

RPPR Final Report

as of 21-Aug-2023

Agency Code: 21XD

Proposal Number: 80512SMCF

Agreement Number: W911NF-22-1-0108

INVESTIGATOR(S):

Name: Ph.D. Chenfeng Ke
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Phone Number: 6036466967
Principal: N

Name: Ph.D. Ronald Smaldone
Email: ronald.smaldone@utdallas.edu
Phone Number: 19728836342
Principal: Y

Organization: **Gordon Research Conferences, Inc.**

Address: 512 Liberty Lane, West Kingston, RI 028921502

Country: USA

DUNS Number: 075712877

EIN: 050300482

Report Date: 30-Jun-2023

Date Received: 14-Aug-2023

Final Report for Period Beginning 01-Jul-2022 and Ending 30-Jun-2023

Title: 2022 Additive Manufacturing of Soft Materials Gordon Research Conference

Begin Performance Period: 01-Jul-2022

End Performance Period: 30-Jun-2023

Report Term: 0-Other

Submitted By: Ph.D. Nancy Gray

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Distribution Statement: 1-Approved for public release; distribution is unlimited.

STEM Degrees:

STEM Participants:

Major Goals: Additive manufacturing (AM), often referred to as 3D printing, is a growing technology that promises to disrupt both traditional manufacturing techniques, which is projected to be a 1 trillion-dollar industry by 2030 and has spawned a large number of startup companies all over the country. The rapid development of 3D printing technology creates new demands and opportunities, especially in the applications for biomedicine and soft robotics. As such, research efforts into 3D printing have been highly interdisciplinary, requiring the efforts of mechanical, biomedical and computer engineering, and more recently, chemistry. Particularly in the area of polymer manufacturing, AM offers incredible opportunities for the manufacture of custom materials that would be cost-ineffective to produce on small scales or using designs that are currently not possible using existing manufacturing.

The next great leap for 3D printing will come from the development of new materials and methodology. For this to occur, collaboration is paramount, and the first step is to bring the great minds at the interface of these key areas together. The GRC sponsored meeting we are proposing will include topics related to the 3D printing of "soft materials" such as organic polymers, hydrogels and composites. In general, the study of these types of soft materials share similar design concepts, tools for characterization, and synthetic chemistry. Therefore, there is significant overlap between researchers in this community (in contrast with hard materials), making it likely that this set of topics will be conducive to a GRC with large attendance and interest. This meeting will not cover topics related to AM of metals, ceramics or other inorganic materials. In addition to researchers in the physical sciences and engineering, this meeting will also include topics on design, art and architecture, computational modeling, and the environmental implications of AM. Gordon Conferences are renowned for their close-knit atmosphere which will be conducive to fostering the collaborations needed to advance this field.

Accomplishments: Additive manufacturing (AM), often referred to as 3D printing, is a growing technology that promises to disrupt traditional manufacturing techniques, is projected to be a 1 trillion-dollar industry by 2030 and has spawned a large number of startup companies all over the country. The rapid development of 3D printing technology creates new demands and opportunities, especially in applications for aerospace, biomedicine, and soft robotics. As such, research efforts into AM have been highly interdisciplinary, requiring the efforts of digital design, multiscale simulations, manufacturing methods, materials synthesis, and performance engineering. AM offers incredible opportunities recently in the area of soft materials manufacturing for educators, scientists, engineers,

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entrepreneurs, designers, and artists using synthetic and natural materials such as thermoplastics, photo-curable resins, elastomers, organo- and hydrogels, and their composites. The next great leap for 3D printing will come from the development of new materials and methodology – a truly integrated, multiscale convergence to redefine the field. For this to occur, collaboration is paramount, and the first step is to bring the great minds at the interface of these key areas together.

The conference was successful in terms of the metrics set by the Gordon Research Conference organization. The GRC supported by this grant has 168 attendees.

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

Attendees of this meeting were able to attend talks by leaders and rising early career scholars in additive manufacturing. Since Gordon Conferences are held in locations where interactions between all attendees is encouraged, there was significant opportunity for networking and discussion both informally and formally.

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

Honors and Awards: Nothing to Report

Protocol Activity Status:

Technology Transfer: Nothing to Report

PARTICIPANTS:

Participant Type: PD/PI

Participant: Ron Smaldone PhD

Person Months Worked: 1.00

Project Contribution:

National Academy Member: N

Funding Support:

Participant Type: Co-Investigator

Participant: Chenfeng Ke PhD

Person Months Worked: 1.00

Project Contribution:

National Academy Member: N

Funding Support:

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Partners

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I certify that the information in the report is complete and accurate:

Signature: Bethany Mancuso

Signature Date: 8/14/23 12:38PM



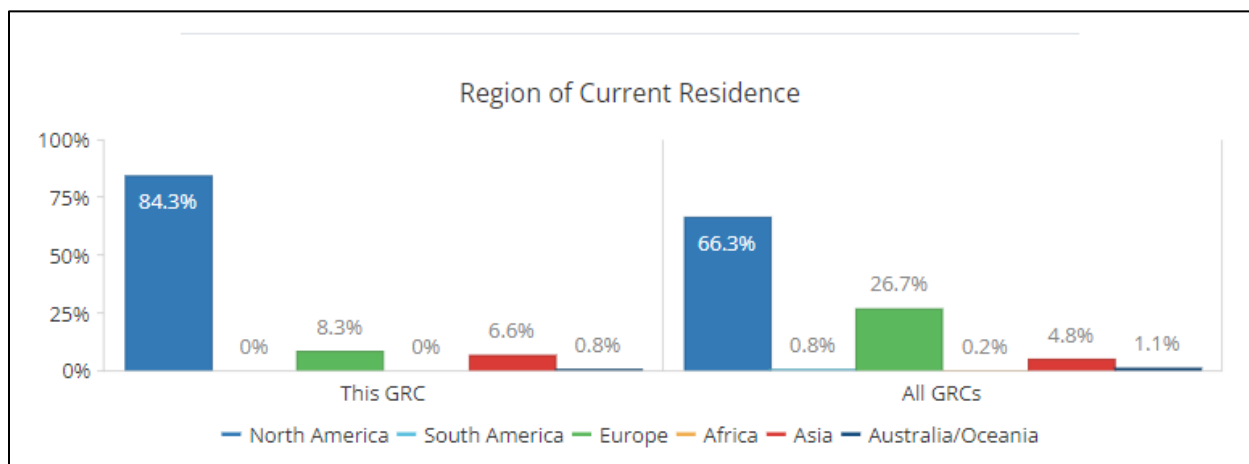
**GORDON RESEARCH CONFERENCES
FINAL PROGRESS REPORT
Army Research Office (ARO)
Grant Number W911NF2210108
Additive Manufacturing of Soft Materials GRC**

Operational Summary

The Gordon Research Conference (GRC) on Additive Manufacturing of Soft Materials were held at the Four Points Sheraton/Holiday Inn Express in Ventura, California from August 7-12, 2022. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.

GRC Conference Participants

The Conference was well-attended with 168 participants. Scientists from academia represented 83% of the participants while attendees from government accounted for 12% and attendees from industry totaled 5%. The meeting also attracted a strong mix of young investigators and senior scientists. Students and post-docs accounted for 44% of all attendees. Approximately 40% of the participants at the 2022 meeting were women. Participants ranged from North America, Europe, Asia and Australia as shown below compared to other GRC meetings.



Conference Program

Additive manufacturing (AM), often referred to as 3D printing, is a growing technology that promises to disrupt traditional manufacturing techniques, is projected to be a 1 trillion-dollar industry by 2030, and has spawned a large number of startup companies all over the country. The rapid development of 3D printing technology creates new demands and opportunities, especially in applications for aerospace, biomedicine, and soft robotics. As such, research efforts into AM have been highly interdisciplinary, requiring the efforts of digital design, multiscale simulations, manufacturing methods, materials synthesis, and performance engineering. AM offers incredible opportunities recently in the area of soft materials manufacturing for educators, scientists, engineers, entrepreneurs, designers, and artists using synthetic and natural materials such as thermoplastics, photo-curable resins, elastomers, organo- and hydrogels, and their composites. The next great leap for 3D printing will come from the development of new materials and methodology – a truly

integrated, multiscale convergence to redefine the field. For this to occur, collaboration is paramount, and the first step is to bring the great minds at the interface of these key areas together.

Conference Budget

Funding provided by the ARO supported partial registration for 8 graduate students, 1 other status participant and 1 post-doc at the GRC.

GRC ARO Disbursement List

Cai, Betty <i>Graduate Student Attendee</i>	Stanford University (United States)	\$500.00
Chyr, Gloria <i>Graduate Student Attendee</i>	Stanford University (United States)	\$500.00
Driskill, Madison <i>Graduate Student Attendee</i>	Stanford University (United States)	\$500.00
Efobi, Jo Ann <i>Graduate Student Attendee</i>	Stanford University (United States)	\$500.00
Fonseca, Nathan <i>Graduate Student Attendee</i>	Arizona State University (United States)	\$500.00
Gastol, Dominika <i>Post Doc Attendee</i>	University of Birmingham (United Kingdom)	\$500.00
Makar-Limanov, Anna <i>Graduate Student Attendee</i>	Stanford University (United States)	\$500.00
Rajesh, Netra Unni <i>Graduate Student Attendee</i>	Stanford University (United States)	\$500.00
Stein, Emily <i>Other Attendee</i>	Stanford University (United States)	\$500.00
Tang, Miao <i>Graduate Student Attendee</i>	Dartmouth College (United States)	\$500.00

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 cutting-edge scientific content, the ample opportunities for networking between junior and senior scientists as well as the candor and inclusion of discussions.

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

Dr. Chenfeng Ke, GRC Chair
Dartmouth College, United States

Dr. Ronald Smaldone, GRC Chair
University of Texas at Dallas, United States

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

Additive Manufacturing of Soft Materials
Gordon Research Conference

Integrating Polymers, Materials and Manufacturing for a Sustainable Future

August 7 - 12, 2022

Chairs Ronald A. Smaldone and Chenfeng Ke

Vice Chairs Timothy E. Long and AJ Boydston

Four Points Sheraton / Holiday Inn Express

1050 Schooner Drive

Ventura, CA, United States

Conference Program

Sunday

2:00 pm - 9:00 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	Additive Manufacturing in Biomaterials Discussion Leaders: AJ Boydston (University of Wisconsin-Madison, United States)
7:40 pm - 8:25 pm	Jason Burdick (University of Colorado Boulder, United States) "Advances in Suspension Bath Printing for Biomedical Applications"
8:25 pm - 8:35 pm	Discussion
8:35 pm - 9:20 pm	Grace Zhang (The George Washington University, United States) "3D/4D Bioprinting for Complex Tissue Regeneration"
9:20 pm - 9:30 pm	Discussion

Monday

7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Group Photo
9:00 am - 12:30 pm	New Polymers and Methods for 3D Printing Discussion Leader: Yue (Jessica) Wang (University of California, Merced, United States)
9:00 am - 9:45 am	Eva Blasco (Heidelberg University, Germany) "3D/4D Printing of Functional Polymers with Light"

9:45 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:15 am	Xuanhe Zhao (Massachusetts Institute of Technology, United States) "3D Printing of Soft, Living and Robotic Materials"
11:15 am - 11:30 am	Discussion
11:30 am - 12:15 pm	Nancy Sottos (University of Illinois at Urbana-Champaign, United States) "Towards Energy-Efficient, Regenerative Printing of Thermoset Polymeric Materials"
12:15 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
3:00 pm - 4:00 pm	The GRC Power Hour™ <i>The GRC Power Hour™ is designed to address diversity and inclusion in the scientific workplace by providing a safe environment for informal and meaningful conversations amongst colleagues of all career stages. The program supports the professional growth of all members of our communities, including ethnicity, race and/or gender identity by providing an open forum for discussion and mentoring.</i> Organizer: Hee Jeung Oh (Pennsylvania State University, United States)
4:00 pm - 6:00 pm	Poster Session
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	Therapeutics in Additive Manufacturing Discussion Leader: Hee Jeung Oh (Pennsylvania State University, United States)
7:30 pm - 8:15 pm	Matthew Becker (Duke University, United States) "Materials and Strategies for 3D Printed Medical Devices"
8:15 pm - 8:30 pm	Discussion
8:30 pm - 9:15 pm	Shrike Zhang (Harvard Medical School, United States) "Microfluidic Coaxial Bioprinting"
9:15 pm - 9:30 pm	Discussion

Tuesday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Light-Based Additive Manufacturing / Young Investigator Forum

Discussion Leader: **Dom Porcincula** (Lawrence Livermore National Laboratory, United States)

9:00 am - 9:45 am	Hayden Taylor (UC Berkeley, United States) "Progress in Volumetric Additive Manufacturing Processes using Photopolymers"
9:45 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:15 am	Cyrille Boyer (University of New South Wales, Australia) "Controlling Nanostructure in 3D Printed Materials by Using Visible Light"
11:15 am - 11:30 am	Discussion
11:30 am - 11:45 am	Grace Gu (UC Berkeley, United States) "Dimensions of Smart Additive Manufacturing"
11:45 am - 11:50 am	Discussion
11:50 am - 12:05 pm	Zachariah Page (The University of Texas at Austin, United States) "Visible Light Projection- and Display-Based 3D Printing"
12:05 pm - 12:10 pm	Discussion
12:10 pm - 12:25 pm	Johanna Schwartz (Lawrence Livermore National Laboratory, United States) "Contrast is Key: Step Growth Polymerizations in Volumetric Additive Manufacturing"
12:25 pm - 12:30 pm	Discussion
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	Technology for Large Scale Additive Manufacturing Discussion Leaders: Emily Davidson (Princeton University, United States)
7:30 pm - 8:15 pm	Joseph Desimone (Stanford University, United States) "Continuous Liquid Interface Production: The Intersection of Materials, Process and Design"
8:15 pm - 8:30 pm	Discussion
8:30 pm - 9:15 pm	James Hansen (3M Company, United States)

	"Commercialization of Additive Manufacturing in Dentistry"
9:15 pm - 9:30 pm	Discussion
Wednesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Applied Additive Manufacturing Discussion Leader: Jamie Messman (Kansas City National Security Campus, United States)
9:00 am - 9:45 am	Andre Studart (ETH Zurich, Switzerland) "3D Printed Hierarchical Materials"
9:45 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:15 am	Keith Brown (Boston University, United States) "3D Printing and Autonomous Experimentation as a Design Tool for Extreme Mechanics"
11:15 am - 11:30 am	Discussion
11:30 am - 12:15 pm	Walter Voit (University of Texas at Dallas, United States) "Photo Polymerization Induced Phase Separation (PIPS) as a Stabilizing Phenomenon for High Performance DLP Polymers"
12:15 pm - 12:30 pm	Discussion
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
7:00 pm - 7:30 pm	Business Meeting <i>Nominations for the Next Vice Chair(s); Complete the GRC Evaluation Forms; Discuss Future Dates and Venue; Election of the Next Vice Chair(s)</i>
7:30 pm - 9:30 pm	Computational and Design Methods in 3D Printing Discussion Leader: Lining Yao (Carnegie Mellon University, United States)
7:30 pm - 8:15 pm	Ole Sigmund (Technical University of Denmark, Denmark) "Inverse Design for Meta Materials and Hierarchical Architected Structures"
8:15 pm - 8:30 pm	Discussion
8:30 pm - 9:15 pm	Seunghwa Ryu (KAIST, South Korea)

	"Data-driven Design of Composite Materials and Structures"
9:15 pm - 9:30 pm	Discussion
Thursday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Sustainability in Additive Manufacturing Discussion Leader: Haritz Sardon (POLYMAT, Spain)
9:00 am - 9:45 am	Andrew Dove (University of Birmingham, United Kingdom) "Sustainably Sourced Resins for Light-based 3D Printing"
9:45 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:15 am	Alshakim Nelson (University of Washington, United States) "Protein-Based Bioplastics for Sustainable Additive Manufacturing"
11:15 am - 11:30 am	Discussion
11:30 am - 12:15 pm	Virginia San Fratello (Emerging Objects, United States) "Printing the Future"
12:15 pm - 12:30 pm	Discussion
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	Nanomaterials in Additive Manufacturing Discussion Leader: Emily Pentzer (Texas A&M University, United States)
7:30 pm - 8:15 pm	Christopher Spadaccini (Lawrence Livermore National Laboratory, United States) "Additive Manufacturing of Architected and Functional Materials"
8:15 pm - 8:30 pm	Discussion
8:30 pm - 9:15 pm	Julia Greer (California Institute of Technology, United States) "Materials by Design: Additive Manufacturing of Nano-Architected, Adaptable Materials"
9:15 pm - 9:30 pm	Discussion

Friday

7:30 am - 8:30 am Breakfast

9:00 am Departure

Contributors

 <p>Gordon Research Conferences <i>Frontiers of Science</i></p>	 <p>Polymer Chemistry</p>
 <p>MSDE</p>	 <p>ACS APPLIED POLYMER MATERIALS</p>
 <p>ACS central science</p>	 <p>Carbon[®]</p>
 <p>DUPONT[™]</p>	 <p>ADAPTIVE3D[™] Desktop Metal Company</p>
 <p>DARTMOUTH</p>	 <p>3M</p>

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 or U.S. Government position, policy, or decision, unless so designated by other documentation.

GRC Attendee List

The list of attendees appears below, sorted by the role recorded in their registration record.

Name	Affiliation	Role	Gender
Ke, Chenfeng	Dartmouth College	Chair	Male
Smaldone, Ronald A	University of Texas at Dallas	Chair	Male
Boydston, AJ	University of Wisconsin-Madison	Vice Chair	Male
Becker, Matthew L	Duke University	Speaker	Male
Blasco, Eva	Heidelberg University	Speaker	Female
Boyer, Cyrille	University of New South Wales	Speaker	Male
Brown, Keith A	Boston University	Speaker	Male
Burdick, Jason A	University of Colorado Boulder	Speaker	Male
Desimone, Joseph	Stanford University	Speaker	No Answer
Dove, Andrew P	University of Birmingham	Speaker	Male
Greer, Julia R	California Institute of Technology	Speaker	Female
Gu, Grace	UC Berkeley	Speaker	Female
Hansen, James	3M Company	Speaker	Male
Nelson, Alshakim	University of Washington	Speaker	Male
Page, Zachariah A	The University of Texas at Austin	Speaker	Male
Ryu, Seunghwa	KAIST	Speaker	Male
San Fratello, Virginia	Emerging Objects	Speaker	Female
Schwartz, Johanna J	Lawrence Livermore National Laboratory	Speaker	Female
Sigmund, Ole	Technical University of Denmark	Speaker	Male
Sottos, Nancy R	University of Illinois at Urbana-Champaign	Speaker	Female
Spadaccini, Christopher M	Lawrence Livermore National Laboratory	Speaker	Male
Studart, Andre R	ETH Zurich	Speaker	Male
Taylor, Hayden	UC Berkeley	Speaker	Male
Voit, Walter E	University of Texas at Dallas	Speaker	Male
Zhang, Grace	The George Washington University	Speaker	Female
Zhang, Shrike	Harvard Medical School	Speaker	Male
Zhao, Xuanhe	Massachusetts Institute of Technology	Speaker	Male
Davidson, Emily C	Princeton University	Discussion Leader	Female
Messman, Jamie	Kansas City National Security Campus	Discussion Leader	Male
Oh, Hee Jeung	Pennsylvania State University	Discussion Leader	Female
Pentzer, Emily	Texas A&M University	Discussion Leader	Female
Porcincula, Dom	Lawrence Livermore National Laboratory	Discussion Leader	Male
Sardon, Haritz	POLYMAT	Discussion Leader	Male
Wang, Yue (Jessica)	University of California, Merced	Discussion Leader	Female
Yao, Lining	Carnegie Mellon University	Discussion Leader	Female

Name	Affiliation	Role	Gender
Altin-Yavuzarslan, Gokce	University of Washington	Poster Presenter	Female
Antich Acedo, Cristina	Postdoctoral Fellow	Poster Presenter	Female
Appelhans, Leah	Sandia National Laboratories	Poster Presenter	Female
Avila, Raudel	Northwestern University	Poster Presenter	Male
Aygun, Cem	Worcester Polytechnic Institute	Poster Presenter	Male
Bezek, Lindsey	Virginia Tech	Poster Presenter	Female
Bortner, Michael	Virginia Tech	Poster Presenter	Male
Brun, Pierre-Thomas	Princeton University	Poster Presenter	Male
Brunel, Lucia	Stanford University	Poster Presenter	Female
Cai, Betty	Stanford University	Poster Presenter	Female
Cao, Changyong (Chase)	Case Western Reserve University	Poster Presenter	Male
Chen, Amylynn	California Institute of Technology	Poster Presenter	Female
Chen, Yong	University of Southern California	Poster Presenter	Male
Choi, Hyeong Yeol	Dong-A University	Poster Presenter	Male
Chowdhury, Farhan	Southern Illinois University Carbondale	Poster Presenter	Male
Chyr, Gloria U	Stanford University	Poster Presenter	Female
Cipriani, Ciera E	Texas A&M University	Poster Presenter	Female
Cortes Guzman, Karen P	University of Texas at Dallas	Poster Presenter	Female
Dadmun, Mark D	University of Tennessee	Poster Presenter	Male
Driskill, Madison	Stanford University	Poster Presenter	Female
Fonseca, Nathan	Arizona State University	Poster Presenter	Male
Friedrich, Leanne M	National Institute of Standards and Technology	Poster Presenter	Female
Fu, Kelvin	University Of Delaware	Poster Presenter	Male
Garg, Akash	Carnegie Mellon University	Poster Presenter	Male
Gastol, Dominika	University of Birmingham	Poster Presenter	Female
Hashimoto, Michinao	Singapore University of Technology and Design	Poster Presenter	Male
Hernandez Carreno, Victor H	University of California, Merced	Poster Presenter	Male
Herrera Cortes, Oscar Alejandro	McMaster University	Poster Presenter	Male
Higgins, Callie	National Institute of Standards and Technology	Poster Presenter	Female
Hill, Ian M	University of California, Merced	Poster Presenter	Male
Hsiao, Kaiwen	Stanford University	Poster Presenter	Female
Huang, Sijia	Lawrence Livermore National Laboratory	Poster Presenter	Female
Hudson, Andrew	Carnegie Mellon University	Poster Presenter	Male
Hull, Sarah	Stanford University	Poster Presenter	Female

Name	Affiliation	Role	Gender
Ilyin, Dan	Stanford University	Poster Presenter	Male
Johnson, Rebecca	University of Texas at Dallas	Poster Presenter	Female
Jung, Imjoo	DongA University	Poster Presenter	Female
Jung, Jiyoung	Korea advanced institute of science and technology	Poster Presenter	Male
Kang, Sung H	Johns Hopkins University	Poster Presenter	Male
Karamzadeh, Vahid	McGill University	Poster Presenter	Male
Kim, Hyunjun	KAIST	Poster Presenter	Male
Kong, Yong Lin	University of Utah	Poster Presenter	Male
Kronenfeld, Jason	Stanford University	Poster Presenter	Male
Larson, Natalie M	Harvard University	Poster Presenter	Female
Laventure, Audrey	University of Montreal	Poster Presenter	Female
LEE, JUNGSOON	Chungnam National University	Poster Presenter	Female
Lee, Junhyeong	KAIST	Poster Presenter	Male
Lee, Junsang	Seoul National University	Poster Presenter	Male
Lee, Juyong	Seoul National University	Poster Presenter	Male
Lee, Sunhee	Dong-A University	Poster Presenter	Female
Leguizamon, Samuel C	Sandia National Lab	Poster Presenter	Male
Lipkowitz, Gabriel	Stanford Univ	Poster Presenter	Male
Lipton, Jeffrey	University of washington	Poster Presenter	Male
Lopez de Pariza Sanz, Xabier	POLYMAT-University of the Basque Country UPV/EHU	Poster Presenter	Male
Lublin, Derek	University of California, Irvine	Poster Presenter	Male
Luposchinsky, Simon	University of Oregon	Poster Presenter	Male
Makar-Limanov, Anna	Stanford University	Poster Presenter	Female
Marnot, Alexandra	Georgia Institute of Technology	Poster Presenter	Female
Millik, S. Cem	University of Washington	Poster Presenter	Male
Mir Hashemian, Paria	Boston University	Poster Presenter	Female
Mirza, Sophia	UC Berkeley - Volumetric Additive Manufacturing Lab (Dr. Hayden Taylor)	Poster Presenter	Female
Morley, Cameron	UC Berkeley	Poster Presenter	Male
Mueller, Jochen	Johns Hopkins University	Poster Presenter	Male
Mun, Jeongwon	Chungnam National University/ Department of clothing and textile	Poster Presenter	Female
Perera, Sachini D	The University of Texas at Dallas	Poster Presenter	Female
Qiang, Zhe	The University of Southern Mississippi	Poster Presenter	Male
Qiu, Kaiyan	Washington State University	Poster Presenter	Male
Rajesh, Netra Unni	Stanford University	Poster Presenter	Female
Rau, Daniel A.	Virginia Tech	Poster Presenter	Male
Remy, Ashele K	University of Texas at Dallas	Poster Presenter	Female

Name	Affiliation	Role	Gender
Rizzo, Riccardo	ETH Zurich	Poster Presenter	Male
Roach, Devin	Sandia National Laboratories	Poster Presenter	Male
Romberg, Stian K	National Institute of Standards and Technology	Poster Presenter	Male
Saccone, Max A	California Institute of Technology	Poster Presenter	Male
Sadaba, Naroa	University of Washington	Poster Presenter	Female
Sadati, Monirosadat (Sanaz)	University of South Carolina	Poster Presenter	Female
Saengow, Chaimongkol	University of Illinois at Urbana-Champaign	Poster Presenter	Male
Santana, Steven	Harvey Mudd College	Poster Presenter	Male
Sarmah, Anubhav	Texas A&M University	Poster Presenter	Male
Savolainen, Henri	Aalto University	Poster Presenter	Male
Seo, S. Eileen	Arizona State University	Poster Presenter	Female
Sharma, Shivani	NIH	Poster Presenter	Female
Shin, Eun Joo	Dong-A university	Poster Presenter	Female
Shiwarski, Daniel J	Carnegie Mellon University	Poster Presenter	Male
Singer, Jonathan P	Rutgers University	Poster Presenter	Male
Soman, Pranav	Syracuse University	Poster Presenter	Male
SONG, KENAN	Arizona State University	Poster Presenter	Male
Stein, Emily	Stanford University	Poster Presenter	Female
Stottlemire, Bryce J	University of Kansas	Poster Presenter	Male
Strzelecka, Aleksandra A	University of California, Irvine	Poster Presenter	Female
Sun, X	UC Berkeley	Poster Presenter	Female
Tang, Miao	Dartmouth College	Poster Presenter	Male
Vidavsky, Yuval	Soreq NRC	Poster Presenter	Male
Wagner, Nicole	Chapman University	Poster Presenter	Female
Wang, Chen	University of Utah	Poster Presenter	Male
Wei, Peiran	Texas A&M University	Poster Presenter	Male
Wong, Jitkanya	University of Washington, Seattle	Poster Presenter	Female
Wu, Chenglin	Missouri University of Science and Technology	Poster Presenter	Male
Wu, Sarah	Massachusetts Institute of Technology	Poster Presenter	Female
Xu, Weinan	University of Akron	Poster Presenter	Male
Yang, Yunchong	Texas A&M University	Poster Presenter	Male
Zhang, TieJun	Khalifa University of Science and Technology	Poster Presenter	Male
Zhong, Zhuoran	Dartmouth College	Poster Presenter	Female
Amis, Eric J	Consultant	Attendee	Male
Cheng, Mark	University of Alabama	Attendee	Male
Coates, Ian	Stanford University - DeSimone Lab	Attendee	Male
Cook, Adam	Sandia National Labs	Attendee	Male
Couvrette, Justin	UC Merced	Attendee	Male
de Beer, Martin	Lawrence Livermore National Laboratory	Attendee	Male

Name	Affiliation	Role	Gender
Efobi, Jo Ann	Stanford University	Attendee	Female
Hansell, Claire	Nature	Attendee	Female
Hernandez-Gordillo, Victor	Lung Biotechnology PBC	Attendee	Male
Jacobson, Gunilla	Stanford University	Attendee	Female
Jiang, Yijie	University of North Texas	Attendee	Male
Kelkar, Sneha	Sartomer(Arkema)	Attendee	Female
Kwak, Jean Won	Stanford University	Attendee	Female
Lawrence, Micah	Stanford University - DeSimone Lab	Attendee	Male
Levenberg, Shulamit	Technion-Israel Institute of Technology	Attendee	Female
Liu, Panyiming	UCI	Attendee	Male
Mancuso, Salvatore P	Oakland University	Attendee	Non-Binary
Manna, Cesar M	NanoDimension	Attendee	Male
Mugnai, Mauro L	Georgetown University	Attendee	Male
Nemitz, Markus P.	Worcester Polytechnic Institute	Attendee	Male
Nsiah, Barbara A	United Therapeutics	Attendee	Female
Patterson, Steven	Honeywell FM&T	Attendee	Male
Rinehart, Samantha	Honeywell FM&T	Attendee	Female
Roumeli, Eleftheria	University of Washington	Attendee	Female
Salash, Jeannie	Honeywell	Attendee	Female
Shusteff, Maxim	Lawrence Livermore National Laboratory	Attendee	Male
Terrel-Perez, Liliana Dongping	LLNL	Attendee	Female
White, Alice E	Boston University	Attendee	Female
Yee, Daryl W	Massachusetts Institute of Technology	Attendee	Male
Yu, Fei	Cornell University	Attendee	Male