12\textsuperscript{th} Annual Engineering Graduate Symposium Program

Friday, November 10\textsuperscript{th}, 2017
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Planning Committees  

Sponsors  

Symposium Schedule  

Maps  

Poster Presentations: Morning Session  

CDR: Control, Dynamics, and Robotics  
CEE: Civil & Environmental Engineering  
EBS: Engineering in Biological Systems  
FAT: Fluid Dynamics, Acoustics, and Thermal Science  
IVM: Integrated Circuits, VLSI and Microsystems  
IOF-1: Industrial, Operations, and Financial Engineering Session 1  
MTR: Medicine and Translational Research  
OPS: Optics, Photonics, and Solid-State Devices  
SMR: Structural Material Research  

Richard and Eleanor Towner Prize for Outstanding Ph.D. Research  

Poster Presentations: Afternoon Session  

ACS-SPS: Atmospheric, Climate Sciences, Space and Planetary Sciences  
AEP: Applied Electromagnetics and Plasma Science  
ATE: Automotive and Transportation Engineering  
CPH: Chemical Physics  
FMR: Functional Material Research  
IOF-2: Industrial, Operations, and Financial Engineering Session 2  
PEN: Power and Energy  
SICC: Signal and Image Processing, Computer Vision and Communication  
SSEC: Systems, Software Engineering and Computer Science  
TCB: Tissue, Cellular, and Biomolecular Engineering
Planning Committee

Office of Student Affairs Staff

Debby Mitchell  Director of Partnerships, Outreach and Retention
Tiffany Porties  Assistant Director of Partnerships, Outreach and Retention
Andria Rose  Coordinator for Graduate Programs
Shira Washington  Coordinator for Graduate Programs

Student Volunteers

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<thead>
<tr>
<th>Name</th>
<th>Dept.</th>
<th>Role(s)</th>
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<tr>
<td>Harsh Agarwal</td>
<td>ChE</td>
<td>OPS Session Chair</td>
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<tr>
<td>Francisco Aldarondo</td>
<td>IOE</td>
<td>IOF-2 Session Chair</td>
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<tr>
<td>Yawei Chen</td>
<td>ME</td>
<td>FAT Session Chair</td>
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<tr>
<td>Sarah Cusson</td>
<td>AE</td>
<td>AEP Session Chair, Judge Recruiter</td>
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<tr>
<td>Amin Ghadami</td>
<td>ME</td>
<td>CDR Session Chair</td>
</tr>
<tr>
<td>Nahal Habibi</td>
<td>ChE</td>
<td>MTR Session Chair</td>
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<tr>
<td>Muhammad Abdullah Hashmi</td>
<td>ME</td>
<td>IOF-1 Session Chair</td>
</tr>
<tr>
<td>Adeline Hong</td>
<td>BME</td>
<td>TCB Session Chair</td>
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<tr>
<td>Amina Hussein</td>
<td>AP</td>
<td>Co-Chair</td>
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<tr>
<td>Houtan Jebelli</td>
<td>CEE</td>
<td>SSEC Session Chair</td>
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<tr>
<td>Chengang Ji</td>
<td>ECE</td>
<td>Publicity</td>
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<tr>
<td>Jonas Kersulis</td>
<td>ECE</td>
<td>Judge Recruiter, Logistics, Editor</td>
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<tr>
<td>Mahdi Khalili</td>
<td>ECE</td>
<td>CEE Session Chair</td>
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<tr>
<td>Justin Koczak</td>
<td>ME</td>
<td>ATE Session Chair, Logistics, Editor</td>
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<tr>
<td>Tianyu Liu</td>
<td>MACR</td>
<td>CPH Session Chair</td>
</tr>
<tr>
<td>Neda Maghsoodi</td>
<td>ME</td>
<td>EBS Session Chair</td>
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<tr>
<td>Jose Mesa</td>
<td>NAME</td>
<td>Co-Chair</td>
</tr>
<tr>
<td>Name</td>
<td>Dept.</td>
<td>Role(s)</td>
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<tr>
<td>Maya Nath</td>
<td>MSE</td>
<td>Towner Session Chair, Judge Recruiter</td>
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<tr>
<td>Zhicheng Ouyang</td>
<td>CEE</td>
<td>Publicity</td>
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<tr>
<td>Siddharth Suhas Pawar</td>
<td>AE</td>
<td>Logistics, Editor</td>
</tr>
<tr>
<td>Naomi Ramesar</td>
<td>ChE</td>
<td>PEN Session Chair</td>
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<tr>
<td>Donald Richardson</td>
<td>IOE</td>
<td>Logistics, Editor</td>
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<tr>
<td>Amin Sandoughsaz</td>
<td>ECE</td>
<td>IVM Session Chair, Judge Recruiter</td>
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<tr>
<td>Huanyi Shui</td>
<td>ME</td>
<td>Sponsor Recruiter</td>
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<tr>
<td>Kaylee Smith</td>
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<td>Judge Recruiter</td>
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<tr>
<td>Zhaolun Su</td>
<td>ECE</td>
<td>SIC Session Chair</td>
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<tr>
<td>Suyash Tandon</td>
<td>ME</td>
<td>ACS-SPS Session Chair</td>
</tr>
<tr>
<td>Emine Sumeyra Turali Emre</td>
<td>BME</td>
<td>Co-Chair</td>
</tr>
<tr>
<td>Maria Ward Rashidi</td>
<td>MSE</td>
<td>FMR Session Chair</td>
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Patricia Mafoletti, University Recruiter
pmafoletti@exponent.com

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Symposium Schedule

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<td>Duderstadt Center Gallery</td>
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<tr>
<td>Registration &amp; Information</td>
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<tr>
<td>8:30 AM-9:20 AM</td>
<td>Chesebrough Auditorium, Chrysler Center</td>
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<tr>
<td>Admissions Success: Applying to</td>
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<td>Graduate School and Preparing for</td>
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<td>Campus Visit</td>
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<td>9:00 AM-5:00 PM</td>
<td>Duderstadt Center</td>
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<tr>
<td>Sponsor Interview Sessions:</td>
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<td>Exponent</td>
<td>Duderstadt Study Room 2372</td>
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<td>Sandia National Laboratories</td>
<td>Duderstadt Study Room 2374</td>
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<tr>
<td>9:30 AM-10:15 AM</td>
<td>Chesebrough Auditorium, Chrysler Center</td>
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<td>Welcome Remarks and Keynote Address</td>
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<td>Morning Poster Session</td>
<td>Duderstadt Center &amp; EECS Atrium</td>
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<td>10:30 AM-11:35 AM</td>
<td>Morning session odd numbers present</td>
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<td>11:55 AM- 1:00 PM</td>
<td>Morning session even numbers present</td>
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<td>10:30 AM-3:30 PM</td>
<td>Duderstadt Center Atrium</td>
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<tr>
<td>Sponsor Booths:</td>
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<td>Exponent</td>
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<td>FedEx</td>
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<td>12:00 PM-2:00 PM</td>
<td>Duderstadt Center Gallery</td>
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<td>Tishman Hall Atrium, Beyster Building</td>
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<td>Pierpont Commons Lounge Areas</td>
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<tr>
<td>Time/Event</td>
<td>Location</td>
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<tr>
<td>1:00 PM-2:00 PM Exponent Information Session</td>
<td>1180 Duderstadt Center</td>
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<tr>
<td>1:00 PM-3:00 PM Richard &amp; Eleanor Towner Prize for Outstanding Ph.D. Research Poster Presentation</td>
<td>Pierpont Commons Atrium</td>
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<td>Afternoon Poster Session</td>
<td>Duderstadt Center &amp; EECS Atrium</td>
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<tr>
<td>1:45 PM-2:50 PM Afternoon session odd numbers present</td>
<td>Afternoon session odd numbers present</td>
</tr>
<tr>
<td>3:10 PM-4:15 PM Afternoon session even numbers present</td>
<td>Afternoon session even numbers present</td>
</tr>
<tr>
<td>1:45 PM-5:00 PM Prospective Students Meet Department Representatives</td>
<td>Duderstadt Center Gallery</td>
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<tr>
<td>2:00 PM-5:00 PM Departmental Visits</td>
<td>Various CoE Locations</td>
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</tbody>
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The award dinner for poster presenters will take place on **Wednesday, November 15th, 2017**, from **5:00 pm to 7:00 pm**, in the Johnson Rooms, Lurie Engineering Center (LEC).

This schedule may also be accessed online at the following link: [https://gradsymposium.engin.umich.edu/schedule/](https://gradsymposium.engin.umich.edu/schedule/)
Maps

Duderstadt Center – 1st Floor

Duderstadt Center – 2nd Floor

Sponsor Interview Rooms
Chesebrough Auditorium

EECS Building – 1st Floor
Pierpont Commons
Poster Presentations:
Morning Session

EECS Atrium and Duderstadt
10:30 am – 1:00 pm
Location: EECS Atrium

CDR: Control, Dynamics, and Robotics
Session Chair: Amin Ghadami

Supratransmission in a metastable modular metastructure for nonreciprocal wave transmission
Z. Wu, Y. Zhen, K.W. Wang

Fuel Cell Thermal Management: Modeling, Specifications and Correct-by-Construction Control Synthesis
Liren Yang, Amey Karnik, Benjamin Pence, Md Tawhid Bin Waez
Necmiye Ozay

Calibrated Mixed Reality for Scalable Multi-Robot Experiments
Victoria Edwards, Edwin Olson

Stealthy Deception Attacks for Cyber-Physical Systems
Romulo Meira Goes, Stephane Lafortune

Enforcement of security and privacy properties: An interface-based approach using event insertion and erasure
Yiding Ji, Stéphane Lafortune

Semantic Mapping: Revisiting Put That There in Real Domestic Environment
Zhen Zeng, Yunwen Zhou, Odest Chadwicke Jenkins

Generating provably-correct 2D push recovery controllers by patching 1D controllers
Zexiang Liu, Necmiye Ozay

Stochastic Feedback Combustion Control at High Dilution Limit
Bryan Maldonado, James Freudenberg, Anna Stefanopoulou

Legged Robot State-Estimation Through Combined Forward Kinematic and Preintegrated Contact Factors
Ross Hartley, Josh Mangelson, Lu Gan, Maani Ghaffari, Jeffery M. Walls, Ryan M. Eustice, Jessy W. Grizzle
A Nonparametric Approach to Scene Estimation with Inter-object Relations towards Goal-directed Manipulation
Karthik Desingh, Zhen Zeng, Odest Chadwicke Jenkins

Increasing the Feasibility of Equalized Performance Guarantees via Convex Optimization
Kwesi Rutledge, Sze Zheng Yong, Necmiye Ozay

Synchronous and Asynchronous Multi-Agent Coordination With cLTL+ Constraints
Yunus Emre Sahin, Necmiye Ozay

**Location: Duderstadt Center**

**CEE: Civil & Environmental Engineering**

Session Chair: Mohammad Khalili

EEG-based Field Construction Workers' Stress Measurement
Houtan Jebelli, SangHyun Lee

Ordinary Camera-Mounted Drone Based Human Centric Scene Understanding for Construction Hazard
Daeho Kim, SangHyun Lee

System-Level Reliability-Based Design Optimization for Uncertain and Dynamic Wind-Induced Large-Scale Building Systems
Arthriya Suksuwan, Seymour M.J. Spence

Development of a Wireless Sensor Network Architecture for Dense and Rapid Deployment in Smart Cities
Katherine A. Flanigan, Jerome P. Lynch

Performance of Foam Filled Tubular Steel Braces under Seismic Loading
Malcolm Ammons, Jason McCormick

Developing Rapid, Accurate, and Field-Adaptable Sediment Testing by SedImaging
Andrea Ventola, Roman Hryciw
Adaptive perception, planning, and execution for robotized construction joint filling
Kurt M. Lundeen, Vineet R. Kamat, Carol C. Menassa, Wes McGee

How Accessible Are Our Cities? A Cross-sectional Analysis Of Access To Green Space
Tim Williams, Tom Logan, Kevin Liberman, Connie Zuo, Seth Guikema

Location: Duderstadt Center
EBS: Engineering in Biological Systems
Session Chair: Neda Maghsoodi

Biomaterial scaffolds recruit an aggressive population of metastatic tumor cells in vivo
Grace Bushnell, Tejaswini Hardas, Rachel Dudek, Yining Zhang, Robert Oakes, Jacqueline Jeruss, Lonnie Shea

A computational study of growth-driven folding patterns on shells, with application to the developing brain
S. Verner, K. Garikipati

Heat as a novel treatment of Staphylococcus epidermidis biofilms in an in vitro catheter model
Joanne Beckwith, Shannon Brewer, J. Scott Van Epps, Michael J. Solomon

Multiparametric MRI Defines Temporal and Spatial Heterogeneities in Thrombosis: Towards Precision Medicine in Deep Vein Thrombosis
Olivia R. Palmer, Grey Braybrooks, Jose A. Diaz, Joan M. Greve

A Polymeric Nanoparticle Platform for the Prevention of Relapsing-Remitting Experimental Autoimmune Encephalomyelitis
Kevin Hughes, Ryan Pearson, Liam Casey, Sandeep Kakade, Madeleine North, Leon Wang, Mei Lei, Stephen Miller, Lonnie Shea

Effects of three-dimensional MT topology on kinesin-mediated nanotransport
Kejie Chen, Woochul Nam, Bogdan Epureanu
Morphological-Feature-Based Cancer Cell Migration Prediction Using Artificial Neural Network (ANN)
Zhixiong Zhang, Lili Chen, Brock Humphries, Riley Brien, Max S. Wicha, Kathryn E. Luker, Gary D. Luker, Yu-Chih Chen, Euisik Yoon

Gene expression profiling of tumor cell subpopulations derived from implantable biomaterial scaffolds in mice with metastatic breast cancer
Tejaswini Hardas, Grace Bushnell, Lonnie Shea, Jacqueline Jeruss

Serially passaging ovarian cancer spheroids in vitro in 3D hanging drop array as a model for emergence of chemoresistance and enrichment of cancer stem cell population
Maria R. Ward Rashidi, Shreya Raghavan, Pooja Mehta, Elyse M. Fleck, Eric N. Horst, Ronald J. Buckanovich, Geeta Mehta

Location: Duderstadt Center
FAT: Fluid Dynamics, Acoustics, and Thermal Science
Session Chair: Yawei Chen

Laser-Optical Investigation of Highly Radiative, High Temperature Homogeneous Combustion
Kumar Aanjaneya, Weiyu Cao, Yawei Chen, Arvind Atreya

Kelvin-Helmholtz evolution in subsonic cold streams feeding galaxies

Output Error Control for Unsteady Flow Simulations
Kaihua Ding, Krzysztof Fidkowski

Numerical Analysis of Local and Global Hydroelastic Response to Wetdeck Slamming Events on Multihull Vessels
Matthew Graham, Kevin Maki

Radiative Heat Transfer in a Particle Laden Flow: Numerical Methods
Kaelan Hansson, Iain Boyd
High-Capacity Thermal Energy Storage Materials: Identification by Computational Screening and Machine Learning Analysis
Steven Kiyabu, Jeffrey S. Lowe, Alauddin Ahmed, Donald J. Siegel

High-Speed Imaging Studies of Gasoline Fuel Sprays at Fuel Injection Pressures from 300 to 1500 bar
Mario Medina, Mohammad Fatouraie, Margaret Wooldridge

Mass-Varying Aerothermoelastic Hypersonic Vehicle Modeling and Simulation
Philippe Sabbagh, Carlos E.S. Cesnik

Flow Control Using Passive Vortex Generators
Suyash Tandon, Eric Johnsen, Kevin Maki

Big data analysis for damage characterization of aerospace structures based on nonlinear guided wave simulation tool UM/LISA
Hui Zhang, Carlos E.S. Cesnik

Multi-artery heat-pipe spreader: monolayer-wick receding meniscus transitions and optimal performance
Minki Kim, Massoud Kaviany

**Location: EECS Atrium**

**IVM: Integrated Circuits, VLSI and Microsystems**
Session Chair: Amin Sandoughsaz

High Quality Factor Gyroscope Resonators Formed with Blowtorch Reflow Molding
Tal Nagourney, Jae Yoong Cho, Sajal Singh, Behrouz Shiari, Ali Darvishian, Khalil Najafi

Low-Noise MEMS Gyroscope System for Navigation
Christopher Boyd, Jong-Kwan Woo, Jae Yoong Cho, Tal Nagourney, Ali Darvishian, Behrouz Shiari, Khalil Najafi
RF-Echo: Decimeter Accurate, Long Range Localization System Using Low Power ASIC Tag for Public Safety Applications
Li-Xuan Chuo, Zhihong Luo, Dennis Sylvester, David Blaauw, Hun-Seok Kim

3-D Biomimetic Hair Accelerometer Arrays
Yemin (Stacey) Tang, Khalil Najafi

A Charge-Mode In-Memory Computing Deep Neural Network
Myungjoon Choi, Ziyun Li, Taewook Kang, Yiqun Zhang, Zhehong Wang, Bowen Liu, Hengfei Zhong, Jiaqing Bu, Hun-Seok Kim, David Blaauw, Dennis Sylvester

Kyuseok Lee, Seokjun Park, Sung-Yun Park, JiHyun Cho, Euisik Yoon

Time Synchronization in a Network of Bluetooth Low Energy Beacons
Farzad Asgarian, Khalil Najafi

In Situ Acoustomagnetic Interrogation of a Glaucoma Valve with Integrated Wireless Microactuator
Ramprasad M. Nambisan, Scott R. Green, Joshua D. Stein, Yogesh B. Gianchandani

Location: Duderstadt Center
IOF-1: Industrial, Operations, and Financial Engineering Session 1
Session Chair: Muhammad Hashmi

The role of behavior in undermining the effectiveness of adaptive measures in reducing long-term vulnerability to natural hazards
T M Logan, S D Guikema, J D Bricker

Statistical Modeling in the Absence of System Specific Data – Prediction of Water Main Breaks
Thomas Ying-Jeh Chen, Jared Anthony Beekman, Seth David Guikema
Eye tracking: a promising method for measuring trust in automation in real time
Yidu Lu, Kevin Lieberman, Nadine Sarter

Visual and auditory feedback to improve touchscreen usability in a turbulent environment
Yuzhi Wan, Julie C. Prinet, Nadine Sarter

Smart Production Systems: Theory and Application
Pooya Alavian, Semyon M. Meerkov

Comparing Two Goods-to-Person Order Picking Systems for Online Retailing
Francisco J. Aldarondo

Micromechanics-based Modeling of additively manufactured metallic parts
Mohsen Taheri Andani, Reza Mirzaeifar, Jun Ni

Design and Trajectory Optimization of a Morphing Wing Aircraft
John P. Jasa, John T. Hwang, Joaquim R. R. A. Martins

Location: Duderstadt Center
MTR: Medicine and Translational Research
Session Chair: Nahal Habibi

Liver functional assessment via linearization of 2-compartment model of gadoxetic-acid uptake in dynamic contrast enhanced magnetic resonance imaging
Josiah Simeth, Adam Johansson, Dawn Owen, Kyle Cuneo, Michelle Mierzwa, Mary Feng, Theodore S. Lawrence, Yue Cao

Transport analysis of antibody-drug conjugate bystander effects and payload tumoral distribution: designing effective clinical therapies
Eshita Khera, Cornelius Cilliers, Sumit Bhatnagar, Greg Thurber

Two-step emulsion solvent evaporation technique for fabricating biodegradable rod-shaped drug carriers
Hanieh Safari, Omolola Eniola-Adefeso
Role of Red Blood Cell Deformability on Cellular and Particle Dynamics in Blood Flow
Mario Gutierrez, Margaret B. Fish, Omolola Eniola-Adefeso

Towards a physiologically-relevant in vitro model for oral drug product delivery in the human gastrointestinal tract
Niloufar Salehi, Patrick D. Sinko, Nicholas Job, Meagan Dean, Gregory Amidon, Robert M. Ziff, Gordon Amidon

Development of Restricted Diffusion Model for Differentiation of Tumor from Normal Tissue in Glioblastoma
Yuan Li, Michelle Kim, Hemant Parmar, Yue Cao

Location: EECS Atrium

OPS: Optics, Photonics, and Solid-State Devices
Session Chair: Harsh Agarwal

Increased Blocking Voltage in Solution Processed ZTO HVTFTs through Drain Offset
Christopher Allemang, Rebecca L. Peterson

Reliable, all-phosphorescent stacked white organic light emitting devices with a high color rendering index
Caleb Coburn, Changyeong Jeong, Stephen Forrest

A High Speed, High Sensitivity, and Universal Graphene Vapor Sensor for Both Polar and Non-polar Molecules
Wenzhe Zang, Girish S. Kulkami, Hongbo Zhu, Kyunghoon Lee, Xudong Fan, Zhaohui Zhong

Leaky Mode Coupling in Asymmetric Subwavelength Gratings
Michael Barrow, Martin Scherr, Jamie Phillips

Spin-coated zinc tin oxide film made via metal-organic decomposition route
Youngbae Son, Alex Liao, Becky (R.L.) Peterson

Fundamentals and Applications of Organic-Inorganic Hybrid Semiconductors
Anurag Panda, Stephen Forrest
Pulsed laser deposition of In2O3-SnO2: from films to nanowires
Del Gaudio, D., Reese, C., Boone, C., Yarlagadda, S., Heron, J. T., Shalish, I., Goldman, R. S.

Self-referenced single-shot THz detection
Brandon K. Russell, Benjamin K. Ofori-Okai, Zhijiang Chen, Matthias C. Hoffmann, Ying Y. Tsui, Siegfried H. Glenzer

Photo-assisted Capacitance-Voltage Characterization of Interface States in SiO2/β-Ga2O3 (010) MOS Capacitors
Hannah Masten, Jamie Phillips, Rebecca L. Peterson

Charge transport in highly doped (010) β-Ga2O3 single crystals made by edge-defined film-fed growth
Zumrad Kabilova, Cagliyan Kurdak, Rebecca L. Peterson

The role of halogen bonding in room temperature, metal free organic phosphors
Ramin Ansari, Daniel Hashemi, John Kieffer

Highly Sensitive Photodetectors Based on Hybrid Organic-Inorganic Interface
Che-Hsuan Cheng, Haozhu Wang, Zidong Li, Parag B. Deotare

Coherence Transfer in CdSe Colloidal Quantum Dots Revealed by 2D Optical Spectroscopy
Albert Liu, Diogo B. Almeida, Wan Ki Bae, Lazaro A. Padilha, Steven T. Cundiff

Studying Semiconductor/Liquid Junctions with Ultramicroelectrodes
Saurabh Acharya, Mitchell Lancaster, Stephen Maldonado

Artificial Plasmon: a design-friendly alternative for micro-biosensing and high speed millimeter-scale communication
Soumitra R. Joy, Mikhail Eremenchouk, Pinaki Mazumder

Nearly Polarization Independent Longwave Infrared Transmission Filters via Two-Dimensional Subwavelength Dielectric Gratings
Martin Scherr, Michael Barrow, Jamie Phillips

Microscopic theory for local semiconductor excitations and nanostructures
Markus Borsch
Quantum Spectroscopy with Extreme Nonlinearities  
B. Girodias

Modeling of Thermoelectric Transport in Polycrystalline Organic Semiconductors  
Aman Kumar Jha, Kevin P. Pipe

AlN/h-BN Nanowire Heterostructures for Deep Ultraviolet Photonics  
David Arto Laleyan, Songrui Zhao, Hong Nhung Tran, Huy Binh Le, Zetian Mi

Structural Color Filters: Fundamentals and Opportunities for Real-world Applications  
Chengang Ji, L. Jay Guo

Low Temperature Carrier Transport Measurements on Low Doped HgCdTe  
Justin Easley, Erdem Arkun, Michael Carmody, Jamie Phillips

Photovoltaic Infrared Energy Harvesting for Bio-Implantable Devices  
Eunseong Moon, David Blaauw, Jamie Phillips

**Location: Duderstadt Center**  
**SMR: Structural Material Research**  
**Session Chair: Benjamin Derby**

Interaction of Glide Dislocations with Extended Precipitates in Mg-Nd alloys  
Zhihua Huang, John E. Allison, Amit Misra

Molecular Dynamics Study of the Polycondensation of Water at a Polyimide/Cu(100) Interface  
Eleanor Coyle, Katherine Sebeck, John Kieffer

Integrated Imaging of Self-Organized Modified Eutectics  
Saman Moniri, Xianghui Xiao, Ashwin J. Shahani

The Effect of Ti on the High Temperature Oxidation of Ni-based Alloys  
Talia L. Barth, Emmanuelle A. Marquis

Local Control of Dislocations in Colloidal Materials  
Bryan VanSaders, Julia Dshemuchadse, Sharon C. Glotzer
Design of Liquid Crystalline Conjugated Polymers for Directed Alignment
Da Seul Yang, Kyeongwoon Cheong, Maciej Barlóg, Mohammed Al-Hashimi, Jinsang Kim

Use of Wavelet Analysis for an Objective Evaluation of the Formation of Pills in Nonwoven Fabrics
Dandan Wang, J. R. Barber, W. Lu, M. D. Thouless

Isolation of Aramid Nanofibers for Strong Polymeric Composites
Jiajun Lin, Mohammad H. Malakooti, Brendan A. Patterson, Henry A. Sodano

Simulation of Micro-Scale Shear Bands Using Peridynamics with an Adaptive Dynamic Relaxation Method
Jiangyi Luo, Veera Sundararaghavan

Matrix Cracking and Fiber Breaks in SiC/SiC CMCs Using In Situ Tomography Techniques
Ashley Hilmas, K. Sevener, J. Halloran, A. Singhal, Y. Zhou, E. Maillet, Y. Gao G. Wilson
Richard and Eleanor Towner Prize for Outstanding Ph.D. Research Poster Competition

_Pierpont Commons Atrium_
1:00 pm – 3:00 pm
Location: Pierpont Commons Atrium
Richard and Eleanor Towner Prize for
Outstanding Ph.D. Research
Session Chair: Maya Nath

Compute Caches
Shaizeen Aga, Supreet Jeloka, Arun Subramaniyan, Satish Narayanasamy, David Blaauw, Reetuparna Das

Dual-Polarized Fully-Populated Common-Aperture Cavity-Backed Slot Antenna for Empowering Broadband Full-Duplex Communication
S. Mohammad Amjadi, Kamal Sarabandi

Designing Self-Healing Superhydrophobic Surfaces with Exceptional Mechanical Durability
Mathew Boban, Kevin Golovin, Joseph M. Mabry, Anish Tuteja

The Role of Socio-Cognitive Mechanism in Construction Workers' Safety Behaviors
Byungjoo Choi, SangHyun Lee

Real-Time 3D Compton Imaging
Jiyang Chu, Zhong He

Probing Thermal Transport and Energy Conversion at the Nanoscale
Longji Cui

Preprogrammed long-term pulsatile Parathyroid Hormone delivery to strengthen bone and promote bone regeneration
Ming Dang, Amy J. Koh, Xiaobing Jin, Laurie K. McCauley, Peter X. Ma

Optimally Weighted PCA for High-Dimensional Heteroscedastic Data
David Hong, Laura Balzano, Jeffrey A. Fessler

Securing Modern Appified Platform through Systematic Program Analysis and Design
Yunhan (Jack) Jia
Computational Multi-Physics Analysis and Modeling for Improved High-Speed Vehicle Performance
Ryan C. Kitson

Directing Biointerfacial Events Using Polymer Brushes
Ramya Kumar, Domenic Kratzer, Irina Kopyeva, Kenneth Cheng, Joerg Lahann

Understanding and controlling resistive switching in oxide-based memristors for memory and neuromorphic computing
Jihang Lee, William Schell, Xiaojian Zhu, Emmanouil Kioupakis, Wei D. Lu

Multiscale Investigation of Shape Memory Alloy Fatigue
William LePage, John Shaw, Samantha Daly

Machine Learning for Optimal Detection of Metastatic Prostate Cancer
Selin Merdan, Christine Barnett, James E. Montie, David C. Miller, Brian T. Denton

Numerical hydroelastic algorithm for the analysis of water entry problems with high forward speed
Jose D. Mesa

Twinning-Detwinning Behavior During the Low-Cycle Fatigue Testing of Pure Magnesium Using High Energy X-Ray Diffraction
Aeriel D. Murphy, Darren C. Pagan, Armand Beaudoin, Matthew P. Miller, John E. Allison

Discriminating Materials Using a Multi-particle Approach in an Active Interrogation Environment
Jason Nattress

Deep Design: Product Aesthetics for Heterogeneous Markets
Yanxin Pan, Alexander Burnap, Jeffrey Hartely, Richard Gonzalez, Panos Papalambros

Flexible Supply Chain Network Design under Correlated Uncertainty
Nima Salehi Sadghiani, Mark S. Daskin

Automated Mesh Adaptation for Efficient Aircraft Design
Devina Sanjaya, Krzysztof Fidkowski, Laslo Diosady, and Scott Murman
Out-of-Band Acoustic Fields: Theory and Applications
Brian M. Worthmann, David R. Dowling

The impact of airborne pollen on precipitation via the aerosol indirect effect
Matthew C. Wozniak, Allison L. Steiner

Prepare for next Ebola-like Outbreak: Studies on Enveloped Virus Inactivation Mechanisms
Yinyin Ye, Krista Rule Wigginton
Poster Presentations: Afternoon Session

EECS Atrium and Duderstadt
1:45 pm – 4:15 pm
Satellite-derived SIF Observations Show Coherent Responses to Interannual Climate Variations
Zachary Butterfield, Gretchen Keppel-Aleks

Multi-fluid MHD simulations of Europa’s interaction with Jupiter’s magnetosphere
Camilla D. K. Harris, Xianzhe Jia, James A Slavin, Martin Rubin, Gábor Tóth

Empirical Modeling of ICMEs using ACE/SWICS Ionic Distributions
Yeimy Rivera, Enrico Landi, Susan Lepri, Jason Gilbert

3D Hall MHD-EPIC Simulations of Ganymede’s Magnetosphere
Hongyang Zhou, Gábor Tóth, Xianzhe Jia

A Position-Independent Highly-Efficient Wireless Power Transfer Based on Coupled Nonlinear Resonant Circuits
Omar Abdelatty, Xiaoyu Wang, Amir Mortazawi

GPS Constellation Power Monitor System for High Accuracy CYGNSS L1B Calibration/Validation: Design, Implementation and Calibration
Tianlin Wang, Christopher Ruf, Scott Gleason, Bruce Block, Darren McKague, Damen Provost

Zero-dimensional modeling of the Hall thruster breathing mode
Ethan Dale, Benjamin Jorns, Kentaro Hara
Sampling Requirements for Wideband Autocorrelation Radiometric (WiBAR) Remote Sensing of Dry Snowpack and Lake Icepack
Mohammad Mousavi, Roger De Roo, Kamal Sarabandi, Anthony W. England

High order harmonic generation with femtosecond mid-infrared laser
Jinpu Lin, John Nees, Karl Krushelnick, Franklin Dollar, Tam Nguyen

Intrinsically Switchable and Miniaturized Ferroelectric Bulk Acoustic Wave Filters
Milad Zolfagharloo Koohi, Suhyun Nam, Amir Mortazawi

Metamaterial Bessel Beam Radiator
Nikolaos Chiotellis, Anthony Grbic

Low-Frequency Plasma Oscillations in the Plume of a Low Temperature Magnetic Nozzle
Shadrach Hepner, Timothy Collard, Justin Little, Benjamin Jorns

Scalable Phased Array Architectures with a Reduced Number of Tunable Phase Shifters
Fatemeh Akbar, Amir Mortazawi

Dispersion relation measurements of plasma modes in the near-field plume of a 9-kW magnetically shielded thruster
Zachariah A. Brown, Benjamin A. Jorns

Scattering of Lossy Dielectric Surfaces in Full Wave Simulation of Maxwell’s Equations with Dense Grid and Neighborhood Impedance Boundary Conditions
Tai Qiao, Tsang Leung, Shurun Tan

Scaling Laws of Rotating Magnetic Field Field-Reversed Configuration Thrusters
Joshua M. Woods, Benjamin A. Jorns, Alec Gallimore
**Location: Duderstadt Center**

**ATE: Automotive and Transportation Engineering**
Session Chair: Justin Koczak

Steering Torque Disturbance Modeling for Control of Electric Power Steering System  
Akshay Bhardwaj, Brent Gillespie

Intelligent Cruise Control of Diesel Powered Vehicles  
Addressing the Fuel Consumption Versus Emissions Trade-off  
Chunan Huang, Rasoul Salehi, Anna Stefanopoulou

Impact of Bulk Modulus and Speed of Sound of Jet Fuels on Unintended Fuel Injection Timing Shift  
Taemin Kim, André L. Boehman

Effects of a Delay Compensation Aid on Teleoperation of Unmanned Ground Vehicles  
Shihan Lu, Meng Yuan Zhang, Tulga Ersal, X. Jessie Yang

Trip-Based Graph Partitioning in Peer-to-Peer Ridesharing  
Yuexi Tu, Neda Masoud

**Location: Duderstadt Center**

**CPH: Chemical Physics**
Session Chair: Tianyu Liu

Optimization of Smooth Isotropic Pair Potentials for the Self Assembly of Complex Structures  
Carl S. Adorf, James Antonaglia, Julia Dshemuchadse, Sharon C. Glotzer

Self-Consistent Computation of the Directional Shear and Young’s Moduli in Small Molecular Organic Semiconductors  
Shantonio Birch, Shuying Li, Kevin Pipe

Engineering Energy Flow in Multimetallic Plasmonic Photocatalysts  
Steven Chavez, Umar Aslam, Suljo Linic
Dead Lithium: Mass Transport Effects on Voltage, Capacity, and Failure of Lithium Metal Anodes
Kuan-Hung Chen, Kevin N. Wood, Eric Kazyak, William S. LePage, Andrew L. Davis, Adrian J. Sanchez, Neil P. Dasgupta

3D Nano-metallic Thin Films by Design
Benjamin Derby, Yuchi Cui, Jon Kevin Baldwin, Amit Misra

Chitosan as a yield stress fluid: concentration dependent rheology and microdynamics
Nina Gasbarro

Harnessing Immune System to Battle Cancer by Using Protein-Based Nanoparticles
Nahal Habibi, Stephanie Christau, Lukasz Ochyl, James J. Moon, Joerg Lahann

Reconfigurable Light Diffraction Response of Ellipsoidal Colloids by Electric Field Assisted Assembly
Peng-Kai Kao, Michael Durkin, Michael Solomon

Influence of Softness on Binary Sphere Crystal Stability
Allen LaCour, Carl S. Adorf, Sharon C. Glotzer

Direct methane conversion to ethane and ethylene by oxidative coupling
Valentina Omoze Igenegbai, Brittany Lancaster Farrell, Suljo Linic

Strain-Induced Reduction in Dynamic Lattice Disorder in Small Molecular Organic Semiconductors
Shuying Li, Shantonio Birch, Kevin P. Pipe

Working towards a Multivalent Battery by Studying the Effects of (de)localization of d-electrons on Ion Transport in Chevrel Phase Mo6 S8
Everardo Olide, Donald Siegel

Workflow Design and Management with signac-flow
Vyas Ramasubramani, Carl S. Adorf, Paul M. Dodd, Sharon C. Glotzer
Spatiotemporal Evolution of Layer-by-Layer Assembled Oppositely Charged Polyelectrolytes Multilayer Thin Films
Ali Salehi, Ronald G. Larson

Comparison of Active Motion Induced by AC Electric Fields and Ionic Fields
Keara Saud, Michael Solomon

Designing DNA-Functionalized Nanoparticle Binary Assemblies
Benjamin Swerdlow, Matthew Spellings, Julia Dshemuchadse, Sharon Glotzer

Growth of Nanoparticles in Reactive Systems
Qi Wang, Paolo Elvati, Angela Violi

High activity carbide supported catalysts for aldehyde water shift
Wei-Chung Wen, Ronald Hobson, Levi T. Thompson

Location: Duderstadt Center
FMR: Functional Materials Research
Session Chair: Maria Ward Rashidi

Solution-Grown Organolead Trihalide Perovskite Single Crystals for Radiation Spectroscopy
Suneel Joglekar, L. Jay Guo, Mark Hammig

Post-synthetic Functionalization of Three-Dimensional Covalent Organic Frameworks
Xingjian Ma, Timothy F. Scott

Engineering Magnetic Functionality and Structure in Entropy Stabilized Oxides
Peter B. Meisenheimer, Thomas J. Kratofil, John T. Heron

Near-Edge Optical and Phonon Properties of $\beta$-Ga$_2$O$_3$
Kelsey Mengle, Guangsha Shi, Dylan Bayerl, Emmanouil Kioupakis

Systematic nanoparticle drug delivery analysis in high-grade serous ovarian cancer
Catherine Snyder, Anish Tuteja, Geeta Mehta

Influence of conjugated polymer morphology on electronic properties at the polymer/conductor interface
Investigating the role of acidity in oxidation catalysis using model metal-oxide catalysts
Trenton Wilke, Mark Barteau

Selective Wettability Membranes for Enhanced Liquid Separation and Fouling Prevention
Ethan R. Post, Gibum Kwon, Anish Tuteja

Correlating the Interface Resistance and Surface Adhesion of the Li Metal-Solid Electrolyte Interface
Michael Wang, Jeff Sakamoto

Location: Duderstadt Center
IOF-2: Industrial, Operations, and Financial Engineering Session 2
Session Chair: Francisco Aldarondo

A Stochastic Programming Approach to Determine Decision Boundaries for Medical Diagnosis
Gian-Gabriel P. Garcia, Mariel S. Lavieri, Ruwei Jiang, Steven P. Broglio, Michael McCrea, Thomas W. McAllister

Effects of reliability levels and reliability information calculation methods on trust, dependence and task performance
Na Du, Qiaoning Zhang, X. Jessie Yang

Design of Multimodal Closed Queuing Networks for Transportation-as-a-Service
Qi Luo, Shukai Li, Robert Hampshire, Sharon Di

Quantitative Models for Managing Multi-Node Replenishment Logistics in the Food Supply Chain
Alejandro Vigo Camargo, Yavuz A. Bozer

Statistical prediction of hand-load carrying strategy and load level from wearable inertial sensor data
Sol Lim, Clive D’Souza

Aperture Control for VMAT Planning Systems
W.E. Henao, M. Epelman, E. Romeijn, K. Younge, C. Anderson, M. Matuszak
Development of a Computational Driver Performance Model for In-vehicle Direct/Indirect Manual and Speech Interactions
Heejin Jeong, Yili Liu

Adaptive Submodular Ranking
Prabhanjan Kambadur, Viswanath Nagarajan, Fatemeh Navidi

Location: EECS Atrium
PEN: Power and Energy
Session Chair: Naomi Ramesar

Transfer-Power Measurement: A Non-Contact Method for Fair and Accurate Metering of Wireless Power Transfer in Electric Vehicles
Sung Yul Chu, Al-Thaddeus Avestruz

A Non-Uniformly-Sampled Digital Controller for Constant-On-Time Valley-Current-Mode (NUS-COTCM) Buck Voltage Regulation Modules (VRMs)
Xiaofan Cui, Al-Thaddeus Avestruz

Critical Parameter Values for Marginal Recovery from Parameter-Dependent Disturbances
Michael Fisher, Ian Hiskens

Printed, Metallic Thermoelectric Generators Integrated with Pipe Insulation for Powering Wireless Sensors
Brian Lezzy

Approximation Methods for Scheduling Battery Energy Storage for Multiple Services
Abigail Kern, Olivier Mégel, Jeremiah Johnson, Johanna Mathieu

Quantifying energy efficiencies of buildings providing ancillary services
Aditya Keskar, Sina Afshari, Paul Giessner, Ian Hiskens, Jeremiah Johnson, Johanna Mathieu

Cost, timeline, and technology pathway of climate cure with direct air capture versus timely emissions abatement
Tae Lim, Sarang D Supekar, Steven J Skerlos

Addressing Synchronization and Oscillations under Market-based Coordination of Distributed Energy Resources
Md Salman Nazir, Ian A. Hiskens
Impacts on the Local Power Network when Residential Loads Provide Energy Balancing Services to the Regional Network
Stephanie C. Ross, Gabrielle Vuylstekte, Johanna L. Mathieu

Multiple Access Wireless Power Transfer
Akshay Sarin, Al-Thaddeus Avestruz

Water-Power Distribution Network Coupling for Optimal Pumping to Reduce Energy Costs and Promote Resilience
Anna Stuhlmacher, Johanna L. Mathieu, Vijay Gupta

Designing a Better Battery with Artificial Neural Network
Bin Wu, Sangwoo Han, Kang Shin and Wei Lu

The Impact of Load Models in an Algorithm for Improving Voltage Stability via Control of Demand Response Resources
Mengqi Yao, Daniel K. Molzahn, Johanna L. Mathieu

Wireless Power Transfer for Implantable Medical Devices Using Piecewise Resonance to Achieve High Peak-to-Average Power Ratio
Xin Zan, Al-Thaddeus Avestruz

Location: EECS Atrium
SICC: Signal and Image Processing, Computer Vision and Communication
Session Chair: Zhaolun Su

Optimal Estimation of Information Measures and their Applications
Morteza Noshad Iranzad, Kevin R. Moon, Salimeh Yasaei Sekeh, Alfred O Hero III

Differential Privacy of ADMM-based Distributed Machine Learning Algorithms
Xueru Zhang, Mingyan Liu

Predictive models for transitions in brain states
Megha Ghosh, Omar J. Ahmed

Personalized PageRank Estimation for Many Nodes: The Impact of Clustering on Complexity
Daniel Vial, Vijay Subramanian
Acoustic localization of distributed coherent and incoherent sources using SEMWAN with subarray smoothing
Tyler Flynn, David Dowling

WaterGAN: Unsupervised Generative Network to Enable Real-time Color Correction of Monocular Underwater Images
Jie Li, Katherine A. Skinner, Ryan Eustice, Matthew Johnson-Roberson

Accelerated diffusion-weighted magnetic resonance imaging using a low-rank tensor model
Lianli Liu, Yue Cao, James M. Balter, Jeffrey A. Fessler

Click Here: Human-Localized Keypoints as Guidance for Viewpoint Estimation
Ryan Szeto, Jason J. Corso

Feature Evaluation For EMG-Based Load Classification
Anne Gu, Deema Totah, Kira Barton

Sparse Coding with Memristor Networks
Fuxi Cai, Patrick Sheridan, Chao Du, Wen Ma, Zhengya Zhang, Wei D. Lu

A Convex Clustering Formulation Using the Similarity Matrix
Yutong Wang, Laura Balzano, Clayton Scott, Venkatesh Saligrama

Location: EECS Atrium
SSEC: Systems, Software Engineering and Computer Science
Session Chair: Houtan Jebelli

Performance characterization for a taxonomy of threading models applied to mid-tier servers
Akshitha Sriraman, Thomas F. Wenisch

Localization, Approximations, and Nonlinear Consensus for Distributed Non-convex Optimization with Applications to Resource Allocation
Hsu Kao, Vijay Subramanian

A Descending Price Auction for Matching Markets
Shih-Tang Su, Vijay G. Subramanian, Grant Schoenebeck, Jacob D. Abernethy
Foofah: A Programming-By-Example System for Synthesizing Data Transformation Programs  
Zhongjun Jin, Michael R. Anderson, Michael Cafarella, H. V. Jagadish

Effective Premium Discrimination for Designing Cyber Insurance Policies with Rare Losses  
Mohammad Mahdi Khalili, Mingyan Liu

A new locally tree like object: Erlang Weighted Tree  
M. Moharrami, V. Subramanian, M. Liu

Closing the Gap between Structured Codes and Random Unstructured Codes for Communication Networks  
Mohsen Heidari, Farhad Shirani, S. Sandeep Pradhan

On a structural theory of fault detection for affine systems  
Mustafa Kara, Necmiye Ozay

A Descending Price Auction for Matching Markets  
Shih-Tang Su, Vijay G. Subramanian, Grant Schoenebeck, Jacob D. Abernethy

dsNN: Improving Energy Efficiency with Data Specialized Neural Networks  
Babak Zamirai, Salar Latifi, Jiecao Yu, Scott Mahlke

Scalable Control of Cyber-Physical Systems  
Mohammad Rasouli, Demosthenis Teneketzis

Long term effects of pair programming  
Max Smith, Andrew Giugliano, Andrew DeOrio

Location: EECS Atrium

TCB: Tissue, Cellular, and Biomolecular Engineering  
Session Chair: Adeline Hong

Matrix Elasticity Defines Cell Migration Modes in Aligned Fibrous Microenvironments  
William Y. Wang, Brendon M. Baker

Quantitative Single-Cell Analysis of Cancer Drug Response  
Natacha Comandante Lou, Mohammad Fallahi-Sichiani
Bacterial MscL in Mammalian Cells for Novel Mechanobiology Applications
Johanna Heureaux-Torres, Victoria Murray, Di Chen, Cheri X. Deng, Gary Luker, Kathy Luker, Allen P. Liu

Role of Fiber-Mediated Mechanical Cell-Cell Communication in Endothelial Cell Network Formation
Christopher D. Davidson, Brendon M. Baker

Fluid Shear Stress Induces Chemoresistance, Proliferation, and Mechanotransduction Phenotypes in Breast Cancer Cells
Caymen Novak, Shreya Raghavan, Eric Horst, Geeta Mehta
Notes