

# SYMPOSIUM NM3

Aerogels and Aerogel-Inspired Materials  
April 17 - April 21, 2017

## Symposium Organizers

Stephanie Brock, Wayne State University  
Alexander Eychmueller, TU Dresden  
Nicholas Leventis, Missouri University of Science and  
Technology  
Stephen Steiner, Aerogel Technologies, LLC

## Symposium Support

Blueshift  
NASA- Glenn Research Center

## 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](http://www.mrs.org/publications-news)). Papers submitted and accepted for publication in MRS Advances ([www.mrs.org/mrs-advances](http://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

## TUTORIAL

### Aerogels—Synthesis, Characterization and Applications

Monday Morning, April 17, 2017  
8:00 AM – 3:15 PM  
PCC West, 100 Level, Room 105 A

The tutorial will bring newcomers and experienced researchers up-to-date with the state of the art of aerogel research in different areas. The format will be hands-on mixed with PowerPoint and open discussion during the whole schedule. A packet of demo procedures will be provided.

#### 8:00 AM - 8:10 AM

*Introduction to Aerogels* – Stephen Steiner

#### 8:10 AM - 8:35 AM

*Synthesis of Gels—Oxides*

- Silica – Matthias Koebel
- Metal Oxides – Stephen Steiner

#### 8:35 AM - 9:30 AM

*Synthesis of Gels—Polymers*

- Isocyanate-Derived – Nicholas Leventis
- Phenolics – Nicholas Leventis
- Derivative Aerogels—Amorphous Carbon, Smelttable Metals, Carbides and Nitrides – Nicholas Leventis
- Amine-Derived – Stephen Steiner

#### 9:30 AM - 10:00 AM

*Synthesis of Gels—Non-Oxides Continued*

- Nanocarbons – Stephen Steiner
- Quantum Dot – Stephanie Brock
- Noble Metals – Laura Kühn
- Biopolymers – Irina Smirnova

#### 10:00 AM BREAK

#### 10:30 AM - 11:25 AM

*Molding, Solvent Exchanging and Chemical Functionalization* – Ryan Nelson

#### 11:25 AM - 12:00 PM

*Drying I*

- Supercritical Drying – Pavel Gurikov
- Evaporative Drying – Debra Rolison

#### 12:00 PM - 12:45 PM LUNCH

#### 12:45 PM - 12:55 PM

*Drying II*

- Freeze Drying – Justin Griffin

#### 12:55 PM - 2:00 PM

*Characterization of Gels and Aerogels*

- Physical Properties – Justin Griffin
- Mechanical Properties – Justin Griffin
- Thermal, Temperature and Flammability Properties – Justin Griffin
- Morphology – Nicholas Leventis
- Electrochemical Properties – Debra Rolison

#### 2:00 PM - 3:10 PM

*Applications*

- Insulation and Daylighting – Matthias Koebel
- Batteries and Supercapacitors – Debra Rolison
- Catalysis – Bin Cai
- Photochemical Properties – Stephanie Brock
- Lightweight Plastics Replacements – Stephen Steiner

#### 3:10 PM - 3:15 PM

*Conclusions* – Stephen Steiner

Instructors

Stephen Steiner, Aerogel Technologies, LLC  
Nicholas Leventis, Missouri University of Science and Technology  
Matthias Koebel, Swiss Federal Laboratories for Materials Science and Technology (EMPA)  
Stephanie Brock, Wayne State University  
Laura Kühn, TU Dresden  
Bin Cai, TU Dresden  
Pavel Gurikov, Hamburg University of Technology  
Debra Rolison, U.S. Naval Research Laboratory  
Justin Griffin, Aerogel Technologies, LLC  
Ryan Nelson, Aerogel Technologies, LLC  
Irina Smirnova, Hamburg University of Technology

SESSION NM3.1: Aerogels from Two-Dimensional Nanostructures  
Session Chairs: Nicholas Leventis and Debra Rolison  
Monday Afternoon, April 17, 2017  
PCC West, 100 Level, Room 105 BC

#### 3:15 PM NM3.1.01

**Shape Control via Additively Manufactured Metal Bistetrazoleamine Precursors and Combustion Synthesis for Hierarchical Structure Nanoporous Metal Foams** Bryce C. Tappan; Los Alamos National Laboratory, United States.

#### 3:30 PM NM3.1.02

**Graphene Aerogel as a Scaffold towards the Creation of Environmentally Friendly Thermoelectric Materials** Elizabeth A. Barrios; University of Central Florida, United States.

#### 3:45 PM NM3.1.03

**Ultra-light and Highly Compressible Graphene/Boron Nitride Aerogel for Multifunctional Applications** Hongling Li; Nanyang Technological University, Singapore.

#### 4:00 PM NM3.1.04

**2D Ti<sub>3</sub>C<sub>2</sub> Hierarchically Structured Aerogels for Energy Applications** Vildan Bayram; University of Manchester, United Kingdom.

#### 4:15 PM NM3.1.05

**Manufacture of Complex Graphene Aerogel Structures through Room Temperature Freeze Casting** Gabriel Casano; University of Manchester, United Kingdom.

#### 4:30 PM NM3.1.06

**Three-Dimensional Nitrogen-Doped Graphene Aerogels Enhance Power Density of Microbial Fuel Cells** Tianyu Liu; University of California, Santa Cruz, United States.

SESSION NM3.2: Energy Production and Storage  
Session Chairs: Nicholas Leventis and Stephen Steiner  
Tuesday Morning, April 18, 2017  
PCC West, 100 Level, Room 105 BC

**10:30 AM \*NM3.2.01**

**Aerogels—An Architectural Guide to Advances in Energy** Debra R. Rolison; U.S. Naval Research Laboratory, United States.

**11:00 AM NM3.2.02**

**Cellulose Nanofibril (CNF)—Reduced Graphene Oxide (RGO)—MoO<sub>3</sub> Nanobelt Hybrid Aerogels for High Performance Supercapacitors** Qifeng Zheng; University of Wisconsin-Madison, United States.

**11:15 AM NM3.2.03**

**Aerogel Catalysts for Energy Applications** Elies Molins; ICMA-B-CSIC, Spain.

**11:30 AM PANEL DISCUSSION: Gel Talks—Ideas the Aerogel Community Needs to Know**

SESSION NM3.3: Polymer Aerogels  
Session Chairs: Stephanie Brock and Kazuyoshi Kanamori  
Tuesday Afternoon, April 18, 2017  
PCC West, 100 Level, Room 105 BC

**1:30 PM NM3.3.01**

**Effect of Backbone Chemistry on Mechanical and Optical Properties of Polyimide Aerogels** Stephanie Vivod; NASA Glenn Research Center, United States.

**2:00 PM NM3.3.02**

**Shape Memory Polyurethane Aerogels for Deployable Panels and Biomimetic Applications** Nicholas Leventis; Missouri University of Science & Technology, United States.

**2:15 PM NM3.3.03**

**Polyimide Aerogels with Aliphatic Links in the Oligomer Backbone—Towards More Flexible Aerogels** Haiquan Guo; Ohio Aerospace Institute, United States.

**2:30 PM NM3.3.04**

**Flexible Polyisocyanate Based Aerogels** Roxana Trifu; Aspen Aerogels, United States.

**2:45 PM NM3.3.05**

**Transparent Polymer Aerogels** Gabriel Iftime; Palo Alto Research Center, United States.

**3:00 PM BREAK**

SESSION NM3.4: Silica Aerogels and Composites  
Session Chairs: Alexander Eychmueller and Stephanie Vivod  
Tuesday Afternoon, April 18, 2017  
PCC West, 100 Level, Room 105 BC

**3:30 PM \*NM3.4.01**

**Silicone-Based Organic-Inorganic Hybrid Aerogels and Xerogels** Kazuyoshi Kanamori; Kyoto University, Japan.

**4:00 PM NM3.4.02**

**Advanced Composite Porous Materials—Silica Aerogel with Nanotube Fillers** Galit Bar; Soreq NRC, Israel.

**4:15 PM NM3.4.03**

**Rapid Fabrication of Native, Cross-Linked and Hybrid Aerogels** Massimo F. Bertino; Virginia Commonwealth University, United States.

**4:30 PM NM3.4.04**

**Ambient-Dried Superinsulating and Monolithic Silica-Based Aerogels via the Use of Short Cellulose Fibers** Gediminas Markevicius; MINES ParisTech, France.

**4:45 PM NM3.4.05**

**Exploring the Versatile Surface Chemistry of Silica Aerogels for Multipurpose Application** Luisa Duraes; University of Coimbra, Portugal.

SESSION NM3.5: Poster Session I: Aerogels and Aerogel Inspired Materials—Assemblies of 2D Nanostructures, Energy Storage, Silica, Nanocomposites and Polymer Aerogels

Session Chairs: Alexander Eychmueller and Stephen Steiner  
Tuesday Afternoon, April 18, 2017  
8:00 PM - 10:00 PM  
Sheraton, Third Level, Phoenix Ballroom

**NM3.5.01**

**Designing Benzoxazine-Based Carbon Aerogel as Electrode Materials for Supercapacitors** Thanyalak Chaisuwan; Chulalongkorn University, Thailand.

**NM3.5.02**

**3D Porous Graphene Nanostructure Fabricated with a Simple, Fast, Scalable Process for Applications in High Performance Flexible Gel-Type Supercapacitors** Shih-Yuan Lu; National Tsing Hua University, Taiwan.

**NM3.5.03**

**Development of Low Density Silica Aerogels for Laser Induced Plasma Studies** A. Venkateswara Rao<sup>1,2</sup>; <sup>1</sup>Shivaji University, India; <sup>2</sup>Bhabha Atomic Research Center, India.

**NM3.5.04**

**CuFe<sub>2</sub>O<sub>4</sub> – SiO<sub>2</sub> Aerogel and Xerogel Nanocomposites—Synthesis and Characterization** Anna Corrias; University of Kent, United Kingdom.

**NM3.5.05**

**Applications of Composites Scaffolds Synthesized by a Novel Sol-Gel/ Freeze-Casting Hybrid Method under Ambient Conditions** Haw-Kai Chang; National Tsing Hua University, Taiwan.

**NM3.5.06**

**High Energy Density Ultrafast Supercapacitors Based on Edge Oriented Graphene in Graphitized Bacterial Cellulose Aerogel** Nazifah Islam; Texas Tech University, United States.

**NM3.5.07**

**Anisotropic Graphene Aerogels—Synthesis, Characterization and Their Application as Energy Storage Materials** Xuetong Zhang; Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), CAS, China.

**NM3.5.08**

**Synthesis of Graphene-Silica Aerogel Composite with Superior Separation Performance for Organic Compounds** Yaping Zhao; Shanghai Jiao Tong University, China.

**NM3.5.09**

**Polysaccharide-Reinforced Silica Aerogels** Zoran Novak; University of Maribor, Slovenia.

**NM3.5.10**

**New Strategy to Mechanically Reinforce Aerogel by *In Situ* Growing Nanofillers** Benxue Liu; Advanced Materials Institute, Shandong Academy of Sciences, China.

**NM3.5.11**

**Silica Aerogel Synthesized under Ambient Pressure Drying, without Surface Hydrophobization** Lorena Alvarez Contrera; Centro de Investigación en Materiales Avanzados, S.C., Mexico.

**NM3.5.12**

**Silica Aerogels Impregnated with Copper-Containing Nanoparticles—An Investigation of Three-Way Catalytic Ability** Ann Anderson; Union College, United States.

**NM3.5.13**

**Preparation and Structural Analysis of Magnesium Oxide Aerogels** [Jiankai Zhang](#); Beijing University of Chemical Technology, China.

**NM3.5.14**

**Applications for Oleophilic Hydrophobic Graphite Sponges** [Fabian E. Villalobos](#); University of California Riverside, United States.

**NM3.5.15**

**Fast Synthesis of Spherical Silica Aerogel Powders via Emulsion Polymerization from Waterglass** [Haejin Hwang](#); INHA University, Korea (the Republic of).

**NM3.5.16**

**Nanoporous Silica Aerogel Membranes for CO<sub>2</sub> Capture** [Yi-Feng Lin](#); Chung Yuan Christian University, Taiwan.

**NM3.5.17**

**The Effect of Embedded Nanoarchitectures on the Mechanical Properties of Silica Aerogels** [Lucy Morgan](#); University of Kent, United Kingdom.

**NM3.5.18**

**Preparation of Silica Aerogel and Its Properties as in Thermal Insulation Coating** [Noppakun Sanpo](#); SCG Chemicals Co., Ltd., Thailand.

**NM3.5.19**

**Visible Light Induced Photocatalytic Hydrogen Evolution Using a CdS-Ni<sub>2</sub>P Hybrid Aerogel System** [Da Li](#); Wayne State University, United States.

SESSION NM3.6: Frontier Aerogels I—Chalcogenides, Metals and Shaped  
Session Chairs: Indika Arachchige and Alexander Eychemueller  
Wednesday Morning, April 19, 2017  
PCC West, 100 Level, Room 105 BC

**8:00 AM \*NM3.6.01**

**Platelets, Dots, Rods—Aerogelation of Shape-Controlled Nanocrystals** [Nadja C. Bigall](#); Physical Chemistry, Leibniz Universität Hannover, Germany.

**8:30 AM NM3.6.02**

**Programmable Assembly of Nanoparticles into Multicomponent Aerogels** [Stephanie L. Brock](#); Wayne State University, United States.

**8:45 AM NM3.6.03**

**Understanding the Formation of Low-Density, Linker-Mediated All-Inorganic Semiconductor Nanocrystal Aerogels** [Amita Joshi](#); Los Alamos National Lab, United States.

**9:00 AM NM3.6.04**

**Shape-Engineering of the Building Blocks in Multimetallic Hierarchical Aerogels** [Bin Cai](#); TU Dresden, Germany.

**9:15 AM NM3.6.05**

**Synthesis and Characterization of Ceria Cuboidal Nanoparticles Stabilized into a Silica Aerogel Matrix** [Anna Corrias](#); University of Kent, United Kingdom.

**9:30 AM NM3.6.06**

**Ultra-Low Density Nanoporous Silver Foams via Freeze-Casting of Nanowires** [Tyler M. Fears](#); Lawrence Livermore National Laboratory, United States.

**9:45 AM NM3.6.07**

**Direct Solution-Based Reduction Synthesis of Au, Pd and Pt Aerogels** [John Burpo](#); United States Military Academy, United States.

**10:00 AM BREAK**

SESSION NM3.7: Frontier Aerogels II—Metals  
Session Chairs: Nadja Bigall and Nicholas Leventis  
Wednesday Morning, April 19, 2017  
PCC West, 100 Level, Room 105 BC

**10:30 AM \*NM3.7.01**

**Noble Metal Aerogels—From Model Studies to Polymer Electrolyte Fuel Cell Performance** [Thomas J. Schmidt](#)<sup>1,2</sup>; <sup>1</sup>Paul Scherrer Institute, Switzerland; <sup>2</sup>ETH Zurich, Switzerland.

**11:00 AM NM3.7.02**

**Bimetallic Pt-M (M=Ni, Cu, Co, Fe) Aerogels as Efficient Catalysts for Oxygen Reduction** [Laura Kuehn](#); TU Dresden, Germany.

**11:15 AM NM3.7.03**

**3D Ordered Nanostructured Ferromagnetic and Electronic Metal Metal lattices Synthesized from Mesoporous Templates—High Pressure Chemical Deposition, Surface Modification and Confinement-Induced Physical Properties** [Yunzhi Liu](#); The Pennsylvania State University, United States.

**11:30 AM \*NM3.7.04**

**Oxidation-Induced Self-Assembly of Metal Nanoparticles into High Surface Area, Electrically Conducting Nanostructures—Noble Metal Aerogels** [Indika U. Arachchige](#); Virginia Commonwealth University, United States.

SESSION NM3.8: Functional Aerogels for Sensors and Catalysts  
Session Chairs: Stephanie Brock and Barbara Milow  
Wednesday Afternoon, April 19, 2017  
PCC West, 100 Level, Room 105 BC

**1:30 PM NM3.8.01**

**Protein Nanofiber Gold Aerogels—Properties and Applications** [Gustav Nystroem](#); ETH Zurich, Switzerland.

**1:45 PM NM3.8.02**

**Effects of Interfacial Design in Au–TiO<sub>2</sub> and Cu–TiO<sub>2</sub> Plasmonic Aerogels for Visible Light–Driven Photocatalysis** [Debra R. Rolison](#); U.S. Naval Research Laboratory, United States.

**2:00 PM NM3.8.03**

**Monolithic High Li- and B-Content Aerogels—Lithioborates, Lithiosilicates, Lithioborosilicates and Non-Oxide Lithium Boron, Lithium Boron Carbide and Lithium Boron Silicon Carbide** [Stephen Steiner](#); Aerogel Technologies, LLC, United States.

**2:15 PM NM3.8.04**

**Assembly of Tin-Doped Indium Oxide Nanocrystals into Three-Dimensional Plasmonic Gels via Depletion-Attraction Interactions** [Camila Saez Cabezas](#); The University of Texas at Austin, United States.

**2:30 PM BREAK**

SESSION NM3.9: Environmental Remediation  
Session Chairs: Thomas Schmidt and Stephen Steiner  
Wednesday Afternoon, April 19, 2017  
PCC West, 100 Level, Room 105 BC

**3:30 PM \*NM3.9.01**

**Polysaccharide Based Aerogels as Sustainable Absorbing Materials** [Barbara Milow](#); DLR, Germany.

**4:00 PM NM3.9.02**

**Composite Aerogels for Water Remediation Applications** [Maria F. Casula](#); University of Cagliari, Italy.

**4:15 PM NM3.9.03**

**Mechanically-Durable Aerogels—A Path toward Transformed Oil Remediation Strategies** [Desiree Plata](#); Yale University, United States.

**4:30 PM NM3.9.04**

**Sucrose-Derived Carbon Sponge with Superporous, Superhydrophobic, Oleophilic and Ferromagnetic Properties for Environmental Cleaning** Daisy Patino; University of California, Riverside, United States.

**4:45 PM NM3.9.05**

**Ultralight and Mechanically Robust Cellulose Ester Aerogels for Environmental Remediation** Anurodh Tripathi; North Carolina State University, United States.

SESSION NM3.10: Carbon Aerogels  
Session Chairs: Hai Duong and Alexander Eychmueller  
Thursday Morning, April 20, 2017  
PCC West, 100 Level, Room 105 BC

**8:00 AM \*NM3.10.01**

**The Evolution of Carbon Aerogels—Allotropes, Composites and Graphene-Inspired** Marcus A. Worsley; Lawrence Livermore National Lab, United States.

**8:30 AM NM3.10.02**

**Carbon Aerogels and Carbon Aerogel Composites** Wendell E. Rhine; Aspen Aerogels, Inc., United States.

**8:45 AM NM3.10.03**

**Polymeric Aerogels as a Point of Departure for Fundamental Mechanistic Studies—The Case of Polybenzoxazine and Other Phenolic Type Aerogels** Nicholas Leventis; Missouri University of Science & Technology, United States.

**9:00 AM NM3.10.04**

**Tailoring of Pores in Carbon Aerogels Using 3D Printed Structures** Swetha Chandrasekaran; Lawrence Livermore National Laboratory, United States.

**9:15 AM NM3.10.05**

**Mesosopic Simulations of Structural and Mechanical Properties of Carbon Nanotube Aerogels** Alexey N. Volkov; University of Alabama, United States.

**9:30 AM COMMERCIALIZATION PANEL****10:00 AM BREAK**

SESSION NM3.11: Assemblies of Zero- and One-Dimensional Biopolymers and Nanocarbons

Session Chairs: Stephanie Brock and Marcus Worsley  
Thursday Morning, April 20, 2017  
PCC West, 100 Level, Room 105 BC

**10:30 AM \*NM3.11.01**

**Mass Production and Applications of Carbon Nanotube Aerogels and Cellulose Aerogels from Environmental Waste** Hai M. Duong; National University of Singapore, Singapore.

**11:00 AM NM3.11.02**

**Multiscale Order in Self-Aligned Carbon Nanotube Aerogels** Eric R. Meshot; Lawrence Livermore National Laboratory, United States.

**11:15 AM NM3.11.03**

**Direct Synthesis and Properties of Low-Density Nanofibrous Carbon Structures** Roger Welsh; Millersville University, United States.

**11:30 AM NM3.11.04**

**Solvent-Vapor Infusion Driven Self-Assembly of Fullerene Nanostructures** Tony Jefferson Gnanaprakas; The University of Arizona, United States.

**11:45 AM NM3.11.05**

**Cellulose Aerogel and Its Graphitized Aerogel for High-Performance Lithium-Sulfur Battery** Guofeng Ren; Texas Tech University, United States.

SESSION NM3.12: Industrialization and Commercialization

Session Chairs: Nicholas Leventis and Wibke Loelsberg  
Thursday Afternoon, April 20, 2017  
PCC West, 100 Level, Room 105 BC

**1:30 PM \*NM3.12.01**

**nexAERO—A Disruptive Aerogel Materials Company—Technology, Key Markets and Vision** Matthias M. Koebel; Empa - Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

**2:00 PM NM3.12.02**

**Commercialization of Mechanically Strong, Multifunctional Monolithic Aerogels—Airloy® Ultramaterials** Stephen Steiner; Aerogel Technologies, LLC, United States.

**2:15 PM NM3.12.03**

**Lean Aerogel Manufacturing—Overview towards Efficient Industrial Aerogel Productions** Francisco Ruiz; Keey Aerogel, France.

**2:30 PM NM3.12.04**

**Development of Roll to Roll Polyimide Aerogels** Garrett D. Poe; Blueshift International Materials, Inc., United States.

**2:45 PM NM3.12.05**

**Recent Developments and Applications of Engineered Aerogels at Taasi** Yosry Attia; Taasi Corporation, United States.

**3:00 PM BREAK**

SESSION NM3.13: Advances in Aerogel Insulation  
Session Chairs: Matthias Koebel and Stephen Steiner  
Thursday Afternoon, April 20, 2017  
PCC West, 100 Level, Room 105 BC

**3:30 PM \*NM3.13.01**

**SLENTITE®—The Robust PU Aerogel Panel** Dirk Weinrich; BASF, Germany.

**4:00 PM NM3.13.02**

**Application of Aerogel Blanket Insulation in Exterior Wall Constructions** Phalguni Mukhopadhyaya; University of Victoria, Canada.

**4:15 PM NM3.13.03**

**Stabilization of Alumina and Aluminosilicate Aerogels for High Temperature Applications** Frances I. Hurwitz; NASA-GRC, United States.

**4:30 PM NM3.13.04**

**Fibre Reinforced Silica Aerogel Blankets by Ambient Pressure Drying for Thermal Protection** A. Venkateswara Rao; Shivaji University, India.

**4:45 PM NM3.13.05**

**Effect of Aging on Silica Aerogel Properties and the Structure of Glass Wool-Aerogel Composites by X-Ray Tomography** Subramaniam Iswar<sup>1,2</sup>; <sup>1</sup>Swiss Federal Laboratories for Materials Science and Technology, Empa, Switzerland; <sup>2</sup>Adolphe Merkle Institute, University of Fribourg, Switzerland.

SESSION NM3.14: Poster Session II: Aerogels and Aerogel Inspired Materials—Carbon, Assemblies of 0D and 1D Nanostructures, Frontier Aerogels, Environmental Remediation, Processing and Light and Sound  
Session Chairs: Stephanie Brock and Nicholas Leventis  
Thursday Afternoon, April 20, 2017  
8:00 PM - 10:00 PM  
Sheraton, Third Level, Phoenix Ballroom

**NM3.14.01**

**Tuning Aerogels for High Potential Thermoelectric Materials** Kristian Schneider; Dresden University of Technology, Germany.

**NM3.14.02**

**Mechanical Properties of Silica Aerogels for Photovoltaic Applications—Input from Modelling and Experimental Work** [Romain Cauchois](#); DSM Ahead R&D, Netherlands.

**NM3.14.03**

**Preparation and Thermal Conductivity of Silica Aerogel-Based Rigid Board** [Kazuma Kugimiya](#); Panasonic Corporation Eco Solutions Company, Japan.

**NM3.14.04**

**Hierarchical, Tunable Pore Size Polymer Aerogel Capsules for Fusion Targets** [Christopher Hamilton](#); Los Alamos National Laboratory, United States.

**NM3.14.05**

**Development of Low Carbon Building Envelope Systems Using Aerogels—European Perspectives** [Raymond G. Ogden](#); Oxford Brookes University, United Kingdom.

**NM3.14.06**

**Direct Ink Writing of Activated Carbon Aerogels** [Swetha Chandrasekaran](#); Lawrence Livermore National Laboratory, United States.

**NM3.14.07**

**Assembly of Spherical and Finite-Sized One-Dimensional Oxide Structures** [Jaswinder Sharma](#); Oak Ridge National Laboratory, United States.

**NM3.14.08**

**Development and Fabrication of Uniform Ultra-Low Density Aerogel Coatings inside Hollow Spheres** [Tom Braun](#); Lawrence Livermore National Laboratory, United States.

**NM3.14.09**

**ESR Detection of X-Ray-Induced Free Radicals in Crosslinked Silica Aerogels** [Firouzeh Sabri](#); University of Memphis, United States.

**NM3.14.10**

**Optical Properties of Aerogels—Applications to Dispersive Forces and Radiative Heat Transfer** [Raul Esquivel-Sirvent](#); Universidad Nacional Autonoma de Mexico, Mexico.

**NM3.14.11**

**On-Sun Demonstration of a Solar-Thermal Aerogel Receiver (STAR)** [Lee A. Weinstein](#); Massachusetts Institute of Technology, United States.

**NM3.14.12**

**In Situ Nanoparticle Encapsulation in Aerogels by Ultraviolet Photopolymerization for Targeted Drug Delivery Applications** [Sarath Witanachchi](#); University of South Florida, United States.

**NM3.14.13**

**Nanoporous Cyclic Organic Aerogels for Selective Carbon Dioxide Capture** [Eric Leonhardt](#); Texas A&M University, United States.

**NM3.14.14**

**Ultralow-Density Transparent Boehmite Nanofiber Aerogels and Cryogels for Nanoglue** [Gen Hayase](#); Tohoku University, Japan.

**NM3.14.15**

**Nanoparticle Chalcogenide Aerogels—Assemblies via Covalent Crosslinking** [Indika K. Hewavitharana](#); Wayne State University, United States.

**NM3.14.16**

**Challenges in Structural and Thermal Analysis of Aerogels** [Christian Scherdel](#); Bavarian Center for Applied Energy Research, Germany.

**NM3.14.17**

**Aerogels of Chitosan—Relation between Chitosan Solution Properties and Nanostructure of the Aerogel** [Gonzalo Santos-Lopez](#); Centro de Investigación en Alimentación y Desarrollo A.C., Mexico.

**NM3.14.18**

**Acemannan Aerogels—Promising Biofunctional Scaffolds** [Daniel A. Miramon-Ortiz](#); Centro de Investigación en Alimentación y Desarrollo A.C., Mexico.

**NM3.14.19**

**Hierarchical, Tunable Pore Size Organic and Inorganic Aerogels from Sacrificial Templates** [Stephanie Edwards](#); Los Alamos National Laboratory, United States.

SESSION NM3.15: Processing and Part Fabrication—Challenges and Opportunities

Session Chairs: Marc Hodes and Stephen Steiner

Friday Morning, April 21, 2017

PCC West, 100 Level, Room 105 BC

**8:00 AM \*NM3.15.01**

**Engineering Bacterial Cellulose Nanocomposites—Aerogel-Inspired Biopolymers** [Anna Roig](#); ICMA-B-CSIC, Spain.

**8:30 AM NM3.15.02**

**Modelling of the Extraction Processes for Aerogel Production** [Irina Smirnova](#); TU Hamburg-Harburg, Germany.

**8:45 AM NM3.15.03**

**Practical Considerations in Scale-up of Aerogel Monoliths** [Ryan T. Nelson](#); Aerogel Technologies, United States.

**9:00 AM NM3.15.04**

**Hazard Analysis of a Rapid Supercritical Extraction Process for Aerogel Fabrication** [Bradford A. Bruno](#); Union College, United States.

**9:15 AM NM3.15.05**

**Fluoride Aerogels Based on AlF<sub>3</sub>—Direct Preparation, Nanostructure and Some Surface Characteristics** [Tomaz Skapin](#); Jozef Stefan Institute, Slovenia.

**9:30 AM NM3.15.06**

**Preparation of One Square Foot Aerogel Monolith** [Mamoru Aizawa](#); Tiem Factory Inc., Japan.

**9:45 AM NM3.15.07**

**An Introduction to Aerogels for Use in High Energy Density Plasma Physics Experiments at AWE Target Fabrication** [Ian Hayes](#); AWE, United Kingdom.

**10:00 AM BREAK**

SESSION NM3.16: Characterization

Session Chairs: Nicholas Leventis and Anna Roig

Friday Morning, April 21, 2017

PCC West, 100 Level, Room 105 BC

**10:30 AM \*NM3.16.01**

**Towards Rigorous Measurements and Modeling of Supercritical Carbon Dioxide Drying of Sol Gels** [Marc Hodes](#); Tufts University, United States.

**11:00 AM NM3.16.02**

**Effective Characterization of Mechanical and Thermal Properties of Mechanically Strong Aerogels** [Justin S. Griffin](#); Aerogel Technologies, United States.

**11:15 AM NM3.16.03**

**Computational Mechanics of Aerogels and Aggregation-Based Nanocomposite Materials** [Lev Gelb](#); University of Texas at Dallas, United States.

**11:30 AM NM3.16.04**

**Adsorption on Aerogels—Thermodynamic Study by Supercritical Fluid Chromatography** [Pavel Gurikov](#); Hamburg University of Technology, Germany.

**11:45 AM NM3.16.05**

**Pore Size and Porosity Analysis of Meso- and Macroporous Sol-Gel Based Materials by Using Electroacoustics** [Matthias Thommes](#); Quantachrome Instruments, United States.

SESSION NM3.17: Biomedical and Bionic Applications  
Session Chairs: Alexander Eychmueller and Hongbing Lu  
Friday Afternoon, April 21, 2017  
PCC West, 100 Level, Room 105 BC

**1:30 PM \*NM3.17.01**

**Aerogels as Scaffolds—Response of PC 12 Neuronal Cells to Surface Topography and Substrate Stiffness** [Kyle J. Lynch](#); University of Memphis, United States.

**2:00 PM NM3.17.02**

**Polymer Thermoelectric Aerogels for E-Skin Sensors** [Shaobo Han](#); Linköping University, Sweden.

**2:15 PM NM3.17.03**

**Hydrophobically-Modified Nanoporous Silica Aerogel as a Bacteria Repelling Hygienic Material for Enhanced Healthcare** [Jun K. Oh](#); Texas A&M University, United States.

**2:30 PM BREAK**

SESSION NM3.18: Son et Lumiere (Sound and Light)  
Session Chairs: Stephanie Brock and Firouzeh Sabri  
Friday Afternoon, April 21, 2017  
PCC West, 100 Level, Room 105 BC

**3:00 PM \*NM3.18.01**

**Superior Sound Transmission Loss in Mechanically Strong and Ductile Aerogels** [Hongbing Lu](#); The University of Texas at Dallas, United States.

**3:30 PM NM3.18.02**

**First Steps towards Bio-Based Static True Volumetric 3D Displays—Transparent Cellulose Scaffolds Covalently Equipped with Photon Upconverting Rare Earth Metal Doped Nanophosphors (uc-NP)** [Falk Liebner](#); BOKU University Vienna, Austria.

**3:45 PM NM3.18.03**

**Optically Transparent, Thermally Insulating Silica Aerogels for Solar-Thermal Receivers** [Sungwoo Yang](#); Massachusetts Institute of Technology, United States.

**4:00 PM NM3.18.04**

**Optical Switching of Silica-Aerogels upon Gas Sorption** [Christian Scherdel](#); Bavarian Center for Applied Energy Research, Germany.

**4:15 PM NM3.18.05**

**Understanding the Wave-Subwavelength Structure Coupling in the Aerogels** [Ai Du](#); Tongji University, China.

**4:30 PM NM3.18.06**

**Preparation and Properties of Transparent Polymethylsiloxane Aerogels with Ethenylene-Bridging Moiety** [Taiyo Shimizu](#); Kyoto University, Japan.

SESSION NM3.19: Art  
Session Chairs: Stephanie Brock and Stephen Steiner  
Friday Afternoon, April 21, 2017  
PCC West, 100 Level, Room 105 BC

**4:45 PM NM3.19.01**

**Spirited Skies Project—Silica Aerogel in Art and Design Applications** [Ioannis Michaloudis](#); Charles Darwin University, Australia.