



Microfluidic Phenomena and Global Challenges

June 3 - 4, 2017

Chairs

Julea Vlassakis and Tyler R. Ray

Renaissance Tuscany Il Ciocco

Via Giovanni Pascoli

Lucca (Barga), IT

Conference Description

The Gordon Research Seminar on Physics and Chemistry of Microfluidics is a unique forum for graduate students, post-docs, and other scientists with comparable levels of experience and education to present and exchange new data and cutting edge ideas.

Pursuit of scientific discovery without a preconceived agenda is critical for advancing human knowledge and technological innovation. Indeed, this is evidenced through the theoretical and experimental discoveries that have shaped microfluidics into a field that bridges fundamental inquiry with impactful applications. Even so, society faces a growing list of challenges—clean water, energy, environmental remediation, and healthcare—which require the research focus of scientists and engineers. This seminar seeks to provoke thoughtful discourse on the role of microfluidics in generating solutions for these challenges through both theoretical and technological creativity.

Specifically, the focus of this meeting is to provide a forum to communicate the most recent fundamental and applied advances in micro- and nanofluidics. United in the utilization of novel fluid physics, topic areas of interest include traditional areas such as analyte detection/sensing, point-of-care diagnostics, and cell characterization as well as emerging areas including material synthesis, additive manufacturing, and energy storage/generation. By bringing together the emerging student and postdoc thought-leaders, the 2017 GRS offers a critical forum for providing unhindered, elucidative, and forward-looking discussions necessary for continued discovery and technological disruption in microfluidics. The meeting will also include a mentorship session with a small panel of faculty and industry experts for an open discussion on professional development and related topics of interest.



Related Meeting



This GRS will be held in conjunction with the "Physics and Chemistry of Microfluidics" Gordon Research Conference (GRC). Those interested in attending both meetings must submit an application for the GRC in addition to an application for the GRS. Refer to the [associated GRC program page](#) for more information.

Conference Program

Saturday	
1:30 pm - 4:30 pm	Arrival and Check-in
3:00 pm - 3:15 pm	Introductory Comments by GRC Site Staff / Welcome from the GRS Chair
3:15 pm - 4:00 pm	Keynote Session: Nano/Micro-Scale Self-Assembly Phenomena and Applications Discussion Leaders: Daniel Nelson (University of Virginia, USA) and Cullen Buie (Massachusetts Institute of Technology, USA)
3:15 pm - 3:45 pm	Matthew Tirrell (University of Chicago, USA) "Modular Micellar Nanoparticles for Biomedical Applications"
3:45 pm - 4:00 pm	Discussion
4:00 pm - 5:30 pm	Poster Session
5:30 pm - 7:30 pm	Frontiers of Micro-Scale Fabrication Discussion Leader: Marc Chooljian (UC Berkeley and UCSF Graduate Program in Bioengineering, USA)
5:30 pm - 5:50 pm	Rachel Collino (University of California, Santa Barbara, USA) "Acoustic Control of Two-Phase Microstructures During Extrusion Printing"
5:50 pm - 6:00 pm	Discussion
6:00 pm - 6:20 pm	Brian Giera (Lawrence Livermore National Laboratory, USA) "Machine Learning of Microfluidics"



6:20 pm - 6:30 pm	Discussion
6:30 pm - 6:50 pm	Peter Shankles (University of Tennessee, USA) "Accessible Microfluidics Through Feature-Based Design Software for 3D Printing"
6:50 pm - 7:00 pm	Discussion
7:00 pm - 7:20 pm	Ashlyn Young (North Carolina State University, USA) "Microfluidic Engineering of <i>In Vitro</i> Organ Models"
7:20 pm - 7:30 pm	Discussion
8:00 pm - 9:00 pm	Dinner
Sunday	
7:30 am - 8:30 am	Breakfast
9:00 am - 11:00 am	Microfluidic Analysis of Complex Samples Discussion Leaders: Peter Aldridge (University of Toronto, Canada) and Catherine Klapperich (Boston University, USA)
9:00 am - 9:20 am	Lisa Mahler (Leibniz Institute for Natural Product Research and Infection Biology, Germany) "A Droplet-Microfluidic Approach to Illuminate Microbial Dark Matter"
9:20 am - 9:30 am	Discussion
9:30 am - 9:50 am	Miguel Xavier (University of Southampton, United Kingdom) "Microfluidic Characterisation of Size, Dielectric and Mechanical Properties of Primary Skeletal Stem Cells from Human Bone Marrow for Label-Free Cell Isolation"
9:50 am - 10:00 am	Discussion
10:00 am - 10:20 am	Jina Ko (University of Pennsylvania, USA) "Identification of Panels of Exosomal RNA Biomarkers for Machine Learning Based Diagnosis of Pancreatic Cancer"
10:20 am - 10:30 am	Discussion



10:30 am - 10:50 am	Shannon Krauss (University of Virginia, USA) "An Integrated Centrifugal Polyester Microfluidic Device for Detection of Explosives Residue Using Smartphone Analysis"
10:50 am - 11:00 am	Discussion
11:00 am - 12:30 pm	Poster Session <i>Coffee will be served in the poster area from 11:00 am - 11:30 am</i>
12:30 pm - 1:30 pm	Lunch
1:30 pm - 2:30 pm	Mentorship Component: The Future of Microfluidics and Your Impact in an Evolving Field <i>Four panelists from academia and industry will share their insights about the future of microfluidics and how to prepare for your career in the field. The session will begin with 5 minutes of each panelist describing their career path, and then the discussion leaders will open the floor for Q&A in topics such as how to develop a research vision, and identifying impactful industry positions.</i> Discussion Leaders: Tyler Ray (Northwestern University, USA) and Julea Vlassakis (University of California, Berkeley, USA)
1:30 pm - 2:30 pm	Panel Discussion <i>The Future of Microfluidics</i> <ul style="list-style-type: none"> • Cullen Buie (Massachusetts Institute of Technology, USA) • Vicki Loise (Society for Laboratory Automation and Screening (SLAS), USA) • Matthew Tirrell (University of Chicago, USA)
2:30 pm - 3:00 pm	Evaluation Period <i>Fill in GRS Evaluation Forms</i>
3:00 pm	Seminar Concludes

Contributors



		
		
		

