

## Appendix I: Workshop Program and Seminar Abstracts

### *National Science Foundation workshop on Control and System Integration of Micro- and Nano-Scale Systems*

#### **Monday March 29**

##### **Morning**

- 7:00–7:30 Front Desk (all laptops checked for viruses at NSF, go to room 357)
- 7:30–8:00 Room 375 Breakfast
- 8:00–8:30 Room 375 **Welcome and introduction to the workshop**  
Benjamin Shapiro; University of Maryland  
Maria Burka, Delcie Durham, Masayoshi Tomizuka, Kishan Baheti; NSF
- 8:30–9:10 Room 375 **Wireless Integrated MicroSystems (WIMS): Coming Revolution in the Gathering of Information** Ken Wise, University of Michigan
- Room 375 **Introduction to the six theme areas:**
- 9:20–9:40 *MEMS Design/Fabrication, Devices, and Systems: Research Directions in MEMS*  
Martin Schmidt, MIT
- 9:40–10:00 *Nano Fabrication: A Review of Nanofabrication Efforts and Challenges*  
Jun Jiao, Portland State University
- 10:00–10:15 Break
- 10:15–10:35 *BioMEMS and/or Nanobiotechnological Systems: MEMS for Biomedical Applications*  
Bill Tang, Irvine
- 10:35–10:55 *Biological (or Biomolecular or Biochemical) and Chemical Systems on the Micro- and Nano-Length Scales: Challenges and Opportunities in Biological Systems Analysis and Design* Costas Maranas, Penn State
- 10:55–11:15 *Control Systems with a MEMS and/or Nano Perspective: Dynamics and Control of Thin Film Microstructures* Panagiotis Christofides, UCLA
- 11:15–11:35 *Measurement, Modeling, and Model Validation at the Micro/Nanoscale: Modeling Transport in Micro and Nanofluidic Devices* Terry Conlisk, Ohio State University
- 11:40–Noon Room 375 **Charge to breakout groups** Benjamin Shapiro, UMD  
Pickup lunch provided in/outside room 375. To be taken by workshop participants to breakout rooms.

##### **Afternoon**

- Noon–2:30 **Theme breakout sessions** (working lunch)  
Participants go to the room that corresponds to their primary theme: the theme that they applied under. (People who applied under the theme “other” are free agents: they will go to theme that they feel most closely matches their expertise.)
- Noon–2:30 Room 330: **MEMS** Panel: Berg, Lal, Solzbacher
- Noon–2:30 Room 375: **Nano** Panel: Meletis, Terry, Tabib-Azar, Cui
- Noon–2:30 Room 530: **Bio-MEMS** Panel: Eggleton, Heller, Friedman
- Noon–2:30 Room 130: **Bio-Chem Systems** Panel: Dube, Barton
- Noon–2:30 Room 580: **Control** Panel: Knospe, Zourntos, Devasia, Simaan
- Noon–2:30 Room 680: **Measurement/Modeling** Panel: Beskok, Salapaka, Liburdy, Gallivan
- 2:30–3:00 Break (Theme representatives prepare their charts.)

3:00–3:45	Room 375	<b>Micro and Nano-Scale Systems for the Acquisition of Chemical and Biochemical Information</b> Mike Ramsey, Oak Ridge National Lab
	Room 375	<b>Theme representatives report back to main audience</b>
3:45–4:00	<b>MEMS</b>	(presented by theme representative)
4:00–4:15	<b>Nano</b>	(presented by theme representative)
4:15–4:30	<b>Bio-MEMS</b>	(presented by theme representative)
4:30–4:45	<b>Bio-Chem Systems</b>	(presented by theme representative)
4:45–5:00	<b>Control</b>	(presented by theme representative)
5:00–5:15	<b>Meas/Modeling</b>	(presented by theme representative)
5:15–6:30	Room 375	<b>Discussion in main audience</b>
6:30		<b>DINNER</b> —a list of restaurants in the area will be provided. Further ad hoc discussions during dinner.

## **Tuesday March 30**

### ***Morning***

7:30–8:00	Room 375	Breakfast
8:00–8:40	Room 375	<b>Design and Engineering of Bio-Molecular Nano-Devices and Systems</b> Anantha Krishnan, DARPA
8:40–9:00	Room 375	<b>Workshop report from NSF Nanoscale Systems, Dynamics and Control, ACC 2003</b> Metin Sitti, CMU
9:05–11:30		<b>Theme breakout sessions with re-organized audience</b> Participants organized by secondary (randomly chosen) theme, see participants list. Continue discussions and incorporate comments from previous day, formulation and prioritization of research directions, etc.
9:05–11:30:	Room 365: <b>MEMS</b>	Panel: Berg, Lal, Solzbacher
9:05–11:30:	Room 375: <b>Nano</b>	Panel: Meletis, Terry, Tabib-Azar, Cui
9:05–11:30:	Room 530: <b>Bio-MEMS</b>	Panel: Eggleton, Heller, Friedman
9:05–11:30:	Room 380: <b>Bio-Chem Systems</b>	Panel: Dube, Barton
9:05–11:30:	Room 580: <b>Control</b>	Panel: Knospe, Zourntos, Devasia, Simaan
9:05–11:30:	Room 730: <b>Measurement/Modeling</b>	Panel: Beskok, Salapaka, Liburdy, Gallivan
11:30–Noon	Break	(Theme representatives prepare their charts.)
	Room 375	Theme representatives report back to main audience.

### ***Afternoon***

Noon–12:10	<b>MEMS</b>	(results presented by theme representative)
12:10–12:20	<b>Nano</b>	(results presented by theme representative)
12:20–12:30	<b>Bio-MEMS</b>	(results presented by theme representative)
12:30–12:40	<b>Bio-Chem Systems</b>	(results presented by theme representative)
12:40–12:50	<b>Control</b>	(results presented by theme representative)
12:50–1pm	<b>Meas/Modeling</b>	(results presented by theme representative)
1pm–2pm	Room 375	<b>Discussion in main audience</b> (Lunch is provided.) <b>Workshop summation</b>
2:00pm	Adjourn	