

2009 SAMPE Fall Technical Conference
Session Presentation Listings

October 19-21, 2009
Century II Convention Center, Wichita, Kansas
<http://Wichita.sampe.org>

Tuesday, October 20

Room 209B

Advances in Manufacturing & Out of Autoclave I

Session Chairs: Gail Hahn, The Boeing Company - Phantom Works; John Russell, AFRL/RXMT; and Amit Vyas, Spirit AeroSystems Inc.

9:00 AM: Advanced Composite Cargo Aircraft

J. D. Russell, Air Force Research Laboratory, Wright-Patterson Air Force Base, OH; B. Shenk, R. Holzwarth, Air Force Research Laboratory, Wright-Patterson Air Force Base, OH; M. Swanson, D. Paige, M. Tresnak, S. Ames, Lockheed Martin Aeronautics Company, Palmdale, CA; P. Neumeier, Lockheed Martin Aeronautics Company, Marietta, GA

9:25 AM: Prototype Fabrication and Assembly of Large Scale Integrated Out-of-Autoclave (OOA) Structures (ITAR)

G. Rossi, J. D. Russell, Air Force Research Laboratory, Wright-Patterson AFB, OH

9:50 AM: Properties of an Out-of-Autoclave Prepreg Material: Oven Versus Autoclave

J. Courter, J. Dustin, A. Ritchey, R. B. Pipes, Purdue University, West Lafayette, IN; L. Sargent, W. Purcell, Applied Composites Engineering, Indianapolis, IN

10:15 AM: Non-Autoclave Prepreg Manufacturing Technology for Primary Aerospace Structure

G. Hahn, G. G. Bond, The Boeing Company, Berkeley, MO

11:00 AM: Low Cost, Short Lead Tooling for Limited Use and Lower Temperatures

N. Froeschner, J. M. Griffith, The Boeing Company, St. Louis, MO

11:25 AM: Advanced Materials and Technologies for Wide-Body Aircraft Structures

L. B. Rosa, F. D. R. Amado, UESC – Universidade Estadual de Santa Cruz, Brazil

11:50 AM: Morphing Mold Tools

B. Halford, Surface Generation Ltd, Lyndon, UK

Room 205

Sensors in Aerospace Systems

Session Chair: Anindya Ghoshal, United Technologies Research Center

9:00 AM: Structural Health Monitoring of Carbon Fiber Composites using Inherently Conducting Polymeric Films

A. K. Singh, D. Kim, H. Yang, B. W. Pitts, G. J. Tregre, Crosslink, Hattiesburg, MO; P. J. Kinlen, Crosslink, St. Louis, MO

9:25 AM: Metallized Carbon Nanofiber Based Nanocomposites for Electrochemical Sensing

L. Li, K. Lafdi, University of Dayton Research Institute, Dayton, OH

9:50 AM: Visibility of Viscoelastic Properties During Processing of Fiber Reinforced Thermoset Resin Systems

L. Dorworth, Abaris Training Resources, Inc., Reno, NV

10:15 AM: The Embedding of Optical Fibre Sensors for SHM

M. Volanthen, L. Rumsey, R. Caesley, Insensys, Fareham, UK; A. Ghoshal, G. Welsh, United Technologies Research Center, East Hartford, CT; N. Bordick, US Army RDECOM, Fort Eustis, VA

Room 207

Resin & Plastics Technology - Non-Epoxy Systems

Session Chairs: Axel Böettcher, Boettcher Consult; Jeff Wiggins, University of Southern Mississippi; and Volker Altsadt, Universitaet Bayreuth

9:00 AM: Impact of Cure Environment on Mechanical Properties and Network Morphology of Vinyl Ester Resin Systems

J. Swanson, J. W. Rawlins, University of Southern Mississippi, Hattiesburg, MS

9:25 AM: New Developments in Polyarylether Amide Resin Technology

F.-A. von Itter, B. Schafran, Evonik Degussa GmbH, Marl, Germany

9:50 AM: Reactive Rotational Molding of Thermoset Polyurethane: Application to H₂ Storage Liner Production

J. Viale, F. Nony, L. Delnaud, P. Mazabraud, CEA Le Ripault, Monts, France; J.-F. Gerard, UMR 5223 – INSA Lyon, Villeurbanne, France; A. Tcharkhtchi, PIM – ENSAM Paris, Paris, France; A. Baron, Raigi, Rouvray St. Denis, France

10:15 AM: Benzoxazine Resins for Composite Materials - Recent Developments

R. Schönfeld, S. Kreiling, C. Sawaryn, A. Taden, Henkel AG & Co. KGaA, Düsseldorf, Germany

11:00 AM: Effects of Annealing on Mechanical Properties of Uniaxial Oriented Polypropylene Film

M. Deevey, B. Chen, J. Chung, Frontier Performance Polymers Corporation, Dover, NJ; J. Song, M. Sennett, US Army, RDECOM - NSRDEC, Natick, MA; T. Woo, US Army, RDECOM - ARDEC, Picatinny Arsenal, NJ

Room 207

Epoxy Resin Technology I

Session Chairs: Axel Böettcher, Boettcher Consult; Jeff Wiggins, University of Southern Mississippi; and Volker Altsadt, Universitaet Bayreuth

11:25 AM: Atomistic Modelling of Crosslinked Epoxy Polymer

A. Bandyopadhyay, P. K. Valavala, G. M. Odegard Michigan Technological University, Houghton, MI

11:50 AM: Near IR Kinetics and Correlation of Cure of Epoxy Resins

M. Pramanik, J. O. Swanson, J. A. Scott, S. K. Mendon, J. W. Rawlins, The University of Southern Mississippi, Hattiesburg, MS

Room 208

Design & Analysis of Composite Structures I

Session Chairs: Brian Kitt, Spirit AeroSystems Inc.; Phil Sears, eServ; and Walter Horn, Wichita State University

11:00 AM: Scatter Analysis of Composites and Adhesive Joints for Substantiation of Modern Aircraft Structures

W. Seneviratne, J. S. Tomblin, National Institute for Aviation, Wichita, KS

11:25 AM: The Buckling Response of Tapered Composite Plates Based on Third-Order Theory

S. Akhlaque-E-Rasul, R. Ganesan, Concordia University, Montreal, Canada

11:50 AM: Asymmetric and Tension-Shear Coupling Model Based on Non-Orthogonal Constitutive Law for Dry Fabric Composites

W. Lee, M.-K. Um, J.-H. Byun, KIMS, Changwon, South Korea

Room 205

The Role of Education in Composites Engineering

Session Chair: Brad Jorgenson, South Dakota School of Mines & Technology

11:50 AM: Experimental Characterization of Composite Materials across the Curriculum

B. Abdel-Magid, M. Grami, S. Ziaee, Winona State University, Winona, MN

Room 209B

Advances in Manufacturing & Out of Autoclave II

Session Chairs: Gail Hahn, The Boeing Company - Phantom Works; John Russell, AFRL/RXMT; and Amit Vyas, Spirit AeroSystems Inc.

1:40 PM: The Cure Cycle Reduction of Advanced High Temperature Polyimide (ITAR)

E. Stone, B. Pinkerton, A. Arhelger, Vought Aircraft Industries, Dallas, TX

2:05 PM: Optimization of Composite Ply Kits

J. A. Petermeier, R. P. Willardson, K. R. Wilkinson, eServ, A Perot Systems Company, Plano, TX

2:30 PM: Experimental Study of Milling Bifurcations

A. Radhakrishnan, J. Kennedy, R. Fales, University of Missouri - Columbia, Columbia, MO

Room 208

Design & Analysis of Composite Structures II

Session Chairs: Brian Kitt, Spirit AeroSystems Inc.; Phil Sears, eServ; and Walter Horn, Wichita State University

1:40 PM: Simple Analytical Techniques for Laminated Cylinders and Plates

T. Fronk, S. L. Folkman, E. Clark Utah State University, Logan, UT

2:05 PM: 21st Century Analysis and Design of Composite Flight Vehicle Structures using an FEA-Based Electronic Handbook

S. J. Leemans, Advatech Pacific, Tempe, AZ

2:30 PM: Bridging the Gap Between Physics and Large-scale Structural Analysis: A Novel Method for Fatigue Life Prediction of Composites

R. Fertig III, Firehole Technologies, Laramie, WY

4:40 PM: Design and Analysis Methods for Composite Load Introduction Fittings

P. Middendorf, M. Siemetzki, T. Havar, K. Zimmermann, EADS Deutschland GmbH, Innovation Works, Munich, Germany

3:25 PM: Simulating Impact Damage to Composite Structures

A. Hsu, NEi Software Inc., Westminster, CA

3:50 PM: Composite Aircraft Assemblies: The Complete Solution

O. Guillermin, Vistagy, Waltham, MA

4:15 PM: Quantitative Microstructural Analysis of a Nylon 6,6/E-Glass Long Fiber Thermoplastic Composite

V. S. Chevali, U. K. Vaidya, G. M. Janowski, The University of Alabama at Birmingham, Birmingham, AL

Room 205

Damage Tolerance & Fracture Mechanics

Session Chairs: Waruna Seneviratne, National Institute for Aviation Research; and Rick Willardson, eServ

1:40 PM: Computational Simulation of Progressive Damage in Composite Stiffened Panels with Discrete Source Damage

H. Zhang, F. Abdi, Alpha STAR Corporation, Long Beach, CA

2:05 PM: Robust Design of Assembled Composite Joining Concepts, a Combined Durability-Reliability Evaluation

F. Abdi, F. Rognin, Alpha STAR Corporation, Long Beach, CA; J. Housner, Analytical Enterprises, Newport News, VA; K. Nikbin, Imperial College of London, UK

2:30 PM: Load Rate Effects on the Crush Response of Laminated Corrugated Beams

S. Keshavanarayana, K. Y. Tan, S. F. Elyas, Wichita State University, Wichita, KS

3:25 PM: Rate Sensitivity of Fracture Toughness of Laminated Composites

S. Keshavanarayana, P. N. Nandakumar, Wichita State University, Wichita, KS

3:50 PM: Damage Tolerance of Full-Scale Notched Composite Sandwich Panels

Keshavanarayana, J. Tomblin, Wichita State University, Wichita, KS; P. Shyprykevich, C. Davies, FAA William J. Hughes Technical Center, Atlantic City, NJ

Room 206

3-D Nanostructured Advanced Composites

Session Chairs: Brian Wardle, MIT; and Larry Drzal, Michigan State University

1:40 PM: Health Monitoring of Aligned Carbon Nanotube (CNT) Enhanced Composites

D. M. Barber, S. S. Wicks, B. L. Wardle, Massachusetts Institute of Technology, Cambridge, MA; A. Raghavan, C. T. Dunn, S. S. Kessler, Metis Design Corporation, Cambridge, MA

2:05 PM: Towards Multifunctional Enhancement of Composite Aerostructures Via the Incorporation of Aligned Carbon Nanotubes

M. S. Tsai, R. Guzman de Villoria, B. L. Wardle, Massachusetts Institute of Technology, Cambridge, MA

2:30 PM: Polymer-Based Carbon Nanotube Composites in the Space Environment

L. Daniel, MIT, Boston, MA; M. Chipara, The University of Texas Pan American, Edinburg, TX

3:25 PM: Investigation of Nanostructure Effects and Interactions on the Elastic Properties of Buckypaper-Polymer Nanocomposites

C. Tsai, C. Zhang, A. Vanli, B. Wang, Florida State University, Tallahassee, FL

3:50 PM: Processing and Properties of Functionalized Graphite Nanoplatelet/Epoxy Composites

Z. Wang, H. Thomas Hahn, UCLA, Los Angeles, CA; D. Wang, L.-S. Tan, Air Force Research Laboratory, Wright-Patterson AFB, OH

4:15 PM: Optimal Matching of Thermal Vibrations into Carbon Nanotubes

K.G.S.H Gunawardana, K. Mullen, The University of Oklahoma, Norman, OK

Room 207

Epoxy Resin Technology II

Session Chairs: Axel Böettcher, Boettcher Consult; Jeff Wiggins, University of Southern Mississippi; and Volker Altsadt, Universitaet Bayreuth

1:40 PM: Effect of Amine Isomerism on Glass Transition and Free Volume of Epoxy-Amine Network Based on Glycidyl Ether of Bisphenol-F (DGEBF) and Diaminodiphenyl Sulfone (DDS)

M. Kaushik, M. B. Jackson, S. R. Heinz, J. S. Wiggins, S. Nazarenko, The University of Southern Mississippi, Hattiesburg, MS

2:05 PM: Measuring Compression Strain Recovery in Thermoset Matrices using Digital Image Correlation

S. Heinz, J. Wiggins, The University of Southern Mississippi, Hattiesburg, MS

2:30 PM: Mechanical Properties and Network Structure of Blended Epoxy Resins

M. Pramanik, J. O. Swanson, J. A. Scott, S. K. Mendon, J. W. Rawlins, The University of Southern Mississippi, Hattiesburg, MS

3:25 PM: Characterizing Fortified Epoxy Amine Matrixes with Latent Uretdione Crosslinking Agents

J. Rawlins, K. Davis, The University of Southern Mississippi, Hattiesburg, MS

3:50 PM: The Effect of Different Matrix Materials on the Properties of Structural Composites Fabricated from Waste Carpet

A. Jain, G. Pandey, R. Vaidyanathan, R. P. Singh, Oklahoma State University, Stillwater, OK

4:15 PM: Specialty Anhydrides for High-Performance Composites

K. Shah, Evonik Jayhawk Fine Chemicals Corporation, Galena, KS

4:40 PM: Technical Advances in Epoxy Technology for Wind Turbine Blade Composite Fabrication

G. C. Jacob, B. Hoevel, H. Q. Pham, M. L. Dettloff, N. E. Verghese, R. H. Turakhia, G. Hunter, Dow Chemical Company, Freeport, TX; J. F. Mandell, D. D. Samborsky, Montana State University, Bozeman, MT

Room 209B

Tooling Advancements

Session Chairs: Carl Fiegenbaum and Jeff Priest, Spirit AeroSystems, Inc.

3:25 PM: Rapid Manufacturing Of Large Master Models And High Temperature Resistant Tools

W. L. Miller, P. D. Christou, D. Howland, Huntsman Advanced Materials, The Woodlands, TX

3:50 PM: 900F Glass Transition Temperature Material for Structural Composites and High Temperature Composite Tooling Applications

J. E. Lincoln, Z. McHale, R. J. Jurek, S. L. Hout, D. B. Curliss, Performance Polymer Solutions Inc., Moraine, OH

4:15 PM: Machining, Bonding, Sealing, and Venting of Carbon Foam for Production Tooling

D. M. Kaschak, R. Shao, G. D. Shives, A. J. Francis, GrafTech International, Parma, OH

4:40 PM: Nanocomposite Mold Fabrications and Applications

K. Han, B. Rice, J. Hickey, T. Glenchur, D. Johnson, J. Hartings, University of Dayton Research Institute, Dayton, OH

Room 204

Ballistic Composites

Session Chair: John F. Osterndorf, USA RDECOM-ARDEC

3:25 PM: Low and Medium Speed Multi-Axial Impact Responses of Fiber Reinforced Thermoplastic and Thermoset Composites

B. Chen, O. Kizhner, O. Chainani, J. Chung, Frontier Performance Polymers Corporation, Dover, NJ; T. Woo, L. Moy, J. Osterndorf, D. Prillaman, US Army, RDECOM-ARDEC; R. Basavaraju, US Army, TARDEC; J. Song, US Army, NSRDEC; B. Liaw, F. Delale, City College of New York, New York, NY

3:50 PM: The Ballistic Impact Resistance of Polypropylene Composites

R. Roylance, T. Godfrey, E. Welsh, US Army Natick Soldier Research Development & Engineering Center, Natick, MA

Room 204

Automated Tape Placement/Automated Fiber Placement

Session Chair: Brice Johnson, Boeing Phantom Works

4:15 PM: Machine-Independent Automated Fiber Placement Programming & Simulation

J. Schule, CGTech, Irvine, CA

4:40 PM: Tow Steered CFRP Aircraft Parts – Preforming and Mechanical Properties

K. Hazra, K. Potter, M. Wisnom, ACCIS, University of Bristol, Bristol, UK

Wednesday, October 21

Room 209B

Technologies to Assist Composite Manufacturers I

Session Chairs: Jim Leslie, ACPT, Inc; and Linda Clements, C&C Innovation Strategies, Inc.

9:00 AM: Technology Gained from Composite Development Programs

J. C. Leslie, Advanced Composite Products & Technology, Huntington Beach, CA

9:25 AM: New Low/No VOC Coating Technologies for Composite Applications

M. O. Wells, K. A. Wood, S. Lacock, Arkema, Inc., King of Prussia, PA

9:50 AM: Nano-fiber Reinforced Enhancements in Composite Polymer Matrices

C. Chamis, NASA Glenn Research Center, Cleveland, OH

10:15 AM: Specialty Building Blocks for Composites: An Overview

K. Shah, Evonik Jayhawk Fine Chemicals Corporation, Galena, KS; T.-P. Sauer, Evonik Degussa GmbH, Marl, Germany

11:00 AM: Developing Breakdown Tooling From Initial Concept Stage Through Final Production

R. Starck, Paragon D&E, Grand Rapids, MI

11:25 AM: Cleaning for Effective Coating of Composites

B. Kanegsberg, E. Kanegsberg, BFK Solutions LLC, Pacific Palisades, CA

11:50 AM: Tooling for Composite Materials: Problems and Solutions

L. L. Clements, J. L. Crowley, C&C Innovation Strategies, Inc., Dayton, NV

Room 208

Testing & Qualification of Materials

Session Chairs: Beth Clarkson, NASA National Center for Advanced Materials Performance

9:00 AM: Multivariate Equivalence Testing for Composite Materials

E. Clarkson, National Institute for Aviation Research, Wichita, KS

9:25 AM: Evaluation of Cubic Specimens for Compression Testing at Different Strain Rates

J.F. Acosta, K. S. Raju, Wichita State University, Wichita, KS

9:50 AM: Mechanical Behavior of Woven Thermoplastic Composites Under Varying Strain Rates

U. Sharma, G. Reyes, University of Michigan-Dearborn, Dearborn, MI

10:15 AM: Modified Coefficient of Variation Approach to set Basis Values for Newly Developed Composite Materials

E. Clarkson, Y. Ng, Wichita State University, Wichita, KS

11:00 AM: Impact Strength of Hybrid Fiber-Reinforced Polymers at Cryogenic Temperatures

M. Lambert, E. A. Clark, T. H. Fronk, Utah State University, Logan, UT; J. Noorda, HyPerComp Engineering Inc., Brigham City, UT

11:25 AM: Representing Viscoelastic Response of a Curing Laminate

M. Stover, B. Kelpine, AvPro Inc. Norman, OK

11:50 AM: Simple Destructive Test Methodology to Determine the Mechanical Bond Strength of Coatings on Ceramic Fibers

J. Lincoln, R. J. Jurek, D. B. Curliss, M. Grigsby, M. Napoli, Performance Polymer Solutions Inc., Moraine, OH; M. Rich, L. T. Drzal, B. Rook, Michigan State University, East Lansing, MI

Room 204

Nanocomposites and Multifunctional Materials

Session Chair: Bob Minaie, Wichita State University

9:00 AM: Multifunctional Carbon Fiber Epoxy-matrix Composites for Energy Harvesting

S. Han, S.Wang, D. D. L. Chung, University at Buffalo, State University of New York, Buffalo, NY

9:25 AM: Nanotube Buckypaper Composite Actuators for Morphing Structure Applications

S.-Y. Tsai, I.-W. Chen, Z. Liang, B. Wang, C. Zhang, FAMU-FSU College of Engineering, Tallahassee, FL; S. Walsh, Army Research Laboratory (ARL), Aberdeen Proving Ground, MD

9:50 AM: Thermoplastic Polyurethane Elastomer-Clay and -Carbon Nanofiber Nanocomposites: Flammability Studies

J. H. Koo, K. C. Nguyen, J. C. Lee, W. K. Ho, M. C. Bruns, O. A. Ezekoye, University of Texas at Austin, Austin, TX

10:15 AM: Influence of Nanoparticles on the Thermal and MEchanical Properties of PMR-15 and Candidate Replacement Resins

S. G. Miller, NASA Glenn Research Center, Cleveland, OH; P. Heimann, Ohio Aerospace Institute, Cleveland, OH; M. Maryanski, University of Akron, Akron, OH; J. Bauer, University of Michigan, Ann Arbor, MI

11:00 AM: Dispersion Optimization of Exfoliated Graphite Nanoplatelets in Polyetherimide Nanocomposites: Extrusion vs Precoating vs Solid State Ball Milling

H. Wu, B. Rook, L. T. Drzal, Michigan State University, Lansing, MI

11:25 AM: Multifunctional Exfoliated Graphite Nanoplatelets/High Density Polyethylene Nanocomposites

X. Jiang, L. T. Drzal, Michigan State University, Lansing, MI

11:50 AM: Composite Films Prepared by Deposition of Manganese Dioxide and Polypyrrole on In-Situ Grown Carbon Nanotubes for Supercapacitors

L. Li, K. Lafdi, University of Dayton Research Institute, Dayton, OH

Room 205

Composite Foams

Session Chairs: David Kaschak, Graftech; James Klett, Oak Ridge National Laboratory; and Ed Semmes, Consultant

9:00 AM: Flexible Molded Polyurethane Foams with Clay and Silica Nanofillers

I. Javni, K. Song, J. Lin, Z. S. Petrovic, Kansas Polymer Research Center, Pittsburg State University, Pittsburg, KS

9:25 AM: Graphite Foam Performance in Heat Exchanger Applications

P. G. Stansberry, E. Pancost, Y. Xiong, J. Norley, GrafTech International Holdings, Inc., Parma, OH

9:50 AM: Tensile Strength of Aluminum Foam-Polypropylene Interpenetrating Phase Composites

J. Hadley, N. Rayess, N. Dukhan, University of Detroit Mercy, Detroit, MI; D. Q. Houston, Ford Motor Company, Dearborn, MI

10:15 AM: Coal Derivatives for Sprayable Carbon Foams

E. B. Kennel, M. E. Heavner, M. Mukka, O. A. Olajide, C. Prasad, P. Subramanian, A. H. Stiller, West Virginia University, Morgantown, WV

Room 207

Epoxy Resin Technology III

Session Chairs: Axel Böettcher, Boettcher Consult; Jeff Wiggins, University of Southern Mississippi; and Volker Altsadt, Universitaet Bayreuth

9:00 AM: A Nanoscale Investigation of Epoxy Resin Nodule Development

C. Sahagun, S. Morgan, University of Southern Mississippi, Hattiesburg, MS

9:25 AM: Fast Composite Production with Reactive Epoxy Resins

M. Döring, U. Arnold, A. Schmidt, Karlsruhe Research Center, Baden-Wuerttemberg, Germany

9:50 AM: Aspects of High-Volume Series Production with High Performance Fibre-Reinforced Plastics

V. Altstädt, J. Krämer, B. Uwe, University of Bayreuth, Bayreuth, Germany

Room 207

Bio-, Natural and Innovative Materials I

Session Chairs: Borys Schafran, Evonik Degussa Corporation; and Warren Hatfield, Hawker Beechcraft

11:00 AM: New Bio-Based Polyurethane Resins for Composites and Polymeric Concrete

I. Javni, M. Ionescu, D. P. Hong, Z. S. Petrovic, Pittsburg State University, KPRC, Pittsburg, KS

11:25 AM: Novel Monomer Process for Parylene Coating Applications

C. Lee, A. Kumar, Dielectric Systems Inc., Fremont, CA; M. Capalongan, Stratamet Inc., Fremont, CA

11:50 AM: Structure-Properties Relationship of Polyimides Derived From Different Composition of Diamines and Dianhydrides

Q. Luo, N. Bilic, Z. Petrovic, Kansas Polymer Research Center, Pittsburg State University, Pittsburg, KS

Room 208

Core & Sandwich Materials

Session Chair: Abhishek K. Singh, Crosslink

1:40 PM: Mechanical Properties of Laser-Welded Grade 9 Titanium Honeycomb Core

G. Jones, Benecor, Incorporated, Wichita, KS

2:05 PM: Electrically Conductive Hollow Carbon Microspheres in a Polymer Matrix

C. Walls, A. Simpson, BAM, Inc, Knoxville, TN

2:30 PM: Interfacial Fracture Properties of Novel Carbon Foam Sandwich Structures

S. Rangaraj, G. Reyes, University of Michigan Dearborn, Dearborn, MI

3:25 PM: Effect of Core Shear Modulus on the Transmission Loss of Composite Honeycomb Panels

T. Wang, J. Maxon, D. Hornick, A. Foose, J. Fila, Gulfstream Aerospace Corporation, Savannah, GA

3:50 PM: Mechanical Properties of Sandwich Composites from Recycled Tires

A. Bhadra, G. Pandey, R. Vaidyanathan, R. P. Singh, Oklahoma State University, Stillwater, OK

Room 204

Nanofiber Technology, Uses

Session Chair: Frank Ko, University of British Columbia

1:40 PM: Recent Progress in Carbon Nanotube Fibers and Yarns

F. Ko, Y. Wan, AMPEL, The University of British Columbia, Vancouver, Canada

2:05 PM: Nanoclay Reinforced Flax Nanocomposite by Electrospinning

C. Wang, F. K. Ko, M. Alcock, The University of British Columbia, Vancouver, Canada

2:30 PM: Manufacturing Neat SWCNT Fibers from reduced SWCNT in DMSO

J. Guan, L. Tay, B. Simard, National Research of Canada, Ottawa, Canada

3:25 PM: Superhydrophobic Behavior of Electrospun Micro and Nanofibers

M. Ceylan, R. Asmatulu, W. Khan, Wichita State University, Wichita, KS; N. Nuraje, Massachusetts Institute of Technology, Cambridge, MA

3:50 PM: Properties of Recycled PVC and PS Nanocomposite Fibers at Various NiZn Ferrite Loadings

R. Asmatulu, V. Dandin, W. Khan, Wichita State University, Wichita, KS

Room 207

Bio-, Natural and Innovative Materials II

Session Chairs: Borys Schafran, Evonik Degussa Corporation; and Warren Hatfield, Hawker Beechcraft

1:40 PM: Chopped Prepregs - A Compelling Performance and Cost Alternative Material Form

Jack D. Fudge, Blackbird Composites, San Ramon, CA

2:05 PM: Biobased Adhesives for Wood and Metal

A. Zlatanic, Z. S. Petrovic, Kansas Polymer Research Center, Pittsburg, KS

2:30 PM: Examination of a Low Temperature Paste Adhesive as an alternative to Film Adhesives for Process Cost Reduction

D. Klapprott, Henkel Aerospace, Bay Point, CA

3:25 PM: Vegetable Oil Based Epoxy Resins

D. P. Hong, I. Javni, Z. S. Petrovic, Pittsburg State University, KPRC, Pittsburg, KS

3:50 PM: Creep Friction of Neoprene on Graphite Epoxy

S. J. Mills, United Launch Alliance, Trinity, AL

4:15 PM: Thermal and Mechanical Studies of Wood Flour Reinforced Polyurethane Composites

G. T. Strawder, M. V. Hosur, S. Jeelani, Y. Zhou, Tuskegee University, Tuskegee, AL

Room 209B

Technologies to Assist Composite Manufacturers II

Session Chairs: Jim Leslie, ACPT, Inc; Linda Clements, C&C Innovation Strategies, Inc.

1:40 PM: A Comparison of the Environmental Attributes of Thermoplastic vs. Thermoset Composites

M. Favaloro, Ticona Engineering Polymers, Amesbury, MA

2:05 PM: The Basics of Materials Engineering

S. Peters, Process Research, Mountain View, CA

2:30 PM: Performance of New Repair Adhesives in State of Art Structural Composite Repairs

S. Lehmann, O. Lammerschop, Henkel Corporation, Bay Point, CA

Room 205

Infusion Technology - Applications

Session Chair: Dirk Heider, University of Delaware

1:40 PM: A New Empirical Approach to Predict Microcracking in Composites – Resin and Fiber Preform Effects

Y. Yoon, X. Fang, W. W. Lin, GE Global Research, Niskayuna, NY; J. A. Woods, The Boeing Company, Seattle, WA

2:05 PM: Design and Fabrication of VARTM Fabricated Skin Panels with Integrated Hollow Stiffeners

D. Heider, P. Schulze, J. Tierney, J. W. Gillespie, Jr., University of Delaware, Newark, DE

2:30 PM: Cost Effective Production and Lightweight Transportation Frames Made in Tri Dimensional Composite Materials

J. Verhaeghe, G. Nouwen, J. Kustermans, Acrosoma NV, Lokeren, Belgium

Room 205

Infusion Technology - Resins/Preforms

Session Chair: Dirk Heider, University of Delaware

3:25 PM: High Service Temperature Polymer Matrix Composite Process Development

C. Homrighausen, A. Mereness, Eltron Research & Development Inc., Boulder, CO

3:50 PM: Chopped Carbon Fiber Airplane Propeller Spinner

M. Janney, E. Geiger, Jr., T. Gunder, N. Baitcher, R. Johnson, Materials Innovation Technologies LLC, Fletcher, NC

4:15 PM: Continuous Process Chain for Robot Stitched Preforms

J. Filsinger, EADS Deutschland GmbH, Munich, Germany

4:40 PM: Cost-efficient Preforming Process for Complex High-performance Fibre-reinforced Composites: Mechanical Properties

U. Beier, J. K. W. Sandler, V. Altstädt, Polymer Engineering, University of Bayreuth, Bayreuth, Germany; H. Spanner, C. Weimer, Eurocopter Deutschland GmbH, Munich, Germany

Room 209B

Building Blocks to Advanced Materials Applications

Session Chair: Michael Knight, Teijin Aramid USA

3:25 PM: Prosthetics & Orthotics Manufacturing Initiative (POMI): Composite Socket Testing & Novel Design and Fabrication Paradigm

C. W. Norfolk, J. Osborn, SCRA / ARDI, Anderson, SC

3:50 PM: Toxicity of Nanomaterials and Recent Developments in Protection Methods

R. Asmatulu, E. Asmatulu, A. Yourdkhani, Wichita State University, Wichita, KS

4:15 PM: Increasing the Efficiency of Pharmaceutical Drugs for Magnetic Targeted Drug Delivery

H.L. Wamocho, R. Asmatulu, M. M. El-Tabey, H. Misak, J. S. Gopu, B. Cooper, J. Ho, and H.H. Hamdeh, Wichita State University, Wichita, KS

4:40 PM: ImpacGard® For Long Lasting Protection in Transportation Applications

M. Kubota, J. W. Long, Kubota Research Associates, Inc., Hockessin, DE; S. Yarlagadda, University of Delaware, Newark, DE

Thursday, October 21

Room 205

Nano and Conductivity/EMI

Session Chair: Nate Hansen, Conductive Composites Company

9:00 AM: Lightweight Highly Effective Shielding Veil for Conductive Composites (ITAR)

G. Hansen, N. Hansen, Conductive Composites Company, Midway, UT

9:25 AM: Electromagnetically Shielding Spray Paints Using Commercial-off-the-Shelf Polymer Systems (ITAR)

G. Hansen, N. Hansen, Conductive Composites Company, Midway, UT

9:50 AM: Highly Electrical Conductive Multi-Walled Carbon Nanotube/BMI Composites

Q. Cheng, J. G. Park, J. Bao, Z. Liang, C. Zhang, B. Wang, FAMU-FSU College of Engineering, Tallahassee, FL

10:15 AM: Eliminating Tradeoffs in Conductive Composites via Novel Heterogeneous Structures

T. Fornes, N.D. Huffman, S.B. Carruthers, LORD Corporation, Cary, NC

11:00 AM: Electrically-Conductive Skins for Morphing UAVs

E. S. Handy, GVD Corporation, Cambridge, MA; T. Sanderson, Raytheon Missile Systems, Tucson, AZ; R. Justice, Air Force Research Laboratory, Wright-Patterson AFB, OH

11:25 AM: Integrated EMI Coatings for Composites Through Engineered Use of Nanofillers

A. Morgan, T. J. Stonecash, J. L. Pierce, University of Dayton Research Institute, Dayton, OH

11:50 AM: Preparation of Hollow Metallic Fibers for Electromagnetic Wave Absorbing Materials

J. Woo Yi, S. Bok Lee, J. Bong Kim, S. Kwan Lee, K. Yeon. Park, Korea Advanced Institute of Science and Technology, Daejeon, Korea; M. Keun Yoon, South Dakota School of Mines & Technology, Rapid City, SD

Room 204

Nano-Enhanced Resins for Aerospace Applications I

Session Chair: Ming C. Liu, Spirit AeroSystems Inc.

9:00 AM: Carbon Nanotube Enhanced Composite Materials

W. Wang, F. Meyer, Y. Wang, G. Miller, S. Potluri, Zyvex Performance Materials, Columbus, OH

9:25 AM: Development of Boron Cage Compound Nanocomposite Elastomers

M. F. Hawthorne, M. W. Lee, Jr., University of Missouri–Columbia International Institute of Nano and Molecular Medicine, University of Missouri – Columbia, Columbia, MO; D. E. Bowen III, E. A. Eastwood, National Nuclear Security Administration’s Kansas City Plant Honeywell Federal Manufacturing & Technologies, Kansas City, MO

9:50 AM: Development of Epoxy and Urethane Boron Cage Compound Nanocomposites

M. F. Hawthorne, M. W. Lee, Jr., University of Missouri–Columbia International Institute of Nano and Molecular Medicine, University of Missouri – Columbia, Columbia, MO; E. A. Eastwood, D. E. Bowen III, National Nuclear Security Administration’s Kansas City Plant Honeywell Federal Manufacturing & Technologies, Kansas City, MO

10:15 AM: Carbon Nanofibers Toughened AS-4/EPON862 Prepreg and its Laminate Properties

K.-T. Hsiao, J. Ryals, University of South Alabama, Mobile, AL; P. H. Wu, M. C. Liu, Chief Scientist Office, Spirit AeroSystems, Inc., Wichita, KS

11:00 AM: Nano-Scale Resin Modifications in Fiberglass Laminates Containing Ply Drops

S. L. Donaldson, University of Dayton, Dayton, OH; T. J. Stonecash, S. Sihn, University of Dayton Research Institute, Dayton, OH

11:25 AM: Dispersion of Short and Long Nanotubes using Microfluidic Method for Composite Applications

Y. Tian, C. Zeng, Z. Liang, C. Zhang, B. Wang, FAMU-FSU College of Engineering, Tallahassee, FL

11:50 AM: Shape Memory Polymer Nanocomposites with Carbon Nanofiber Paper

H. Lu, Y. Tang, E. Chew, J. Gou, University of Central Florida, Orlando, FL; H. Lu, J. Leng, S. Du, Harbin Institute of Technology, Harbin, China

Room 207

High Temperature Resins & Composites I

Session Chair: Kenny Johnson, Air Force Research Laboratory

9:00 AM: Thermal Oxidative Barrier Coating for Polymer Matrix Composites (ITAR)

T. Bullions, W. Ronk, GE Aviation, Cincinnati, OH

9:25 AM: Improving the Manufacturability and Durability of Thick Polyimide Matrix Composites (ITAR)

J. Lincoln, S. Hout, D. B. Curliss, Performance Polymer Solutions Inc., Moraine, OH

9:50 AM: High Temperature Structural Adhesives for Wide Area Bonding Applications

J. Lincoln, A. Javorina, D. B. Curliss, Performance Polymer Solutions Inc.,
Moraine, OH

10:15 AM: Moisture Effects on Silicon Carbide-Reinforced Imide Matrix Composites with High-Temperature Finishes (ITAR)

R. E. Allred, J.-M. Gosau, J. P. Barlow, H. Wang
, Adherent Technologies, Inc, Albuquerque, NM

11:00 AM: Effect of Stacking Sequence on Oxidation Behavior of Polymeric Matrix Composites (ITAR)

G. Tandon, University of Dayton Research Institute, Dayton, OH; K. V. Pochiraju, Stevens Institute of Technology,
Hoboken, Nj; R. B. Hall

Materials and Manufacturing Directorate, Air Force Research Laboratory,
WPAFB, OH

11:25 AM: Alternate Monomer Suppliers for AFR-PE-4 (ITAR)

J. Magato, R. A. Gray, Maverick Corporation, Blue Ash, OH

11:50 AM: Compimide® P500: A New Bismaleimide Powder for Advanced Composites

S. Evsyukov, B. Kramer, T. Pohlmann, H. D. Stenzenberger, Evonik
Technochemie GmbH, Dossenheim, Germany

Room 206

Lightning Strike Protection

Session Chair: Yulia Kostogorova-Beller, National Institute for Aviation
Research

9:00 AM: Carbon Nanomembrane for Lightning Strike Protection (ITAR)

J. Ravine, NanoTechLabs, Inc., Kettering, OH; R. Czerw, NanoTechLabs, Inc.,
Yadkinville, NC; J. Schultz, National Composite Center, Kettering, OH

9:25 AM: Damage Response of Carbon/ Epoxy Composite Plates Subjected to Mechanical Impact and Simulated Lightning Strike

P. Feraboli, H. Kawakami, University of Washington, Seattle, WA

9:50 AM: Hole Protection with Expanded Grommets in Carbon Fiber Reinforced Plastic

J. Ransom, M. Wehrmeister, D. Bakken, Fatigue Technology, Seattle, WA

10:15 AM: Carbon Nanofiber Paper for Lightning Strike Protection of Composite Materials via Hybrid Carbon Nanofiber Paper

F. Liang, Y. Tang, J. Gou, University of Central Florida, Orlando, FL; D. Firsich,
Inorganic Specialists, Inc., Miamisburg, OH; J. Fielding, Air Force Research
Laboratory, Wright-Patterson Air Force Base, OH

Room 209B

Manufacturing with Nano-modified Composites

Session Chair: Susan Robitaille, Renegade Materials Corp.

9:00 AM: Field Emission Improvement of Carbon Nanotube Buckypaper by Laser Post-Treatment

H. Y. Miao, Department of Electrical Engineering, Tunghai University, Taichung, Taiwan; Y. Chen, M. Zhang, R. Liang, C. Zhang, B. Wang, Florida State University, Tallahassee, FL; S. Walsh, Army Research Laboratory Aberdeen Proving Ground, MD

9:25 AM: The Distribution and Flow of Nickel Powder and Carbon Nanotubes Mixed in an Aluminum Matrix via Friction Stir Welding

H. E. Misak, C. A. Widener, D. A. Burford, R. Asmatulu, Wichita State University, Wichita, KS

9:50 AM: Novel Core Shell Rubber Particles for High Performance Thermosets

D. Sober, R. Nishimura, S. Walsh, Kaneka Texas Corp., Pasadena, TX

10:15 AM: Mechanical Characterization of Unidirectional Thermoplastic Nanocomposites

K. Narasimhan, S. Roy, The University of Alabama, Tuscaloosa, AL

Room 206

Infusion Technology - Processing Effects

Session Chair: Dirk Heider, University of Delaware

11:00 AM: Pressure Behavior during Vacuum Assisted Processing (VAP)

Ö. Eksik, TUBITAK Marmara Research Center, Material Institute, Kocaeli, Gebze, Turkey; S. Chandrabalan, Ö. Eksik, H. Deffor, P. Simacek, J.W. Gillespie, Jr., S. Advani, D. Heider University of Delaware, Newark, DE

11:25 AM: Spring-In Prediction for Cylindrical Composite Specimens Manufactured with VARTM

K. Jin Teoh, K.-T. Hsiao, University of South Alabama, Mobile, AL

11:50 AM: Use of Controlled Radical Polymerization in Elevated Temperature Vacuum Infusion of Large Parts

M. O. Wells, A. Cocquyt, Arkema, Inc., King of Prussia, PA

Room 209B

Filament Winding and Pultrusion I

Session Chairs: John Green, GSG Inc.; Anand Rau, Toray; and Clem Hiel, SAMPE Fellow

11:00 AM: Improvements in FEA of Composite Overwrapped Pressure Vessels

R. Willardson, eServ, a Perot Systems Company, Plano, TX; D. Gray, Dassault Systemes Simulia Corp., Lewisville, TX; T. Delay, NASA, MSFC, Huntsville, AL

11:25 AM: Mechanical Property Characterization and Finite Element Analysis of Pultruded I-beam

M. Saha, J. Anderson, University of Oklahoma, Norman, OK

11:50 AM: Polyurethane Resins for Pultrusion

R. A. Cageao, J. Hayes, C. Snyder, Bayer MaterialScience LLC, Pittsburgh, PA

Room 209B

Filament Winding and Pultrusion II

Session Chairs: John Green, GSG Inc.; Anand Rau, Toray; and Clem Hiel, SAMPE Fellow

1:45 PM: The Cryogenic Bonding Evaluation of a Thin-Walled Aluminum Lined Composite Overwrapped Pressure Vessel

E. Clark, T. H. Fronk, M. D. Lambert, Utah State University, Smithfield, UT

2:10 PM: Improving the Reliability of Electrical Grid Infrastructure: Case Study of Pultruded Fiber Reinforced Inorganic (FRI) for Fire Protection

C. Hiel, Composite Support & Solutions Inc, Rancho Palos Verdes, CA

2:35 PM: Research and Development Towards New Generations of Full Composite Tanks Dedicated to 70MPa Gaseous Hydrogen Storage

C. Thomas, F. Nony, S. Villalonga, P. Mazabraud, French Atomic Energy Commission, Monts, France; M.-C. Lafarie, M. Bertin, D. Bertheau, ENSMA – LMPM-UMR CNRS, Chasseneuil, France

3:35 PM: Carbon Fiber Sandwich Construction Beam using Continuous Resin Transfer Molding

B. Hochman, Glasforms, Inc., San Jose, CA

4:00 PM: How Aerospace Technology is Improving the Electrical Transmission Grid

E. Bosze, CTC Cable Corporation, Irvine, CA

Room 204

Nano-Enhanced Resins for Aerospace Applications II

Session Chair: Ming C. Liu, Spirit AeroSystems Inc; and Kuang-Ting Hsiao, University of South Alabama

2:10 PM: Nano-Enhanced, High Temperature, Abrasion Resistant Coatings

R. A. Gray, J. R. Magato, S. Gronauer, Maverick Corp, Blue Ash, OH

2:35 PM: Corrosion Protection of Unclad 2024-T3 Aluminum Surface with both Chromium Conversion and MWCNT Nanocomposite Coatings

R. Asmatulu, C. Hille, H. Misak, Wichita State University, Wichita, KS

1:45 PM: Enhancement of Mechanical and Electrical Properties of Fiber-Reinforced Polymer Composites Through Addition of CNF by Electrophoretic Deposition

A. Rodriguez, M. Guzman, C. Lim, B. Minaie, Wichita State University, Wichita, KS

3:00 PM: Nano InTM Resin Film, An Innovative Solution for Nanocomposites

P. Lucas, Nanoledge Inc., Boucherville, Québec, Canada; J. Le Corvec, V+I Composites, Ottawa, Canada

Room 207

High Temperature Resins & Composites II

Session Chair: Kenny Johnson, Air Force Research Laboratory

1:45 PM: Carbon Dioxide Filtration through Sustainable Carbon Carbon Composite Filters

A. Sfakianakis, V. Drakonakis, J. C. Seferis, Polymeric Composites Laboratory - GloCal / FREEDOM , Seattle ,WA; G. C. Papanicolaou, Depy. of Mechanical Engineering and Aeronautics , Rio , Patras , Greece; C. C. Doumanidis, University of Cyprus, Nicosia, Cyprus

2:10 PM: Fabrication and Characterization of High Temperature Resin/Carbon Fiber/Carbon Nanotube Multi-scale Composites

X. Fu, C. Zhang, T. Liu, Z. Liang, B. Wang, Florida State University, Tallahassee, FL

2:35 PM: Advances in Material Testing Methods for High Temperature Composites

K. Mercer, K. A. Kenzel, San Diego Composites, Inc., San Diego, CA

Room 206

POSS Resin Systems

Session Chair: Jeff Wiggins, University of Southern Mississippi

1:45 PM: High Temperature Epoxies Enhanced by Nanostructured Polyhedral Oligomeric Silsesquioxane (POSS) Molecules

B. X. Fu, C. DeArmitt, J. Schwab, Hybrid Plastics, Inc, Hattiesburg, MS

2:10 PM: High Performance Polyimide Materials Enhanced by Polyhedral Oligomeric Silsesquioxane (POSS) Molecules

J. Lichtenhan, J. Schwab, B. Fu, Hybrid Plastics, Inc, Hattiesburg, MS

2:35 PM: Novel POSS-epoxy Based High Temperature Composite Matrix

M. Jackson, J. S. Wiggins, Southern Miss, Hattiesburg, MS; B. Fu, Hybrid Plastics, Hattiesburg, MS

3:00 PM: Clay-Thermoset Nanocomposites for Different Applications

T.-D. Ngo, M.-T. Ton-That, National Research Council Canada- IMI, Boucherville, Canada

Room 204

Automation & Optimization of Autoclave Cure

Session Chair: Tom Rose, Av Pro Inc.

3:35 PM: Modification of Time-Temperature-Transformation Diagram to Obtain a Comprehensive Cure Map for Polymer Composites

S.M. Sabzevari, S. Alavi-Soltani, H. Koushyar, and B. Minaie, Wichita State University, Wichita, KS

4:00 PM: Correlation Between Viscoelastic and Mechanical Properties for an Out-of-Autoclave Polymer Composite

C. Gernaat, S. Alavi-Soltani, M. Guzman, A. Rodriguez, B. Minaie, Wichita State University, Wichita, KS; J. Welch, Spirit AeroSystems, Wichita, KS

Room 207

Nondestructive Evaluation & Inspection

Session Chair: Nick Gianaris, General Dynamics Land Systems

3:35 PM: Large Radome NDI (ITAR)

S. Hall, Raytheon, McKinney, TX

4:00 PM: Fiber Optic Monitoring of Structural Composites using Optical Backscatter Reflectometry

D. Peairs, L. Sterner, K. Flanigan, V. Kochergin, Luna Innovations, Blacksburg, VA

4:25 PM: Ultrasonic Phased Array Tools for Composite Inspection During Maintenance and Manufacturing

A. Lamarre, J. Habermehl, Olympus NDT, Quebec City, Canada