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Gordon Research Conferences, Inc.
512 Liberty Lane

West Kingston, RI 02892 -1502

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UU	UU	UU	UU		19b. TELEPHONE NUMBER 215-983-1981

RPPR Final Report
as of 18-Oct-2018

Agency Code:

Proposal Number: 73035EGCF **Agreement Number: W911NF-18-1-0141**
INVESTIGATOR(S):

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Organization: **Gordon Research Conferences, Inc.**
Address: 512 Liberty Lane, West Kingston, RI 028921502
Country: USA
DUNS Number: 075712877 EIN: 050300482
Report Date: 14-Nov-2018 Date Received: 17-Sep-2018
Final Report for Period Beginning 19-Apr-2018 and Ending 14-Aug-2018
Title: 2018 Energetic Materials Gordon Research Seminar
Begin Performance Period: 19-Apr-2018 **End Performance Period:** 14-Aug-2018
Report Term: 0-Other
Submitted By: Nancy Ryan Gray Email: grants@grc.org
Phone: (401) 360-1505

STEM Degrees: 0 **STEM Participants:** 0

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: Report Uploaded

Training Opportunities: Speakers, discussion leaders, poster presenters and attendees simultaneously contributed to and benefited from the collective skills and experience shared throughout the conference. The funding provided by NSF was invaluable to the success of 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

RPPR Final Report
as of 18-Oct-2018

GORDON RESEARCH CONFERENCES

FINAL REPORT
Army Research Office
Energetic Materials GRS

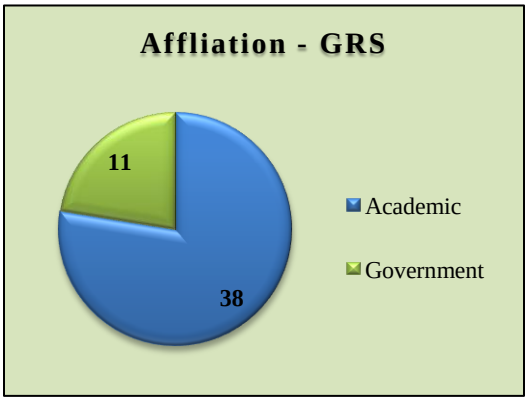
Grant NumberW911NF-18-1-0141
June 2-3, 2018

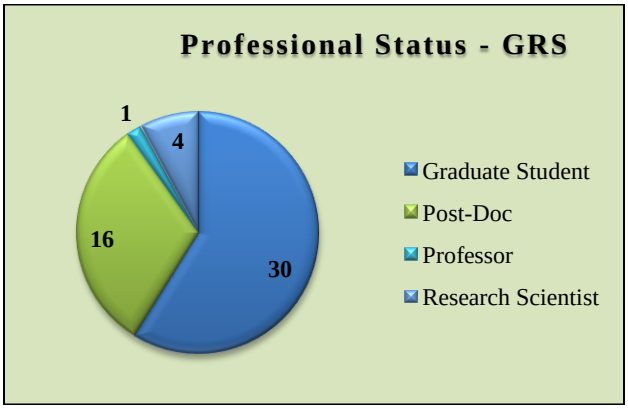
Operational Summary

The Gordon Research Seminar (GRS) on Energetic Materials was held at the Grand Summit Hotel at Sunday River in Newry, Maine from June 2-3, 2018. The seminar covered a variety of scientific topics and the content presented was highly rated by participants.

Seminar Participants

The Conference was well-attended with 51 participants. Scientists from academia represented 75% of the participants while attendees from government accounted for 22%. Students and post docs combined accounted for 89% of all attendees. Approximately 20% of the participants at the 2018 seminar were women.





Conference Program

The Gordon Research Seminar on Energetic Materials was a unique forum for graduate students, post-docs, and other scientists with comparable levels of experience and education to present and exchange new data and cutting edge ideas. This seminar will allow early-career scientists to discuss their research, learn about career opportunities, and develop their understanding of the current state of the field.

The 2018 Energetic Materials GRS focused on new advances in modeling, experimental developments and synthesis. The conference explored how these fields can be coupled in order to advance our understanding of energetic materials.

Conference Budget

Funding provided by the Army Research Office supported partial registration and/or travel for 9 postdocs, 30 graduate studentsa and 1 professor at the GRS.

Conference Feedback

Participants had an opportunity to provide feedback at the end of the seminar. The feedback collected was extremely positive. Evaluations included positive comments regarding the interactions with poster presenters, technical talks and new ideas from diverse fields.

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. Leora Dresselhaus-Cooper, GRS Chair
Massachusetts Institute of Technology

Dr. William Shaw, GRS Co-Chair
Lawrence Livermore National Laboratory

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

Energetic Materials (GRS)

Gordon Research Seminar

Advances in Modeling, Experimental Developments and Synthesis of Energetic Materials

June 2 - 3, 2018

Chairs Leora E. Dresselhaus-Cooper and William Shaw

Conference Program

Saturday

2:00 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	Development of New Energetic Materials Discussion Leader: **Stuart Kennedy** (The University of Edinburgh, United Kingdom)
3:45 pm - 3:55 pm	Opening Remarks
3:55 pm - 4:00 pm	Introduction by Discussion Leader
4:00 pm - 4:10 pm	**Ivan Gospodinov** (Ludwig Maximilian University of Munich, Germany) "Pyridazine Scaffold as a New Building Block for the Design of Energetic Materials"
4:10 pm - 4:15 pm	Discussion
4:15 pm - 4:25 pm	**Daniel Elton** (University of Maryland, College Park, USA) "Machine Learning for Design and Discovery of New Energetic Materials"
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	Energetic Materials Beyond Organics / Large-Scale Energetics and Detonations Discussion Leaders: **Norbert Szimhardt** (Ludwig Maximilian University of Munich, Germany) and **Jonathan Bennion** (U.S. Army Research Laboratory, USA)
7:30 pm - 7:35 pm	Introduction by Discussion Leader
7:35 pm - 7:45 pm	**Kyle Overdeep** (Air Force Research Laboratory, USA) "Aluminum-Based Core-Shell Nanoclusters"
7:45 pm - 7:50 pm	Discussion
7:50 pm - 8:00 pm	**Dylan Kline** (University of Maryland, College Park, USA) "Probing the Reaction Mechanisms of Energetic Nanomaterials with High-Speed Color Camera Pyrometry"
8:00 pm - 8:05 pm	Discussion
8:05 pm - 8:15 pm	**Miles Rehwoldt** (University of Maryland, College Park, USA) "Investigation into the Structure-Function Relation of 3D Printed Energetic Films"
8:15 pm - 8:20 pm	Discussion
8:20 pm - 8:30 pm	**Elliot Wainwright** (Johns Hopkins University, USA) "Development of a Coded Aperture Snapshot Spectral Imaging (CASSI) System for Combustion Diagnostics of Reactive Composite Fuels"
8:30 pm - 8:35 pm	Discussion
8:35 pm - 8:40 pm	Introduction by Discussion Leader
8:40 pm - 8:50 pm	**Michael Nielsen** (Lawrence Livermore National Laboratory, USA)

	"Formation Pathways of Carbon Allotropes in Detonation Soots"
8:50 pm - 8:55 pm	Discussion
8:55 pm - 9:05 pm	**Zetu Jiba** (CSIR / University of Pretoria, South Africa) "Chemical Formulations Towards Additive Manufacturing Technology of Non-Cast High Energetic Materials"
9:05 pm - 9:10 pm	Discussion
9:10 pm - 9:20 pm	**Michael Sakano** (Purdue University, USA) "Role of Molecular Disorder on the Reactivity of RDX"
9:20 pm - 9:25 pm	Discussion
9:25 pm - 9:30 pm	General Discussion
Sunday	
7:30 am - 8:30 am	Breakfast
9:00 am - 11:00 am	Dynamics in Molecular Energetics / New Strategies in Energetic Materials Discussion Leaders: **William Bassett** (University of Illinois at Urbana-Champaign, USA) and **Hayleigh Lloyd** (University of Edinburgh, United Kingdom)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:15 am	**Daniel McMullan** (Auburn University, USA) "Why Is the Emission of Laser-Induced Plasmas from Energetics Much Shorter Lived than the Similar Emission from Non-Energetics?"
9:15 am - 9:20 am	Discussion
9:20 am - 9:30 am	**Belinda Johnson** (University of Illinois at Urbana-Champaign, USA) "Temperture Dynamics of High Explosive Crystals Under Shock Compression"
9:30 am - 9:35 am	Discussion
9:35 am - 9:45 am	**Akshay Dandekar** (Purdue University, USA) "Computational Study of Fracture and Temperature Rise in HMX-Polymer Composites for Compressive, Tensile and Vibration Loading"
9:45 am - 9:50 am	Discussion
9:50 am - 10:00 am	**Xiaoyu Zhang** (Vanderbilt University, USA) "Experimental and Computational Investigations of Interface Chemistry Dependence and Parameter Sensitivity of Dynamic Response and Fracture in Energetic Materials"
10:00 am - 10:05 am	Discussion
10:05 am - 10:10 am	Introduction by Discussion Leader
10:10 am - 10:20 am	**Philip Guerieri** (Army Research Laboratory, USA) "Silicon Quantum Dots: Taking Energetic Porous Silicon Off-Chip"
10:20 am - 10:25 am	Discussion
10:25 am - 10:35 am	**Loudon Campbell** (Texas Tech University, USA) "Additive Manufacturing of Mock Energetic Materials"
10:35 am - 10:40 am	Discussion
10:40 am - 10:50 am	**Kerri-Lee Chintersingh-Dinnall** (New Jersey Institute of Technology, USA) "Doping Boron for Improved Ignition and Combustion"
10:50 am - 10:55 am	Discussion

10:55 am - 11:00 am	General 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: Starting a Career in Energetic Materials Discussion Leaders: **Leora Dresselhaus-Cooper** (Massachusetts Institute of Technology, USA) and **William Shaw** (Lawrence Livermore National Laboratory, USA)
1:30 pm - 2:30 pm	**Panel Discussion** *Careers in Energetic Materials* • **Eric Bukovsky** (Lawrence Livermore National Laboratory, USA) • **Nick Glumac** (University of Illinois at Urbana-Champaign, USA)
2:30 pm - 3:00 pm	Evaluation Period *Fill in GRS Evaluation Forms*
3:00 pm	Seminar Concludes

Contributors

Energetic Materials Gordon Research Seminar – Registration List

Name	Organization	Participation
Andrews, Stephen A	Los Alamos National Laboratory	Poster Presenter
Arlington, Shane Q	Johns Hopkins University/Dept of Materials Science	Poster Presenter
Atceken, Nurunnisa	University of Edinburgh	Poster Presenter
Baker, Caroline	Purdue University	Poster Presenter
Bassett, William P	Lawrence Livermore National Laboratory	Discussion Leader
Bennion, Jonathan C	U.S. Army Research Laboratory	Discussion Leader
Boddorff, Andrew	Georgia Institute of Technology	Poster Presenter
Bukovsky, Eric V	Lawrence Livermore National Laboratory	Speaker
Campbell, Loudon L	Texas Tech University	Speaker
Chapman, Clinton J	South Dakota School of Mines	Poster Presenter
Chintersingh-Dinnall, K	New Jersey Institute of Technology	Speaker
Dandekar, Akshay V	Purdue University	Speaker
Dresselhaus-Cooper, L	Massachusetts Institute of Technology	Chair
Duarte, Camilo A	Purdue University	Poster Presenter
Elton, Daniel C	University of Maryland, College Park	Speaker
Glumac, Nick	University of Illinois at Urbana-Champaign	Speaker
Gospodinov, Ivan G.	Ludwig Maximilian University of Munich	Speaker
Grant, Jesse P	Johns Hopkins University	Poster Presenter
Grilli, Nicolò	Purdue University - Mechanical Engineering	Poster Presenter
Guerieri, Philip M	Army Research Laboratory	Speaker
Jiba, Zetu	CSIR / University of Pretoria	Speaker
Johnson, Belinda P	University of Illinois at Urbana-Champaign	Speaker
Kennedy, Stuart	The University of Edinburgh	Discussion Leader
Kiselev, Vitaly G.	Brown University	Poster Presenter
Kline, Dylan J.	University of Maryland, College Park	Speaker
Kroonblawd, Matthew P.	Lawrence Livermore National Laboratory	Poster Presenter
Lloyd, Hayleigh	University of Edinburgh	Discussion Leader
Matveev, Sergey M	University of Illinois at Urbana Champaign	Poster Presenter
McMullan, Daniel R	Auburn University	Speaker
Miller, Kelsea	Texas Tech University, Department of Mechanical Engineering, Combustion Lab	Poster Presenter
Mursalat, Mehnaz	New Jersey Institute of Technology	Poster Presenter
Nielsen, Michael	Lawrence Livermore National Laboratory	Speaker
Overdeep, Kyle R	Air Force Research Laboratory	Speaker
Pauls, Joshua	University of Notre Dame	Poster Presenter
Powell, Michael	Purdue University/Los Alamos National Lab	Poster Presenter
Rehwoldt, Miles	University of Maryland, College Park	Speaker
Rice, Betsy M	US Army Research Laboratory	Poster Presenter
Sakano, Michael N	Purdue University	Speaker
Salvati, Lawrence	University of Illinois	Poster Presenter
Shaw, William	Lawrence Livermore National Laboratory	Chair
Sims, Adam W	University of Illinois Urbana-Champaign	Poster Presenter
Sorensen, Christian J	Purdue University	Poster Presenter
Szimhardt, Norbert	Ludwig Maximilian University of Munich	Discussion Leader
Tidey, Jeremiah P	University of Toledo	Poster Presenter

Valluri, Siva Kumar	New Jersey Institute of Technology and Sciences	Poster Presenter
Wainwright, Elliot R	Johns Hopkins University	Speaker
Wang, Haiyang	University of Maryland	Poster Presenter
Westphal, Eric R	Purdue University	Poster Presenter
Wood, Mitchell A	Sandia National Labs	Poster Presenter
Zaug, Joseph M	Lawrence Livermore National Laboratory	Poster Presenter
Zhang, Xiaoyu	Vanderbilt University	Speaker