Future Directions of Advanced Materials

McMaster University

A TWO-DAY WORKSHOP, hosted by Brockhouse Institute of Materials Research (BIMR, Dr. Alex Adronov), highlighting research on advanced materials with significant implications for the future of health, the environment, and energy. Specifically, this workshop will be a platform for researchers to learn about the latest advances in materials pertaining to four key themes, including the Future of Biomaterials, Artificial Intelligence in Materials Research, Sustainable Materials and Quantum Materials. The overall goal of this workshop will be to stimulate BIMR researchers to think about new directions for Materials Research.
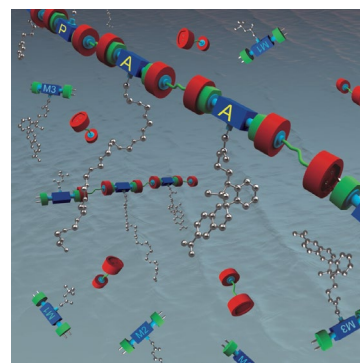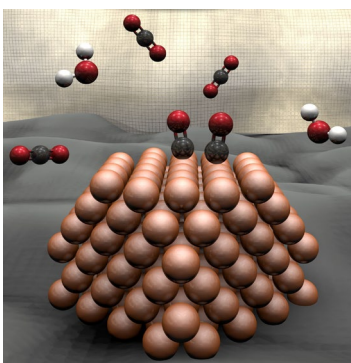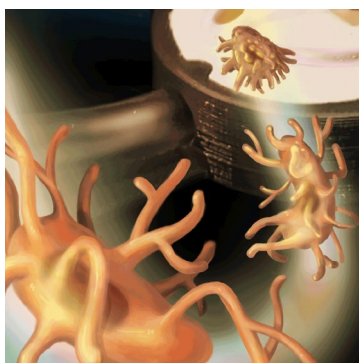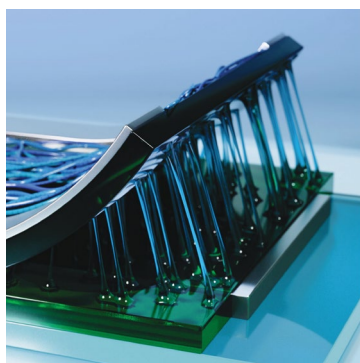
May 31-June 1, 2023

Workshop is FREE.

📅 REGISTER by visiting the website below.

https://brockhouse.mcmaster.ca/events/

KEYNOTE SPEAKERS 👤
- Dr. Milica Radisic, University of Toronto
- Dr. Mario Leclerc, Laval University

TOPICS ✏️
- Future of Biomaterials
- Future of Sustainable Materials
- Future of Artificial Intelligence in Materials Research
- Future of Quantum Materials

Brockhouse Institute for Materials Research

Future Directions of Advanced Materials
Wednesday, May 31, 2023

9:25 EDT	OPENING REMARKS

9:30	KEYNOTE LECTURE

9:30 Towards Heart and Kidney On-a-Chip
Milica Radisic, University of Toronto

10:10	FUTURE OF BIOMATERIALS

10:10 Bio-inspired materials processing: Time-tested tricks for sustainable fabrication
Matt Harrington, McGill University

10:40 Insights into biomaterial host responses: tissue damage, TLR signalling and macrophage-material interactions
Lindsay Fitzpatrick, Queens University

11:10 Polymeric conjugates and surfaces for local immune modulation and detection
Ryan Wylie, McMaster University

11:40 Convergence of synthetic biology and biomaterial design: the case for DNA nanotechnology
Leo Chou, University of Toronto

12:10	LUNCH/BREAK

13:00	FUTURE OF ARTIFICIAL INTELLIGENCE IN MATERIALS RESEARCH

13:00 TBD Title
Gabe Gomes, Carnegie Mellon University

13:30 Developing Transferable and Interpretable Potential Energy Surfaces with Machine Learning
Farnaz Heidar-Zadeh, Queens University

14:00 Towards cybernetic materials design with self-driving laboratories
Riley Hickman, University of Toronto

14:30 Differentiable physics: differentiable programing for physical simulations
Rodrigo Vargas-Hernandez, McMaster University

15:00	DAY CLOSING

Future Directions of Advanced Materials
Thursday, June 1, 2023

9:25 EDT	**OPENING REMARKS**
9:30	**KEYNOTE LECTURE**

9:30 Green Chemistry for Green Energy
Mario Leclerc, Laval University

10:10	**FUTURE OF SUSTAINABLE MATERIALS**

10:10 Cleavable comonomer additives for deconstructable and recyclable vinyl polymers
Elisabeth Prince, University of Waterloo

10:40 Reaction Development for Sustainable Polymer Chemistry
Erin Stache, Cornell University

11:10 Designing sustainable materials from nanocellulose & protein amyloids: emerging building blocks for functional applications
Kevin De France, Queens University

11:40 Photocatalysis to synthesize, derivatize, depolymerize, and degrade polymers
Brent Sumerlin, University of Florida

12:10	**LUNCH/BREAK**
13:00	**FUTURE OF QUANTUM MATERIALS**

13:00 Direct-bonded diamond membranes for heterogenous quantum and electronic technologies
Alexander High, University of Chicago

13:30 How electron hydrodynamics can eliminate the Landauer-Sharvin resistance
Thomas Scaffidi, University of California, Irvine

14:00 Unconventional states in quantum materials hosting kinetic and geometric frustration
Stephen Wilson, University of California, Santa Barbara

14:30 Weyl induced magnetism
Fazel Tafti, Boston College

15:00	**DAY CLOSING**