

**REPORT DOCUMENTATION PAGE**

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| <b>6. AUTHOR(S)</b><br>Dr. Scott White  |                    |                                |                                   | <b>5d. PROJECT NUMBER</b>                                    |  |
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|   |                    |                                |                                   | <b>5f. WORK UNIT NUMBER</b>                                  |  |
| <b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b><br>Gordon Research Conferences<br>512 Liberty Lane<br>West Kingston, RI 02892 |                    |                                |                                   | <b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>              |  |
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| <b>14. ABSTRACT</b><br>See Attached   |                    |                                |                                   |  |  |
| <b>15. SUBJECT TERMS</b>  |                    |                                |                                   |  |  |
| <b>16. SECURITY CLASSIFICATION OF:</b>  |                    |                                | <b>17. LIMITATION OF ABSTRACT</b> | <b>18. NUMBER OF PAGES</b>                                   | <b>19a. NAME OF RESPONSIBLE PERSON</b>           |
| <b>a. REPORT</b>  | <b>b. ABSTRACT</b> | <b>c. THIS PAGE</b>            |                                   |  | <b>19b. TELEPHONE NUMBER (Include area code)</b> |
| U   | U                  | U                              | UU                                |  | Darlene Armstrong<br>401-360-1505                |



# GORDON RESEARCH CONFERENCES FINAL PROGRESS REPORT Office of Naval Research Grant Number N00014-15-1-2415

Multifunctional Materials & Structures GRC  
January 31-February 5, 2016

## Operational Summary

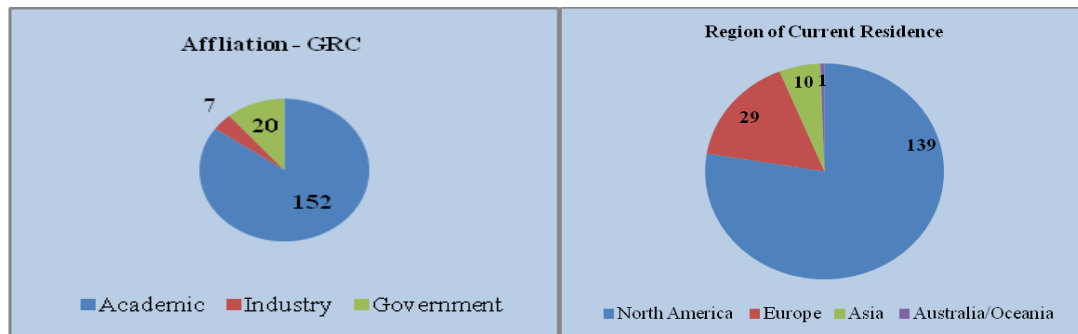
The Gordon Research Conference (GRC) on Multifunctional Materials & Structures was held at the Four Points Sheraton in Ventura, California from January 31-February 5, 2016. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.



## Conference Participants

The new Conference was well-attended with 179 participants. Scientists from academia represented 85% of the participants while attendees from government accounted for 11% and those from industry totaled 4%. The meeting also attracted a strong mix of young investigators and senior scientists. Students and post-docs accounted for 30% of all attendees.

Of the 179 attendees, 94 voluntarily responded to a general inquiry regarding ethnicity on the GRC registration form. Of the 94 respondents 4% were minorities, 46% Hispanic and 0% African American. Approximately 23% of the participants at the 2016 meeting were women.



## Conference Program

The Gordon Research Conference on Multifunctional Materials and Structures aimed to extend and accelerate interdisciplinary research activities in this emerging field, which incorporates mechanics, materials science, engineering science, physics, chemistry and biology. Multifunctional design encompasses materials, structures and/or material systems that have the ability to perform multiple functions through judicious combinations of structural properties and at least one additional functional capability as dictated by the system application requirements. The individual material elements are participating, concurrently or sequentially, in distinct, beneficial physical processes thereby delivering truly dramatic improvements in system-level efficiency beyond possible incremental improvements. Visionary contexts for multifunctional systems include (a) "autonomic" structures that can sense, diagnose and respond to external stimuli with minimal external intervention, (b) "adaptive" structures allowing reconfiguration or readjustment of functionality, shape and mechanical properties on demand, and (c) "self-sustaining" systems with structurally integrated power harvest/storage/transmission capabilities. The conference addressed key scientific issues underpinning the advancement of these systems such as: translation of model biological functions to synthetic materials, accelerating transport or dynamic chemical changes in strong, stiff materials, optimizing interfaces between hard and soft materials, multi-physics modeling of multi-component systems, etc. The meeting brought together a cross-section of academic scholars, government researchers and planners, and industry professionals thus catalyzing new efforts and worldwide collaborations.

## Conference Budget

Funding provided by the Office of Naval Research supported partial registration and travel for graduate students, professors, assistant professors, research scientist and research directors at the meeting.

## Conference Feedback

Participants had an opportunity to provide feedback at the end of the Conference. The feedback collected from the meeting was extremely positive. Evaluations included numerous positive remarks regarding the high quality discussions, well balanced program, the novel ideas presented and the variety of speakers.

GRC would like to thank the Office of Naval Research for its continued support of the meetings. The contributions received from the Office of Naval Research have been critical to the success of the conferences and are having a measurable impact in advancing the frontiers of science worldwide.

Dr. B. L. (Les) Lee, GRC Chair  
Johns Hopkins University

Dr. Nancy Ryan Gray  
President and Chief Executive Officer  
Gordon Research Conferences

**Multifunctional Materials & Structures**  
*Gordon Research Conference*  
 The Science of Autonomic, Adaptive and Self-Sustaining Systems  
 January 31 - February 5, 2016  
**Four Points Sheraton / Holiday Inn Express**  
**Ventura, CA**  
 Chairs: **B. L. (Les) Lee & Scott R. White**  
 Vice Chairs: **James P. Thomas & Nancy R. Sottos**

Contributors



Final Meeting Program

Sunday

|                   |  |
|-------------------|--|
| 4:00 pm - 8:00 pm | Arrival and Check-in   |
| 6:00 pm           | Dinner   |
| 7:30 pm - 7:40 pm | Welcome / Introductory Comments by GRC Site Staff  |
| 7:40 pm - 9:30 pm | <b>Sensing and Self-Diagnosis</b><br>Discussion Leader: <b>Donald Leo</b> (University of Georgia, USA)                                 |
| 7:40 pm - 7:45 pm | Opening Remarks  |
| 7:45 pm - 7:50 pm | Introduction by Discussion Leader  |
| 7:50 pm - 8:25 pm | <b>Fu-Kuo Chang</b> (Stanford University, USA)<br>"Neurological System-Inspired Sensing Materials for Fly-by-Feel Autonomous Vehicles" |
| 8:25 pm - 8:40 pm | Discussion   |
| 8:40 pm - 9:15 pm | <b>Yong Chen</b> (University of California, Los Angeles, USA)<br>"Neuromorphic Network Based on Carbon Nanotube/Polymer Composites"    |
| 9:15 pm - 9:30 pm | Discussion   |

Monday

|                   |             |
|-------------------|-------------|
| 7:30 am - 8:30 am | Breakfast   |
| 8:30 am           | Group Photo |

9:00 am - 12:30 pm

## Self-Healing, Remodeling and Regeneration

Discussion Leader: **Ellen Arruda** (University of Michigan, USA)

9:00 am - 9:05 am Introduction by Discussion Leader

9:05 am - 9:40 am **Richard Weinkamer** (Max Planck Institute of Colloids and Interfaces, Germany)  
"Osteocyte Networks, Functional Porosity and Continuous Damage Repair in Bone"

9:40 am - 10:00 am Discussion

10:00 am - 10:25 am Coffee Break

10:25 am - 11:00 am **Thomas Speck** (Albert-Ludwigs-Universitaet Freiburg, Germany)  
"Learning from Plants for Bio-Inspired Self-Healing Materials and Structures"

11:00 am - 11:20 am Discussion

11:20 am - 11:55 am **Jeffrey Moore** (University of Illinois at Urbana-Champaign, USA)  
"Design of Self-Healing Structural Composite Materials"

11:55 am - 12:15 pm Discussion

12:15 pm - 12:25 pm Late-Breaking Topic

12:25 pm - 12:30 pm Discussion

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session

6:00 pm Dinner

7:30 pm - 9:30 pm

## Modeling and Simulation

Discussion Leader: **Martin Dunn** (Singapore University of Technology and Design, Singapore)

7:30 pm - 7:35 pm Introduction by Discussion Leader

7:35 pm - 8:10 pm **Anna Balazs** (University of Pittsburgh, USA)  
"Designing Sensory and Adaptive Composite Materials"

8:10 pm - 8:30 pm Discussion

8:30 pm - 9:05 pm **Sharon Glotzer** (University of Michigan, USA)  
"Reconfigurable Materials from Programmable Colloids"

9:05 pm - 9:25 pm Discussion

9:25 pm - 9:30 pm General Discussion

## Tuesday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm

## Self-Cooling and Thermal Management

Discussion Leader: **George Lesieutre** (The Pennsylvania State University, USA)

9:00 am - 9:05 am Introduction by Discussion Leader

9:05 am - 9:40 am **Abraham Stroock** (Cornell University, USA)  
"Plant-Inspired Designs for Efficient Heat Transfer"

9:40 am - 10:00 am Discussion

10:00 am - 10:25 am Coffee Break

10:25 am - 11:00 am **Nancy Sottos** (University of Illinois at Urbana-Champaign, USA)  
"Self-Cooling of Structural Polymers and Composites"

11:00 am - 11:20 am Discussion  
11:20 am - 11:55 am **Aaron Esser-Kahn** (University of California, Irvine, USA)  
"Microvascular Systems for Mass and Energy Transport"  
11:55 am - 12:15 pm Discussion  
12:15 pm - 12:25 pm **Ping Liu** (Advanced Research Projects Agency-Energy, USA)  
"Recent Trends in Multifunctional Energy Storage Systems"  
12:25 pm - 12:30 pm Discussion  
12:30 pm Lunch  
1:30 pm - 4:00 pm Free Time  
4:00 pm - 6:00 pm Poster Session  
6:00 pm Dinner

7:30 pm - 9:30 pm **Self-Powered Systems**

Discussion Leader: **Shashank Priya** (Virginia Tech, USA)  
7:30 pm - 7:35 pm Introduction by Discussion Leader  
7:35 pm - 8:10 pm **Eric Wetzel** (U.S. Army Research Laboratory, USA)  
"Structural Integration of Energy Harvesting and Storage Systems"  
8:10 pm - 8:30 pm Discussion  
8:30 pm - 9:05 pm **Leif Erik Asp** (Chalmers University of Technology, Sweden)  
"Multifunctional Structural Power Composites"  
9:05 pm - 9:25 pm Discussion  
9:25 pm - 9:30 pm General Discussion

**Wednesday**

7:30 am - 8:30 am Breakfast  
9:00 am - 12:30 pm **Adaptive Materials**  
Discussion Leader: **Ray Baughman** (University of Texas at Dallas, USA)  
9:00 am - 9:05 am Introduction by Discussion Leader  
9:05 am - 9:40 am **Richard Vaia** (U.S. Air Force Research Laboratory, USA)  
"Mechanical Adaptivity: Material Design from Molecular to Emergent"  
9:40 am - 10:00 am Discussion  
10:00 am - 10:25 am Coffee Break  
10:25 am - 11:00 am **Andre Studart** (ETH Zurich, Switzerland)  
"Bio-Inspired Materials that Self-Shape Through Programmed Microstructures"  
11:00 am - 11:20 am Discussion  
11:20 am - 11:55 am **Chiara Daraio** (ETH Zurich, Switzerland)  
"Plant Nanobionic Materials"  
11:55 am - 12:15 pm Discussion  
12:15 pm - 12:25 pm **David Stepp** (U.S. Army Research Office, USA)  
"Recent Trends of Research Activities on Force-Activated Materials"  
12:25 pm - 12:30 pm Discussion  
12:30 pm Lunch  
1:30 pm - 4:00 pm Free Time  
4:00 pm - 6:00 pm Poster Session

|                   |   |
|-------------------|---|
| 6:00 pm           | Dinner  |
| 7:00 pm - 7:30 pm | <u>Business Meeting</u><br><i>Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair</i> |
| 7:30 pm - 9:30 pm | <b>Actuation and Morphing</b><br>Discussion Leader: <b>Jayanth Kudva</b> (NextGen Aeronautics, Inc., USA)   |
| 7:30 pm - 7:35 pm | Introduction by Discussion Leader   |
| 7:35 pm - 8:10 pm | <b>Daniel Inman</b> (University of Michigan, USA)<br>"From Wing Warping to Morphing Wing, the Legacy of the Wright Brothers Continues"  |
| 8:10 pm - 8:30 pm | Discussion  |
| 8:30 pm - 9:05 pm | <b>Graham Taylor</b> (Oxford University, United Kingdom)<br>"Dynamic Reconfigurations of Bird Wing During Adaptive Gliding Flight"  |
| 9:05 pm - 9:25 pm | Discussion  |
| 9:25 pm - 9:30 pm | General Discussion  |

## Thursday

|                     |   |
|---------------------|---|
| 7:30 am - 8:30 am   | Breakfast   |
| 9:00 am - 12:30 pm  | <b>Multifunctional Design Optimization</b><br>Discussion Leader: <b>James Thomas</b> (U.S. Naval Research Laboratory, USA)                |
| 9:00 am - 9:05 am   | Introduction by Discussion Leader   |
| 9:05 am - 9:40 am   | <b>Somnath Ghosh</b> (Johns Hopkins University, USA)<br>"An Integrated Spatio-Temporal Multi-Scale Computational Modeling System"         |
| 9:40 am - 10:00 am  | Discussion  |
| 10:00 am - 10:25 am | Coffee Break  |
| 10:25 am - 11:00 am | <b>Ioannis Chasiotis</b> (University of Illinois at Urbana-Champaign, USA)<br>"Micro- and Nano-Structures for Multifunctional Interfaces" |
| 11:00 am - 11:20 am | Discussion  |
| 11:20 am - 11:55 am | <b>James Guest</b> (Johns Hopkins University, USA)<br>"Topology Optimization for the Design of Multifunctional Material Architectures"    |
| 11:55 am - 12:15 pm | Discussion  |
| 12:15 pm - 12:25 pm | <b>Massimo Ruzzene</b> (National Science Foundation, USA)<br>"Recent Trends in Metamaterials and Non-Reciprocal Materials"                |
| 12:25 pm - 12:30 pm | Discussion  |
| 12:30 pm            | Lunch   |
| 1:30 pm - 4:00 pm   | Free Time   |
| 4:00 pm - 6:00 pm   | <u>Poster Session</u>   |
| 6:00 pm             | Dinner  |
| 7:30 pm - 9:30 pm   | <b>Processing and Manufacturing Issues</b><br>Discussion Leader: <b>Jeffery Baur</b> (U.S. Air Force Research Laboratory, USA)            |
| 7:30 pm - 7:35 pm   | Introduction by Discussion Leader   |
| 7:35 pm - 8:10 pm   | <b>Daniel Therriault</b> (Ecole Polytechnique de Montreal, Canada)<br>"3D Printing of Multifunctional Composites and Polymers"            |

|                   |   |
|-------------------|---|
| 8:10 pm - 8:30 pm | Discussion  |
| 8:30 pm - 9:05 pm | <b>H. Jerry Qi</b> (Georgia Institute of Technology, USA)<br>"4D/5D Printed Composites for Topology Transforming Devices" |
| 9:05 pm - 9:25 pm | Discussion  |
| 9:25 pm - 9:30 pm | Closing Remarks   |

## Friday

|                   |           |
|-------------------|-----------|
| 7:30 am - 8:30 am | Breakfast |
| 9:00 am           | Departure |

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The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.



**REGISTRATION LIST**  
**Multifunctional Materials & Structures - 2016**

| <b><u>Name</u></b>          | <b><u>Organization</u></b>                    | <b><u>Participation</u></b> | <b><u>Status</u></b> |
|-----------------------------|---|-----------------------------|----------------------|
| <b>Adnan, Ashfaq</b>        | University of Texas at Arlington              | Attendee                    | Registered           |
| <b>Antartis, Dimitrios</b>  | University of Illinois at Urbana-Champaign    | Poster Presenter            | Registered           |
| <b>Arrieta, Andres</b>      | Purdue University                             | Poster Presenter            | Registered           |
| <b>Arruda, Ellen M</b>      | University of Michigan                        | Discussion Leader           | Registered           |
| <b>Asp, Leif Erik</b>       | Chalmers University of Technology             | Speaker                     | Registered           |
| <b>Athanasopoulos, N</b>    | University of Patras                          | Poster Presenter            | Registered           |
| <b>Balazs, Anna C</b>       | University of Pittsburgh                      | Speaker                     | Registered           |
| <b>Barth, Friedrich G.</b>  | University of Vienna                          | Attendee                    | Registered           |
| <b>Baughman, Ray H</b>      | University of Texas at Dallas                 | Discussion Leader           | Registered           |
| <b>Baur, Jeffery</b>        | U.S. Air Force Research Laboratory            | Discussion Leader           | Registered           |
| <b>Bergamini, Andrea E.</b> | ETH Zürich                                    | Poster Presenter            | Registered           |
| <b>Bielefeldt, Brent</b>    | Texas A&M University                          | Poster Presenter            | Registered           |
| <b>Boechler, Nicholas S</b> | University of Washington                      | Poster Presenter            | Registered           |
| <b>Bonanomi, Luca</b>       | ETH Zurich                                    | Poster Presenter            | Registered           |
| <b>Bond, Ian P</b>          | University of Bristol                         | Poster Presenter            | Registered           |
| <b>Boucher, Robert</b>      | The Boeing Company                            | Attendee                    | Registered           |
| <b>Brinson, Catherine</b>   | Northwestern University                       | Poster Presenter            | Registered           |
| <b>Brubaker, Kyle</b>       | University of California, Irvine              | Poster Presenter            | Registered           |
| <b>Bruck, Hugh A</b>        | University of Maryland                        | Poster Presenter            | Registered           |
| <b>Carman, Gregory</b>      | University of California at Los Angeles       | Attendee                    | Registered           |
| <b>Celestine, Asha-Dee</b>  | Harvard University                            | Attendee                    | Registered           |
| <b>Cha, Sang-Ho</b>         | Kyonggi University                            | Poster Presenter            | Registered           |
| <b>Chang, Fu-Kuo</b>        | Stanford University                           | Speaker                     | Registered           |
| <b>Chasiotis, Ioannis</b>   | University of Illinois at Urbana-Champaign    | Speaker                     | Registered           |
| <b>Chen, Yong</b>           | University of California, Los Angeles         | Speaker                     | Registered           |
| <b>Chien, Chihchun</b>      | University of California, Merced              | Poster Presenter            | Registered           |
| <b>Chung, Jaeyoon</b>       | University of California Irvine               | Poster Presenter            | Registered           |
| <b>Correll, Nikolaus</b>    | University of Colorado                        | Poster Presenter            | Registered           |
| <b>Coulais, Corentin</b>    | FOM Institute AMOLF                           | Poster Presenter            | Registered           |
| <b>Danesh, Cameron D</b>    | UCLA  | Poster Presenter            | Registered           |
| <b>Daraio, Chiara</b>       | ETH Zurich                                    | Speaker                     | Registered           |
| <b>Di Giacomo, Raffaele</b> | ETH Zurich D-MAVT                             | Poster Presenter            | Registered           |
| <b>Dickinson, Benjamin</b>  | Air Force Research Laboratory                 | Poster Presenter            | Registered           |
| <b>Domann, John P</b>       | University of California, Los Angeles         | Poster Presenter            | Registered           |
| <b>Dou, Nicholas G</b>      | Caltech                                       | Poster Presenter            | Registered           |
| <b>Dunn, Martin L</b>       | Singapore University of Technology and Design | Discussion Leader           | Registered           |
| <b>Elbanna, Ahmed E</b>     | University of Illinois Urbana Champaign       | Poster Presenter            | Registered           |
| <b>Ermanni, Paolo</b>       | ETH Zurich                                    | Poster Presenter            | Registered           |
| <b>Erturk, Alper</b>        | Georgia Tech                                  | Poster Presenter            | Registered           |
| <b>Esser-Kahn, Aaron P</b>  | University of California, Irvine              | Speaker                     | Registered           |
| <b>Filocamo, Shaun F</b>    | US Army NSRDEC                                | Poster Presenter            | Registered           |

|                             |   |                   |            |
|-----------------------------|---|-------------------|------------|
| <b>Fisher, Timothy S</b>    | Purdue University                                   | Poster Presenter  | Registered |
| <b>Gamble, Lawren L</b>     | University of Michigan                              | Poster Presenter  | Registered |
| <b>Garg, Mayank</b>         | University of Illinois at Urbana Champaign          | Poster Presenter  | Registered |
| <b>Geubelle, Philippe H</b> | University of Illinois                              | Poster Presenter  | Registered |
| <b>Ghosh, Somnath</b>       | Johns Hopkins University                            | Speaker           | Registered |
| <b>Gladman, Amelia S</b>    | Harvard University                                  | Poster Presenter  | Registered |
| <b>Glotzer, Sharon C</b>    | University of Michigan                              | Speaker           | Registered |
| <b>Greenhalgh, Emile S</b>  | Imperial College London                             | Attendee          | Registered |
| <b>Grocholski, Brent</b>    | American Association for the Advancement of Science | Attendee          | Registered |
| <b>Groehn, Franziska</b>    | University Erlangen                                 | Poster Presenter  | Registered |
| <b>Guest, James</b>         | Johns Hopkins University                            | Speaker           | Registered |
| <b>Gupta, Satyandra K</b>   | University of Maryland                              | Poster Presenter  | Registered |
| <b>Hahn, Gail L</b>         | Boeing Research & Technology                        | Attendee          | Registered |
| <b>Hajela, Prabhat</b>      | Rensselaer Polytechnic Institute                    | Attendee          | Registered |
| <b>Handa, Sheetal</b>       | BP International Ltd.                               | Attendee          | Registered |
| <b>Hanna, Yohanna G</b>     | University of Southern California                   | Poster Presenter  | Registered |
| <b>Hao, Menglong</b>        | Purdue University                                   | Poster Presenter  | Registered |
| <b>Hartl, Darren J</b>      | Air Force Research Lab / Texas A&M Univ.            | Poster Presenter  | Registered |
| <b>He, Ximin Tracy</b>      | Arizona State University                            | Poster Presenter  | Registered |
| <b>Herrera, Steven A</b>    | University of California, Riverside                 | Poster Presenter  | Registered |
| <b>Hopkins, Jonathan B</b>  | UCLA  | Poster Presenter  | Registered |
| <b>Hosseinioust, Zeinab</b> | Max Planck Institute for intelligent systems        | Poster Presenter  | Registered |
| <b>Huang, Guoliang</b>      | University of Missouri                              | Poster Presenter  | Registered |
| <b>Hwang, Dong Soo</b>      | Pohang University of Science and Technology         | Poster Presenter  | Registered |
| <b>Inman, Daniel</b>        | University of Michigan                              | Speaker           | Registered |
| <b>Jayan, B. Reerja</b>     | Carnegie Mellon University                          | Poster Presenter  | Registered |
| <b>Joo, James</b>           | AFRL/RQVC   | Attendee          | Registered |
| <b>Jovanova, Jovana J</b>   | Pennsylvania State University                       | Poster Presenter  | Registered |
| <b>Kang, Sung H</b>         | Johns Hopkins University                            | Poster Presenter  | Registered |
| <b>Kieffer, John</b>        | University of Michigan                              | Attendee          | Registered |
| <b>Kim, Yoonseob</b>        | University of Michigan, Ann Arbor                   | Poster Presenter  | Registered |
| <b>Kim, Seon Jeong</b>      | Hanyang University                                  | Attendee          | Registered |
| <b>Kim, Shi Hyeong</b>      | Hanyang University                                  | Poster Presenter  | Registered |
| <b>Kim, Keon Jung</b>       | Hanyang University                                  | Poster Presenter  | Registered |
| <b>Kisailus, David J.</b>   | University of California at Riverside               | Attendee          | Registered |
| <b>Kleiman, Maya</b>        | University of California, Irvine                    | Poster Presenter  | Registered |
| <b>Kotov, Nicholas</b>      | University of Michigan                              | Poster Presenter  | Registered |
| <b>Kraus, Tobias</b>        | INM – Leibniz Institute for New Materials           | Poster Presenter  | Registered |
| <b>Kudva, Jayanth</b>       | NextGen Aeronautics, Inc.                           | Discussion Leader | Registered |
| <b>Lacarbonara, Walter</b>  | Sapienza University of Rome                         | Attendee          | Registered |
| <b>Lagoudas, Dimitris</b>   | Texas A&M Engineering                               | Poster Presenter  | Registered |
| <b>LaMattina, Bruce</b>     | Charlotte Research Institute                        | Attendee          | Registered |
| <b>Lamoureux, Aaron</b>     | University of Michigan                              | Poster Presenter  | Registered |
| <b>Lawton, Timothy J</b>    | NSRDEC  | Poster Presenter  | Registered |
| <b>Lee, Jaeah</b>           | University of Texas at Dallas                       | Poster Presenter  | Registered |

|                               |  |                   |            |
|-------------------------------|--|-------------------|------------|
| <b>Lee, Haiwon</b>            | Hanyang University                             | Poster Presenter  | Registered |
| <b>Lee, Kyung Jin</b>         | Chungnam National University                   | Attendee          | Registered |
| <b>Lee, Howon</b>             | Rutgers University                             | Poster Presenter  | Registered |
| <b>Lee, Hye-Eun</b>           | Seoul National University                      | Poster Presenter  | Registered |
| <b>Lee, B. L. (Les)</b>       | Johns Hopkins University                       | Chair             | Registered |
| <b>Leo, Donald</b>            | University of Georgia                          | Discussion Leader | Registered |
| <b>Lesieutre, George</b>      | The Pennsylvania State University              | Discussion Leader | Registered |
| <b>Li, Wenle</b>              | University of Illinois Urbana-Champaign        | Poster Presenter  | Registered |
| <b>Li, Guoqiang</b>           | Louisiana State University/Southern University | Poster Presenter  | Registered |
| <b>Li, Yaning</b>             | University of New Hampshire                    | Poster Presenter  | Registered |
| <b>Liu, Ping</b>              | Advanced Research Projects Agency-Energy       | Speaker           | Registered |
| <b>Liu, Liping</b>            | Rutgers University                             | Attendee          | Registered |
| <b>Lopez Hernandez, H</b>     | University of Illinois                         | Poster Presenter  | Registered |
| <b>Lu, Nanshu</b>             | University of Texas at Austin                  | Poster Presenter  | Registered |
| <b>Lynch, Christopher</b>     | UCLA   | Poster Presenter  | Registered |
| <b>Maute, Kurt</b>            | University of Colorado.                        | Poster Presenter  | Registered |
| <b>McEvoy, Michael</b>        | University of Colorado at Boulder              | Poster Presenter  | Registered |
| <b>Mello, Charlene M</b>      | US Army Natick Soldier RDEC                    | Attendee          | Registered |
| <b>Minnich, Austin</b>        | Caltech  | Poster Presenter  | Registered |
| <b>Mminary, Majid</b>         | University of Texas at Dallas                  | Poster Presenter  | Registered |
| <b>Mohapatra, Hemakesh</b>    | University of California Irvine                | Poster Presenter  | Registered |
| <b>Monner, Hans P</b>         | DLR - German Aerospace Center                  | Attendee          | Registered |
| <b>Mooney, Damian A</b>       | University College Dublin                      | Attendee          | Registered |
| <b>Moore, Jeffrey S</b>       | University of Illinois at Urbana-Champaign     | Speaker           | Registered |
| <b>Mouritz, Adrian</b>        | RMIT University                                | Attendee          | Registered |
| <b>Nayakanti, Nigamaa</b>     | Massachusetts Institute of Technology          | Poster Presenter  | Registered |
| <b>Nepal, Dhriti</b>          | Air Force Research Lab                         | Attendee          | Registered |
| <b>Ochoa, Ozden O</b>         | Texas A&M University                           | Attendee          | Registered |
| <b>Olson, Jeff</b>            | Lockheed Martin Space Systems Company          | Poster Presenter  | Registered |
| <b>Peijs, Ton</b>             | Queen Mary University of London                | Poster Presenter  | Registered |
| <b>Pelegri, Assimina</b>      | Rutgers University                             | Poster Presenter  | Registered |
| <b>Prakash, Vikas</b>         | Case Western Reserve University                | Attendee          | Registered |
| <b>Priya, Shashank</b>        | Virginia Tech                                  | Discussion Leader | Registered |
| <b>Qi, H. Jerry</b>           | Georgia Institute of Technology                | Speaker           | Registered |
| <b>Qidwai, Siddiq</b>         | US Naval Research Laboratory                   | Poster Presenter  | Registered |
| <b>Reich, Gregory</b>         | Air Force Research Laboratory                  | Attendee          | Registered |
| <b>Reichl, Katherine K</b>    | University of Michigan, Ann Arbor              | Poster Presenter  | Registered |
| <b>Reid, Russell C</b>        | Naval Research Laboratory                      | Poster Presenter  | Registered |
| <b>Reitz, Thomas L</b>        | Air Force Research Laboratory                  | Poster Presenter  | Registered |
| <b>Rivera, Jesus</b>          | University of California, Riverside            | Poster Presenter  | Registered |
| <b>Roberts, Christopher C</b> | University of California, Los Angeles          | Poster Presenter  | Registered |
| <b>Robertson, Ian D</b>       | University of Illinois Urbana-Champaign        | Poster Presenter  | Registered |
| <b>Rosenbury, C</b>           | University of North Carolina at Charlotte      | Poster Presenter  | Registered |
| <b>Roy, Ajit K</b>            | Air Force Research Laboratory                  | Poster Presenter  | Registered |
| <b>Ruzzene, Massimo</b>       | National Science Foundation                    | Speaker           | Registered |

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|-----------------------------|---|------------------|------------|
| <b>Sanders, Brian</b>       | Embry-Riddle Aeronautical University              | Attendee         | Registered |
| <b>Sarkar, Swarnavo</b>     | National Institute of Standards and Technology    | Poster Presenter | Registered |
| <b>Schaedler, Tobias A</b>  | HRL Laboratories, LLC                             | Poster Presenter | Registered |
| <b>Schmied, Jascha</b>      | ETH Zurich  | Attendee         | Registered |
| <b>Shaffer, Christopher</b> | UCLA  | Poster Presenter | Registered |
| <b>Shaw, John A</b>         | University of Michigan                            | Poster Presenter | Registered |
| <b>Shepherd, Robert F</b>   | Cornell University                                | Poster Presenter | Registered |
| <b>Shtein, Max</b>          | University of Michigan                            | Poster Presenter | Registered |
| <b>Shyu, Terry</b>          | University of Michigan                            | Poster Presenter | Registered |
| <b>Siegmund, Thomas</b>     | Purdue University                                 | Poster Presenter | Registered |
| <b>Skorb, Katsiaryna</b>    | Max Planck Institute of Colloids and Interfaces   | Attendee         | Registered |
| <b>Smith, Lisa</b>          | Texas A&M University                              | Poster Presenter | Registered |
| <b>Sodano, Henry A</b>      | University of Michigan                            | Attendee         | Registered |
| <b>Sottos, Nancy R</b>      | University of Illinois at Urbana-Champaign        | Vice Chair       | Registered |
| <b>Speck, Thomas</b>        | Albert-Ludwigs-Universitaet Freiburg              | Speaker          | Registered |
| <b>Stepp, David M</b>       | U.S. Army Research Office                         | Speaker          | Registered |
| <b>Stroock, Abraham D</b>   | Cornell University                                | Speaker          | Registered |
| <b>Studart, Andre R</b>     | ETH Zurich  | Speaker          | Registered |
| <b>Sugino, Christopher</b>  | Georgia Institute of Technology                   | Poster Presenter | Registered |
| <b>Tabarraei, Alireza</b>   | University of North Carolina at Charlotte         | Poster Presenter | Registered |
| <b>Talo, Michela</b>        | Sapienza University of Rome                       | Poster Presenter | Registered |
| <b>Taylor, Graham</b>       | Oxford University                                 | Speaker          | Registered |
| <b>Thakre, Piyush R</b>     | Dow Chemical Company                              | Attendee         | Registered |
| <b>Therriault, Daniel</b>   | Ecole Polytechnique de Montreal                   | Speaker          | Registered |
| <b>Thomas, James P</b>      | U.S. Naval Research Laboratory                    | Vice Chair       | Registered |
| <b>Tracy, Joseph B</b>      | North Carolina State University                   | Poster Presenter | Registered |
| <b>Truby, Ryan L</b>        | Harvard University, Paulson School of Engineering | Poster Presenter | Registered |
| <b>Tudor, Andrew</b>        | University of California, Los Angeles             | Poster Presenter | Registered |
| <b>Uzarski, Joshua R</b>    | US Army Natick Soldier Research, Development      | Poster Presenter | Registered |
| <b>Vaia, Richard A</b>      | U.S. Air Force Research Laboratory                | Speaker          | Registered |
| <b>Volakis, John L</b>      | Ohio State University                             | Attendee         | Registered |
| <b>Wang, Qiming</b>         | University of Southern California                 | Poster Presenter | Registered |
| <b>Weinkamer, Richard</b>   | Max Planck Institute of Colloids and Interfaces   | Speaker          | Registered |
| <b>Wetzel, Eric D.</b>      | U.S. Army Research Laboratory                     | Speaker          | Registered |
| <b>White, Scott R</b>       | University of Illinois at Urbana-Champaign        | Chair            | Registered |
| <b>Wickenheiser, Adam</b>   | The George Washington University                  | Poster Presenter | Registered |
| <b>Windsor, Shane P</b>     | University of Bristol                             | Poster Presenter | Registered |
| <b>Xu, Sheng</b>            | University of California, San Diego               | Attendee         | Registered |
| <b>Yanagisawa, Yu</b>       | The University of Tokyo                           | Poster Presenter | Registered |
| <b>Yang, Jinkyu</b>         | University of Washington                          | Poster Presenter | Registered |
| <b>Yaraghi, Nicholas A</b>  | University of California, Riverside               | Poster Presenter | Registered |
| <b>Yeom, Bongjun</b>        | Myongji University                                | Poster Presenter | Registered |
| <b>Yu, Kai</b>              | Georgia Institute of Technology                   | Poster Presenter | Registered |
| <b>Yushin, Gleb</b>         | Georgia Institute of Technology                   | Poster Presenter | Registered |
| <b>Zavattieri, Pablo D</b>  | Purdue University                                 | Poster Presenter | Registered |

**Zenkert, Dan**

KTH - Royal Institute of Technology

Attendee

Registered

**Zhou, Zhong**

The University of Texas at Dallas

Poster Presenter

Registered

**Zorzetto, Laura**

University of Liege

Poster Presenter

Registered

**179 Attendees**