



Forces, Fields, and Flows in Biological, Energy and Manufacturing Applications of Microfluidics

June 4 - 9, 2017

Chairs

Catherine M. Klapperich and Dino Di Carlo

Vice Chairs

Cullen R. Buie and Hang Lu

Renaissance Tuscany Il Ciocco

Via Giovanni Pascoli

Lucca (Barga), IT

Conference Description

The conference brings together scientists, engineers and clinicians to discuss and advance cutting edge knowledge of microfluidics. Microfluidics are small scale systems that could be used to diagnose disease, enable unique physical and biological experiments and create new materials. The goal of the 2017 meeting is to bridge the gap between scientists and engineers focused on fundamentals and those translating fundamental work into new applications. The conference is sure to spark animated discussion, new interactions and fruitful collaborations!

The conference will consist of 9 topical sessions and active poster sessions. The conference will be held in conjunction with an associated GRS. We will also host a "Power Hour", committed to inclusion and the professional development of women in science. This program was created to help address the challenges that women face in science and provides a forum for discussion and mentoring.

Related Meeting



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

information.

Conference Program

Sunday	
4:00 pm - 8:00 pm	Arrival and Check-in
6:00 pm - 7:00 pm	Dinner
7:30 pm - 7:40 pm	Introductory Comments by GRC Site Staff / Welcome from the GRC Chair
7:40 pm - 9:30 pm	Point of Care Technologies Discussion Leader: Richard Crooks (The University of Texas at Austin, USA)
7:40 pm - 8:10 pm	David Issadore (University of Pennsylvania, USA) "Hybrid Microelectronic/Microfluidic Chips for Rare Cell and Rare Exosome Detection Directly in Blood"
8:10 pm - 8:35 pm	Discussion
8:35 pm - 9:05 pm	Paul Yager (University of Washington, USA) "Better/Faster/Cheaper POC NAATs – Pick Three"
9:05 pm - 9:30 pm	Discussion
Monday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Nucleic Acid Analysis and Next Generation Sequencing Discussion Leader: Nicole Pamme (University of Hull, United Kingdom)
9:00 am - 9:30 am	Adam Abate (University of California, San Francisco, USA) "Quantitative Biology with High Throughput Droplet Microfluidics"
9:30 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break

10:30 am - 11:00 am	Rajiv Bharadwaj (10x Genomics, USA) "Changing the Definition of Sequencing Drop by Drop"
11:00 am - 11:30 am	Discussion
11:30 am - 12:00 pm	Yanyi Huang (Peking University, China) "Microfluidic Single Cell Sequencing"
12:00 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
3:00 pm - 4:00 pm	Power Hour <i>The GRC Power Hour is an optional informal gathering open to all meeting participants. It is designed to help address the challenges women face in science and support the professional growth of women in our communities by providing an open forum for discussion and mentoring.</i> Organizers: Maribel Vazquez (City College of New York, USA) and Catherine Klapperich (Boston University, USA)
4:30 pm - 6:00 pm	Poster Session
6:00 pm - 8:00 pm	Fields, Forces, and Flows Discussion Leader: Jonathan Posner (University of Washington, USA)
6:00 pm - 6:30 pm	Minami Yoda (Georgia Institute of Technology, USA) "Near-Wall Dynamics of Suspended Colloidal Particles in Microscale Shear and Electrokinetic Flow"
6:30 pm - 7:00 pm	Discussion
7:00 pm - 7:30 pm	Baskar Ganapathysubramanian (Iowa State University, USA) "Inertial Fluid Flow Sculpting: Computational Methods and Applications"
7:30 pm - 8:00 pm	Discussion
8:00 pm - 9:00 pm	Dinner

Tuesday

7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Group Photo
9:00 am - 12:30 pm	Flow-Structure Interactions Discussion Leader: David Sinton (University of Toronto, Canada)
9:00 am - 9:25 am	Chang-Jin Kim (University of California, Los Angeles, USA) "Drag Reduction: Microfluidics for Macro Application"
9:25 am - 9:45 am	Discussion
9:45 am - 10:10 am	Pier-Luca Maffettone (Universita degli Studi di Napoli , Italy) "An Open Issue in Viscoelastic Microfluidics: Multiparticle Dynamics"
10:10 am - 10:30 am	Discussion
10:30 am - 11:00 am	Coffee Break
11:00 am - 11:25 am	Carolyn Ren (University of Waterloo, Canada) "Microwave Assisted Droplet Sensing, Heating and Mixing and Image Analysis Assisted Droplet Manipulation"
11:25 am - 11:45 am	Discussion
11:45 am - 12:10 pm	Amy Shen (Okinawa Institute of Science and Technology, Japan) "Elastic and Inertial Instabilities in Microfluidic Flows"
12:10 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	Poster Session
6:00 pm - 8:00 pm	Wearable and Implantable Systems Discussion Leader: Jeff Tza-Huei Wang (Johns Hopkins University, USA)
6:00 pm - 6:40 pm	Ellis Meng (University of Southern California, USA) "Wet Implantable Microsensors"
6:40 pm - 7:00 pm	Discussion

7:00 pm - 7:40 pm	Sumita Pennathur (University of California, Santa Barbara, USA) "Untethering Diabetes Through Innovative Engineering"
7:40 pm - 8:00 pm	Discussion
8:00 pm - 9:00 pm	Dinner
Wednesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Cell Mechanics Discussion Leader: John Oakey (University of Wyoming , USA)
9:00 am - 9:30 am	Jianping Fu (University of Michigan, USA) "Mechanobiology, Pluripotent Stem Cells, and Early Embryonic Development"
9:30 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:00 am	Jochen Guck (Technische Universität Dresden, Germany) "Feeling for Cell Function: Morpho-Rheological Phenotyping at 1,000 Cells/Sec"
11:00 am - 11:30 am	Discussion
11:30 am - 12:00 pm	Wilbur Lam (Emory University / Georgia Institute of Technology, USA) "Cellular Mechanics of Hematologic Processes and Diseases"
12:00 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	Poster Session
6:00 pm - 8:00 pm	Logic and Computational Design Discussion Leader: Frances Ligler (North Carolina State University / University of North Carolina at Chapel Hill, USA)

6:00 pm - 6:30 pm	Douglas Densmore (Boston University, USA) "Fluigi: Hardware, Software, and Wetware Automated Design for Synthetic Biology"
6:30 pm - 7:00 pm	Discussion
7:00 pm - 7:30 pm	Elliot Hui (University of California, Irvine, USA) "Computation and Control by Microfluidic Logic"
7:30 pm - 8:00 pm	Discussion
8:00 pm - 9:00 pm	Dinner
Thursday	
7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Business Meeting <i>Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair</i>
9:00 am - 12:30 pm	Living Systems Discussion Leader: Elain Fu (Oregon State University, USA)
9:00 am - 9:30 am	Roman Stocker (ETH Zurich, Switzerland) "Microbe-Fluidics"
9:30 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:00 am	Maribel Vazquez (City College of New York, USA) "Microfluidics for the Visual System"
11:00 am - 11:30 am	Discussion
11:30 am - 12:00 pm	Julia Yeomans (University of Oxford, United Kingdom) "Active Matter in Microchannels"
12:00 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch

1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	Poster Session
6:00 pm - 8:00 pm	3D Printing Discussion Leader: James Sterling (Keck Graduate Institute, USA)
6:00 pm - 6:40 pm	Albert Folch (University of Washington, USA) "Microfluidics: The Gap Between Academia and Manufacturing"
6:40 pm - 7:00 pm	Discussion
7:00 pm - 7:40 pm	Noah Malmstadt (University of Southern California, USA) "Applications of 3D-Printed Microfluidics: Nanomanufacturing and Biomarker Detection"
7:40 pm - 8:00 pm	Discussion
8:00 pm - 9:00 pm	Dinner
Friday	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

Contributors

 Gordon Research Conferences	 Carl Storm Underrepresented Minority Fellowship	 Predominantly Undergraduate Institution Fund (PUI)
	 National Institutes of Health <small>Turning Discovery Into Health</small>	 Boston University College of Engineering Department of Biomedical Engineering
 College of Engineering		
 scienion ENABLING LIFE SCIENCE	 UCLA	 analytical chemistry

biotechnne®		
--------------------	--	--