20–17:50	Himanshu Mishra (Invited)	Water–Hydrophobe Interfaces: From Debunking Myths to Enabling Global Food–Water–Climate Resilience
17:50–18:20	Lauren Zarzar (Invited)	Structural colors from multi-reflection interference in microstructures

DAY 2 — WEDNESDAY, AUGUST 12, 2026

Time	Speaker	Title
8:55–9:00	Welcome and Daily Update	
SESSION 2-1 — NATURE INSPIRED WETTING SURFACES		
Chair: Guojun Liu		
9:00–9:45	Boxin Zhao (Keynote)	From Gecko Feet to Coral Reefs: Bioadhesion Mechanisms as a Design Principle for Soft Matter Engineering
9:45–10:00	Glen McHale	Static and Kinetic Droplet Friction on Liquid-like Surfaces
10:00–10:30	María J. Mosquera (Invited)	Beyond the Lotus Effect: Exploring Self-Cleaning Superhydrophilic Structures Inspired by Fish-Scales
10:30–11:00	COFFEE BREAK	
SESSION 2-2 — ROBUST WATER REPELLENCY		
Chair: Jungki Ryu		
11:00–11:30	Kevin Golovin (Invited)	Grafted Polydimethylsiloxane Chains as a Replacement for Perfluoroalkyl Substances
11:30–11:45	Youhua Jiang	Surface-Coating Decoupling for New Superhydrophobic Surfaces
11:45–12:15	Junping Zhang (Invited)	Robust Superhydrophobic Coatings and Their Applications
12:15–13:15	LUNCH (on your own)	
13:15–14:15	POSTER SESSION	
SESSION 2-3 — NATURE INSPIRED DROPLET MANIPULATION		
Chair: Dong Woog Lee		
14:15–14:45	Sanghyuk Wooh	TBD
14:30–14:45	Ben Hatton	Bio-inspired topographies to reduce microbial attachment by touch transmission in clinical environments
14:45–15:00	Yuhan Liu	Biomimetic Omniphobic Reentrant Structures Processed by Femtosecond Laser Machining
15:00–15:30	Anderson Ho Cheung Shum (Invited)	Assembly and Processes along All-Aqueous Interfaces
15:30–15:45	Jaime Colchero	Key to Wetting Studies: Chemical and Morphological Variability at the Nanoscale as Visualized by Atomic Force Microscopy
15:45–16:15	Hyomin Lee (Invited)	Nature-Inspired Microstructured Nonwetting Architectures for Transparent Antifogging Surfaces
16:15–16:45	COFFEE BREAK	
SESSION 2-4 — DROPLET IMPACTING / EVAPORATION / DIRECTIONAL WETTING		
Chair: Kevin Golovin		
16:45–17:15	Peichun Amy Tsai (Invited)	Complex Droplet Wetting and Impact on Structured Surfaces
17:15–17:30	Gregory Brock	Directional Wetting via Femtosecond Laser Machined Nepenthes-Inspired Microstructures
17:30–17:45	Clarissa Schönecker	A Concept and Proof-of-Principle for a Microstructured Surface Converting a Vertical Temperature Gradient into Horizontal Fluid Motion
17:45–18:00	GROUP PHOTO	
18:30–22:00	BANQUET — Hart House, University of Toronto (7 Hart House Circle, Toronto, ON M5S 3H3)	

DAY 3 — THURSDAY, AUGUST 13, 2026

Time	Speaker	Title
8:55–9:00	Welcome and Daily Update	
SESSION 3-1 — NATURE INSPIRED ADHESION		
Chair: Clarissa Schönecker		
9:00–9:30	Jonathan Wilker (Invited)	From the Sea to Sustainability: Development of Next Generation Adhesives
9:30–9:45	Salvio Suárez-García	Mussel-Inspired Surface Engineering of Multifunctional Catechol Polymers for Health and Sustainability
9:45–10:00	Abhinav Naga	When and How Particles Are Removed by Drops
10:00–10:30	COFFEE BREAK	
SESSION 3-2 — NATURE INSPIRED STRUCTURES		
Chair: Sanghyuk Wooh		
10:30–11:00	Abdul Shakoor (Invited)	Bio-inspired Self-reporting and Self-healing Composite Coatings for Advanced Corrosion Protection
11:00–11:30	Willem Noorduin (Invited)	Autonomous Patterning and Transformation: Nature-Inspired Routes to Functional Surfaces
11:30–11:45	Sami Khan	Mass Transfer Enhancement in Continually Replenished Bio-Inspired Aerophilic Surfaces
11:45–12:00	AWARD CEREMONY	

FRIDAY, AUGUST 14, 2026: Optional Tour to University of Waterloo Campus

Please refer to the pamphlet for directions to the University of Waterloo campus.

Point of contact:

Sushanta K. Mitra

skmitra@uwaterloo.ca

Link to program and full abstracts online:



Poster Presentations

P01	Sungho Lee	Preparation of MgO-CaO-P ₂ O ₅ glasses for biomedical applications via liquid phase method
P02	Glen McHale	Droplet Pinning on Slippery Biphilic Surfaces
P03	Adya Karthikeyan	Rechargeable and compostable slippery liquid infused porous surfaces
P04	Seamus Lilley	Determining the Ingression and Breakthrough Pressure of Micromeshes
P05	Jinhyung Kim	Nature-Inspired Vibration-Induced Separation of Pinned Droplets for Capture of Surface-Buried Particulates
P06	Aleksandra Nastic	Rapid Synthesis of Nano- and Micro-Porous Copper Surfaces Driven by Selective Dealloying of Micrometer-Sized Cu-Al Powder
P07	Rakesh Choubey	Eco-friendly hydrophobic slippery coatings for enhanced protection against marine corrosion and biofouling
P08	Carina Bittner	From Natural to Synthetic Melanosomes: Shape-Directed Self-Assembly in Avian Photonic Crystals
P09	Ray Ju	Design and Fabrication of Hierarchical 3D Printed Catalytic Structures
P10	Kiran Mungroo	3D Printing Polyurethane Elastomer Pillars for Bio-Inspired Microgrippers
P11	Xin Tang	Stepwise Dewetting in Micro-Architectures for Voxeled Additive Manufacturing
P12	Alfonso B. Mosquera	Nature's Roughness: Smart Wetting with Diatomaceous Earth
P13	Wei Jinfei	Durable Superhydrophobic/Superamphiphobicity Coatings for Prevention of Rain Attenuation of 5G/Weather Radomes and Anti-icing of High-voltage Transmission Tower
P14	Bucheng Li	Liquid Impalement Resistance and Mechanically Robust Superhydrophobic Coatings with Anti-icing Performance
P15	Wu Matthew	A Sintering Model of Snow Adhesion
P16	MinHo Lee	Biocompatibility Study of ECM-Mimicking Eggshell Membrane-Containing GelMA Cryogel for Microstructure Control
P17	Tyler Olson	Mode-dependent adhesion characterization of ice-shedding surfaces
P18	Teresa Busch	Auxetic Structures Fabricated via Femtosecond Laser Micromachining
P19	Zoe Meyer	Durable, broad-spectrum anti-biofouling polyurethane-based coatings
P20	Seo-Young Kim	ECM-Mimetic Hybrid Coating Based on Bioactive Ceramics and Natural Polymers for Osteoinductive Molecule Delivery
P21	Belén Pepió-Tárrega	Mussel-Inspired Catecholamine Surfaces for ROS-Mediated Antimicrobial Activity Against Planktonic Bacteria and Biofilms
P22	Itasaka Hiroki	Correlative Chemical and Nanomechanical Characterization of Resin-Dentin Hybrid Interfaces Using Confocal Raman Microscopy and Viscoelastic AFM
P23	Hyuneui Lim	Future Research Directions for Multifunctional Nature Inspired Surfaces: Opportunities and Challenges
P24	Matthew Wu	Procedurally Evaluating the Snow Shedding Behavior of Coated Surfaces

P25	Min-suk Oh	Enhancing PEM Fuel Cell Performance via APCVD-Engineered Superhydrophobic Aluminum Bipolar
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University of Toronto Map

Meals aren't provided during NISE 2026, so here are some well-reviewed spots within a short walk of the Medical Sciences Building — a mix of on-campus quick bites and a short detour to Kensington Market.

