

RPPR Final Report

as of 23-May-2023

Agency Code: 21XD

Proposal Number: 80604PECF

Agreement Number: W911NF-22-1-0095

INVESTIGATOR(S):

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Principal: Y

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

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EIN: 050300482

Report Date: 14-Mar-2023

Date Received: 27-Dec-2022

Final Report for Period Beginning 15-Jun-2022 and Ending 14-Dec-2022

Title: 2022 Defects in Semiconductors Gordon Research Conference and Gordon Research Seminar

Begin Performance Period: 15-Jun-2022

End Performance Period: 14-Dec-2022

Report Term: 0-Other

Submitted By: Ph.D. Nancy Gray

Email: grants@grc.org

Phone: (401) 783-4011

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

STEM Degrees: 0

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: Developing the ability to control and manipulate defects in semiconductor materials and devices has been of fundamental importance to the semiconductor industry from its inception. In nanoscale devices the presence of a single defect can have a profound influence on device performance. In many semiconductor device applications, including the solar industry, to achieve optimal device performance defect minimization within the bulk and at interfaces is of paramount importance. To achieve the exquisite control required, detailed attention needs to be given to the appropriate combination of theory, characterization and control. Not all defects are detrimental to device performance and in some cases defects can be used as the active element of a device or material. That is particularly true in the case of emerging quantum devices where single defects with desirable optical and electronic properties are being used to develop quantum computing, quantum metrology and spintronic technologies. The Gordon Research Conference on Defects in Semiconductors focused on the key issues of defect formation, characterization, control and utilization that need to be addressed for continued development in semiconductor and emerging quantum device technologies.

This Gordon Research Conference on Defects in Semiconductors offered a unique opportunity for scientists and technologists to address key questions and opportunities associated with defects across the full spectrum of semiconductor materials and devices. The off-the-record format of the conference allowed an opportunity for full and frank discussion of new discoveries and challenges. The conference blended lecture hall presentation and in-depth discussion with social gatherings to provide an environment in which young scientists and experienced practitioners in the field can actively engage in sharing concerns and advances in semiconductor research. Attendees benefited from the conference-friendly facilities and relaxed atmosphere of Colby-Sawyer College. The format of the conference and the local environment provided an excellent opportunity to discuss science and to develop networks and new collaborations.

The conference addressed theory, characterization, control and utilization of defects in a broad range of

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semiconductor materials and devices of topical interest. This included defects in wide band-gap nitride, oxide, and carbide semiconductors and novel two-dimensional materials such as transition metal di-chalcogenides and other graphene analogues. Attention was also focused on emerging materials for photovoltaics including the perovskites. Technological applications range from electronics for power generation, power distribution, and lighting to spintronics and quantum information processing.

The Gordon Research Conference is complemented by a highly successful Gordon Research Seminar (GRS) designed by and for graduate students and post-doctoral fellows. The two-day GRS preceded the GRC, acclimatizing young scientists to the unique style of Gordon Conferences and encouraging them to share and present their ideas to their peers. Attendance at both the GRS and GRC provided young scientists with a unique opportunity to actively engage in this area of research that is of fundamental importance to existing and future developments in semiconductor and quantum technologies.

The Gordon Research Seminar on Defects in Semiconductors explored two general themes. First, how experimental and theoretical techniques allow us to characterize defects at the microscopic level and their formation in semiconductor materials. Second, how one can utilize these insights via defect engineering to control the optical, electronic, and thermal properties of a material. Applications included but were not limited to optoelectronic devices, quantum technologies, and photocatalytic materials.

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

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

Signature: Darlene Armstrong

Signature Date: 12/27/22 12:00PM



**GORDON RESEARCH CONFERENCES
FINAL REPORT
US Army Research Office
Defects in Semiconductors GRC/GRS
Grant Number W911NF-22-1-0095**

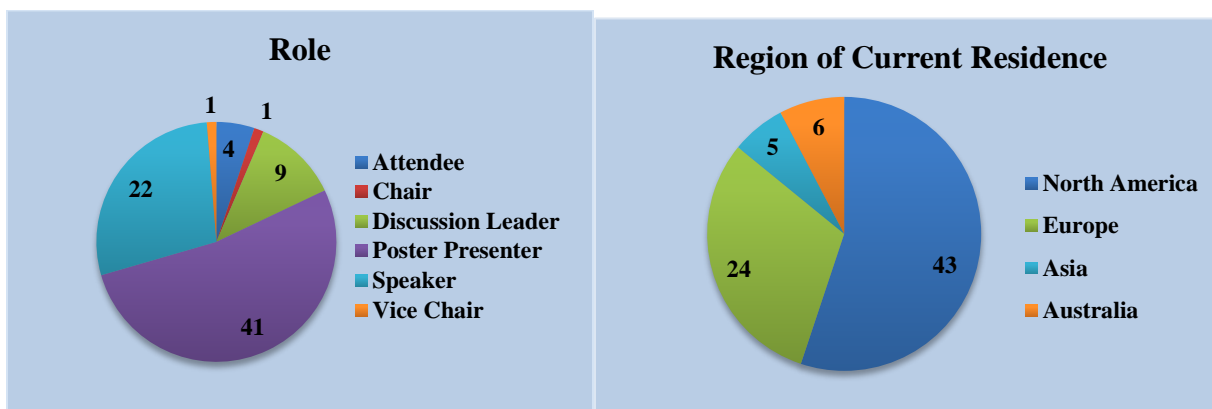
Operational Summary

The Gordon Research Conference (GRC) and the Gordon Research Seminar (GRS) on Defects in Semiconductors were held at Colby-Sawyer College in New London, New Hampshire from August 13-19, 2022. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.



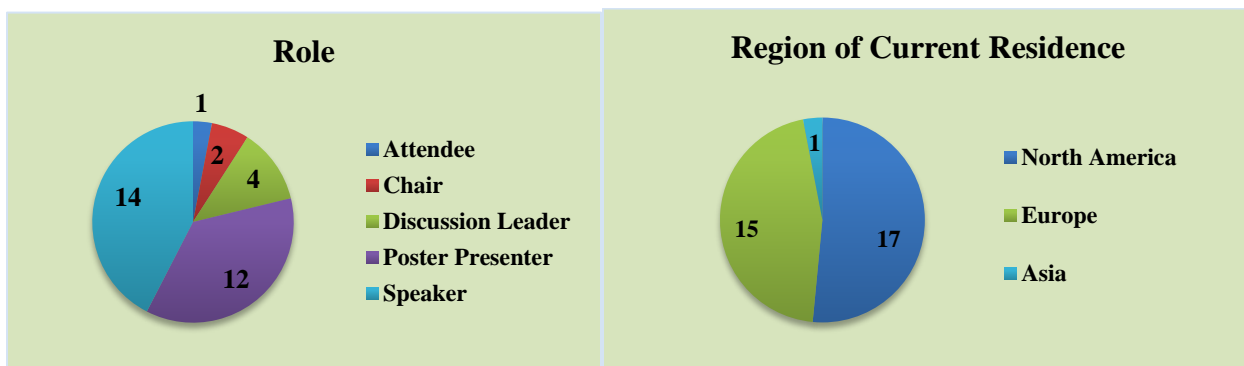
Conference Participants

The Conference was well-attended with 78 participants. Scientists from academia represented 91% of the participants while attendees from government accounted for 9%. The meeting also attracted a strong mix of young investigators and senior scientists. Students and post-docs accounted for 50% of all attendees. Approximately 28% of the participants at the 2022 meeting were women.



Seminar Participants

The Conference was well-attended with 33 participants. Students and post docs combined accounted for 93% of all attendees. Approximately 27% of the participants at the 2022 seminar were women.



Conference Program

Developing the ability to control and manipulate defects in semiconductor materials and devices has been of fundamental importance to the semiconductor industry from its inception. In nanoscale devices the presence of a single defect can have a profound influence on device performance. In many semiconductor device applications, including the solar industry, to achieve optimal device performance defect minimization within the bulk and at interfaces is of paramount importance. To achieve the exquisite control required, detailed attention needs to be given to the appropriate combination of theory, characterization and control. Not all defects are detrimental to device performance and in some cases defects can be used as the active element of a device or material. That is particularly true in the case of emerging quantum devices where single defects with desirable optical and electronic properties are being used to develop quantum computing, quantum metrology and spintronic technologies. The Gordon

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The conference addressed theory, characterization, control and utilization of defects in a broad range of semiconductor materials and devices of topical interest. This included defects in wide band-gap nitride, oxide, and carbide semiconductors and novel two-dimensional materials such as transition metal di-chalcogenides and other graphene analogues. Attention was also focused on emerging materials for photovoltaics including the perovskites. Technological applications range from electronics for power generation, power distribution, and lighting to spintronics and quantum information processing.

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Conference Budget

Funding provided by the US Army Research Office supported partial registration for 1 research scientist, 3 post docs, 3 professors, 1 associate professor and 9 graduate students at the GRC and 1 research scientist, 19 graduate students, 1 assistant professor and 5 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 regarding the opportunity to network, ample time for discussion and the cutting edge science presented. Evaluations from the GRS included positive remarks regarding the stimulating scientific discussions, networking and interactive poster sessions.

GRC would like to thank the US 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. Jeffrey McCallum, GRC Chair
University of Melbourne

Dr. Kai-Mei Fu, GRC Vice Chair
University of Washington

Dr. Ymir Kalmann Fordason, GRS Chair
University of Oslo

Dr. Hongling Lu, GRS Chair
University of Michigan

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

Defects in Semiconductors

Gordon Research Conference

Defect Formation, Characterization, Control and Utilization

August 14 - 19, 2022

Chair Jeffrey C. McCallum

Vice Chair Kai-Mei C. Fu

Colby-Sawyer College

541 Main Street

New London, NH, 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 Developments in Defect Spectroscopy and Metrology
Discussion Leader: Lasse Vines (University of Oslo, Norway)

7:40 pm - 7:50 pm Introduction by Discussion Leader

7:50 pm - 8:25 pm Darshana Wickramaratne (US Naval Research Laboratory, United States)
"Defect Identification Based on First-Principles Calculations for Deep-Level Transient Spectroscopy"

8:25 pm - 8:40 pm Discussion

8:40 pm - 9:15 pm Jean-Philippe Tetienne (RMIT University, Australia)
"Multi-Modal Imaging Using Spin Defects in Diamond and Hexagonal Boron Nitride"

9:15 pm - 9:30 pm Discussion

Monday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm Characteristics of Defects in 2D Materials and Oxide Semiconductors
Discussion Leader: Joel Varley (Materials Science Division, Lawrence Livermore National Laboratory, United States)

9:00 am - 9:20 am Introduction by Discussion Leader

9:20 am - 9:55 am Gergo Thiering (Wigner Research Centre for Physics, Hungary)
"Non-Radiative Relaxation Processes of the Neutral Nitrogen Vacancy Centre by Means of Ab-Initio Calculations"

9:55 am - 10:10 am Discussion

10:10 am - 10:40 am Coffee Break

10:40 am - 11:15 am	Matt McCluskey (Washington State University, United States) "Using Light to Change Hydrogen-Related Defects in Oxide Semiconductors"
11:15 am - 11:30 am	Discussion
11:30 am - 12:05 pm	John Lyons (U.S. Naval Research Laboratory, United States) "Doping Challenges in Wide-Band-Gap Oxides: DX-Like Donors and Polaronic Acceptors"
12:05 pm - 12:20 pm	Discussion
12:20 pm - 12:30 pm	General 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> Organizers: Kai-Mei Fu (University of Washington, United States) and Hongling Lu (University of Michigan, United States)
4:00 pm - 6:00 pm	Poster Session
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	Color Centers in Wide Band-Gap Semiconductors and 2D Materials for Quantum Applications Discussion Leader: Yuan Ping (University of California Santa Cruz, United States)
7:30 pm - 7:50 pm	Introduction by Discussion Leader
7:50 pm - 8:25 pm	Chitraleema Chakraborty (University of Delaware, United States) "Single Photon Emitters in 2D Materials"
8:25 pm - 8:40 pm	Discussion
8:40 pm - 9:15 pm	Cyrus Dreyer (Stony Brook University , United States) "First-Principles Calculations of Point Defects for Quantum Technologies"
9:15 pm - 9:30 pm	Discussion
Tuesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Spin Centers: Spectroscopy and Applications

Discussion Leader: Takeshi Ohshima (National Institutes for Quantum Science and Technology (QST), Japan)

9:00 am - 9:20 am Introduction by Discussion Leader

9:20 am - 9:55 am Brett Johnson (RMIT University, Australia)
"Spin Dependent Recombination in Silicon Carbide"

9:55 am - 10:10 am Discussion

10:10 am - 10:40 am Group Photo / Coffee Break

10:40 am - 11:15 am Michael Stavola (Lehigh University, United States)
"H Trapped by VGa in the β , α , and ϵ Phases of Ga₂O₃"

11:15 am - 11:30 am Discussion

11:30 am - 12:05 pm Mark Turiansky (University of California, Santa Barbara, United States)
"Point Defects in Wide-band-gap Semiconductors for Quantum Information Applications"

12:05 pm - 12:20 pm Discussion

12:20 pm - 12:30 pm General 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 Defects in Nitride Semiconductors
Discussion Leader: Mary Ellen Zvanut (University of Alabama at Birmingham, United States)

7:30 pm - 7:50 pm Introduction by Discussion Leader

7:50 pm - 8:25 pm Ramon Collazo (North Carolina State University, United States)
"Point Defect Management in III-Nitrides"

8:25 pm - 8:40 pm Discussion

8:40 pm - 9:15 pm Annemarie Exarhos (Lafayette College, United States)
"Quantum Emission in Hexagonal Boron Nitride"

9:15 pm - 9:30 pm Discussion

Wednesday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm	Defects in Photovoltaic Materials and Devices, Identification and Control Discussion Leader: Dane deQuilettes (MIT Lincoln Laboratory, United States)
9:00 am - 9:20 am	Introduction by Discussion Leader
9:20 am - 9:55 am	Hele Savin (Aalto University, Finland) "Copper Defects in Silicon – Harmful or Not?"
9:55 am - 10:10 am	Discussion
10:10 am - 10:40 am	Coffee Break
10:40 am - 11:15 am	Wolfram Kwapil (University of Freiburg, Germany) "Long-Term Instabilities in PV Devices in the Field due to Bulk Defect Evolution"
11:15 am - 11:30 am	Discussion
11:30 am - 12:05 pm	Vladan Strevanovic (Colorado School of Mines, United States) "Defect Modelling and Materials Discovery: Perovskite-Inspired Photovoltaic Materials"
12:05 pm - 12:20 pm	Discussion
12:20 pm - 12:30 pm	General 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	High Resolution Imaging and Characterization of Defects Discussion Leader: Paul Koenraad (Eindhoven University of Technology, The Netherlands)
7:30 pm - 7:40 pm	Introduction by Discussion Leader
7:40 pm - 8:15 pm	Lorenzo Rigutti (CNRS University of Rouen Normandie, France) "In-Situ Photoluminescence Inside a Tomographic Atom Probe: Insights in Semiconductor Microscopy and Field-Emission Physics"
8:15 pm - 8:30 pm	Discussion
8:30 pm - 8:40 pm	Introduction by Discussion Leader

8:40 pm - 9:15 pm Rajib Rahman (University of New South Wales, Australia)
"Quantum State Imaging of Dopants and Defects with Sub-Atomic Resolution"

9:15 pm - 9:30 pm Discussion

Thursday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm Defect Characterization and Control
Discussion Leader: Filip Tuomisto (University of Helsinki, Finland)

9:00 am - 9:20 am Introduction by Discussion Leader

9:20 am - 9:55 am AnYao Liu (Australian National University, Australia)
"Gettering by Poly-Si/SiO_x Passivating Contacts and Dielectric Thin Films in Silicon Photovoltaics"

9:55 am - 10:10 am Discussion

10:10 am - 10:40 am Coffee Break

10:40 am - 11:15 am Koji Yokoyama (ISIS Neutron and Muon Source, United Kingdom)
"Muon Spin Relaxation Probes of Carrier Kinetics and Charge Exchange Interaction of Muonium in Semiconductors"

11:15 am - 11:30 am Discussion

11:30 am - 12:05 pm Evangelia Takou (Virginia Tech, United States)
"Spin-photon Interfaces in Color-centers for Quantum Networks"

12:05 pm - 12:20 pm Discussion

12:20 pm - 12:30 pm General 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 Keynote Session: Toward Single Defect Imaging in Layered and 3D Materials
Discussion Leader: Kai-Mei Fu (University of Washington, United States)

7:30 pm - 7:45 pm Introduction by Discussion Leader

7:45 pm - 8:35 pm Jianwei Miao (University of California, Los Angeles, United States)
"Atomic Electron Tomography: Adding New Dimensions to Pinpoint Single Defects in Materials"

8:35 pm - 8:55 pm Discussion
8:55 pm - 9:15 pm General Discussion
9:15 pm - 9:30 pm Closing Remarks

Friday

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

Contributors



“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.”

Defects in Semiconductors (GRS)

Gordon Research Seminar

Defect Formation, Characterization, Control and Utilization

August 13 - 14, 2022

Chairs Hongling Lu and Ymir Kalmann. Frodason

Colby-Sawyer College

541 Main Street

New London, NH, 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	Defect Engineering and Characterization <i>The placement of this session within the GRS will depend on the number of received abstracts whose topics align with the theme of this session.</i> Discussion Leader: Artur Lozovoi (The City College of New York, United States)
3:45 pm - 4:00 pm	Tom Delord (CUNY- City College of New York, United States) "Superconductor-induced Suppression of the Electric Noise in a Near-surface NV Spin"
4:00 pm - 4:10 pm	Discussion
4:10 pm - 4:25 pm	Eleanor Nichols (University of Cambridge, United Kingdom) "Towards quantum-confined spin-qubits in monolayer, semiconducting WSe ₂ "
4:25 pm - 4:30 pm	Discussion
4:30 pm - 6:00 pm	Poster Session
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	Experimental and Theoretical Methods for Defect Characterization <i>The placement of this session within the GRS will depend on the number of received abstracts whose topics align with the theme of this session.</i> Discussion Leader: Christopher Savory (University College London, United Kingdom)
7:30 pm - 7:50 pm	Fangzhou Zhao (University of California, Santa Barbara, United States) "Impurity Auger Recombination in Gallium Nitride from First Principles"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	Seán Kavanagh (University College London (UCL) & Imperial College London, United Kingdom) "Symmetry-breaking and Reconstruction at Point Defects in Solids"
8:20 pm - 8:30 pm	Discussion

8:30 pm - 8:50 pm Tom Verstijnen (Eindhoven University of Technology, The Netherlands)
"Isoelectronic Doping of GaAs with Bi and N Studied with DFT and X-STM"

8:50 pm - 9:00 pm Discussion

9:00 pm - 9:20 pm Darian Smalley (University of Central Florida, United States)
"Metrology and Characterization of Point Defects in Transition Metal Dichalcogenides Using Scanning Tunneling Microscopy Enhanced with Machine Learning"

9:20 pm - 9:30 pm Discussion

Sunday

7:30 am - 8:30 am Breakfast

9:00 am - 11:00 am Quantum Technologies: The Role of Defects
The placement of this session within the GRS will depend on the number of received abstracts whose topics align with the theme of this session.
Discussion Leader: Hannah Stern (University of Cambridge, United Kingdom)

9:00 am - 9:20 am Xingyi Wang (University of Washington, United States)
"Correlate Optical Properties of Point Defects to Atomic Coordinates in ZnO Nanostructures"

9:20 am - 9:30 am Discussion

9:30 am - 9:50 am Pranta Saha (University of California, Davis, United States)
"Color Center Photonics in Triangular Geometry"

9:50 am - 10:00 am Discussion

10:00 am - 10:20 am Ethan Williams (Dartmouth College, United States)
"Comparison of Power Spectra in Diamond at 2.5 GHz for Nitrogenic Defects"

10:20 am - 10:30 am Discussion

10:30 am - 10:50 am Ryan Parker (Cambridge University, United Kingdom)
"Photonic indistinguishability of the tin-vacancy center in nanostructured diamond"

10:50 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: After the PhD: Job Opportunities in the Public and Private Sectors
Discussion Leaders: Hongling Lu (University of Michigan, United States) and Ymir Frodason (University of Oslo, Norway)

1:30 pm - 2:30 pm

Panel Discussion

After the PhD: Job Opportunities in the Public and Private Sectors

- Chitrleema Chakraborty (University of Delaware, United States)
- Joel Varley (Materials Science Division, Lawrence Livermore National Laboratory, United States)
- Richard Brierley (Nature Physics, United Kingdom)

2:30 pm - 3:00 pm

Evaluation Period

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

3:00 pm

Seminar Concludes

Contributors



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“The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army 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
McCallum, Jeffrey C	University of Melbourne	Chair	Male
Fu, Kai-Mei C	University of Washington	Vice Chair	Female
Chakraborty, Chitraleema	University of Delaware	Speaker	Female
Collazo, Ramon	North Carolina State University	Speaker	Male
Dreyer, Cyrus	Stony Brook University	Speaker	Male
Exarhos, Annemarie L	Lafayette College	Speaker	Female
Johnson, Brett C	RMIT University	Speaker	Male
Kwapil, Wolfram	University of Freiburg	Speaker	Male
Liu, AnYao	Australian National University	Speaker	Female
Lu, Hongling	University of Michigan	Speaker	Female
Lyons, John L	U.S. Naval Research Laboratory	Speaker	Male
McCluskey, Matt	Washington State University	Speaker	Male
Miao, Jianwei	University of California, Los Angeles	Speaker	Male
Rahman, Rajib	University of New South Wales	Speaker	Male
Rigutti, Lorenzo	CNRS University of Rouen Normandie	Speaker	Male
Savin, Hele	Aalto University	Speaker	Female
Stavola, Michael J	Lehigh University	Speaker	Male
Strevanovic, Vlado	Colorado School of Mines	Speaker	Male
Takou, Evangelia	Virginia Tech	Speaker	Female
Tetienne, Jean-Philippe	RMIT University	Speaker	Male
Thiering, Gergo	Wigner Research Centre for Physics	Speaker	Male
Turiansky, Mark E.	University of California, Santa Barbara	Speaker	Male
Wickramaratne, Darshana	US Naval Research Laboratory	Speaker	Male
Yokoyama, Koji	ISIS Neutron and Muon Source	Speaker	Male
deQuillettes, Dane W.	MIT Lincoln Laboratory	Discussion Leader	Male
Koenraad, Paul M	Eindhoven University of Technology	Discussion Leader	Male
Ohshima, Takeshi	National Institutes for Quantum Science and Technology (QST)	Discussion Leader	Male
Ping, Yuan	University of California Santa Cruz	Discussion Leader	Female
Tuomisto, Filip	University of Helsinki	Discussion Leader	Male
Varley, Joel B	Materials Science Division, Lawrence Livermore National Laboratory	Discussion Leader	Male
Vines, Lasse	University of Oslo	Discussion Leader	Male
Zvanut, Mary Ellen	University of Alabama at Birmingham	Discussion Leader	Female
akkouch, alaa	Max Planck Institute for the Structure and Dynamics of Matter	Poster Presenter	Female
Al saqri, Noor alhuda	Sultan Qaboos University	Poster Presenter	Female
Austin, Hayley J	Lehigh University	Poster Presenter	Female

Name	Affiliation	Participation	Gender
Cao, Jim	Shanghai Jiao Tong University / Florida State University	Poster Presenter	Male
Chang, Seohyoung	Chung-Ang University, South Korea	Poster Presenter	Male
Chatratin, Intuon	University of Delaware	Poster Presenter	Female
Clopton, Grady	University of Illinois Urbana Champaign	Poster Presenter	Male
Cooper, Joshua	University of Michigan	Poster Presenter	Male
Delord, Tom	CUNY- City College of New York	Poster Presenter	Male
Frodason, Ymir Kalmann	University of Oslo	Poster Presenter	Male
Fuchs, Gregory D	Cornell University	Poster Presenter	Male
Gusdorff, Jordan A.	University of Pennsylvania	Poster Presenter	Female
Hansen, Ethan	University of Washington	Poster Presenter	Male
Hommedal, Ylva Knausgård	University of Oslo (UiO)	Poster Presenter	Female
Janotti, Anderson	University of Delaware	Poster Presenter	Male
Karbasizadeh, Siavash	University of California, Santa Barbara	Poster Presenter	Male
Karlsen, Kjetil	University of Oslo	Poster Presenter	Male
Kavanagh, Seán R	University College London (UCL) & Imperial College London	Poster Presenter	Male
Langørgen, Amanda	University of Oslo	Poster Presenter	Female
Lee, Jong-Sook	Chonnam National University	Poster Presenter	Female
Lee, Channyung	University of Illinois Urbana-Champaign	Poster Presenter	Male
Lozovoi, Artur	The City College of New York	Poster Presenter	Male
Maciaszek, Marek	Center for Physical Sciences and Technology (FTMC), Vilnius	Poster Presenter	Male
McCullian, Brendan	Cornell University	Poster Presenter	Male
Mengyan, Patrick W	Northern Michigan University	Poster Presenter	Male
Mitchell, Jared	University of Michigan	Poster Presenter	Male
Nichols, Eleanor	University of Cambridge	Poster Presenter	Female
Nicolson, Adair	University College London Chemistry	Poster Presenter	Male
Norman, Victoria A	University of California, Davis	Poster Presenter	Female
Pansegrau, Christopher P	Washington State University	Poster Presenter	Male
Park, Sungjin	Korea Electrotechnology Research Institute	Poster Presenter	Male
Parker, Ryan A	Cambridge University	Poster Presenter	Male
Pederson, Christian	University of Washington	Poster Presenter	Male
Portoff, Amanda	Lehigh University	Poster Presenter	Female
Saha, Pranta	University of California, Davis	Poster Presenter	Male
Savory, Christopher	University College London	Poster Presenter	Male
Smalley, Darian	University of Central Florida	Poster Presenter	Male
Stern, Hannah L	University of Cambridge	Poster Presenter	Female
Venzie, Andrew	Lehigh University	Poster Presenter	Male
Verstijnen, Tom	Eindhoven University of Technology	Poster Presenter	Male
Wang, Xingyi	University of Washington	Poster Presenter	Female

Name	Affiliation	Participation	Gender
Williams, Ethan Q	Dartmouth College	Poster Presenter	Male
Willis, Joe	University College London	Poster Presenter	Male
Zhao, Fangzhou	University of California, Santa Barbara	Poster Presenter	Male
Brierley, Richard	Nature Physics	Attendee	Male
Xiong, Yihuang	Dartmouth College	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
Frodason, Ymir Kalmann	University of Oslo	Chair	Male
Lu, Hongling	University of Michigan	Chair	Female
Brierley, Richard	Nature Physics	Speaker	Male
Chakraborty, Chitraleema	University of Delaware	Speaker	Female
Delord, Tom	CUNY- City College of New York	Speaker	Male
Kavanagh, Seán R	University College London (UCL) & Imperial College London	Speaker	Male
Nichols, Eleanor	University of Cambridge	Speaker	Female
Parker, Ryan A	Cambridge University	Speaker	Male
Saha, Pranta	University of California, Davis	Speaker	Male
Smalley, Darian	University of Central Florida	Speaker	Male
Varley, Joel B	Materials Science Division, Lawrence Livermore National Laboratory	Speaker	Male
Verstijnen, Tom	Eindhoven University of Technology	Speaker	Male
Wang, Xingyi	University of Washington	Speaker	Female
Williams, Ethan Q	Dartmouth College	Speaker	Male
Zhao, Fangzhou	University of California, Santa Barbara	Speaker	Male
Lozovoi, Artur	The City College of New York	Discussion Leader	Male
Savory, Christopher	University College London	Discussion Leader	Male
Stern, Hannah L	University of Cambridge	Discussion Leader	Female
Austin, Hayley J	Lehigh University	Poster Presenter	Female
Clopton, Grady	University of Illinois Urbana Champaign	Poster Presenter	Male
Cooper, Joshua	University of Michigan	Poster Presenter	Male
Hansen, Ethan	University of Washington	Poster Presenter	Male
Hommedal, Ylva Knausgård	University of Oslo (UiO)	Poster Presenter	Female
Karbasizadeh, Siavash	University of California, Santa Barbara	Poster Presenter	Male
Karlsen, Kjetil	University of Oslo	Poster Presenter	Male
Langørgen, Amanda	University of Oslo	Poster Presenter	Female
Lee, Channyung	University of Illinois Urbana-Champaign	Poster Presenter	Male
McCullian, Brendan	Cornell University	Poster Presenter	Male
Mitchell, Jared	University of Michigan	Poster Presenter	Male
Nicolson, Adair	University College London Chemistry	Poster Presenter	Male
Norman, Victoria A	University of California, Davis	Poster Presenter	Female
Park, Sungjin	Korea Electrotechnology Research Institute	Poster Presenter	Male
Willis, Joe	University College London	Poster Presenter	Male