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Final Report: 2018 Gordon Research Conference on Multifunctional Materials and Structures: Bridging the Gap between Biological and Synthetic Systems

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611102

6. AUTHORS

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAMES AND ADDRESSES

Gordon Research Conferences, Inc.
512 Liberty Lane

West Kingston, RI 02892 -1502

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS (ES)

U.S. Army Research Office
P.O. Box 12211
Research Triangle Park, NC 27709-2211

10. SPONSOR/MONITOR'S ACRONYM(S)
ARO

11. SPONSOR/MONITOR'S REPORT NUMBER(S)
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12. DISTRIBUTION AVAILIBILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

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

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	15. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Nancy Sottos
UU	UU	UU	UU		19b. TELEPHONE NUMBER 217-333-1041

RPPR Final Report
as of 01-May-2020

Agency Code:

Proposal Number: 71933MSCF **Agreement Number: W911NF-18-1-0055**
INVESTIGATOR(S):

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Principal: Y

Organization: **Gordon Research Conferences, Inc.**
Address: 512 Liberty Lane, West Kingston, RI 028921502
Country: USA
DUNS Number: 075712877 EIN: 050300482
Report Date: 21-Jul-2018 Date Received: 21-Aug-2018
Final Report for Period Beginning 22-Dec-2017 and Ending 21-Apr-2018
Title: 2018 Gordon Research Conference on Multifunctional Materials and Structures: Bridging the Gap between Biological and Synthetic Systems
Begin Performance Period: 22-Dec-2017 **End Performance Period:** 21-Apr-2018
Report Term: 0-Other
Submitted By: Ph.D. Nancy Gray Email: grants@grc.org
Phone: (401) 360-1505
Distribution Statement: 1-Approved for public release; distribution is unlimited.

STEM Degrees: **STEM Participants:**

Major Goals: Organizing a Gordon Research Conference involves extensive communication with the research community to identify important issues at the frontiers of the field, and solicit suggestions for speakers and discussion leaders to participate in the conference. The Chair then contacts prospective participants to invite them to talk and discuss the nature of their contributions. The Chair then communicates the topics and aims of the conference through web pages, contact with relevant international professional bodies and email to members of the research community around the world to encourage applications for participation in the conference. The Chair is then responsible for assessing and accepting the applications and fielding a host of questions both concerning the technical content and practical aspects of conference participation.

Accomplishments: 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. Multifunctionality is ubiquitous in biological systems and leads to systems that are highly efficient material and energy-wise. Bio-systems are synthesized at a molecular level with a limited palate of material ingredients resulting in multiscale hierarchical material architectures with active, coupled chemical, electrical, mechanical processes and signaling. However, there is a large gap in our current understanding of how to translate and scale the science of multifunctionality in biological/natural systems for creating larger-scale synthetic materials and structures with unique multifunctional capabilities and new levels of performance. Visionary examples include "autonomic" structures that can sense, diagnose and respond to external stimuli, "adaptive" structures allowing reconfiguration of functionality, shape, mechanical, and electromagnetic properties, and "self-sustaining" systems with integrated energy storage and harvesting capabilities. This conference focused on addressing the scientific issues underpinning advancements in: the translation of model biological functions to synthetic systems, signaling (e.g. chemical, electrical, mechanical), self-learning, chemical transport and transformation for control of mechanical properties, the role of interfaces and design/fabrication approaches for creating multi-scale hierarchical material systems with multifunctional performance.

Training Opportunities: Speakers, discussion leaders, poster presenters and attendees simultaneously contributed to and benefited from the collective skills and experience shared throughout the conference.

Results Dissemination: The final program has been posted on the GRC website.

RPPR Final Report
as of 01-May-2020

Honors and Awards: Nothing to Report

Protocol Activity Status:

Technology Transfer: Nothing to Report

GORDON RESEARCH CONFERENCES

FINAL PROGRESS REPORT
Army Research Office
Multifunctional Materials and Structures GRC

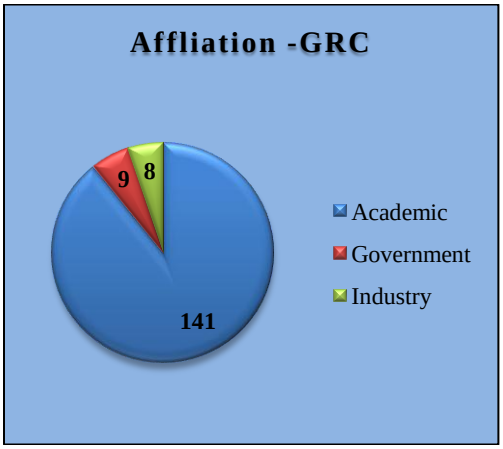
Grant Number W911NF-18-1-0055
January 14-19, 2018

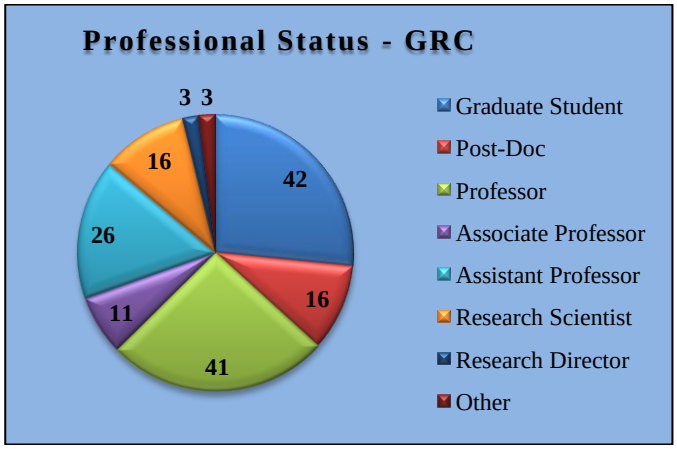
Operational Summary

The Gordon Research Conference (GRC) on Multifunctional Materials and Structures was held at the Four Points Sheraton in Ventura, California from January 14-19, 2018. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.

Conference Participants

The Conference was well-attended with 158 participants. Scientists from academia represented 89% of the participants while attendees from government accounted for 6% and those from industry totaled 5 %. The meeting also attracted a strong mix of young investigators and senior scientists. Students and post-docs accounted for 37% of all attendees. Approximately 28% of the participants at the 2018 meeting were women.





Conference Program

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. Multifunctionality is ubiquitous in biological systems and leads to systems that are highly efficient material and energy-wise. Bio-systems are synthesized at a molecular level with a limited palate of material ingredients resulting in multiscale hierarchical material architectures with active, coupled chemical, electrical, mechanical processes and signaling. However, there is a large gap in our current understanding of how to translate and scale the science of multifunctionality in biological/natural systems for creating larger-scale synthetic materials and structures with unique multifunctional capabilities and new levels of performance. Visionary examples include "autonomic" structures that can sense, diagnose and respond to external stimuli, "adaptive" structures allowing reconfiguration of functionality, shape, mechanical, and electromagnetic properties, and "self-sustaining" systems with integrated energy storage and harvesting capabilities. This conference focused on addressing the scientific issues underpinning advancements in: the translation of model biological functions to synthetic systems, signaling (e.g. chemical, electrical, mechanical), self-learning, chemical transport and transformation for control of mechanical properties, the role of interfaces and design/fabrication approaches for creating multi-scale hierarchical material systems with multifunctional performance.

Conference Budget

Funding provided by the Army Research Office supported partial registration and travel for 1 postdoc, 13 graduate students, 7 professors, 1 associate professor and 2 assistant professors at the GRC.

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 opportunity to hear

new advances in the field, networking opportunities and talks that pushed the boundaries of traditional thoughts and procedures.

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

Dr. James Thomas, GRC Chair
US Naval Research Laboratory

Dr. Nancy Sottos, GRC Chair
University of Illinois at Urbana-Champaign

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

Multifunctional Materials and Structures
Gordon Research Conference
Bridging the Gap Between Biological and Synthetic Systems
January 14 - 19, 2018

Chairs - James P. Thomas and Nancy R. Sottos
Vice Chair - Daniel J. Inman

Four Points Sheraton / Holiday Inn Express
1050 Schooner Drive
Ventura, CA, US

Conference Program

Sunday

4:00 pm - 8:00 pm	Arrival and Check-in
6:00 pm - 7:00 pm	Dinner
7:30 pm - 7:40 pm	Introductory Comments by GRC Site Staff / Welcome from the GRC Chair
7:40 pm - 9:30 pm	Morphing Materials and Structures Discussion Leader: Gregory Reich (Air Force Research Laboratory, USA)
7:40 pm - 7:45 pm	Introduction by Discussion Leader
7:45 pm - 8:20 pm	David Lentink (Stanford University, USA) "How Birds Morph Their Wings"
8:20 pm - 8:35 pm	Discussion
8:35 pm - 9:10 pm	Ray Baughman (University of Texas at Dallas, USA) "Strong, Powerful Artificial Muscle Yarns and Fibers Whose Multifunctionality Provides Intelligence and the Ability to Harvest Energy"
9:10 pm - 9:25 pm	Discussion
9:25 pm - 9:30 pm	General Discussion

Monday

7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Group Photo
9:00 am - 12:30 pm	Bioinspired Design for Multifunctionality Discussion Leader: Clement Sanchez (Laboratoire de Chimie de LA Materiere Condensee, France)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:40 am	Martin Bechthold (Harvard Graduate School of Design, USA) "Ceramic Matters"
9:40 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:05 am	Martin Dunn (Singapore University of Technology and Design, Singapore) "Better than Bioinspired? Digital Design and Manufacturing Workflows for Multifunctional

Products"

11:05 am - 11:25 am Discussion

11:25 am - 12:00 pm Daniel McAdams (Texas A&M University, USA)
"Technology Evolution and Bioinpsired Design: Technological Disruption for New Materials"

12:00 pm - 12:20 pm Discussion

12:20 pm - 12:30 pm Poster Previews

12:30 pm - 1:30 pm Lunch

1:30 pm - 4:00 pm Free Time

3:00 pm - 4:00 pm Power Hour
The GRC Power Hour is an optional informal gathering open to all meeting participants. It is designed to help address the challenges women face in science and support the professional growth of women in our communities by providing an open forum for discussion and mentoring.
Organizer: Ellen Arruda (University of Michigan, USA)

4:00 pm - 6:00 pm Poster Session

6:00 pm - 7:00 pm Dinner

7:30 pm - 9:30 pm Bioinspired Sensing and Signaling
Discussion Leader: Friedrich Barth (University of Vienna, Austria)

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

7:35 pm - 8:10 pm John Rogers (Northwestern University, USA)
"Materials for Bio-Integrated Semiconductor Devices"

8:10 pm - 8:30 pm Discussion

8:30 pm - 9:05 pm Stephen Sarles (University of Tennessee, USA)
"Membrane-Based Biomolecular Materials: From Bioinspired Sensing to Synaptic-Mimics for Neuromorphic Computing"

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 Biological and Synthetic Regeneration
Discussion Leader: Aaron Esser-Kahn (University of Chicago, Institute for Molecular Engineering, USA)

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

9:05 am - 9:40 am Peter Fratzl (Max Planck Institute of Colloids and Interfaces, Germany)
"A Materials Science View on Bone Growth and Regeneration"

9:40 am - 10:00 am Discussion

10:00 am - 10:30 am Coffee Break

10:30 am - 11:05 am Samuel Stupp (Northwestern University, USA)
"Materials that Communicate with or Behave Like Living Systems"

11:05 am - 11:25 am Discussion

11:25 am - 12:00 pm Scott White (University of Illinois at Urbana-Champaign, USA)
"(Re)Generation and Growth of Synthetic Polymers and Composites: Morphogenic Manufacturing"

12:00 pm - 12:20 pm Discussion

12:20 pm - 12:30 pm Poster Previews

12:30 pm - 1:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session

6:00 pm - 7:00 pm Dinner

7:30 pm - 9:30 pm Additive Manufacturing for Multifunctional Systems
Discussion Leader: Andre Studart (ETH Zurich, Switzerland)

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

7:35 pm - 8:10 pm Julia Greer (California Institute of Technology, USA)
"Additive Manufacturing and Chemical-Mechanical Functionality of Three-Dimensional Nano-Architected Materials"

8:10 pm - 8:30 pm Discussion

8:30 pm - 9:05 pm Ryan Wicker (University of Texas at El Paso, USA)
"Increasing Component Functionality via Multi-Process Additive Manufacturing"

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 Smart Surfaces and Interfaces
Discussion Leader: Ivan Parkin (University College London, United Kingdom)

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

9:05 am - 9:40 am Kathryn Wahl (U.S. Naval Research Laboratory, USA)
"Barnacle-Inspired Antifouling and Adhesives"

9:40 am - 10:00 am Discussion

10:00 am - 10:30 am Coffee Break

10:30 am - 11:05 am Haeshin Lee (KAIST, South Korea)
"Mussel-and-Insect-Inspired Self-Sealing Materials"

11:05 am - 11:25 am Discussion

11:25 am - 12:00 pm Joanna Aizenberg (Harvard University, USA)
"Multifunctional Materials for Marine Environments: Combating Biofouling, Corrosion and Ice in a Single Coating"

12:00 pm - 12:20 pm Discussion

12:20 pm - 12:30 pm Poster Previews

12:30 pm - 1:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session

6:00 pm - 7:00 pm Dinner

7:30 pm - 9:30 pm Organic-Inorganic Hybrids
Discussion Leader: Helmut Cölfen (University of Konstanz, Germany)

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

7:35 pm - 8:10 pm Olli Ikkala (Aalto University, Finland)
"Sequential Templating Through the Length Scales for Equilibrium and Dissipative Functions"

8:10 pm - 8:30 pm Discussion

8:30 pm - 9:05 pm Lara Estroff (Cornell University, USA)
"Bio-Inspired Mineralization: Interfaces Between Polymers and Crystals"

9:05 pm - 9:25 pm Discussion

9:25 pm - 9:30 pm General Discussion

Thursday

7:30 am - 8:30 am Breakfast

8:30 am - 9:00 am Business Meeting
Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair

9:00 am - 12:30 pm Functional Architectures via Folding and Origami
Discussion Leader: Kaushik Bhattacharya (California Institute of Technology, USA)

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

9:05 am - 9:40 am Johannes Overvelde (AMOLF, The Netherlands)
"Finding the Mechanically Stable States of Prismatic Architected Materials"

9:40 am - 10:00 am Discussion

10:00 am - 10:30 am Coffee Break

10:30 am - 11:05 am Max Shtein (University of Michigan, USA)
"Origami and Kirigami Structures and Devices for Adaptive and Autonomic Control and Energy Conversion"

11:05 am - 11:25 am Discussion

11:25 am - 11:50 am Jayanth Kudva (NextGen Aeronautics, Inc., USA)
"Multifunctional Advanced Materials for Morphing and Mission-Adaptive Innovative Aircraft"

11:50 am - 12:00 pm Discussion

12:00 pm - 12:20 pm General Discussion

12:20 pm - 12:30 pm Poster Previews

12:30 pm - 1:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session

6:00 pm - 7:00 pm Dinner

7:30 pm - 9:30 pm Reconfigurable Soft Assemblies
Discussion Leader: Nikolaus Correll (University of Colorado Boulder, USA)

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

7:35 pm - 8:10 pm Rebecca Kramer-Bottiglio (Yale University, USA)
"Robotic Skins with Distributed Sensing, Actuation and Control"

8:10 pm - 8:30 pm Discussion

8:30 pm - 9:05 pm Robert Shepherd (Cornell University, USA)
"Distributed Actuation, Sensing, and Embodied Energy in Soft Robotic Systems: Application to Haptics, Prosthetics, and Virtual Reality Immersion"

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

Contributors

Gordon Research Conferences
Frontiers of Science

Carl Storm International Diversity Fellowship Program

NSF

Office of Naval Research ONR Science & Technology

AFOSR
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

NEXTGEN AERONAUTICS

MATERIALS CHEMISTRY FRONTIERS

Multifunctional Materials

United Technologies Research Center

Multifunctional Materials and Structures (2018)

Name	Organization	Participation
Acevedo, Ruben	University of Maryland College Park	Poster Presenter
Adnan, Ashfaq	University of Texas at Arlington	Poster Presenter
Aguasvivas Manzano, S	University of Colorado Boulder	Poster Presenter
Aizenberg, Joanna	Harvard University	Speaker
Alleyne, Marianne	University of Illinois at Urbana-Champaign	Poster Presenter
Arrieta, Andres F	Purdue University	Poster Presenter
Arruda, Ellen M	University of Michigan	Attendee
Asp, Leif E	Chalmers University of Technology	Attendee
Ayarza Leon, Jorge Luis	The University of Chicago	Poster Presenter
Barreiros, Jose	Cornell University	Attendee
Barth, Friedrich G.	University of Vienna	Discussion Leader
Baughman, Ray H	University of Texas at Dallas	Speaker
Baur, Jeffery W	U.S. Air Force Research Laboratory	Attendee
Beblo, Richard V	University of Dayton Research Institute	Poster Presenter
Bechthold, Martin	Harvard Graduate School of Design	Speaker
Bhattacharya, Kaushik	California Institute of Technology	Discussion Leader
Bielefeldt, Brent	Texas A&M University	Poster Presenter
Bond, Ian P	University of Bristol	Attendee
Brancolini, Giorgia	CNR - National Research Council	Poster Presenter
Brinson, Catherine	Duke University	Poster Presenter
Brodnik, Neal R	California Institute of Technology	Poster Presenter
Bruck, Hugh A	University of Maryland	Poster Presenter
Casalotti, Arnaldo	University of Roma Tre	Poster Presenter
Celestine, Asha-Dee	Auburn University	Poster Presenter
Chang, Fu-Kuo	Stanford University	Attendee
Chang, Eric	Stanford University	Poster Presenter
Chasiotis, Ioannis	University of Illinois at Urbana-Champaign	Poster Presenter
Chen, Chun-Teh	Massachusetts Institute of Technology	Poster Presenter
Chen, Yong	University of California, Los Angeles	Attendee
Chen, Yangyang	University of Missouri	Poster Presenter
Chung, Jaeyoon	Behr Process Corporation	Attendee
Claridge, Shelley A.	Purdue University	Poster Presenter
Cölfen, Helmut	University of Konstanz	Discussion Leader
Correll, Nikolaus	University of Colorado Boulder	Discussion Leader
Crall, Matthew D	The University of Tulsa	Poster Presenter

Daraio, Chiara	California Institute of Technology	Attendee
das, sambeeta	University of Pennsylvania	Poster Presenter
Dean, Leon M	University of Illinois at Urbana-Champaign	Poster Presenter
Deshpande, Anagh T	University of Louisville	Poster Presenter
Doona, Christopher	US Army - Natick Soldier RD&E Center	Attendee
Dunn, Martin L	Singapore University of Technology and Design	Speaker
Egusa, Shunji	University of North Carolina Charlotte	Poster Presenter
Erturk, Alper	Georgia Institute of Technology	Attendee
Esser-Kahn, Aaron P	University of Chicago, Institute for Molecular Engineering	Discussion Leader
Estroff, Lara A	Cornell University	Speaker
Evke, Erin E	University of Michigan	Poster Presenter
Feinberg, Adam M	University of Illinois Urbana-Champaign	Poster Presenter
Fratzl, Peter	Max Planck Institute of Colloids and Interfaces	Speaker
Gamble, Lawren L	University of Michigan	Poster Presenter
Geubelle, Philippe H	University of Illinois	Poster Presenter
Greer, Julia R	California Institute of Technology	Speaker
Groo, LoriAnne	University of Michigan	Poster Presenter
Gu, Grace X.	Massachusetts Institute of Technology	Poster Presenter
Gupta, Satyandra K	University of Southern California	Poster Presenter
Hahn, Gail L	Boeing Research & Technology	Attendee
Hamilton, Andrew R	University of Southampton	Poster Presenter
Handa, Sheetal	BP International Ltd.	Attendee
Harvey, Christina	University of British Columbia	Poster Presenter
He, Ximin	University of California, Los Angeles	Poster Presenter
Holten-Andersen, Niels	Massachusetts Institute of Technology	Poster Presenter
Hong, Sang Hyeon	Korea Advanced Institute of Science and Technology	Poster Presenter
Hong, Jong-Dal	Incheon National University	Poster Presenter
Hopkins, Jonathan B	University of California, Los Angeles	Poster Presenter
Hu, Yuhang	University of Illinois at Urbana-Champaign	Attendee
Hu, Jia	3M Company	Attendee
Huang, Guoliang	University of Missouri	Poster Presenter
Huss, Jessica C.	Max Planck Institute of Colloids and Interfaces	Poster Presenter
Hutchens, Shelby B	University of Illinois Urbana-Champaign	Poster Presenter
Ikkala, Olli T	Aalto University	Speaker
Inman, Daniel J	University of Michigan	Vice Chair
Jayaram, Kaushik	Harvard University	Poster Presenter
Keller, Michael W	The University of Tulsa	Poster Presenter
Kennedy, William J	AFRL/RXCC	Poster Presenter
Keplinger, Christoph	University of Colorado Boulder	Poster Presenter
Kieffer, John	University of Michigan	Poster Presenter
Kong, Tiantian	Shenzhen University	Poster Presenter

Kotikian, Arda	Harvard University	Poster Presenter
Kramer-Bottiglio, Rebecca	Yale University	Speaker
Kraus, Tobias	Leibniz-Institute for New Materials	Poster Presenter
Kudva, Jayanth	NextGen Aeronautics, Inc.	Speaker
Lamuta, Caterina	Beckman Institute, University of Illinois at Urbana-Champaign	Poster Presenter
Lee, Haeshin	Korea Advanced Institute of Science and Technology	Speaker
Lee, Haesung A.	Korea Advanced Institute of Science and Technology	Poster Presenter
Lee, Haiwon	Hanyang University	Attendee
Lee, B. L. (Les)	Air Force Office of Scientific Research	Attendee
Lee, Victoria J	California Institute of Technology	Poster Presenter
Leng, Jinsong	Harbin Institute of Technology	Attendee
Lentink, David	Stanford University	Speaker
Lerch, Michael M.	University of Groningen	Poster Presenter
Li, Yang	University of Colorado Boulder	Poster Presenter
Li, Qiaochu	Massachusetts Institute of Technology	Poster Presenter
Litwin, Shannon	Georgia Institute of Technology	Attendee
Liu, Huiying	University of Illinois at Urbana-Champaign	Poster Presenter
Liu, Liping	Rutgers University	Poster Presenter
Liu, Jessica A	North Carolina State University	Poster Presenter
Liu, Liwu	Harbin Institute of Technology	Poster Presenter
Lloyd, Evan M	University of Illinois	Poster Presenter
Long, Rong	University of Colorado Boulder	Poster Presenter
Mantese, Joseph V	United Technologies Research Center	Attendee
McAdams, Daniel A	Texas A&M University	Speaker
Mehrotra, Vivek	Teledyne Scientific Company	Attendee
Minary, Majid	University of Texas at Dallas	Poster Presenter
Moreno, Salvador	University of Texas at Dallas	Poster Presenter
Naumov, Pance	New York University Abu Dhabi	Attendee
Neella, Nagarjuna	Indian Institute of Science	Poster Presenter
Nowack, Ricardo	Ernst-Moritz-Arndt-University Greifswald	Poster Presenter
O'Masta, Mark R	HRL Laboratories, LLC	Poster Presenter
O'Neill, Maura	Cornell University	Attendee
Overvelde, Johannes T.B.	AMOLF	Speaker
Pankonien, Alexander M	Air Force Research Laboratory	Poster Presenter
Parkin, Ivan P.	University College London	Discussion Leader
Patrick, Jason F	North Carolina State University	Attendee
Peters, Kara	National Science Foundation	Attendee
Pratapa, Phanisri P	Georgia Institute of Technology	Attendee
Pulati, Nuerxida	The Pennsylvania State University	Poster Presenter
Qu, Shaoxing	Zhejiang University	Attendee
Reich, Gregory	Air Force Research Laboratory	Discussion Leader

Reid, Russell C	University of North Texas	Poster Presenter
Riley, Katherine	Purdue University	Poster Presenter
Rogers, John	Northwestern University	Speaker
Roh, Sangchul	North Carolina State University	Poster Presenter
Roy, Ajit K	Air Force Research Laboratory	Attendee
Sakorikar, Tushar	Indian Institute of Technology, Madras	Poster Presenter
Sanchez, Clement	Laboratoire de Chimie de LA Materiere Condensee	Discussion Leader
Sarles, Stephen A	University of Tennessee	Speaker
Schindler, Claudia	Ernst-Moritz-Arndt University Greifswald	Poster Presenter
Shan, Wanliang	University of Nevada, Reno	Attendee
Shepherd, Robert F	Cornell University	Speaker
Shin, Mikyung	Korea Advanced Institute of Science and Technology	Poster Presenter
Smith, Scott H	The Georgia Institute of Technology	Poster Presenter
Sodano, Henry A	University of Michigan	Poster Presenter
Sottos, Nancy R	University of Illinois at Urbana-Champaign	Chair
Sprague, Ethan C	University of Michigan	Poster Presenter
Studart, Andre R	ETH Zurich	Discussion Leader
Stupp, Samuel I	Northwestern University	Speaker
Sugino, Christopher	Georgia Institute of Technology	Poster Presenter
Talo, Michela	Sapienza University of Rome	Poster Presenter
Thakre, Piyush R	DowDupont	Attendee
Therriault, Daniel	Ecole Polytechnique de Montreal	Poster Presenter
Thomas, James P	US Naval Research Laboratory	Chair
Tracy, Joseph B	North Carolina State University	Poster Presenter
Truby, Ryan L	Harvard University	Poster Presenter
Tyrpak, David	University of Southern California School of Pharmacy	Poster Presenter
Valdivia y Alvarado, Pablo	Singapore University of Technology and Design	Attendee
Vernerey, Franck J	University of Colorado, Boulder	Poster Presenter
Wallace, Andrea K	Massachusetts Institute of Technology	Poster Presenter
Wang, Ya	Stony Brook University	Poster Presenter
Wang, Shunzhi	Northwestern University	Poster Presenter
Wang, Liqiu	The University of Hong Kong	Poster Presenter
Wang, Younseon	Korea Advanced Institute of Science and Technology	Poster Presenter
Wangpraseurt, Daniel	University of Cambridge	Poster Presenter
Whitfield, Colette J	Newcastle University	Poster Presenter
Wicker, Ryan	University of Texas at El Paso	Speaker
Wissa, Aimy	University of Illinois Urbana-Champaign	Poster Presenter
Xia, Yiwei	Georgia Institute of Technology	Poster Presenter
Xiao, Jianliang	University of Colorado Boulder	Poster Presenter
Yourdkhani, Mostafa	University of Illinois at Urbana-Champaign	Poster Presenter
Zenkert, Dan	KTH Royal Institute of Technology	Attendee