

# Mariana Tsacoumis Meyer

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## EDUCATION

**University of Maryland, College Park, Ph. D. in Bioengineering, expected 2012**

*GPA: 3.9*

*Research Advisor: Dr. Reza Ghodssi*

*Relevant Coursework: Cellular Rate Processes and Transport, Biochemistry, Cell Biology, Design and Fabrication of MEMS*

**Stanford University, BS in Mechanical Engineering, received June 2007**

*GPA: 3.5 (Mechanical Engineering GPA: 3.6)*

*Research Advisor: Dr. Beth Pruitt*

*Relevant Coursework: Fluid Mechanics, Manufacturing and Design, Heat Transfer, Mechatronics, Integrated Circuit Fabrication*

## RESEARCH EXPERIENCE

**University of Maryland, College Park, MEMS Sensors and Actuators Laboratory**

*Graduate Research Assistant*

August 2007 to present

- Development of microfluidic testbeds for investigation of bacterial biofilms, with drug development applications
  - o Implementation of optical density monitoring to evaluate biofilm growth and to distinguish between biofilms grown in microfluidic channels under differing physical and chemical conditions
  - o Use of developed procedures to evaluate effect of inhibitors preventing bacterial communication on biofilm formation
  - o Interdisciplinary research collaboration with researchers in materials science and molecular biology

**Stanford University Microsystems Group**

*Undergraduate Research Assistant*

March 2006 – June 2007

*Stanford Mechanical Engineering Summer Undergraduate*

Summer 2006

*Research Institute (SURI)*

- Evaluation of sensitivity and noise properties of piezoresistive micro-cantilevers, and the dependence of performance on piezoresistor fabrication
  - o Development and use of standard measurement procedures for piezoresistor sensitivity and noise
  - o Modeling of piezoresistor fabrication using TSUPREM software
  - o Construction of preliminary model correlating device noise and sensitivity with fabrication parameters, using JMP statistical software

## **National Institute of Standards and Technology (NIST), Building and Fire Research Laboratory**

*Intern, Summer Undergraduate Research*

Summer 2005

*Fellowship (SURF) Program Keynote Speaker*

- Evaluation of the efficiency of thermoelectric cooling devices, including development of testing platform and procedures, collection of data, and processing of results

## **National Institute of Standards and Technology (NIST), Electronics and Electrical Engineering Laboratory**

*Intern*

Summers 2004, 2003

- Website design and maintenance using HTML
- Editing of code for STEP-AP210 Project (Standard for the Exchange of Product Model Data), using SGML and EXPRESS languages to render original EXPRESS documentation useable in an XML environment
- Migration of computers previously on local division network to NIST domain.

## **TEACHING/MENTORING EXPERIENCE**

### **University of Maryland, College Park, MEMS Sensors and Actuators Laboratory**

- Teaching assistant for one graduate-level course, *Transport Phenomena in Bioengineering Systems* (BIOE604), and one undergraduate-level course, *Integrated Circuit Fabrication Laboratory* (ENEE416)
- Graduate student mentor to two high school students, two undergraduate research assistants, and one graduate rotation student at the MEMS Sensors and Actuators Laboratory

## **RESEARCH PROPOSAL EXPERIENCE**

- Contributing author to three research proposals
  - o “*Detection, characterization, and treatment of biofilm infections in vivo*”, PI: Dr. Anjan Nan, Co-PIs: Dr. Reza Ghodssi, Dr. William Bentley, submitted to *National Institutes of Health* (July 2010). Status: not selected for funding
  - o “*Real-time monitoring and characterization of biofilm infections*”, Co-PIs: Dr. Anjan Nan, Dr. Reza Ghodssi, submitted to *University of Maryland, College Park (UMCP) and the University of Maryland, Baltimore (UMB) RESEARCH Seed Program* (February 2010). Status: not selected for funding
  - o “*Real-time monitoring and characterization of biofilm infections*”, PI: Dr. Anjan Nan, Co-PI: Dr. Reza Ghodssi, submitted to *National Institutes of Health* (October 2009). Status: not selected for funding

## **PUBLICATIONS**

### **Journal Papers**

1. J.R. Mallon, A.J. Rastegar, A.A. Barlian, M.T. Meyer, and B.L. Pruitt, “Low 1/f noise, full bridge microcantilever with longitudinal and transverse piezoresistors”, *Applied Physics Letters*, vol. 92, 2008. [Article chosen for inclusion in Feb. 11 2008 issue of *Virtual Journal of Nanoscale Science & Technology*]
2. M.T. Meyer, V. Roy, W.E. Bentley, and R. Ghodssi, “Development and validation of a

microfluidic reactor for biofilm monitoring via optical methods”, *Journal of Micromechanics and Microengineering (JMM)—Special Issue: MEMS in Biology and Medicine*, vol. 21, no. 044023, May 2011.

### Refereed Conference Proceedings

([S]: Short abstract, [L]: Long abstract, [P]: Paper; Presenting authors underlined)

1. M.T. Meyer, V. Roy, W.E. Bentley, and R. Ghodssi, “A Microfluidic Device for Optical Absorbance Monitoring of Bacterial Biofilms”, *IEEE Sensors 2010*, pp. 2291-2294, Waikoloa, HI, November 1-4 2010. [P]
2. M.T. Meyer, Y.W. Kim, V. Roy, S.E. Sardari, A. Iliadis, W.E. Bentley, and R. Ghodssi, “Development of Lab on a Chip Platforms for Bacterial Biofilm Monitoring and Detection”, *2010 International Conference on Biofabrication*, Philadelphia, PA, October 4-6 2010. [L]
3. M.T. Meyer, V. Roy, W.E. Bentley, and R. Ghodssi, “A Microfluidic Platform for Optical Monitoring of Bacterial Biofilms”, *The 26<sup>th</sup> Southern Biomedical Engineering Conference (SBEC)*, pp. 426-429, College Park, MD, April 30-May 2 2010. [P]
4. M.T. Meyer, S.T. Koev, R. Fernandes, W.E. Bentley, and R. Ghodssi, “Toward a Selective Optical Biosensor for Integrated Biofilm Detection”, *The American Vacuum Society 55<sup>th</sup> International Symposium*, Boston, MA, October 19-24, 2008. [S]
5. P. Dykstra, S. T. Koev, M. Meyer, X. Luo, G. W. Rubloff, G. F. Payne, W. E. Bentley, and R. Ghodssi, “The Biopolymer Chitosan for Functionalization of MEMS Sensors,” *The 2008 Solid-State Sensor, Actuator and Microsystems Workshop (Hilton Head 2008)*, Open Poster Session, Hilton Head, SC, June 1-5, 2008. [S]

### Poster Presentations

1. M.T. Meyer, V. Roy, W.E. Bentley, and R. Ghodssi, “A Microfluidic Platform for Optical Monitoring of Bacterial Biofilms”, *The Mid-Atlantic Micro/Nano Alliance Symposium*, Laurel, MD, October 19, 2010
2. M. T. Meyer, S. T. Koev, R. Fernandes, W. E. Bentley, and R. Ghodssi , “A Microfluidic Platform for Optical Monitoring of Bacterial Biofilms,” *The Mid Atlantic MEMS Alliance 10th Annual Special Topics Symposium*, Washington, DC, November 30, 2009.
3. M. T. Meyer, S. T. Koev, V. Roy, W. E. Bentley, and R. Ghodssi , “Toward an Optical Biosensor for Integrated Biofilm Detection,” *Grace Hopper Celebration of Women in Computing Poster Session*, Tuscon, AZ, September 30-October 3, 2009.

## PROFESSIONAL MEMBERSHIPS

AAAS – student member  
IEEE – student member  
BMES – student member

2009 – present  
2010 – present  
2011 – present

## **TECHNICAL SKILLS**

### **Computer Skills**

- MEMS Design (L-Edit, TSUPREM )
- Data Collection and Analysis (LabVIEW, MATLAB, JMP)
- Mechanical Design and Simulation (Solidworks, COMSOL)
- Microsoft Office
- Adobe Photoshop, Dreamweaver

### **Metrology and Characterization Tools**

- Confocal microscopy
- Optical microscopy
- Profilometry

### **Molecular Biology and Microbiology**

- Bacterial cell culture
- Absorption spectroscopy
- Protein expression and purification
- Gel Electrophoresis

### **Microfabrication**

- Contact Lithography
- Wet Etching
- Dicing Saw
- Microfluidic Packaging

### **Programming Languages**

- C/C++
- HTML
- CSS

### **Machining**

- Lathe
- Mill
- LaserCamm
- Soldering
- Brazing
- Oxyacetylene welding