Sunday August 6, 2017

12:00 – 5:00 p.m. Intern Check-in at Regency Suites Hotel
6:00 – 8:30 p.m. Welcome and Pizza Party, Marcus Nanotechnology Building 345 Ferst Drive

Monday August 7, 2017 Global Learning Center

8:30 – 8:40 AM Welcome Room
**Session A: Global Learning Center Room 222**
Moderator: Marylene Palard, University of Texas at Austin

**A.1 8:40-8:50 a.m. Ms. Monica Lopez Martinez, CNF**
Nanostamp Optimization for Single Molecule DNA/Protein Array Studies...............................Page 26

**A.2 8:50-9:00 a.m. Mr. Dante Avalos, CNF**
Flourescent DNA-Binding Proteins for Single Molecule Visualization.................................Page 10

**A.3 9:00-9:10 a.m. Mr. Juan Diego Marin Shyne**
Graphene Liquid Cell for Live Bacterial Imaging using Scanning Electron Microscopy...........Page 26

**A.4 9:10-9:20 a.m. Ms. Kelsey Defrates, MANTH**
Synthesis and Characterization of Protein-Dextran Nanogels for Drug Delivery Applications .................................................................Page 16

**A.5 9:20-9:30 a.m. Ms. Gina pr Castillo Piedra CNS**
Design, Fabrication and Testing of Microfluidic Devices for Biochemical Analysis..............Page 13

**A.6 9:30-9:40 a.m. Ms. Rebekah Priddy, KY MMNIN**
Bioceramic-Based Biomaterial Products for 3D-Printed Orthopedic Screws.......................Page 33

**Session B: Global Learning Center Room 323**
Moderator: David Dikensheets, Montana State University

**B.1 8:40-8:50 a.m. Ms. Melissa Cadena, RTNN**
Hydrogel Probes for Atomic Force Microscopy.................................................................Page 12

**B.2 8:50-9:00 a.m. Ms. Melanie Brunet, SENIC**
Thermal conductivity measurement of polymer fibers using the four-probe method..........Page 11

**B.3 9:00-9:10 a.m. Mr. Freddy Rodriguez, RTNN**
Probing the synthesis and conversion of perovskite single crystals..............................Page 34

**B.4 9:10-9:20 a.m. Ms. Sarah Hordern, SENIC**
Can We Increase Concrete Durability with Nanoparticles?.............................................Page 21

**B.5 9:20-9:30 a.m. Ms. Paola Perez, TNF**
Raman Spectroscopy and Transmission Electron Microscopy of Core-Shell Nanowires...Page 31

**B.6 9:30-9:40 a.m. Mr. Spencer Temples, SENIC**
Sacrificial Polymer Use in the Manufacturing of Low Dielectric Material.......................Page 38

9:40-9:55 a.m.  Break
Session C: Global Learning Center Room 222
Moderator: Lynn Rathbun, Cornell University

C.1 9:55-10:05 a.m. Ms. Belinda Joseph CNS
   Laser Induced Bubble on Plasmonic Topography for Nanoparticle Assembly
   Page 22

C.2 10:05-10:15 a.m. Mr. Saulnier, MONT
   Optimization of Electron Beam Lithography for the Fabrication of Nanostructured Optical Devices
   Page 34

C.3 10:15-10:25 a.m. Ms. Haruna Yano, RTNN & iREG Program
   Influence of Polymer and Nonwoven Properties for Depositing Alumina Thin Films on PVA Nanofibers
   Page 39

C.4 10:25-10:35 a.m. Mr. Hiroya Abe, KY MMNIN & iREG Program
   Laser Assisted Patterning of Free Standing Polystyrene Thin Films
   Page 9

C.5 10:35-10:45 a.m. Mr. Calvin Jones, MONT
   Transistor Process Optimization for Micro-fabrication Courses
   Page 22

C.6 10:45-10:55 a.m. Mr. Christian Franco, MANTH
   Optimal Resolution of Two-Photon Lithography: A Voxel Study
   Page 18

Session D: Global Learning Center Room 323
Moderator: Nancy Healy, Georgia Institute of Technology

D.1 9:55-10:05 a.m. Ms. Olivia Baird, SHyNE
   Improvement of Hydrothermal Synthesis of Lithium Ion Battery Cathode
   Page 10

D.2 10:05-10:15 a.m. Ms. Bailey Masigo
   Understanding the Fundamentals of Hydrogen Evolution Reaction
   Page 27

D.3 10:15-10:25 a.m. Ms. Sanjana Subramaniam MANTH
   Constructing Three-Dimensional Microstructures for Enhanced Adhesion
   Page 36

D.4 10:25-10:35 a.m. Mr. Daniel Drennan CNS
   Examining Polymer Crystallization using Raman Spectroscopy and Polar White Light
   Page 17

D.5 10:35-10:45 a.m. Mr. Zachary Pitcher CNS
   Nucleation Studies of Thin Film Oxides using Atomic Layer Deposition
   Page 32

D.6 10:45-10:55 a.m. Ms. Sarah McDonald CNS
   Optimization of CMOS-Compatible Zero-Index Metamaterials
   Page 27

10:55 11:10 a.m. Break

Session E Global Learning Center Room 222
Moderator: Kathryn Hollar, Harvard University

E.1 11:10-11:20 a.m. Mr. Jonathan Chandonait, CNF
   Deep Ultra-Violet (DUV) Photonic Crystals
   Page 13

E.2 11:20-11:30 a.m. Mr. Andrew Atkins and Mr. Justin Huxel, NCI-SW
   Small Pyramids for Light Trapping in Silicon-Based Heterojunction Solar Cells
   Page 9

E.3 11:30-11:40 a.m. Mr. Nickolas Berger and Ms. Alyssa Graham, NCI-SW
   Improving Electrical and Optical Properties of Thin Silicon Solar Cells Utilizing Nanopillars by Silica Nanosphere Lithography and Metal Assisted Chemical Etching
   Page 11

E.4 11:40 – 11:50 a.m. Mr. Peter Chang, TNF
   Metasurfaces for Optical Power Limiting
   Page 14

E.5 11:50 a.m. – 12:00 p.m. Ms. Rebecca Cheng, CNS
   Optimization of Low-loss Lithium Niobate Nanowaveguide Fabrication
   Page 14
12:00-1:00 p.m. Lunch

Session F Global Learning Center Room 222
Moderator: Ana Sanchez Gonzalez, University of Louisville

F.1 1:00-1:10 p.m. Mr. Jason Mulderrig, MANTH
   Atomic Force Microscopy-based Mechanical Testing Reveals the Mechanisms of Plasticity in Disordered Nanoparticle Packings ............................................. Page 28

F.2 1:10-1:20 p.m. Mr. Michael Hoeft, CNS
   Optimal Strength Nano-Cellular Materials ................................................................ Page 20

F.3 1:20-1:30 p.m. Mr. Roman Marcarelli, CNS
   Low-loss Zero-index Metamaterials Induced by a Bound State in the Continuum .......... Page 25

F.4 1:30 -1:40 p.m. Ms. Katrina Raiche, MANTH
   Decreasing the Defects in Free-Standing Nickel Inverse Opal Cellular Solids ............... Page 33

F.5 1:40-1:50 p.m. Mr. Steven Ochoa, SHyNE
   Transition Metal Sulfide Heterostructures for Hydrogen Evolution Reaction ................ Page 30

F.6 1:50-2:00 p.m. Mr. Paul Cuillerier, KY MNNIN
   Photoconductivity in Rare-earth Doped Nanocrystalline Titanium Dioxide .................. Page 15

2:00-2:15 PM Break

2:15-2:55 p.m. Special Presentation: international REU program at the National Institute for Materials Science Tsukuba, Japan
Presenters: Robert Accolla, Robert Chrotowski, Maya Martirosyan, John Nance, Skye Tackett, Cooper Thome,

2:55-3:10 pm Break

Session G Global Learning Center Room 222
Moderator: Melanie-Claire Mallison, Cornell University

G.1 3:10-3:20 p.m. Mr. Richard Jiang KY MNNIN
   Modification of Signal Propagation Velocity through Printed Circuit Boards by Using High Dielectric ........................................................................................................ Page 21

G.2 3:20-3:30 p.m. Mr. Daniel Teal CNF
   Piezoelectric RF SAW-Base Energy Detectors ................................................................ Page 37

G.3 3:30-3:40 p.m. Mr. Daniel Goto KY MNNIN
   Articulated Four Axes Microrobot ................................................................................ Page 19

G.4 3:40-3:50 p.m. Mr. Nicholas Theut SENIC
   Stretchable Electronics: Processing and Analyzing P3HT-PDMS Devices ....................... Page 38

G.5 3:50-4:00 p.m. Ms. Grason Gasser KY MNNIN
   Dielectrophoresis for Particle Subpopulation Analysis .................................................. Page 19

4:00-4:15 p.m. Break

4:15-4:45 p.m. Special Presentation: Fellowships and other Funding Opportunities
Presenter: Dr. Lynn Rathbun, Cornell University

4:45 p.m. Adjourn
Evening at Tech Rec 6:30 to 9:00 pm – Dinner and game room
Tuesday August 8, 2017  Global Learning Center

8:30 – 8:35 AM Welcome Room

Session H: Global Learning Center Room 222
Moderator Leslie O'Neill, Georgia Institute of Technology

H.1 8:35-8:45 a.m. Mr. Syed Nabeel Shah CNS
Laser-activated Thermoplasmonic Substrates for Intracellular Drug Delivery........Page 35

H.2 8:45-8:55 a.m. Mr. Gabriel Guisado CNF
Bacterial Mechanics on a Chip..............................................................Page 20

H.3 8:55-9:05 a.m. Mr. Leonard Thomas TNF
HCG Optical Characterization...............................................................Page 39

H.4 9:05-9:15 a.m. Ms. Lilia Escobedo MANTH
Fabrication and Characterization of Ti3C2 MXene Electrodes for Studying
Neural Circuits..................................................................................Page 17

H.5 9:15-9:25 a.m. Ms. Minh-Chau Le CNS
Prevention of Occlusion and Cell Adhesion in 3D-printed, Liquid-infused
Typanostomy Tubes........................................................................Page 24

H.6 9:25-9:35 a.m. Mr. Michael D'Agati TNF
Channels for Optical Chemical- and Bio-sensors..................................Page 15

9:35-9:50 a.m. Break

9:50-10:50 Special Presentation – Career Panel
Guests presenters: Dr. Miles Sakwa-Naval-Global Thermostat; Dr. Samantha Andrews-Associate
Director of instruction at Project Lead the Way; Mr. Thomas Johnson-Averette-IEN Process Equipment
Engineer III;

Session I: Global Learning Center Room 222
Moderator: Jamey Wetmore, Arizona State University

I.1 10:00-10:10 a.m. Mr. Yuji Okamoto NCI-SW & iREG Program
Vacuum Spray Deposition of ITO Nanoparticle Buffer Layer for Suppression of Sputtering
Damage on Perovskite/Si Tandem Solar Cells........................................Page 30

I.2 10:10-10:20 a.m. Mr. Carl Feltliner KY MMNIN
Perovskite Solar Cells........................................................................Page 20

I.3 10:20-10:30 a.m. Mr. Yuki Nakashima TNF & iREG Program
Printed CuInSe2 Nanocrystal Photovoltaic Devices (NIST).......................Page 28

I.4 10:30-10:40 a.m. Mr. David Lonstein TNF
Optical Properties of Buried High Contrast Gratings...............................Page 24

I.5 10:40-10:50 a.m. Mr. Brendan Noone KY MMNIN
Exploring Strategies to Effectively Fabricate Conductors within 3D Printed
Plastic Components........................................................................Page 29

11:40-1:00 Box Lunch and Site photos

1:00-2:00 p.m. Special Presentation: Societal Issues of Nanoscale Science and Engineering
Presenter: Dr. Jameson Wetmore, Arizona State University, Associate Director for Social and Ethical
Implications, NNCI
2:00-2:10 Break

Session J Global Learning Center Room 222
Moderator: Nancy Healy, Georgia Institute of Technology

J.1 2:10-2:20 p.m. Mr. Aaron Svidunovich MONT
   Environmental Effects on SU-8 Flexures in MEMS Devices .................................................. Page 37

J.2 2:20-2:30 p.m. Mr. Ryan Silva KY MMNIN
   Gas Microfluidics using MEMS Micro-pumps .............................................................................. Page 36

J.3 2:30-2:40 p.m. Mr. Michael Klaczko CNF
   Probing the Potential of Nanostructured Polymer Brushes ....................................................... Page 23

J.4 2:40-2:50 p.m. Ms. Robin Peter SHyNE
   Design and Fabrication of Micro-Tip Arrays for Nano-Scale Atom-Probe
   Tomography ................................................................................................................................ Page 32

J.5 2:50-3:00 p.m. Mr. Benjamin Wollant MONT
   Characterization of SU-8 Spin Coating over Wafer Topography .............................................. Page 40

3:00-3:20 p.m. Move to Marcus Nanotechnology Building for Poster Session

3:20-3:25 p.m. Set up Poster Session 1

3:25-4:10 p.m. Poster Session 1

4:10-4:15 p.m. Set up Poster Session 2

4:15-5:00 p.m. Poster Session 2

5:00 p.m. Wrap up and adjourn

Evening on your own