

**Air Force Office of Scientific Research**  
**Annual Grantees'/Contractors' Meeting**  
**Mechanics of Multifunctional Materials & Microsystems**  
 Reston, VA, May 10-12, 2010

**AGENDA**

<b>Monday, May 10</b>		
<b>Time</b>	<b>Speaker</b>	<b>Title of Project</b>
<b>08:00</b>		<i>Registration</i>
<b>08:25</b>	Les Lee AFOSR	<i>Opening Remarks</i>
<b>Session Chair: Rich Vaia (AFRL/RXBN)</b>		
08:30	<b>Markus Buehler</b> MIT	(YIP'08) Structural Hierarchies in Biomimetic Materials: Protein Inspired de novo Material
08:55	<b>Ioannis Chasiotis</b> U Illinois	Effect of Nanoscale Fillers on the Local Mechanical Behavior of Polymer Nanocomposites.
09:20	<b>John Kieffer</b> U Michigan	Multiscale Simulation of Interfacial Phenomena and Nanoparticle Placement in Polymer Matrix Composites
09:45	<b>Mrinal Saha</b> U Oklahoma	(DEPSCoR'09) Experimental and Theoretical Studies of Carbon Nanotube Hierarchical Structures in Multifunctional Polymer Composites
<b>10:10</b>	<b>Coffee</b>	<b>Break</b>
<b>Session Chair: Ajit Roy (AFRL/RXBT)</b>		
10:30	<b>Tsu-Wei Chou</b> U Delaware	Multifunctional Carbon Nanotube-Based Sensors for Damage Detection and Self Healing in Structural Composites
10:55	<b>Erik Thostenson</b> U Delaware	(YIP'09) Novel Micro- and Nano-Structured Composites for Sensing and Actuation
11:20	<b>Fu-Kuo Chang</b> Stanford U	Design of CNT Embedded Adhesive Films for Sensing, Control and Reinforcement of PZT Actuator/Sensor Networks
11:45	<b>Akira Todoroki</b> Tokyo Inst. of Technology	Time Domain Reflectometry for Damage Detection of Laminated CFRP Plate
<b>12:10</b>	<b>Lunch</b>	<b>Break</b>

<b>Luncheon Talk - Moderator: To be nominated</b>		
<b>12:30</b>	<b>Fu-Kuo Chang</b> Stanford U	<b>Briefing on MURI '09:</b> "Bio-Inspired Intelligent Sensing Materials for Fly-by-Feel Autonomous Vehicle" (Kick-off meeting in Stanford, CA, on October 29, 2009; <b>Stanford U / U Denver / U Colorado / UCLA</b> ; <b>PI: Fu-Kuo Chang</b> ; <b>Co-PI's: Peter Peumans, Ricardo Dolmetsch, Boris Murmann, Philip Levis, Andrew Ng, Rahmat Shoureshi, Yun-Bo Yi, Robert McLeod, Greg Carman, Yong Chen</b> ; <b>PM: Les Lee</b> ; <b>Co-PM's: Hugh DeLong, Jim Chang</b> )

<b>Session Chair: To be nominated</b>		
<b>13:30</b>	<b>Nicolas Triantafyllidis</b> <b>John Shaw</b> U Michigan	Cellular Shape Memory Structures: Experiments and Modeling
13:55	<b>Ray Baughman</b> U Texas Dallas	New Types of Artificial Muscles for Large Stroke and High Force Applications
14:20	<b>Pat Mather</b> Syracuse U <b>Jerry Qi / Martin Dunn</b> U Colorado	(DCT'09) Reversible Shape Memory Polymers and Composites
14:55	<b>Rich Vaia</b> AFRL/RXBN	Nanostructured, Mechanically-Responsive Polymers: Morphology-Performance-Efficiency Correlations
<b>15:20</b>	<b>Coffee</b>	<b>Break</b>
<b>Session Chair: Ray Baughman (U Texas Dallas) - to be confirmed</b>		
<b>15:40</b>	<b>Benjamin Shapiro</b> <b>Elisabeth Smela</b> U Maryland	(DCT'09) Electroosmotically-Actuated Shape-Changing Materials
16:15	<b>Shiv Joshi</b> NextGen Aeronautics <b>Nakhiah Goulbourne</b> VA Tech <b>Sharon Swartz</b> Brown U	(DCT'09) Reconfigurable, Ultra-Maneuverable Bat Technologies
16:50	<b>Minoru Taya</b> U Washington <b>Frank Ko</b> U British Columbia	(DCT'10) Bio-inspired Design of Super-configurable Multifunctional Structures
<b>17:25</b>	<b>Adjournment</b>	<b>Adjournment</b>

<b>Evening Colloquium</b>		
<b>20:00</b>		(Meeting room available for the discussions with PM and ad hoc group discussions)
<b>21:30</b>	<b>Adjournment</b>	<b>Adjournment</b>

<b>Tuesday, May 11</b>		
<b>Time</b>	<b>Speaker</b>	<b>Title of Project</b>
<b>08:25</b>		<i>Housekeeping</i>
<b>Session Chair: David Banks (Boeing) - to be confirmed</b>		
08:30	<b>Ajit Roy</b> AFRL/RXBT	Multifunctional Hybrid Composites for Thermal Management
08:55	<b>Vikas Prakash</b> Case-Western Reserve U	Carbon Nanotube Based Epoxy Matrix Thermal Interface Materials for Thermal Management in Load Bearing Aerospace Structures

09:20	<b>Abraham Stroock</b> Cornell U	Plant-mimetic Heat Pipes for Operation with Large Inertial and Gravitational Stresses
09:45	<b>Patrick Kwon</b> Michigan State U	Development of New Generation of Perspirable Skin
<b>10:10</b>	<b>Coffee</b>	<b>Break</b>
<b>Session Chair: Jeff Baur (AFRL/RXBC)</b>		
10:30	<b>Jennifer Fielding</b> <b>Max Alexander</b> AFRL/RXBC	Highly Conductive Nanocomposites and Hybrid Materials
10:55	<b>Jimmy Xu</b> Brown U	Nanotube-Polymer Composites for Thermal Signature Reduction and EMI Shielding
11:20	<b>Nancy Sottos</b> U Illinois	Nanostructured Materials for Self-Healing Polymers and Composites
11:45	<b>Chris Mangun</b> CU Aerospace	(STTR Ph II) Self-Healing Adhesives and Composites for Aerospace Systems: Encapsulated Healing Agents
<b>12:10</b>	<b>Lunch</b>	<b>Break</b>

<b>Luncheon Talk - Moderator: To be nominated</b>		
<b>12:30</b>	<b>Scott White</b> U Illinois	<b>Briefing on MURI '05:</b> "Microvascular Composites for Autonomic Response" (5 <sup>th</sup> Annual Review in Urbana-Champaign, IL on August 00, 2010; <b>U Illinois / Duke U / UCLA</b> ; <b>PI: Scott White</b> ; <b>Co-PI's: Nancy Sottos, Jeffrey Moore, Jennifer Lewis, Philippe Geubelle, Kenneth Christensen, Jonathan Freund</b> ; <b>PM: Les Lee</b> ; <b>Co-PM: Hugh DeLong</b> )
<b>Session Chair: Bruce LaMattina (ARO) - to be confirmed</b>		
<b>13:30</b>	<b>Jeff Baur</b> AFRL/RX	Microvascular Composites Via Composite Processing Methods
13:55	<b>Sia Nemat-Nasser</b> UC San Diego	(AFOSR-ARO Joint Program) Healable Composites
14:20	<b>Tony Starr</b> Sensoratrix	(STTR Ph II) Self-Healing Adhesives and Composites for Aerospace Systems: Thermally Remendable Polymers
14:45	<b>Tom Darlington</b> Nanocomposix	(STTR Ph II) Thermally Remendable Composite Structures with Resistive Heating Network of Carbon Fibers
<b>15:10</b>	<b>Coffee</b>	<b>Break</b>
<b>Session Chair: Gregg Abate (RWGN)</b>		
<b>15:30</b>	<b>Nicholas Kotov</b> U Michigan	Engineering of High Toughness in Hierarchically Laminated Carbon Nanotube Composites
15:55	<b>Kelechi Anyaogu</b> Nico Technologies	(STTR Ph I) Multifunctional Nanocomposite Structures via Layer-by-Layer Assembly Process
16:20	<b>David Carnahan</b> NanoLab	(STTR Ph I) Multifunctional Nanocomposite Structures via Layer-by-Layer Assembly Process
16:45	<b>Alex Bogdanovich</b> 3Tex	(STTR Ph I) Multifunctional Prepregs and Laminated Composites Made by Shear Pressing Carbon Nanotube Arrays
<b>17:10</b>	<b>Adjournment</b>	<b>Adjournment</b>

<b>Evening Colloquium</b>		
<b>20:00</b>	<b>Sven Bilén</b> Penn State U	Energy Harvesting on Spacecraft Using Electrodynamic Tethers
20:25		<i>(Meeting room available for the discussions with PM and ad hoc group discussions)</i>
<b>21:30</b>	<b>Adjournment</b>	<b>Adjournment</b>

<b>Wednesday, May 12</b>		
<b>Time</b>	<b>Speaker</b>	<b>Title of Project</b>
<b>08:25</b>		<i>Housekeeping</i>
<b>Session Chair: Dan Inman (VA Tech) - to be confirmed</b>		
08:30	<b>Gregg Abate</b> AFRL/RWGN	Embedded Sensors and Actuators for Micro Munition Air Vehicles
08:55	<b>Ioannis Chasiotis</b> U Illinois	Influence of Grain Structure and Doping on the Deformation and Fracture of Polycrystalline Silicon for MEMS and NEMS
09:20	<b>Zoubaida Ounaies</b> Texas A&M	Active Nanocomposites: Energy Harvesting and Stress Generation Media for Future Multifunctional Aerospace Structures
09:45	<b>Gregory Huff</b> Texas A&M	Multiscale Modeling and Characterization of Electromagnetically Tunable Colloidal-Based Materials
<b>10:10</b>	<b>Coffee</b>	<b>Break</b>
<b>Session Chair: To be nominated</b>		
10:30	<b>Xin Zhang</b> Boston U	Materials and Mechanics of Metamaterial Enhanced MEMS for Terahertz Technology
10:55	<b>Thomas Siegmund</b> <b>Ray Cipra</b> Purdue U	Macroscale Meta-Materials: From Manufacturing to Multifunctional Properties
11:20	<b>C. T. Sun</b> Purdue U	Development of Meta-Composite Materials with Negative Effective Mass Density
11:45	<b>Sia Nemat-Nasser</b> UC San Diego	<i>(DARPA) Mechanical Meta-materials</i>
<b>12:10</b>	<b>Lunch</b>	<b>Break</b>

<b>Luncheon Talk - Moderator: To be nominated</b>		
<b>12:30</b>	<b>John Volakis</b> Ohio State U	<b>Briefing on GameChanger '07:</b> "Multifunctional Hybrid Composite Structures for Load Bearing Antennas" (3 <sup>rd</sup> Annual Review in Columbus, OH on June 15, 2010; <b>Ohio State U / U Minnesota / U Dayton / UCLA / U Michigan</b> ; <b>PI: John Volakis</b> ; <b>Co-PI's: Yakup Bayram, Roberto Rojas, Somnath Ghosh, Stephen Bechtel, Kubilay Sertel, Gregory Washington, Richard James, Liming Dai, Greg Carman, Max Shtein, Nick Kotov</b> ; <b>PM: Les Lee</b> ; <b>Co-PM's: Arje Nachman, Don Silversmith</b> )
<b>Session Chair: Charles Lee (AFOSR) - to be confirmed</b>		
<b>13:30</b>	<b>Les Lee</b> AFOSR	<b>Overview on AFOSR Initiative on "Energy Harvesting from Aerospace Environment"</b>

13:55	<b>Daryoosh Vashaee</b> Oklahoma State U	<i>(Guest Speaker from "High Temperature Aerospace Materials" Program)</i> Thermoelectric Nanocomposite Materials for Medium to High Temperature Range
14:20	<b>Choongho Yu</b> Texas A&M	<i>(Guest Speaker from "Organic Materials Chemistry" Program)</i> Thermoelectric Waste Heat Recovery Using Polymer Nanocomposites
14:45	<b>Douglas Dudis</b> AFRL/RXBT	<i>(Guest Speaker from "Organic Materials Chemistry" Program)</i> Superatom Thermoelectric Materials
<b>15:10</b>	<b>Coffee</b>	<b>Break</b>
<b>Session Chair: Hugh DeLong (AFOSR) - to be confirmed</b>		
<b>15:30</b>	<b>Nikolai Lebedev</b> NRL	<i>(Guest Speaker from "Natural Materials &amp; Systems" Program)</i> Biological Principles of Light Energy Conversion and Photo-induced Electron Transfer
15:55	<b>Rajesh Naik</b> AFRL/RXBN	<i>(Guest Speaker from "Natural Materials &amp; Systems" Program)</i> Energy Harvesting from Photosynthetic-Nanocrystal Hybrids
16:20	<b>Michael Strano</b> MIT	Environmental Hydrocarbon Harvesting for Micro-scale Power Sources Using CNT Arrays
16:45	<b>Amy Marschilok</b> SUNY Buffalo	<i>(Guest Speaker from "High Temperature Aerospace Materials" Program)</i> Porous AG/ICP/RVC Composite Electrodes - A New Approach for Metal/Air Batteries
<b>17:10</b>	<b>Adjournment</b>	<b>Adjournment</b>

<b>Evening Colloquium</b>		
<b>20:00</b>	<b>Poster Session</b>	<i>(Meeting room available for ad hoc group discussions)</i>
<b>21:30</b>	<b>Adjournment</b>	<b>Adjournment</b>

**MEETING SITE & LODGING**

**Hyatt Regency Reston**

1800 Presidents Street, Reston, Virginia, 20190, USA

Phone: 703-709-1234

<http://reston.hyatt.com/hyatt/hotels/index.jsp>

**HOTEL RESERVATION**

Call 1-800-633-7313 for the AFOSR Annual Grantees'/Contractors' Meeting

**MEETING REGISTRATION (*Effective on 2010/02/01*)**

<http://www.anadarko-industries.com/Default.aspx?tabid=100>

*Please Scroll Down to May 2010 -*

“Mechanics of Multifunctional Materials & Microsystems”

“The 1<sup>st</sup> Multifunctional Materials for Defense Workshop”

or

<http://afosr.grantees-contractors-review.sgizmo.com>