

SYMPOSIUM SM2

Advanced Multifunctional Fibers and Textiles
April 18 - April 20, 2017

Symposium Organizers

Michael Rein, Massachusetts Institute of Technology
Max Shtein, University of Michigan-Ann Arbor
Guangming Tao, University of Central Florida

Proceedings Statement

All authors are invited to submit articles based on their 2017 MRS Spring Meeting presentations to the journals in the MRS portfolio (www.mrs.org/publications-news). Papers submitted and accepted for publication in MRS

Advances (www.mrs.org/mrs-advances) will be available as symposium collections. Visit the MRS/Cambridge University Press Publications Booth #100 in the Exhibit Hall to learn more, including MRS Advances print options available at special rates during the meeting week only.

* Invited Paper

SESSION SM2.1: Advances in Fibers and Textiles I
Session Chairs: Max Shtein and Guangming Tao
Tuesday Morning, April 18, 2017
PCC North, 100 Level, Room 122 A

10:30 AM *SM2.1.01

Realizing a Moore's Law for Fibers [Yoel Fink](#); Massachusetts Institute of Technology, United States.

11:00 AM SM2.1.02

3D Printing-Enabled Digitally Designed Multifunctional Polymeric Particle Fabrication [Joshua Kaufman](#); University of Central Florida, United States.

11:15 AM SM2.1.03

Thermal Drawing of Electronic and Photonic Fiber Devices [Michael Rein](#); Massachusetts Institute of Technology, United States.

11:30 AM *SM2.1.04

Tailoring Surface and Rheological Properties of Fiber Materials: Novel Scientific Insight and Opportunities for Multi-Material Fibers [Fabien Sorin](#); École Polytechnique Fédérale de Lausanne (EPFL), Switzerland.

SESSION SM2.2: Energy Storage and Harvesting in Fibers and Textiles
Session Chairs: Alexander Gumennik and Max Shtein
Tuesday Afternoon, April 18, 2017
PCC North, 100 Level, Room 122 A

1:30 PM *SM2.2.01

Micro and Nanostructured Fibers for Smart Surfaces, Triboelectric/Piezoelectric Energy Harvesting and Sensing [Mehmet Bayindir](#); Bilkent University, Turkey.

2:00 PM SM2.2.02

Machine-Washable Smart Fabric for Energy Harvesting and Human Respiratory Monitoring [Youfan Hu](#); Peking University, China.

2:15 PM SM2.2.03

Flexible and Wearable Energy Storage Fibers and Textiles [Ye Zhang](#); Fudan University, China.

2:30 PM *SM2.2.04

Fiber-Shaped Energy Harvesting and Storage Devices [Huisheng Peng](#); Fudan University, China.

3:00 PM BREAK

3:30 PM *SM2.2.05

Advanced Functional Fibers for Energy Harvesting and Bio-Sensing [Lei Wei](#); Nanyang Technological University, Singapore.

4:00 PM *SM2.2.06

Modeling of Textile Mechanical Energy Generators Based on Triboelectric and Piezoelectric Effects [Xiaoming Tao](#); The Hong Kong Polytechnic University, Hong Kong.

4:30 PM SM2.2.07

Machine Washable PEDOT:PSS Dyed Silk Yarns for Wearable Thermoelectrics [Desalegn A. Mengistie](#); Chalmers University of Technology, Sweden.

4:45 PM SM2.2.08

Radiative Human Body Cooling by Nanoporous Polyethylene Textile [Po-Chun Hsu](#); Stanford University, United States.

SESSION SM2.3: Advances in Fibers and Textiles II
Session Chairs: Michael Rein and Sasha Stolyarov
Wednesday Morning, April 19, 2017
PCC North, 100 Level, Room 122 A

8:00 AM *SM2.3.01

The Molten Core Fabrication of Novel Optical and Optoelectronic Fibers [John Ballato](#); Clemson University, United States.

8:30 AM SM2.3.02

Intermediate-Tg-Glasses for Hybrid/Composite Fiber Devices—Recent Advances and New Prospects [Sylvain Danto](#)^{1,2}; ¹Institut de Chimie de la Matière Condensée de Bordeaux, France; ²University of Bordeaux, France.

8:45 AM SM2.3.03

Thermally Drawn, Electrically Conductive Glass Fibers [Guangming Tao](#); University of Central Florida, United States.

9:00 AM *SM2.3.04

High Pressure Chemical Vapor Deposition of Optoelectronic Fiber Material [John V. Badding](#)^{1,2,3}; ¹Pennsylvania State University, United States; ²Pennsylvania State University, United States; ³Pennsylvania State University, United States.

9:30 AM SM2.3.05

Multimaterial Fiber MEMS [Tural Khudiyev](#); Massachusetts Institute of Technology, United States.

9:45 AM SM2.3.06

Novel Method for Micro/Nano Patterning Using Fiber Thermal Drawing Technique [Tung Nguyen-Dang](#); EPFL-IMX-FIMAP, Switzerland.

10:00 AM BREAK

SESSION SM2.4: Novel Fiber Structures
Session Chairs: Michael Rein and Sasha Stolyarov
Wednesday Morning, April 19, 2017
PCC North, 100 Level, Room 122 A

10:30 AM *SM2.4.01

Multimaterial Fibers—From Thermal-Drawing to Melt-Spinning [Ayman F. Abouraddy](#); University of Central Florida, United States.

11:00 AM SM2.4.02

Si-Ge Micro-Spheres of Prescribed Morphology from In-Fiber Capillary Breakup and Controlled Crystallization [Alexander Gumennik](#); Indiana University Bloomington, United States.

11:15 AM SM2.4.03

Diffusive Optical Coatings Loaded with Multiscale Composite Microspheres Produced from Multimaterial Fibers [Felix A. Tan](#); University of Central Florida, United States.

11:30 AM SM2.4.04

In-Fiber High Performance Monocrystalline Semiconducting Nanowires-Based Optoelectronic Devices Wei Yan; EPFL, Switzerland.

11:45 AM SM2.4.05

Surface-Patterned Fiber Chong Hou; Massachusetts Institute of Technology, United States.

SESSION SM2.5: Novel Textiles

Session Chairs: Guangming Tao and Cheng Zhang

Wednesday Afternoon, April 19, 2017

PCC North, 100 Level, Room 122 A

1:30 PM *SM2.5.01

Multimaterial Photonic Fabrics Alexander M. Stolyarov; Massachusetts Institute of Technology Lincoln Laboratory, United States.

2:00 PM SM2.5.02

Characterization of Thermal Protective Fabric Materials under Fire Exposure Sumit Mandal; Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

2:15 PM SM2.5.03

Multi-Material Fibers for Electromechanical Touch Sensing Alexis Page; EPFL - IMX - FIMAP, Switzerland.

2:30 PM BREAK

SESSION SM2.6: Fibers in Bioengineering

Session Chairs: Guangming Tao and Cheng Zhang

Wednesday Afternoon, April 19, 2017

PCC North, 100 Level, Room 122 A

3:30 PM *SM2.6.01

Multimaterial Multifunctional Fibers for Electrical, Optical and Chemical Interrogation of Neural Circuits Xiaoting Jia; Virginia Tech, United States.

4:00 PM SM2.6.02

Stretchable Fibers for Optoelectronic Probing of Spinal Cord Circuits Chi Lu; Massachusetts Institute of Technology, United States.

4:15 PM SM2.6.03

Forcespun Nanofibrous Membranes of Gelatin/Poly(epichlorohydrin-co-ethylene oxide) and Biocompatibility Study for Tissue Engineering Applications Narsimha Mamidi; ITESM, Mexico.

4:30 PM SM2.6.04

Implantable Polymer Composite Electrode with Carbon Nano Fibers (CNF) Aligned during Thermal Drawing as a Reliable Chronic Neural Interface Yuanyuan Guo; Tohoku University, Japan.

4:45 PM SM2.6.05

Multimaterial Porous Fibers as Neural Scaffolds Benjamin Grenn; Massachusetts Institute of Technology, United States.

SESSION SM2.7: Poster Session

Session Chairs: Michael Rein, Max Shtein and Guangming Tao

Wednesday Afternoon, April 19, 2017

8:00 PM - 10:00 PM

Sheraton, Third Level, Phoenix Ballroom

SM2.7.01

Bactericidal Nanofibers for Industrial and Biomedical Applications Parker Cole^{1,2}; ¹University of Arkansas, United States; ²University of Arkansas, United States.

SM2.7.02

The Preparation and the Properties of Novel Carbonized Polyacrylonitrile/Silica Core-Shell Nanofiber Hung-Fan Lee; Chung Yuan Christian University, Taiwan.

SM2.7.03

Electrically Conductive Glass-Carbon Composites Guangming Tao; University of Central Florida, United States.

SESSION SM2.8: Fiber Electrospinning

Session Chairs: Michael Rein and Cheng Zhang

Thursday Morning, April 20, 2017

PCC North, 100 Level, Room 122 A

8:30 AM *SM2.8.01

Centrifugally-Spun Nanofibers for Advanced Energy Storage Xiangwu Zhang; North Carolina State University, United States.

9:00 AM SM2.8.02

Hierarchically Porous Electrospun Nanofiber/Metal-Organic-Framework Nanocomposites for Adsorption Applications Mitchell Armstrong; Arizona State University, United States.

9:15 AM SM2.8.03

Design of Poly-E-Caprolactone (PCL) Three-Dimensional Scaffold for Biomedical Applications Samira Aslanzadeh; Ingenuity Lab, University of Alberta, Canada.

9:30 AM SM2.8.04

Iron-Doped Apatite Nanoparticles Delivered via Electrospun Fiber Mesh for Maximized Bacterial Killing by Bacteriophage Jessica M. Andriolo^{1,2}; ¹University of Montana, United States; ²Montana Tech, United States.

9:45 AM BREAK

10:15 AM *SM2.8.05

Multifunctional and Smart Fibers Designed and Prepared via Organic/Inorganic Hybrid Technology Meifang Zhu; Donghua University, China.

10:45 AM SM2.8.06

Hybridizing Millimeter Long Carbon Nanotubes with Electrospun Fabrics for High Performance Electrically Conductive Textiles Ozkan Yildiz; North Carolina State University, United States.

11:00 AM SM2.8.07

Fabrication of Phase Change Composite Fibers Consisting of n-Octadecane and Silk by the Electrospinning Method for Thermal Regulation Liang Zhao; Tsinghua University, China.

11:15 AM SM2.8.08

Thermoresponsive Janus Membrane Using Electrospun Poly(N-isopropylacrylamide)/Poly(vinylidene fluoride) Fibers Anupama Sargur Ranganath; Singapore University of Tech and Design, Singapore.

11:30 AM SM2.8.09

Steering Surface Topographies of Electrospun Fibers for Controlled Drug Release and Tissue Engineering Applications Rene M. Rossi; Empa, Switzerland.

SESSION SM2.9: Nanofibers and Nanoscale Phenomena in Fibers and Textiles

Session Chairs: Alexander Gumennik and Sasha Stolyarov

Thursday Afternoon, April 20, 2017

PCC North, 100 Level, Room 122 A

1:30 PM *SM2.9.01

Microfiber-Based Microcavities and Miniaturized Fiber Stereo Devices Yan-Qing Lu; Nanjing University, China.

2:00 PM SM2.9.02

Evolution of Electromechanical and Morphological Properties of Aligned Electrospun PVDF-TrFE Piezoelectric Nanofibers with Thermomechanical Post-Processing [Mahmoud Baniasadi](#); University of Texas at Dallas, United States.

2:15 PM SM2.9.03

Ultrafiltration Membranes Surface Modified with Electrospun Nanofibers Exhibit Enhanced Flux and Fouling Resistance [Kerianne M. Dobosz](#); University of Massachusetts Amherst, United States.

2:30 PM SM2.9.04

Personal Thermal Management by Metallic Nanowire-Coated Textile [Po-Chun Hsu](#); Stanford University, United States.

2:45 PM SM2.9.05

Atomic Layer Deposition of Al₂O₃ to Improve Various Properties of Transparent Nanopaper [Thomas Schmitt](#); University of Maryland, College Park, United States.

3:00 PM BREAK

SESSION SM2.10: Advances in Fibers and Textiles III
Session Chairs: Alexander Gumennik and Guangming Tao
Thursday Afternoon, April 20, 2017
PCC North, 100 Level, Room 122 A

3:30 PM SM2.10.01

Carbon Fibers Prepared from Paper Waste [Zafer Mutlu](#); University of California at Riverside, United States.

3:45 PM SM2.10.02

Bicomponent Nonwoven Fabrics as a Substrate for Mass-Production of Polymeric Microspheres [Felix A. Tan](#); University of Central Florida, United States.

4:00 PM SM2.10.03

Nanocarbon and Conducting Polymer Fibre-Based Electrodes—From Energy Storage to Electrochemical Sensing [Carol Crean](#); University of Surrey, United Kingdom.

4:15 PM SM2.10.04

Highly Elastic Hydrogen-Bonded Polymer Complex Fiber [Shuguang Yang](#); Donghua University, China.

4:30 PM SM2.10.05

Engineering Bacterial Cellulose Nanocomposites [Anna Roig](#); Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Spain.

4:45 PM SM2.10.06

Textile Based Temperature Sensors—Fabrication, Characterization and Applications [Qiao Lj](#); Donghua University, China.