

Micro-Swimmers and Soft Robotics

Research Workshop of the
Israel Science Foundation

February 3rd -5th , 2020

Dan and Betty Kahn Mechanical
Engineering Building (Hall 1)
Technion, Haifa, Israel



TECHNION
Israel Institute
of Technology

February 3rd - Monday

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| 08:00-08:45 | Registration & Gathering & Coffee |
| 08:45-08:50 | Opening Remarks – Organizing Committee |
| 08:50-08:55 | Greetings by Prof. Alon Wolf - Vice President for External Relations and Resource Development (VPERRD) |
| 08:55-09:00 | Greeting by MAFAT representative |
| 09:00-09:30 | Bradley Nelson - Programmable Magnetic Micromachines |
| 09:30-10:00 | Peer Fischer - Microswimmers and Nanopropellers Powered by Acoustic- and Magnetic-Fields |
| 10:00-10:30 | Ambarish Ghosh - Multifunctional Helical Nanoswimmers |
| 10:30-11:05 | <i>Coffee Break</i> |
| 11:05-11:35 | Min-Jun Kim - Single Particle Propulsion using Symmetry Breaking and Flagellar Functionalization |
| 11:35-12:05 | Amir Gat - Underactuated Fluidic Control of Continuously Multistable Structures |
| 12:05-12:35 | Shlomo Magdassi - New 3D and 4D Printing Materials for Soft Robotics |
| 12:35-13:50 | <i>Lunch</i> |
| 13:50-14:20 | Matt Travers - How Does the Choice of DNA Nanotechnology Affect the Performance of Microswimmers |

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| 14:20-15:50 | Damien Faivre - Synthetic and Biological Magnetic Microswimmers |
| 15:50-15:25 | <i>Coffee Break</i> |
| 15:25-15:55 | Gilad Yossifon - Active Particles As Mobile Microelectrodes for Label-Free Cargo Transport and Delivery |
| 15:55-16:25 | Orlin Velev - Principles for Electric Field Powering, Propulsion, Actuation and Steering of Multifunctional Microdevices |
| 16:25-16:55 | Moran Bercovici - Dipolar Thermocapillary Motor and Swimmer |
| 19:00-20:00 | <i>Reception Dinner - Bay View Hotel</i> |
| February 4th - Tuesday | |
| 08:15-08:45 | <i>Gathering & Coffee</i> |
| 08:45-09:15 | Joseph Wang - Micromotors Go In-Vivo: From Test Tubes to Live Animals |
| 09:15-09:45 | Metin Sitti - Bio-inspired Small-Scale Soft Swimmers |
| 09:45-10:15 | Anette (Peko) Hosoi - From Razor Clams to Robots: Drawing Engineering Inspiration from Natural Systems |
| 10:15-10:40 | <i>Coffee Break</i> |
| 10:40-11:10 | Antonio De Simone - Locomotion by Shape Control in Nature and Technology |
| 11:10-11:40 | Laetitia Giraldi - Optimal Actuation for Magnetic Micro-Swimmers |

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| 11:40-13:35 | <i>Lunch & Poster Session</i> |
| 13:35-14:05 | Andrejs Cebers - Dynamics of Flexible Ferromagnetic Filaments |
| 14:05-14:35 | David Saintilan - Spontaneous Oscillations, Beating Patterns and Hydrodynamic Synchronization of Active Microfilaments |
| 14:35-15:05 | Leshansky Alex - Symmetry considerations in driven propulsion |
| 15:05-15:30 | <i>Coffee Break</i> |
| 15:30-16:00 | Ehud Yariv - Autophoresis of isotropic particles |
| 16:00-16:30 | Kinneret Keren - Hydrodynamic Centering and Symmetry Breaking in Artificial Cells |
| 16:30-17:00 | Ivan Christov - Soft hydraulics: Hydrodynamic resistances beyond Hagen – Poiseuille |

February 5th - Wednesday

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| 08:15-08:45 | <i>Gathering & Coffee</i> |
| 08:45-09:15 | Moshe Shoham - On the Horizon of Medical Robotics |
| 09:15-09:45 | Sarah Bergbreiter - Adding Soft Materials to Robots at Small Scales |
| 09:45-10:15 | Hod Lipson - Soft Actuators for Soft Robotics |

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| 10:15-10:45 | Robert Shepherd - Novel Fluids in Soft Robot Fluidic Elastomer Actuators |
| 10:45-11:05 | <i>Coffee Break</i> |
| 11:05-11:35 | Yizhar Or - Asymptotic Analysis and Optimal Control of Periodic Inputs for Microswimmers Locomotion |
| 11:35-12:05 | Tamar Flash - Movement control in the octopus : lessons for soft robotic systems |
| 12:05-12:35 | Bnoit Roman - Shape Morphing By Inflation |
| 12:35-13:05 | Silas Alben - Dynamics of Model Snakes and Elastic Sheets |
| 13:05-13:15 | <i>Closing Remarks</i> |
| 13:15-14:30 | <i>Lunch</i> |

Visit the conference website
for more information



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Organizing Committee:

Yizhar Or (Technion – Israel Institute of Technology, Israel)

Amir Gat (Technion – Israel Institute of Technology, Israel)

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