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14. ABSTRACT
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# RPPR Final Report

as of 05-Jan-2023

Agency Code: 21XD

Proposal Number: 80226ESCF

Agreement Number: W911NF-22-1-0064

## INVESTIGATOR(S):

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EIN: 050300482

**Report Date:** 20-Dec-2022

Date Received: 01-Dec-2022

**Final Report** for Period Beginning 21-Apr-2022 and Ending 20-Sep-2022

**Title:** 2022 Ionic Liquids Gordon Research Conference and Gordon Research Seminar

**Begin Performance Period:** 21-Apr-2022

**End Performance Period:** 20-Sep-2022

**Report Term:** 0-Other

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

**STEM Degrees:** 0

**STEM Participants:**

**Major Goals:** Ionic Liquids are materials of almost boundless possibilities. Their countless variations and accessible properties enable them to be applied to virtually any area of science and technology. Building on the foundational work funded primarily by the Department of Defense, research into ionic liquids has seen expansive growth over the past 25 years. Applications of these remarkable materials are being realized in areas as diverse as electrochemical power, renewable fuels and chemicals, advanced materials, sensors, biomaterial processing, biotechnology, catalysis, pharmaceuticals, and separations. Underlying much of this work has been the relatively recent concept that ionic liquids are salts that melt below 100°C, and this paradigm has constrained the perspective of those new to the ionic liquids community. For well over a hundred years ionic liquids were thought of simply as liquid salts, and they were often referred to as molten salts, especially for higher temperature systems. Today ionic liquids and molten salts are thought of as separate and distinct research directions, and there is limited interaction between the two communities. However, just as temperature is a continuum so are ionic liquids. There is much potential for ionic liquids looking beyond 100 °C and exploring more “extreme” conditions. The goal of this GRC is to expand the view of the participants on what ionic liquids are and how moving beyond self-imposed boundaries can enhance the potential of these remarkable materials. Presentations at this GRC will highlight many key interest areas of ionic liquids research and will foster thought provoking and stimulating discussions. In addition, selected talks will seek to expand beyond the conventional boundaries of ionic liquids. Amplifying this will be lively poster sessions and social events that will provide ample opportunities for interaction and dialog.

**Accomplishments:** Ionic Liquids are materials of almost boundless possibilities. Their countless variations and accessible properties enable them to be applied to virtually any area of science and technology. Building on the foundational work of a relatively few dedicated practitioners, research into ionic liquids has seen an unprecedented level of growth over the past 30 years. Applications of these remarkable materials are being realized in areas as diverse as electrochemical power, renewable fuels and chemicals, advanced materials, sensors, biomaterial processing, biotechnology, catalysis, pharmaceuticals, and separations. Underlying much of this work has been the relatively recent concept that ionic liquids are salts that melt below 100 degrees Celsius, and this paradigm may have constrained the perspective of many of those new to the ionic liquids community. For well over a hundred years ionic liquids were thought of simply as liquid salts, and they were often referred to as molten salts, especially for higher temperature systems. Today ionic liquids and molten salts are thought of as separate and distinct research directions, and there is limited interaction between the two communities. However, just as temperature is a continuum so are ionic liquids. There is much potential for ionic liquids looking beyond 100 degrees Celsius and exploring more extreme conditions. The goal of this GRC was to expand the view of the participants on what ionic liquids are and how moving beyond self-imposed boundaries can enhance the potential of these remarkable materials. Presentations at this GRC highlighted many key interest areas of ionic liquids research and will foster

## **RPPR Final Report** as of 05-Jan-2023

thought provoking and stimulating discussions. In addition, selected talks sought to expand beyond the conventional boundaries of ionic liquids.

**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.

**Honors and Awards:** Nothing to Report

**Protocol Activity Status:**

**Technology Transfer:** Nothing to Report

### **Partners**

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

Signature: Darlene Armstrong

Signature Date: 12/1/22 10:51AM

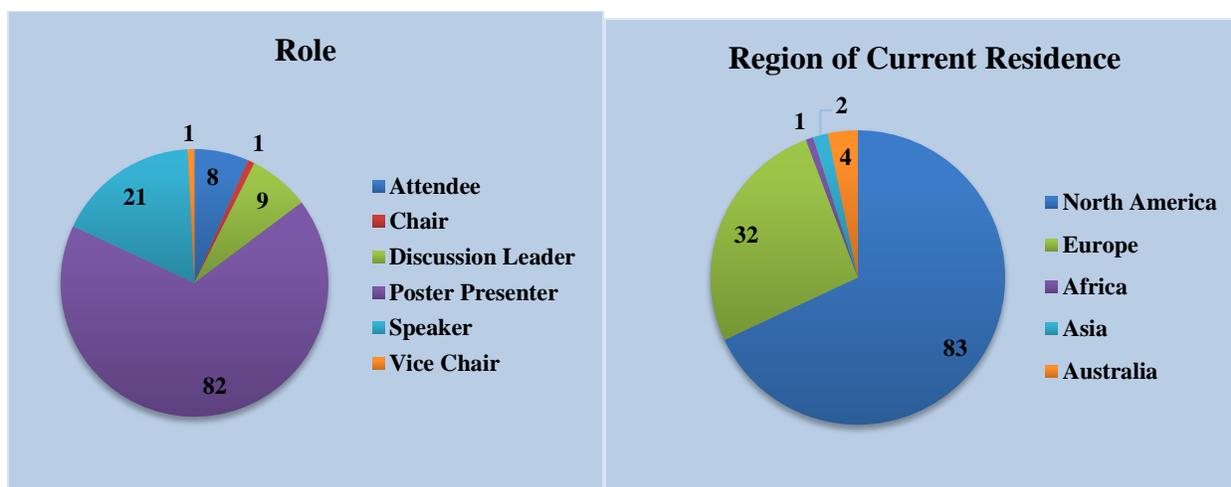


### Operational Summary

The Gordon Research Conference (GRC) and the Gordon Research Seminar (GRS) on Ionic Liquids were held at Grand Summit Hotel at Sunday River in Newry, Maine from August 6-12, 2022. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.

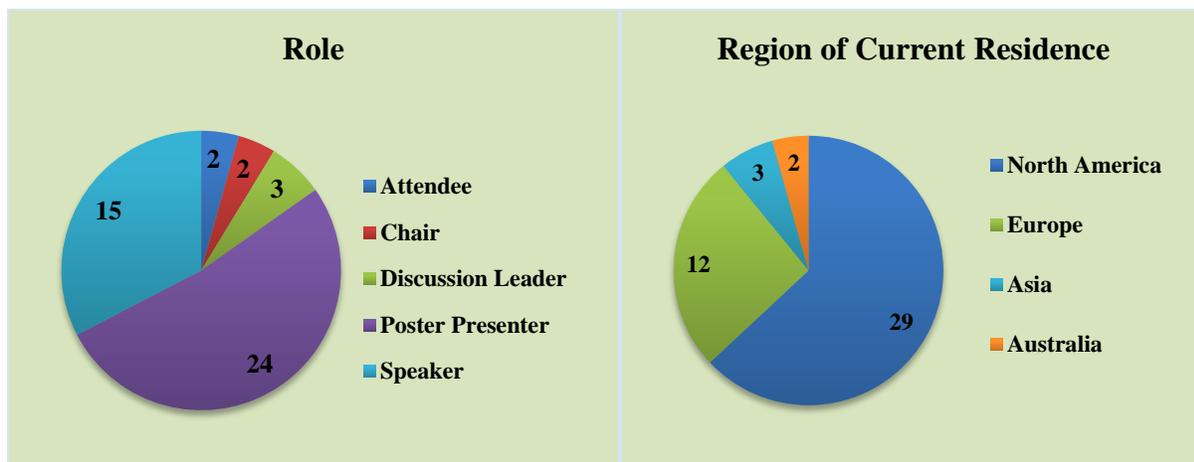
### Conference Participants

The Conference was well-attended with 122 participants. Scientists from academia represented 90% of the participants while attendees from government accounted for 5% 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 46% of all attendees. Approximately 40% of the participants at the 2022 meeting were women.



### Seminar Participants

The Conference was well-attended with 46 participants. Students and post docs combined accounted for 86% of all attendees. Approximately 50% of the participants at the 2022 seminar were women.



### **Conference Program**

Ionic Liquids are materials of almost boundless possibilities. Their countless variations and accessible properties enable them to be applied to virtually any area of science and technology. Building on the foundational work of a relatively few dedicated practitioners, research into ionic liquids has seen an unprecedented level of growth over the past 30 years. Applications of these remarkable materials are being realized in areas as diverse as electrochemical power, renewable fuels and chemicals, advanced materials, sensors, biomaterial processing, biotechnology, catalysis, pharmaceuticals, and separations. Underlying much of this work has been the relatively recent concept that ionic liquids are salts that melt below 100 °C, and this paradigm may have constrained the perspective of many of those new to the ionic liquids community. For well over a hundred years ionic liquids were thought of simply as liquid salts, and they were often referred to as molten salts, especially for higher temperature systems. Today ionic liquids and molten salts are thought of as separate and distinct research directions, and there is limited interaction between the two communities. However, just as temperature is a continuum so are ionic liquids. There is much potential for ionic liquids looking beyond 100°C and exploring more “extreme” conditions. The goal of this GRC was to expand the view of the participants on what ionic liquids are and how moving beyond self-imposed boundaries can enhance the potential of these remarkable materials. Presentations at this GRC highlighted many key interest areas of ionic liquids research and will foster thought provoking and stimulating discussions. In addition, selected talks sought to expand beyond the conventional boundaries of ionic liquids.

Continuing the success of the previous Gordon Research Seminars (GRSs) on Ionic Liquids and in support of the Gordon Research Conferences (GRCs) on Ionic Liquids, the 2022 GRS on Ionic Liquids presented an extraordinary opportunity for graduate students, postdoctoral researchers, and other emerging scientists with comparable levels of experience to exchange new results and innovative ideas from the cutting-edge world of ionic liquid research. The GRS was principally dedicated to empowering tomorrow's leaders in the field, to build synergistic efforts involving interdisciplinary collaborations across scientific disciplines and to bring innovation in the future of ionic liquid applications.

Ionic liquids have garnered significant attention due to their physicochemical properties, including negligible vapor pressure, wide liquid range, high viscosity, and tunable thermal stabilities. Around the world, research groups are advancing ionic liquids in numerous directions by incorporating applied, fundamental and theoretical research, thus making this field very unique. At the GRS, the fullness of these advances was explored in oral presentations and poster sessions. The GRS aimed to provide young researchers a highly intellectually and stimulating yet a relaxed environment to present their research while building a professional network among their peers.

### **Conference Budget**

Funding provided by the Army Research Office supported partial registration for 1 professor, 6 postdocs, 2 associate professors, 3 research scientists, 4 assistant professor and 25 graduate students at the GRC and 1 assistant professor, 15 graduate students and 4 post docs at the GRS.

### **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 from the GRC included numerous positive remarks the excellent program, diverse group of speakers and the wide range of subtopics. Evaluations from the GRS included positive remarks regarding the stimulating scientific discussions, networking and interactive sessions.

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. Paul Trulove, GRC Chair  
United States Naval Academy

Dr. Jared anderson, GRC Vice Chair  
Iowa State University

Dr. Hemant Choudhary, GRS Chair  
Joint BioEnergy Institute/Sandia National  
Laboratories

Dr. Emmanuel Varona-Torres, GRS Chair  
Weaver Consultants Group

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

## **Ionic Liquids**

**Gordon Research Conference**

**Linking Ionic Liquid Structure, Reactions and Applications Across Temperatures**

**August 7 - 12, 2022**

**Chair** Paul C. Trulove

**Vice Chairs** Jared L. Anderson

**Grand Summit Hotel at Sunday River**

97 Summit Road

Newry, ME, 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	<b>Keynote Session: The Future of Ionic Liquids</b> Discussion Leader: <b>Robert Mantz</b> (Army Research Office, United States)
7:40 pm - 7:45 pm	Introduction by Discussion Leader
7:45 pm - 8:25 pm	<b>Tom Welton</b> (Imperial College London, United Kingdom) "Why are Ionic Liquids so Viscous?"
8:25 pm - 8:40 pm	Discussion
8:40 pm - 9:20 pm	<b>Mark Shiflett</b> (University of Kansas, United States) "Project EARTH (Environmentally Applied Research Toward Hydrofluorocarbons)"
9:20 pm - 9:30 pm	Discussion

#### Monday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>Ionic Liquids Beyond the Boundaries</b> Discussion Leader: <b>Sheng Dai</b> (Oak Ridge National Laboratory, United States)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:45 am	<b>James Davis</b> (University of South Alabama, United States) "Recent Developments in the Chemistry of ILs with Perarylated Cations: High Achievers in Thermal Stability and Interesting Players in Biphasic Systems"
9:45 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:10 am	<b>Claudio Margulis</b> (University of Iowa, United States)

	"From Molten Salts to Ionic Liquids and Back. Structurally, What is the Same and What is Different?"
11:10 am - 11:30 am	Discussion
11:30 am - 12:10 pm	<b>Isiah Warner</b> (Louisiana State University, United States) "Am I a Failure Because My Ionic Liquids are Solids?"
12:10 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	<b>The GRC Power Hour™</b> <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> Organizers: <b>Burcu Gurkan</b> (Case Western Reserve University, United States) and <b>Jared Anderson</b> (Iowa State University, United States)
4:00 pm - 6:00 pm	<b>Poster Session</b>
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	<b>Linking Biology and Ionic Liquids</b> Discussion Leader: <b>Paula Berton</b> (University of Calgary, Canada)
7:30 pm - 7:35 pm	Introduction by Discussion Leader
7:35 pm - 8:05 pm	<b>Patrick Dennis</b> (Air Force Research Laboratory, United States) "Protein Liquids for Facile Bio-Functionalization of Materials"
8:05 pm - 8:15 pm	Discussion
8:15 pm - 8:45 pm	<b>Eden Tanner</b> (University of Mississippi, United States) "Ionic liquids for Selective Blood Component Targeting"
8:45 pm - 8:55 pm	Discussion
8:55 pm - 9:25 pm	<b>Arsalan Mirjafari</b> (State University of New York at Oswego, United States) "Ionic Liquids for Gene Delivery: De Novo Design at the Edge of Chaos"
9:25 pm - 9:30 pm	Discussion
<b>Tuesday</b>	
7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Group Photo

9:00 am - 12:30 pm	<b>The Interface Between Ionic Liquids and Deep Eutectic Solvents</b> Discussion Leader: <b>Burcu Gurkan</b> (Case Western Reserve University, United States)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:45 am	<b>Isabel Marrucho</b> (Instituto Superior Técnico, Universidade de Lisboa, Portugal) "Deep Eutectic Solvents: a Platform of Sustainable Technologies"
9:45 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:10 am	<b>Karen Edler</b> (Lund University, Sweden) "Self-Assembly in Deep Eutectic Solvents"
11:10 am - 11:30 am	Discussion
11:30 am - 12:10 pm	<b>Malgorzata Swadzba-Kwasny</b> (Queen's University Belfast, United Kingdom) "Liquid Coordination Complexes"
12:10 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	<b>Poster Session</b>
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	<b>Energy and Sensing Applications of Ionic Liquids</b> Discussion Leader: <b>Hunaid Nulwala</b> (RoCo Global, United States)
7:30 pm - 7:35 pm	Introduction by Discussion Leader
7:35 pm - 8:05 pm	<b>Cristina Pozo-Gonzalo</b> (Deakin University, Australia) "Advances in Electrolytes for Sustainable Batteries and Recovery of Scarce Raw Materials"
8:05 pm - 8:15 pm	Discussion
8:15 pm - 8:45 pm	<b>Jesse McDaniel</b> (Georgia Institute of Technology, United States) "Ionic Liquids at Electrified Interfaces: Inner Layer Capacitance and the Hydrophobic Effect"
8:45 pm - 8:55 pm	Discussion
8:55 pm - 9:25 pm	<b>Elizabeth Biddinger</b> (City College of New York, CUNY, United States) "Ionic Liquid-Modified Interfaces in CO <sub>2</sub> Electroreduction on Copper to Influence Product Selectivity"
9:25 pm - 9:30 pm	Discussion

## Wednesday

7:30 am - 8:30 am

Breakfast

9:00 am - 12:30 pm

### **Ionic Liquids in Future Sustainable Technologies**

Discussion Leader: **Jason Hallett** (Imperial College London, United Kingdom)

9:00 am - 9:05 am

Introduction by Discussion Leader

9:05 am - 9:45 am

**Jason Bara** (University of Alabama, United States)

"Ionic Liquids Meet High-Performance Polymers – Molecular Design Strategies for Tailoring Material Properties and Performance"

9:45 am - 10:00 am

Discussion

10:00 am - 10:30 am

Coffee Break

10:30 am - 11:10 am

**Agnieszka Brandt-Talbot** (Imperial College London, United Kingdom)

"Low-cost Ionic Liquids for the Refining of Lignocellulosic Biomass into Advanced Renewable Materials"

11:10 am - 11:30 am

Discussion

11:30 am - 12:10 pm

**Joan Brennecke** (University of Texas at Austin, United States)

"Olefin/Paraffin Separations with Ionic Liquids"

12:10 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**

*Nominations for the Next Vice Chair(s); Complete the GRC Evaluation Forms; Discuss Future Dates and Venue; Election of the Next Vice Chair(s)*

7:30 pm - 9:30 pm

### **Natural and Synthetic Polymers**

Discussion Leader: **Luke Haverhals** (Natural Fiber Welding, Inc., United States)

7:30 pm - 7:35 pm

Introduction by Discussion Leader

7:35 pm - 8:15 pm

**David Durkin** (United States Naval Academy, United States)

"Ionic Liquid Manipulation and Modification of Biopolymer Substrates"

8:15 pm - 8:35 pm

Discussion

8:35 pm - 9:10 pm

**Julia Shamshina** (Texas Tech University, United States)

"Chitin Processing in Ionic Liquid Media"

9:10 pm - 9:30 pm Discussion

**Thursday**

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Structure-Property Relationships in Ionic Liquids**  
Discussion Leader: **James Cosby** (University of Tennessee Southern, United States)

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

9:05 am - 9:45 am **Ralf Ludwig** (University of Rostock, Germany)  
"Kinetics of Hydrogen Bonds between Ions of Opposite and Ions of Like Charge in Hydroxyl-Functionalized Ionic Liquids"

9:45 am - 10:00 am Discussion

10:00 am - 10:30 am Coffee Break

10:30 am - 11:10 am **Edward Maginn** (University of Notre Dame, United States)  
"Molecular Simulation of Hydrofluorocarbons in Ionic Liquids: Solubility and Impact on Physical Properties"

11:10 am - 11:30 am Discussion

11:30 am - 12:10 pm **Matthew Gebbie** (University of Wisconsin-Madison, United States)  
"Exploring How Ionic Correlations and Collect Assembly Influence Electrochemical Reactivity"

12:10 pm - 12:30 pm Discussion

12:30 pm - 1:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 5:30 pm **Poster Session**

5:30 pm - 7:30 pm **Late-Breaking Topics**  
Discussion Leaders: **Jared Anderson** (Iowa State University, United States)

5:30 pm - 5:45 pm **Roland Kalb** (Proionic GmbH, Austria)  
"Toward Industrialization of Ionic Liquids at Proionic – Recent Developments and Future Perspectives"

5:45 pm - 5:55 pm Discussion

5:55 pm - 6:10 pm **Maariyah Y Suleman** (Imperial College London, United Kingdom)  
"Understanding the Decomposition and Evaporation of Protic Hydrogen Sulfate Ionic Liquids"

6:10 pm - 6:20 pm Discussion

6:20 pm - 6:35 pm **Hemant Choudhary** (Joint BioEnergy Institute / Sandia National Laboratories, United States)  
"Ionic Liquids in Natural and Synthetic Polymers Upcycling"

6:35 pm - 6:45 pm Discussion

6:45 pm - 7:00 pm **Naomi Elstone** (University of York, United Kingdom)  
"Bulk and Interfacial Structure of IL Mixtures"

7:00 pm - 7:10 pm Discussion

7:10 pm - 7:25 pm **Durgesh Wagle** (Florida Gulf Coast University, United States)  
"Covalently Linked Hydrogen Bond Donors: The Other Side of Molecular Frustration in Deep Eutectic Solvents"

7:25 pm - 7:30 pm Discussion

8:00 pm - 9:00 pm Dinner

#### Friday

7:30 am - 8:30 am Breakfast

9:00 am Departure

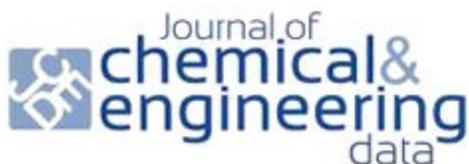
#### Contributors



**Gordon Research  
Conferences**  
*Frontiers of Science*



Predominantly  
Undergraduate  
Institution Fund





Jim Moore Family



This material is based upon work supported by the Air Force Office of Scientific Research under award number FA9550-20-1-0022. Any opinions, finding, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the United States Air Force. 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

## **Ionic Liquids (GRS)**

### **Gordon Research Seminar**

### **Linking Ionic Liquid Structure, Reactions and Applications Across Temperatures**

**August 6 - 7, 2022**

**Chairs** Emmanuel Varona-Torres and Hemant Choudhary

### **Grand Summit Hotel at Sunday River**

97 Summit Road

Newry, ME, United States

### **Conference Program**

#### **Saturday**

1:00 pm - 5:00 pm	Arrival and Check-in
3:30 pm - 3:45 pm	Introductory Comments by GRC Site Staff / Welcome from the GRS Chair
3:45 pm - 4:30 pm	<b>Analytical Techniques in Ionic Liquid and Deep Eutectic Solvents-Based Applications</b> Discussion Leader: <b>Furong Wang</b> (Brookhaven National Lab, United States)
3:45 pm - 4:00 pm	<b>Maariyah Y Suleman</b> (Imperial College London, United Kingdom) "Understanding the Decomposition and Evaporation of Protic Hydrogen Sulfate Ionic Liquids"
4:00 pm - 4:10 pm	Discussion
4:10 pm - 4:25 pm	<b>Adriaan van den Bruinhorst</b> (École Normale Supérieure Lyon, France) "First Evidence of Melting for Choline Chloride Using Fast Scanning Calorimetry"
4:25 pm - 4:30 pm	Discussion
4:30 pm - 6:00 pm	<b>Poster Session</b>
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	<b>Understanding the Correlation of Structure and Properties of Ionic Liquids and Deep Eutectic Solvents</b> Discussion Leader: <b>Oliver Hammond</b> (Stockholm University, Sweden)
7:30 pm - 7:45 pm	<b>Shurui Miao</b> (The University of Sydney, Australia) "Multi-Scale Dynamic Study on The Amphiphilic Nanostructure of Protic Ionic Liquids"
7:45 pm - 7:55 pm	Discussion
7:55 pm - 8:10 pm	<b>Nicholas Tryon-Tasson</b> (Iowa State University, United States) "Developing Novel Ternary Hydrophobic Magnetic Deep Eutectic Solvents and Investigating Their Physico-Chemical Properties"
8:10 pm - 8:20 pm	Discussion
8:20 pm - 8:35 pm	<b>Colleen Lasar</b> (University of Iowa, United States)

"Investigation of the Thermal and Structural Behavior of Imidazolium-Based IL Eutectics"

8:35 pm - 8:45 pm Discussion

8:45 pm - 9:00 pm **Sophia Sagala** (Texas Tech University, United States)  
"Ion Pairing and Dynamics in Ionic Liquids and Ionic Liquid/Molecular Solvent Mixtures"

9:00 pm - 9:10 pm Discussion

9:10 pm - 9:25 pm **Charlotte Borrill** (Imperial College London, United Kingdom)  
"An Investigation into the Physicochemical Properties of 1-Alkyl-3-Methylimidazolium Chloride Ionic Liquids and Their Binary Aqueous Solutions"

9:25 pm - 9:30 pm Discussion

## Sunday

7:30 am - 8:30 am Breakfast

9:00 am - 11:00 am **Future of Ionic Liquids/Deep Eutectic Solvents in Industrial Applications**  
Discussion Leader: **Emmanuel Varona-Torres** (Weaver Consultants Group, United States)

9:00 am - 9:15 am **Rocio Perez** (Academy, United States)  
"Development of Magnetic Cellulose-Based GUMBOS for the Extraction of Emerging Contaminants"

9:15 am - 9:25 am Discussion

9:25 am - 9:40 am **Ashlee Aiello** (National Institute of Standards and Technology, United States)  
"Deconvolution of Ionic Liquid, Cellulose, and Coagulant Interactions in Biphasic Cellulose Yarns"

9:40 am - 9:50 am Discussion

9:50 am - 10:05 am **Eda Cagli** (Case Western Reserve University, United States)  
"Thermal and oxidative stability of [EMIM][2-CNpyr] relevant to CO<sub>2</sub> capture"

10:05 am - 10:15 am Discussion

10:15 am - 10:30 am **Michael Keating** (City College of New York, United States)  
"Ionic Liquid and Ester Co-Solvent System for Improving Physical and Electrochemical Properties of Lithium Metal Battery Electrolyte"

10:30 am - 10:40 am Discussion

10:40 am - 10:55 am **Talia Shmool** (Imperial College London, United Kingdom)  
"Ionic-Liquid Based Strategy for Reviving Lost Therapeutic Candidates"

10:55 am - 11:00 am Discussion

11:00 am - 12:30 pm **Poster Session**

*Coffee will be served in the poster area from 11:00 am - 11:30 am*

12:30 pm - 1:30 pm Lunch

1:30 pm - 2:30 pm **Mentorship Component: Discovering Career Options**

Discussion Leaders: **Emmanuel Varona-Torres** (Weaver Consultants Group , United States) and **Hemant Choudhary** (Joint BioEnergy Institute / Sandia National Laboratories, United States)

1:30 pm - 2:30 pm **Panel Discussion**

*Career Discussions*

- **Paul Trulove** (United States Naval Academy, United States)
- **Joan Brennecke** (University of Texas at Austin, United States)
- **Robert Mantz** (Army Research Office, United States)

2:30 pm - 3:00 pm **Evaluation Period**

*Complete the GRS Evaluation Forms; Election of Future Chair(s)*

3:00 pm Seminar Concludes

#### Contributors



This material is based upon work supported by the Air Force Office of Scientific Research under award number FA9550-20-1-0022. Any opinions, finding, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the United States Air Force.

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	Participation	Gender
Trulove, Paul C	United States Naval Academy	Chair	Male
Anderson, Jared L	Iowa State University	Vice Chair	Male
Bara, Jason E	University of Alabama	Speaker	Male
Biddinger, Elizabeth J	City College of New York, CUNY	Speaker	Female
Brandt-Talbot, Agnieszka	Imperial College London	Speaker	Female
Brennecke, Joan F	University of Texas at Austin	Speaker	Female
Choudhary, Hemant	Joint BioEnergy Institute / Sandia National Laboratories	Speaker	Male
Davis, James H	University of South Alabama	Speaker	Male
Dennis, Patrick B	Air Force Research Laboratory	Speaker	Male
Durkin, David P.	United States Naval Academy	Speaker	Male
Edler, Karen J	Lund University	Speaker	Female
Elstone, Naomi	University of York	Speaker	Female
Gebbie, Matthew	University of Wisconsin-Madison	Speaker	Male
Kalb, Roland S.	Proionic GmbH	Speaker	Male
Ludwig, Ralf	University of Rostock	Speaker	Male
Maginn, Edward J	University of Notre Dame	Speaker	Male
Margulis, Claudio J	University of Iowa	Speaker	Male
Marrucho, Isabel M.	Instituto Superior Técnico, Universidade de Lisboa	Speaker	Female
McDaniel, Jesse G.	Georgia Institute of Technology	Speaker	Male
Mirjafari, Arsalan	State University of New York at Oswego	Speaker	Male
Pozo-Gonzalo, Cristina	Deakin University	Speaker	Female
Shamshina, Julia L	Texas Tech University	Speaker	Female
Shiflett, Mark B	University of Kansas	Speaker	Male
Suleman, Maariyah Y	Imperial College London	Speaker	Female
Swadzba-Kwasny, Malgorzata	Queen's University Belfast	Speaker	Female
Tanner, Eden E L	University of Mississippi	Speaker	Female
Wagle, Durgesh	Florida Gulf Coast University	Speaker	Male
Warner, Isiah M	Louisiana State University	Speaker	Male
Welton, Tom	Imperial College London	Speaker	Male
Berton, Paula	University of Calgary	Discussion Leader	Female
Cosby, James T	University of Tennessee Southern	Discussion Leader	Male
Dai, Sheng	Oak Ridge National Laboratory	Discussion Leader	Male
De Long, Hugh	U.S. Army Research Office	Discussion Leader	Male
Gurkan, Burcu	Case Western Reserve University	Discussion Leader	Female
Hallett, Jason P	Imperial College London	Discussion Leader	Male
Haverhals, Luke M.	Natural Fiber Welding, Inc.	Discussion Leader	Male
Mantz, Robert	Army Research Office	Discussion Leader	Male

Name	Affiliation	Participation	Gender
Nulwala, Hunaid	RoCo Global	Discussion Leader	Male
Acharya, Gobin	Rutgers University	Poster Presenter	Male
Adigun, Babafemi	University of Tennessee	Poster Presenter	Male
Aiello, Ashlee	National Institute of Standards and Technology	Poster Presenter	Female
Anderson, Grace	Massachusetts Institute of Technology	Poster Presenter	Female
Ashfeld, Brandon L	University of Notre Dame	Poster Presenter	Male
Baca, Kalin	University of Kansas	Poster Presenter	Female
Baker, Gary	University of Missouri	Poster Presenter	Male
Benito-Lopez, Fernando	Microfluidics Cluster UPV/EHU; University of the Basque Country	Poster Presenter	Male
Borrill, Charlotte	Imperial College London	Poster Presenter	Female
Bund, Andreas	Technische Universität Ilmenau	Poster Presenter	Male
Burns, Dominic	Queens University Belfast	Poster Presenter	Male
Cagli, Eda	Case Western Reserve University	Poster Presenter	Female
Chism, Claylee	University of Mississippi	Poster Presenter	Female
De Silva, Hikkaduwe Koralege Shash	Iowa State University	Poster Presenter	Female
Do-Thanh, Chi-Linh	University of Tennessee	Poster Presenter	Male
Dobyns, Breanna	University of South Alabama	Poster Presenter	Female
Duranty, Edward R	Western Carolina University	Poster Presenter	Male
Frater, Theodore E	US Army, Combat Capabilities Development Command, Armaments Center	Poster Presenter	Male
Glynn, Kaylie	Ohio State University	Poster Presenter	Female
Haggard, Dorothy	University of Kansas	Poster Presenter	Female
Hammond, Oliver	Stockholm University	Poster Presenter	Male
Hansen, Benworth	OSU	Poster Presenter	Male
Heitz, Mark	SUNY Brockport	Poster Presenter	Male
Hopkins, Todd A	Butler University	Poster Presenter	Male
Ishtaweera, Piyuni Shakila	University of Missouri	Poster Presenter	Female
Ispas, Adriana	Technische Universität Ilmenau	Poster Presenter	Female
Jeddi, Javad	Ohio State University	Poster Presenter	Male
Kaur, Jagdeep	Texas Tech University	Poster Presenter	Female
Keating, Michael	City College of New York	Poster Presenter	Male
Keller, Austin N	The University of Texas at Austin	Poster Presenter	Male
Kist, Jennifer	University of Missouri-Columbia	Poster Presenter	Female
Klemm, Aidan	Case Western Reserve University	Poster Presenter	Male
Kuroda, Daniel G	Louisiana State University	Poster Presenter	Male
Lange, Alyna	University of Potsdam	Poster Presenter	Female
Lasar, Colleen	University of Iowa	Poster Presenter	Female
Luo, Huimin	Oak Ridge National Laboratory	Poster Presenter	Female
Matthews, Richard P	University of East London	Poster Presenter	Male

Name	Affiliation	Participation	Gender
McAlpine, Jack	University of Wisconsin - Madison	Poster Presenter	Male
McGrogan, Anne	Queen's University Belfast	Poster Presenter	Female
Miao, Shurui	The University of Sydney	Poster Presenter	Male
Mokhtari-nori, Narges	University of Tennessee	Poster Presenter	Female
Morales, Abneris	Rutgers University-Camden	Poster Presenter	Female
Ogbodo, Raphael	University of Iowa	Poster Presenter	Male
Paluch, Marian	The University of Silesia in Katowice, Poland	Poster Presenter	Male
Panzer, Matthew J	Tufts University	Poster Presenter	Male
Perez, Rocio	Academy	Poster Presenter	Female
Philippi, Frederik	Imperial College London	Poster Presenter	Male
Poon, Louis	Georgetown University	Poster Presenter	Male
Quitevis, Edward L	Texas Tech University	Poster Presenter	Male
Ravula, Sudhir	The University of Alabama, Tuscaloosa	Poster Presenter	Male
Reichert, William M	University of South Alabama	Poster Presenter	Male
Sagala, Sophia	Texas Tech University	Poster Presenter	Female
Samuel, Shannan	USW	Poster Presenter	Female
Scaglione, Nicolas	CNRS-UMR5182	Poster Presenter	Male
Shmool, Talia Amira	Imperial College London	Poster Presenter	Female
Siegel, Asher	University of Missouri - Columbia	Poster Presenter	Male
Singh, Gagandeep	University of Mississippi	Poster Presenter	Male
Slattery, John M	The University of York	Poster Presenter	Male
Slocik, Joseph	Materials and Manufacturing Directorate/AFRL	Poster Presenter	Male
Socha, Aaron	Queens University of Charlotte	Poster Presenter	Male
Stachurski, Christopher	United States Naval Academy	Poster Presenter	Male
Stumme, Nathan	University of Iowa	Poster Presenter	Male
Thomas, Marie	Fordham University	Poster Presenter	Female
Trivedi, Siddhi	University of Nottingham	Poster Presenter	Female
Tryon-Tasson, Nicholas	Iowa State University	Poster Presenter	Male
Turnaoglu, Tugba	Oak Ridge National Laboratory	Poster Presenter	Female
Uralcan, Betul	Bogazici University	Poster Presenter	Female
van den Bruinhorst, Adriaan	École Normale Supérieure Lyon	Poster Presenter	Male
Vashisth, Priyavrat	University of Mississippi	Poster Presenter	Male
Wang, Furong	Brookhaven National Lab	Poster Presenter	Female
Wang, Ning	University of Notre Dame	Poster Presenter	Female
Warrington, Anna	Deakin University	Poster Presenter	Female
Wieck, Karl	Tufts University	Poster Presenter	Male
Wojnarowska, Zaneta	University of Silesia in Katowice	Poster Presenter	Female
Zhang, Xuhui	University of Illinois Urbana-Champaign	Poster Presenter	Male
Zheng, Qianlu	University of Illinois at Urbana-Champaign	Poster Presenter	Female
Crowley, Margaret	University of South Alabama	Attendee	Female
Eggers, Bill	Bio-logic USA	Attendee	Male

Name	Affiliation	Participation	Gender
El-Zahab, Bilal	Florida International University	Attendee	Male
Freitas, Adilson A.	University of Lisbon	Attendee	Male
Runcevski, Tom	SMU	Attendee	Male
Shimizu, Karina	University of Lisbon	Attendee	Female
Varona-Torres, Emmanuel	Weaver Consultants Group	Attendee	Male
Wishart, James F	Brookhaven National Laboratory	Attendee	Male

## GRS Attendee List

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

Note: Only one primary role is recorded for each registration record, even if the attendee served in multiple roles at the meeting. The recorded role is based on the order of precedence listed below.

Name	Affiliation	Participation	Gender
Choudhary, Hemant	Joint BioEnergy Institute / Sandia National Laboratories	Chair	Male
Varona-Torres, Emmanuel	Weaver Consultants Group	Chair	Male
Aiello, Ashlee	National Institute of Standards and Technology	Speaker	Female
Borrill, Charlotte	Imperial College London	Speaker	Female
Brennecke, Joan F	University of Texas at Austin	Speaker	Female
Cagli, Eda	Case Western Reserve University	Speaker	Female
Keating, Michael	City College of New York	Speaker	Male
Lasar, Colleen	University of Iowa	Speaker	Female
Mantz, Robert	Army Research Office	Speaker	Male
Miao, Shurui	The University of Sydney	Speaker	Male
Perez, Rocio	Academy	Speaker	Female
Sagala, Sophia	Texas Tech University	Speaker	Female
Shmool, Talia Amira	Imperial College London	Speaker	Female
Suleman, Maariyah Y	Imperial College London	Speaker	Female
Trulove, Paul C	United States Naval Academy	Speaker	Male
Tryon-Tasson, Nicholas	Iowa State University	Speaker	Male
van den Bruinhorst, Adriaan	École Normale Supérieure Lyon	Speaker	Male
Hammond, Oliver	Stockholm University	Discussion Leader	Male
Stachurski, Christopher	United States Naval Academy	Discussion Leader	Male
Wang, Furong	Brookhaven National Lab	Discussion Leader	Female
Adigun, Babafemi	University of Tennessee	Poster Presenter	Male
Burns, Dominic	Queens University Belfast	Poster Presenter	Male
Chism, Claylee	University of Mississippi	Poster Presenter	Female
Crowley, Margaret	University of South Alabama	Poster Presenter	Female
De Long, Hugh	U.S. Army Research Office	Poster Presenter	Male
De Silva, Hikkaduwe Koralege Shash	Iowa State University	Poster Presenter	Female
Do-Thanh, Chi-Linh	University of Tennessee	Poster Presenter	Male
Dobyns, Breanna	University of South Alabama	Poster Presenter	Female
Elstone, Naomi	University of York	Poster Presenter	Female
Kaur, Jagdeep	Texas Tech University	Poster Presenter	Female
Keller, Austin N	The University of Texas at Austin	Poster Presenter	Male
Klemm, Aidan	Case Western Reserve University	Poster Presenter	Male
Lange, Alyna	University of Potsdam	Poster Presenter	Female
McAlpine, Jack	University of Wisconsin - Madison	Poster Presenter	Male

Name	Affiliation	Participation	Gender
McGrogan, Anne	Queen's University Belfast	Poster Presenter	Female
Mokhtari-nori, Narges	University of Tennessee	Poster Presenter	Female
Philippi, Frederik	Imperial College London	Poster Presenter	Male
Ravula, Sudhir	The University of Alabama, Tuscaloosa	Poster Presenter	Male
Samuel, Shannan	USW	Poster Presenter	Female
Scaglione, Nicolas	CNRS-UMR5182	Poster Presenter	Male
Singh, Gagandeep	University of Mississippi	Poster Presenter	Male
Stumme, Nathan	University of Iowa	Poster Presenter	Male
Trivedi, Siddhi	University of Nottingham	Poster Presenter	Female
Vashisth, Priyavrat	University of Mississippi	Poster Presenter	Male
Wang, Ning	University of Notre Dame	Poster Presenter	Female
Warrington, Anna	Deakin University	Poster Presenter	Female