2011 International Fiber Symposium

Sponsored by the Fiber Society, AATCC, and the National Textile Center
October 11–13, 2011
Francis Marion Hotel, Charleston, South Carolina, USA

Tuesday, October 11, 2011

CAROLINA A and B

7:00 Registration Desk Opens

7:45 Welcome and Opening Remarks — *Konstantin Kornev (FS, Co-chair), Philip Brown (AATCC, Co-chair), Martin Jacobs (NTC), Ian R. Hardin, Fiber Society President*

8:00–8:45 Plenary Talk: Julian Vincent, University of Bath, United Kingdom
Plant Fibre Structures Inspire Novel Materials and Mechanisms

CAROLINA A

Session: Fibers from Carbon Nanotubes and Applications

Session Chair: Philippe Poulin, CNRS, France

9:15 *Composite Wet Spun Polymer—Nanotube Fibers* - Philippe Poulin, CNRS, France

9:45 *Direct Formation of Carbon Nanotube Fibers During Carbonization Process* - Teddy M. Keller, Naval Research Laboratory

10:15 Break

10:30 *Recent Advances in Carbon Nanotube Fibres* - Juan J. Vilatela, University of Cambridge, United Kingdom

11:00 *Nanotailored Carbon Fibers via Ultralong Carbon Nanotubes: Scale-up and Post Processing* - Jay B. Gaillard, Savannah River National Laboratory

11:30 *Surface Tension Analysis for Characterization of Carbon Nanotube Dispersion* - Vijoya Sa, Clemson University

12:00 Lunch On Your Own and Poster Setup

1:30–5:00 **Student Paper Competitions, Carolina B**

5:15–7:00 **Poster Session, Table Tops, and Reception, Carolina A**

CAROLINA B

Session: Fiber Spinning

Session Chair: Philip J. Brown, Clemson University

9:15 *Structure of Porous, High-modulus Polypropylene Fibers* - David R. Salem, South Dakota School of Mines & Technology

9:45 *Temperature-responsive Fibers for "Smart" Thermal Insulation* - Stephen A. Fossey, U.S. Army Natick Soldier RDE Center

10:15 Break

10:30 *From Centrifugal Spraying to Nanofiber Spinning* - Tao Huang, DuPont

11:00 *Free-surface Electrospinning from a Wire Electrode* - Keith M. Forward, MIT

11:30 *Properties of Nanoclay-added Composite Polypropylene Monofilaments Using Twin and Single Screw Extruders* - Sabit Adanur, Auburn University

12:00 Lunch On Your Own and Poster Setup

1:30 **Fiber Society Student Paper Competition**

2:45 Break

3:00 **NTC Student Paper Competition**

5:00 Session Concludes

5:15–7:00 **Poster Session, Table Tops, and Reception, Carolina A**

CALHOUN

Session: Multifunctional Fibers

Session Chair: Rudolf Hufenus, Empa, Switzerland

9:15 *Design and Development of Fibers with Flexure Rate-dependent Viscoelastic Properties* - Rudolf Hufenus, Empa, Switzerland

9:45 *A Study on the Photostability of Photochromic Fabrics from Hybrid Organosilica Coatings* - Marzieh Parhizkar, Deakin University, Australia

10:15 Break

10:30 *Piezoelectric Sensor Fibers Based on Meltspun Poly(vinylidene fluoride) and Electrically Conductive Polymer Nanocomposites* - Stephan Walter, RWTH Aachen University, Germany

11:00 *Bamboo: A Multifunctional "Green" Fibre* - Tarannum Afrin, Deakin University, Australia

11:30 *Self-decontaminating Multifunctional Nano/Submicrofibers and Nanofibrous Membranes* - Gang Sun, University of California, Davis

12:00 Lunch On Your Own and Poster Setup

1:30–5:00 **Student Paper Competitions, Carolina B**

5:15–7:00 **Poster Session, Table Tops, and Reception, Carolina A**

Wednesday, October 12, 2011

CAROLINA A

Session: Electrospun Nanofibers for Composites

Session Chair: Yuris Dzenis, University of Nebraska, Lincoln

8:00 *The History of the Science and Technology of Electrospinning from 1600 to 1995* - Kathleen Hofman, NZ Institute for Plant & Food Research, New Zealand

8:30 *Mechanical and Morphological Properties of Polymer Nanofibers* - Darrell Reneker, University of Akron

9:00 *Increasing Sampling Efficiency of Particles Using Nanofibers* - Eyal Zussman, Technicon, Israel

9:30 *Production and Characterization of Electrospun Polyaniline* - Yuxi Zhang, MIT

10:00 Break

10:15 *Onset of Electrospinning* - David Lukas, Technical University of Liberec, Czech Republic

10:45 *An Investigation on the Stability of Jet and Electrospinnability of Chitosan/PEO Solutions* - Mehdi Pakravan, Ecole Polytechnique de Montreal, Canada

11:15 *Electrospun Nanofibrous Mats for Composite Membranes* - Benjamin Chu, Stony Brook University

11:45 Lunch On Your Own

Session: Electrospun Nanofibers for Composites (continued)

Session Chair: Yuris Dzenis, University of Nebraska, Lincoln

1:30 *Needleless Electrospinning and Direct Electrospinning of Nanofiber Yarns* - Tong Lin, Deakin University, Australia

2:00 *Chitosan-based Nanofibrous Materials for Effective Burn Treatment* - Yury Salkovskiy, Saratov State University, Russia

2:30 *Biomineralized, Highly Aligned, Nanofiber Array-based Building Unit for Bone Regeneration* - Eleni Katsanevakis, Clemson University

3:00 *Continuous Nanofiber: Reinforced Structural Nanocomposites* - Yuris Dzenis, University of Nebraska, Lincoln

3:30 Break

Session: Advances in Fiber-based Materials

Session Chair: Jack Gillespie, University of Delaware

3:45 *Optimizing Conditions for Creating Graphene Coatings to Create Unique Textile Materials* - Ian R. Hardin, University of Georgia

4:15 *Effect of Cotton Fiber Properties on Properties of Hydroentangled Nonwoven Fabrics* - Paul Sawhney, USDA-ARS-SRRC

4:45 *Tunable Capillary Pore Membranes* - Glen Simmonds, DuPont

5:15 *Effects of Abrasion on Tenacity of Synthetic Fibers* - A. Abu Obaid, University of Delaware

5:45 Session Concludes

6:00–6:45 Fiber Society Annual Business Meeting, Calhoun: *Open to Fiber Society Members Only*

7:00 Reception, Prefunction Area Outside Gold Ballroom

7:30 Awards Banquet, Gold Ballroom

Speaker: Dr. Adrian Freed, CNMAT, UC Berkeley, and Fine Arts, Concordia University, Montreal
Building Interactivity in Textiles and Related Fibers

CAROLINA B

Session: Advanced Textile Materials

Session Chair: Martin I. Jacobs, National Textile Center

8:00 *Photovoltaic Fiber Having Zinc Oxide-Nanoparticles (ZnO-np) and Inverted Layer Sequence* - İsmail Borazan, İstanbul Technical University, Turkey

8:30 *Textile Heartvalve Prosthesis: Assessment of In Vivo Performances* - Frederic Heim, ENSISA, France

9:00 *De Novo Assembly of Extracellular Matrix Proteins* - Mohammad R. Badrossamay, Harvard University

9:30 *Breathable Liquid Repellent Polypropylene Nonwovens for Surgical Gowns* - Sudheer Jinka, Texas Tech University

10:00 Break

Session: Fiber Science Theory and Computer Simulations

Session Chair: Alejandro Rey, McGill University, Canada

10:15 *A Model for Mesophase Wetting of Sheets, Fiber, and Fiber Bundles* - Alejandro Rey, McGill University, Canada

10:45 *Nonclassical Scaling for Forced Wetting of a Nematic Fluid on a Polymeric Fiber* - Mohan Srinivasarao, Georgia Institute of Technology

11:15 *Textile Composite Structures for Sensor Data Transport from Ocean Depths to Internet* - Walter Paul, Woods Hole Oceanographic Institution

11:45 Lunch On Your Own

Session: Fiber Science Theory and Computer Simulations (continued)

Session Chair: Alejandro Rey, McGill University, Canada

1:30 *Bending and Position Hysteresis of Magnetic Microfibers in Nonuniform Magnetic Fields* - Richard Groff, Clemson University

2:00 *Structure and Mechanics of Fiber-reinforced Cylindrical Membranes* - Yogesh Kumar Murugesan, McGill University, Canada

2:30 *Modeling of Liquid Wicking Through Freely Hanging Fabrics* - Daria Monaenkova, Clemson University

3:00 *Characterization of Interfiber Capillary Distance for C-CP Polymer Fiber Separations Columns* - Christopher Cox, Clemson University

3:30 Break

3:45 *Dynamics of Rotational Film Fibrillation and Nanofiber Formation* - Tao Huang, DuPont

Session: Control of Fiber Structures

Session Chair: Takeshi Kikutani, Tokyo Institute of Technology, Japan

4:15 *Effect of the Blending of High-tacticity Component on the Structure and Properties of Elastomeric Fibers of Low-tacticity Polypropylene* - Takeshi Kikutani, Tokyo Institute of Technology, Japan

4:45 *Polymer Fiber-based Field Effect Transistors: Advances and Opportunities* - Richard Gregory, Old Dominion University

5:15 *A Process for Noncircular, High-luster Acrylic Fiber* - Anasuya Sahoo, Aditya Birla Science & Technology, India

5:45 Session Concludes

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Building Interactivity in Textiles and Related Fibers

CALHOUN

Session: Carbon Fibers and Composites

Session Chair: Amod Ogale, Clemson University

8:00 *Crystalline and Tensile Properties of Carbon Nanotube-filled Polyamide-12 Fibers Meltspun by Industry-related Processes* - Sanjukta Chatterjee, Empa, Switzerland

8:30 *Electromagnetic Shielding Mechanisms of Ultrahigh Thermally Treated Carbon Nanofibers-LLDPE Nanocomposites* - Byron Villacorta, Clemson University

9:00 *Fabrication and Characterization of Carbon Nanofiber by Pyrolysis of Freeze-dried Cellulose Nanofiber* - Ehsan Jazaeri, Deakin University, Australia

9:30 *Mechanical Properties of Composite Plates Produced from 1x1 Rib Knit Fabrics with Carbon Fibers* - Mehmet Yuksekkaya, Usak University, Turkey

10:00 Break

10:15 *High Thermal Conductivity Carbon Fibers and Fabrics: Low-cost Petroleum Pitch Precursors* - Young-Pyo Jeon, Clemson University

10:45 *Rapid Manufacture of Carbon Fiber from Organosolv Lignins* - Darren Baker, University of Tennessee

11:15 Presentation TBA

11:45 Lunch On Your Own

Session: Fiber-based Probes and Sensors

Session Chair: Margaret Frey, Cornell University

1:30 *Electrospun Nanofibers for Microfluidic Analytical Systems* - Margaret W. Frey, Cornell University

2:00 *Micro- and Nanofiber Bundles as a Platform for Sensitive Detection of Biomacromolecules* - Kenneth A. Christensen, Clemson University

2:30 *Fabrication and Characterization of Electrospun Semiconductor Nanoparticle-Polyelectrolyte Ultrafine Fiber Composites* - Caroline L. Schauer, Drexel University

3:00 *Development of a Rapid Fiber-based Immunoassay* - Ryan Waddell, Clemson University

3:30 Break

3:45 *Fiber-based Biosensors for mRNA Extraction from Cells* - Victor Maximov, Clemson University

4:15 *Self-assembly of Optically Responsive Nematic Liquid Crystal/Polymer Core-Shell Fibers* - Ebru A. Buyuktanir, Kent State University

Session: Functionalization of Fiber Surfaces

Session Chair: Igor Luzinov, Clemson University

4:45 *Microwave-promoted Deposition of Functionalized Nanoscopic Silica Coatings for Protective Textile Applications* - Jeffery Owens, AFRL

5:15 *Surface-tethered (Bio)Macromolecular Nanostructures and Characterization* - Stefan Zauscher, Duke University

5:45 Session Concludes

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7:00 Reception, Prefunction Area Outside Gold Ballroom

7:30 Awards Banquet, Gold Ballroom

Speaker: Dr. Adrian Freed, CNMAT, UC Berkeley, and Fine Arts, Concordia University, Montreal
Building Interactivity in Textiles and Related Fibers

Thursday, October 13, 2011

CAROLINA A

Session: Protective Clothing and Wetting of Textiles

Session Chair: Jeffery Owens, AFRL

8:00 *Dynamics of a Drop on Elastic Fibers* - Camille Duprat, Princeton University

8:30 *Experimental Determination of Ballistic Performance-Flexibility Relations for Multilayered and Multidirectional Stitched Aramid Woven Fabric Structures* - Kadir Bilisik, Erciyes University, Turkey

9:00 *Textiles for the Next Generation of Military Clothing* - Eugene Wilusz, U.S. Army Natick Soldier RDE Center

9:30 *Toward Self-cooling Gradient Shell for Body Armor* - Ruslan Burtovyy, Clemson University

10:00 Break

10:15 *Oleophobic Coating for Self-cleaning, Fluid-resistant Textiles* - Laura Habersack, Luna Innovations Inc.
10:45 *Observations on the Behaviour of Chemical Warfare Agents and Other Liquids on Super-repellent Textiles* - Corrine Stone, Dstl, United Kingdom
11:15 *Moisture Transport and Reaction Enhancements in Fabrics* - Heidi Schreuder-Gibson, U.S. Army Natick Soldier RDE Center
11:45 *Wettability Gradient-driven Directional Water Transport Across Thin Fibrous Materials* - Tong Lin, Deakin University, Australia
12:15 *Generation of Short Hypersonic Water Jet for Testing of a Material's Rain Erosion Resistivity* - Sergey Lopatnikov, University of Delaware
12:45 Conference Concludes

CAROLINA B

Session: Biomimetics for Fiber Science

Session Chair: You-Lo Hsieh, University of California, Davis

8:00 *Artificial Proboscises* - Konstantin Kornev, Clemson University
8:30 *Botanical Hydroscopic Shape Change Mechanisms for Composite Textile Systems* - Veronika Kapsali, MMT Textiles, United Kingdom
9:00 *Ant-Tex: 3-D Visualization of the Water-repellent Network of Fire Ants* - Nathan Mlot, Georgia Institute of Technology
9:30 *Structure-Function Relationships in Synthetic Spider Silk Fibers Made from Chimeric Proteins* - Florence Teulé, Utah State University
10:00 Break
10:15 *Biopolymer-assembled Nanofibers* - You-Lo Hsieh, University of California, Davis
10:45 *Emulsion Electrospinning of Chitin Nanocrystallites-reinforced Polylactic Acid Nanofiber* - Yuqin Wan, Jiangnam University, China

Session: Polymer Synthesis and Recycling

Session Chair: Fred Cook, Georgia Institute of Technology

11:15 R*emoval of Spandex from Polyamide/Spandex-blended Fabrics by Selective Depolymerization* - Youjiang Wang, Georgia Institute of Technology
11:45 *Polymer Waste Streams for Synthetic Turf Infill* - Richard E. Harper, Georgia Institute of Technology
12:15 *Comparative Study of Characteristics of Knitted Fabrics Made of Recycled Fibres* - Karina Takamune, University of São Paulo, Brazil
12:45 Conference Concludes

GOLD

Session: Functionalization of Fiber Surfaces (continued from Wednesday)

Session Chair: Igor Luzinov, Clemson University

8:00 *Surface Functionalization of Fibers by Grafting to Method* - Igor Luzinov, Clemson University
8:30 *Inkjet Printing Equipment for Narrow Fabrics* - Bertram Wendisch, ENSISA, France
9:00 *Formation and Application of Functional Coatings on Synthetic Fibers* - Jan Genzer, North Carolina State University
9:30 *Stimuli-responsive Alginate Fibers* - Sergiy Minko, Clarkson University
10:00 Break

Session: Optical Fibers

Session Chair: Kathleen Richardson, Clemson University

10:15 *Investigation of Subcritical Crack Growth in Glass Fibers Using Load Relaxation Tests on Bundles* - Jacques Lamon, CNRS/National Institute of Applied Science, France
10:45 *Advances in Semiconductor Core Optical Fibers* - Stephanie Morris, Clemson University
11:15 *A Phototherapy Device Prototype for Neonatal Jaundice Based on POF Fabric* - Jing Shen, Hong Kong Polytechnic University, China
11:45 *Low-loss, High-strength Fibers from Improved Chalcogenide Glasses* - Sylvain Danto, Clemson University
12:15 *Optically Active Polymeric-based Fibers* - Philip Brown, Clemson University
12:45 Conference Concludes

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Poster Session: Tuesday, October 11, 5:15–7:00, Carolina A
Session Chair: Konstantin Kornev

Presenter	Title
Min Li	*Fabrication and Property of the Conductive PTFE/CB Fiber*
Mohamed Boutaayamou	*Study of Conduction Mechanisms in Antistatic Felts at the Mesoscopic Scale*
Maja Somogyi Skoc	*Properties and Preparation of Resistant Polyurethane-coated Fabrics to Ageing by Sol-Gel Thin Films*
HoDong Kim	*A Study on Physical Property of Cement Composite Reinforced with Silane-treated Basalt Chopped Fiber*
Kara Phillips	*Natural Versus Manmade Fabrics: Anisotropic Mechanical Properties*
Phil Gibson	*Dynamic Permeability of Porous Elastic Fabrics*
Zhi-juan Pan	*Effects of Heat Treatment on the Morphology and Mechanical Property of Electrospun PSU Nanofibrous Membrane*
Sun Young Park	*The Influence of Spinning Parameters on PVDF Nanofiber Crystallinity and Crystalline Phase Formation*
Bharat Bajaj	*Coiled Fibers of Poly(amide-co-imide) and Poly(trimellitic anhydride chloride-co-4,4'-methylene dianiline) by Using Mechano-Electrospinning*
Chen-Chih Tsai	*Highly Aligned Electrospun Nanofiber Yarns*
Maryana Kovalchuk	*Fiber-based Probes for Cell Analyses*
Tieling Xing	*Structure and Properties of Silk Grafted with N,N-Dimethylaminoethyl Methacrylate via ARGET ATRP Method*
Nikitha Gutha	*Fluoride Filtration in Drinking Water Using Functionalized Nanofibers*
Austin Beachler	*Spreading of Liquids on Porous Surfaces*
Mahmut O. Kesimci	*Development of Surface Differential Scanning Calorimeter for Evaluation of Evaporative Cooling Efficiency*
Taras Andrukh	*Imbibition of Liquids into Capillaries*
Nancy Elizabeth Allen	*Incorporation and Performance of Molecular Polyoxometalates in Cellulose Substrates*
Xiao-Shi Xu	*Mechanism of Surface Roughness Development in Melt Spinning of Blend Fibers for Artificial Hair*
Michael S. Ellison	*The Challenges of Material Selection for Compliant Robotic Surfaces*
Sam Lukubira	*Melt Spinning of Soy Flour-based Fibers*
Aysin Dural Erem	*Antimicrobial Activity of Polypropylene/Titanium Dioxide Films on Methicillin-resistant Staphyloccocus Aureus*
Martin King	*The Effect of Silver Antimicrobials on the Physical and Thermophysiological Properties of Burn Pressure Garments*
Mustafa Üreyen	*Imparting Multifunctional Properties to PES/Cotton Woven Fabrics by Fluorocarbon and Silver-based Finishing Agents*
Laura E. Lange	*Effects of Plasma Etching on Self-decontaminating Properties of Magnesium Oxide Nanoparticles in Polypropylene Fibers*
Burcak Karaguzel Kayaoglu	*Improving Hydrophobicity on Synthetic Leather Through Plasma Polymerization for Easy Care Effect*
Zarife Doğan	*A Novel Silver Sulfadiazine-loaded Electrospun Nanofiber Wound Dressing*

Ruma Chakrabarti	*Anti-soiling Finish of Polyester Fabrics*
Usha Sayed	*Biomimicking of Enzymes for Textile Processing*
Tamer Abdalrahman	*Hierarchical Architectures for the Strengthening of Mixed-fibre Composites*
Chen-Chih Tsai	*Microwave Heating Study of Carbon Nanofiber Nanocomposites*
Joonhee Park	*Upper Body Sweat Rate, Skin Temperature, and Clothing Microclimate Distribution During Winter Cycling with Air Flow*
Myoung Hee Shim	*Development of Superhydrophobic Fabrics Using Carbon*