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## **RPPR Final Report**

as of 09-Apr-2019

Agency Code:

Proposal Number: 69464PHCF INVESTIGATOR(S):

Agreement Number: W911NF-16-1-0376

Name: Peter Abbamonte Email: abbamont@illinois.edu Phone Number: 2172444861 Principal: Y

Organization: Gordon Research Conferences, Inc. Address: 512 Liberty Lane, West Kingston, RI 028921502 Country: USA DUNS Number: 075712877 EIN: 050300482 Report Date: 21-Jan-2017 Date Received: 10-Jan-2018 Final Report for Period Beginning 22-Jun-2016 and Ending 21-Oct-2016 Title: 2016 Correlated Electron Systems GRC/GRS. Research Area 4. Electronics - 4.1. Solid State Electronics, 4.2. Optoelectronics, 4.4. Electromagnetics, Microwaves and Power, 4.5. Terahertz Science and Tec End Performance Period: 21-Oct-2016 Begin Performance Period: 22-Jun-2016 Report Term: 0-Other Submitted By: Nancy Ryan Gray Email: grants@grc.org Phone: (401) 360-1505

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

#### 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:** The Gordon Research Conference on Correlated Electron Systems is an important forum for new phenomena and techniques in the study of "quantum materials", those whose electronic properties are difficult to understand from a conventional perspective. The scientific program struck a balance between well-established subjects with profound, long-standing mysteries, and emerging areas that show great promise for rapid discoveries. In the former area, the 2016 meeting included sessions on frustrated magnetism, high temperature superconductivity, and the fractional quantum Hall effect, which have all seen important developments in the past few years. In the latter category, sessions were held on iridate and heavy fermion materials in which topological concepts are believed to play a central role, interaction effects in transition metal chalcogen materials, which have been "rediscovered" in recent years and are turning up new surprises, and new theoretical and computational approaches which may lay the groundwork for future transformative discoveries.

The focus of the Gordon Research Seminar on Correlated Electron Systems was on developments at the frontier of quantum many-electron physics, a rapidly evolving field thanks to recent breakthroughs in materials, new experimental probes, and theoretical methods. Through invited presentations and a poster session, the seminar immersed attendees in the conversation that continued at the Correlated Electron Systems Gordon Conference. Topics included: topological systems and Weyl semimetals, spin ice materials, complex oxides, interfaces, material design, magnetism, ultrafast behavior and control, and many body localization.

**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 were invaluable to the success of the Conference.

**Results Dissemination:** Conference Program

# RPPR Final Report as of 09-Apr-2019

Honors and Awards: Nothing to Report

**Protocol Activity Status:** 

Technology Transfer: Nothing to Report



### GORDON RESEARCH CONFERENCES

FINAL PROGRESS REPORT Army Research Office Correlated Electron Systems GRC/GRS

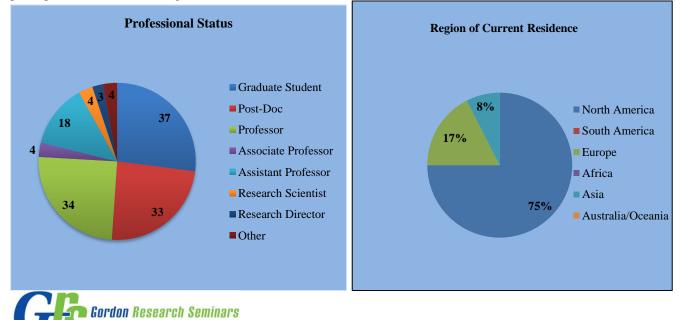
Grant Number W911NF-16-1-0376 June 25-July 1, 2016

#### **Operational Summary**

The Gordon Research Conference (GRC) and Gordon Research Seminar (GRS) on Correlated Electron Systems were held at Mount Holyoke College in South Hadley, Massachusetts from June 25-July 1, 2016. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.

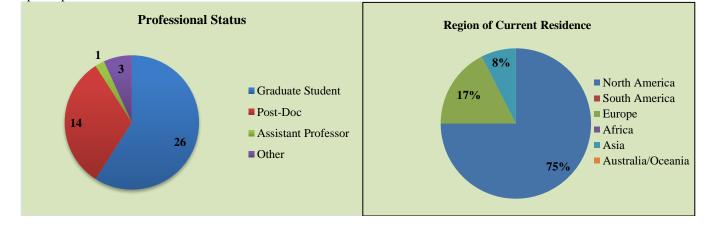
# Conference Participants

The Conference was well-attended with 137 participants. Scientists from academia represented 98% of the participants while attendees from government accounted for 1% and those from industry totaled 1%. The meeting also attracted a strong mix of young investigators and senior scientists. Students and post-docs accounted for 51% of all attendees. Approximately 15% of the participants at the 2016 meeting were women.



#### **Seminar Participants**

The Seminar was well-attended with 44 participants. Scientists from academia represented 93% of the participants while attendees from government accounted for 7%. Students and post docs combined accounted for 91% of all attendees. Approximately 16% of the participants at the 2016 seminar were women.



#### **Conference Program**

The Gordon Research Conference on Correlated Electron Systems is an important forum for new phenomena and techniques in the study of "quantum materials", those whose electronic properties are difficult to understand from a conventional perspective. The scientific program struck a balance between well-established subjects with profound, long-standing mysteries, and emerging areas that show great promise for rapid discoveries. In the former area, the 2016 meeting included sessions on frustrated magnetism, high temperature superconductivity, and the fractional quantum Hall effect, which have all seen important developments in the past few years. In the latter category, sessions were held on iridate and heavy fermion materials in which topological concepts are believed to play a central role, interaction effects in transition metal chalcogen materials, which have been "rediscovered" in recent years and are turning up new surprises, and new theoretical and computational approaches which may lay the groundwork for future transformative discoveries.

The focus of the Gordon Research Seminar on Correlated Electron Systems was on developments at the frontier of quantum manyelectron physics, a rapidly evolving field thanks to recent breakthroughs in materials, new experimental probes, and theoretical methods. Through invited presentations and a poster session, the seminar immersed attendees in the conversation that continued at the Correlated Electron Systems Gordon Conference. Topics included: topological systems and Weyl semimetals, spin ice materials, complex oxides, interfaces, material design, magnetism, ultrafast behavior and control, and many body localization.

#### **Conference Budget**

Funding provided by the Army Research Office supported partial registration for 1 postdoc, 1 assistant professor and 1 research scientist at the GRC and partial registration for 4 graduate students and 2 postdocs 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 included numerous positive remarks regarding the poster sessions, the talks and the overview of the topic before each talk. Evaluations from the GRS included positive comments regarding the open discussions with peers, the scientific sessions and the panel session.

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

Dr. Peter Abbamonte, GRC Chair University of Illinois

Dr. Cassandra Hunt, GRS Chair University of California, Berkeley

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

#### **Correlated Electron Systems**

Gordon Research Conference New Kinds of Electronic Order in Quantum Materials June 26 - July 1, 2016 Mount Holyoke College South Hadley, MA Chairs: <u>Peter Abbamonte</u> & <u>Joel E. Moore</u> Vice Chairs: <u>Piers Coleman</u> & <u>Nigel Hussey</u>

Contributors





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Meeting Program

Sunday			
2:00 pm - 9:00 pm	Arrival and Check-in		
6:00 pm	Dinner		
7:30 pm - 7:40 pm	Welcome / Introductory Comments by GRC Site Staff		
7:40 pm - 9:30 pm	Synergies of Spin-Orbit Coupling and Electronic Repulsion		
	Discussion Leader: Rebecca Flint (Iowa State University, USA)		
7:40 pm - 7:55 pm	Introduction by Discussion Leader		
7:55 pm - 8:20 pm	Bumjoon Kim (Max Planck Institute for Solid State Research, Germany)		
	"Switching the D-Wave Gap via Spin Reorientation in Electron-Doped Sr <sub>3</sub> Ir <sub>2</sub> O <sub>7</sub> "		
8:20 pm - 8:25 pm	Discussion		
8:25 pm - 8:50 pm	Eric Yue Ma (Stanford University, USA)		
	"Metallic Magnetic Domain Walls in Nd <sub>2</sub> Ir <sub>2</sub> O <sub>7</sub> "		
8:50 pm - 8:55 pm	Discussion		
8:55 pm - 9:20 pm	Hidenori Takagi (Max Planck Institute for Solid State Research, Germany)		
	"Quantum Spin Liquid State in Honeycomb-Based Complex Iridium Oxides"		
9:20 pm - 9:30 pm	Discussion		

Monday	
7:30 am - 8:30 am	Breakfast
8:30 am	Group Photo
9:00 am - 12:30 pm	Excitations of Frustrated Magnets
	Discussion Leader: Nandini Trivedi (The Ohio State University, USA)
9:00 am - 9:15 am	Introduction by Discussion Leader
9:15 am - 9:40 am	Kate Ross (Colorado State University, USA) "'Quantum Spin Ice' and Other Phenomena in XY Pyrochlores"
9:40 am - 9:55 am	Discussion
9:55 am - 10:20 am	<b>Gregory MacDougall</b> (University of Illinois at Urbana-Champaign, USA) "Routes for Relieving Orbital Degeneracy in Frustrated Spinel Antiferromagnets"
10:20 am - 10:35 am	Discussion
10:35 am - 11:05 am	Coffee Break
11:05 am - 11:30 am	<b>Stephen Nagler</b> (Oak Ridge National Laboratory, USA) "Kitaev Physics in Alpha-RuCl <sub>3</sub> "
11:30 am - 11:45 am	Discussion
11:45 am - 12:10 pm	J.C. Seamus Davis (Cornell University / Brookhaven National Laboratory, USA) "Supercooled Spin-Liquid State in Dy <sub>2</sub> Ti <sub>2</sub> O <sub>7</sub> "
12:10 pm - 12:25 pm	Discussion
12:25 pm - 12:30 pm	General Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
3:00 pm - 4:00 pm	Power Hour
	The GRC Power Hour is an optional informal gathering open to all meeting participants. It is designed to help address the challenges women face in science and support the professional growth of women in our communities by providing an open forum for discussion and mentoring.
	Organizer: Vidya Madhavan (University of Illinois at Urbana-Champaign, USA)
4:00 pm - 6:00 pm	Poster Session
6:00 pm	Dinner
7:30 pm - 9:30 pm	Strange Metals and Insulators in Heavy-Fermion Compounds
	Discussion Leader: Meigan Aronson (Texas A&M University, USA)

7:30 pm - 7:45 pm	Introduction by Discussion Leader			
7:45 pm - 8:10 pm	Suchitra Sebastian (University of Cambridge, United Kingdom) "Magnetic Quantum Oscillations from a Bulk Fermi Surface in Kondo Insulating SmB <sub>6</sub> "			
8.10 pm 8.20 pm				
8:10 pm - 8:20 pm	Discussion			
8:20 pm - 8:45 pm	Satoru Nakatsuji (University of Tokyo, Japan) "Novel Topological Phases and Quantum Criticality in Correlated Electron Systems"			
8:45 pm - 8:55 pm	Discussion			
8:55 pm - 9:20 pm	Colin Broholm (Johns Hopkins University, USA)			
	"Neutron Scattering as a Probe of Hybridized Bands in Kondo Insulators"			
9:20 pm - 9:30 pm	Discussion			
Tuesday				
7:30 am - 8:30 am	Breakfast			
9:00 am - 12:30 pm	Interaction Effects in 2D Chalcogenides			
	Discussion Leader: Vidya Madhavan (University of Illinois at Urbana-Champaign, USA)			
9:00 am - 9:15 am	Introduction by Discussion Leader			
9:15 am - 9:40 am	Jennifer Hoffman (University of British Columbia, Canada)			
	"STM Studies of Gaps and Surface States in SmB6"			
9:40 am - 9:55 am	Discussion			
9:55 am - 10:20 am Eoin O'Farrell (National University of Singapore, Singapore)				
	"Electric Field Control of Unconventional Superconductivity in 2D TiSe <sub>2</sub> "			
10:20 am - 10:35 am	Discussion			
10:35 am - 11:05 am	Coffee Break			
11:05 am - 11:30 am	Tony Heinz (Stanford University, USA)			
	"Optical Properties of 2D Materials"			
11:30 am - 11:45 am	Discussion			
11:45 am - 12:10 pm	Chandra Varma (University of California, Riverside, USA)			
	"Quantum Criticality, Strange Metals and Superconductivity in 2D Metals"			
12:10 pm - 12:25 pm	Discussion			
12:25 pm - 12:30 pm	General Discussion			
12:30 pm	Lunch			
1:30 pm - 4:00 pm	Free Time			

4:00 pm - 6:00 pm	Poster Session		
6:00 pm	Dinner		
7:30 pm - 9:30 pm	Interaction Effects in Bulk Chalcogenides		
	Discussion Leader: Kai Rossnagel (University of Kiel, Germany)		
7:30 pm - 7:45 pm	Introduction by Discussion Leader		
7:45 pm - 8:10 pm	Minhyea Lee (University of Colorado, USA) "Non-Trivial Spin Textures and Magnetotransport Properties in Inversion Symmetry Broken Magnets"		
8:10 pm - 8:20 pm	Discussion		
8:20 pm - 8:45 pm	Anshul Kogar (University of Illinois / Argonne National Laboratory, USA) "Collective Modes of the Excitonic-Like Insulator in 1T-TiSe <sub>2</sub> "		
8:45 pm - 8:55 pm	Discussion		
8:55 pm - 9:20 pm	Jasper Van Wezel (University of Amsterdam, The Netherlands) "Chiral Charge and Orbital Order from Elemental Chalcogens to TiSe <sub>2</sub> "		
9:20 pm - 9:30 pm	Discussion		
Wednesday			
7:30 am - 8:30 am	Breakfast		
7:30 am - 8:30 am 9:00 am - 12:30 pm	Breakfast Charge Order Versus Superconductivity in Copper Oxides		
	Charge Order Versus Superconductivity in Copper Oxides		
9:00 am - 12:30 pm	Charge Order Versus Superconductivity in Copper Oxides Discussion Leader: Erica Carlson (Purdue University, USA)		
9:00 am - 12:30 pm 9:00 am - 9:15 am	Charge Order Versus Superconductivity in Copper OxidesDiscussion Leader: Erica Carlson (Purdue University, USA)Introduction by Discussion LeaderRiccardo Comin (Massachusetts Institute of Technology, USA)"Resonant X-Ray Scattering Explorations of Charge Order and Broken Symmetries in		
9:00 am - 12:30 pm 9:00 am - 9:15 am 9:15 am - 9:40 am	Charge Order Versus Superconductivity in Copper OxidesDiscussion Leader: Erica Carlson (Purdue University, USA)Introduction by Discussion LeaderRiccardo Comin (Massachusetts Institute of Technology, USA)"Resonant X-Ray Scattering Explorations of Charge Order and Broken Symmetries inUnderdoped Cuprates"		
9:00 am - 12:30 pm 9:00 am - 9:15 am 9:15 am - 9:40 am 9:40 am - 9:55 am	Charge Order Versus Superconductivity in Copper Oxides Discussion Leader: Erica Carlson (Purdue University, USA) Introduction by Discussion Leader Riccardo Comin (Massachusetts Institute of Technology, USA) "Resonant X-Ray Scattering Explorations of Charge Order and Broken Symmetries in Underdoped Cuprates" Discussion Eugene Demler (Harvard University, USA) "Exploring Translational Symmetry Breaking in Cuprates with STM and Resonant X-Ray		
9:00 am - 12:30 pm 9:00 am - 9:15 am 9:15 am - 9:40 am 9:40 am - 9:55 am 9:55 am - 10:20 am	Charge Order Versus Superconductivity in Copper OxidesDiscussion Leader: Erica Carlson (Purdue University, USA)Introduction by Discussion LeaderRiccardo Comin (Massachusetts Institute of Technology, USA)"Resonant X-Ray Scattering Explorations of Charge Order and Broken Symmetries inUnderdoped Cuprates"DiscussionEugene Demler (Harvard University, USA)"Exploring Translational Symmetry Breaking in Cuprates with STM and Resonant X-RayScattering"		
9:00 am - 12:30 pm 9:00 am - 9:15 am 9:15 am - 9:40 am 9:40 am - 9:55 am 9:55 am - 10:20 am 10:20 am - 10:35 am	Charge Order Versus Superconductivity in Copper OxidesDiscussion Leader: Erica Carlson (Purdue University, USA)Introduction by Discussion LeaderRiccardo Comin (Massachusetts Institute of Technology, USA)"Resonant X-Ray Scattering Explorations of Charge Order and Broken Symmetries inUnderdoped Cuprates"DiscussionEugene Demler (Harvard University, USA)"Exploring Translational Symmetry Breaking in Cuprates with STM and Resonant X-RayScattering"Discussion		

11:45 am - 12:10 pm	Louis Taillefer (Université de Sherbrooke, Canada) "The Pseudogap Critical Point of Cuprate Superconductors"
12:10 pm - 12:25 pm	Discussion
12:25 pm - 12:30 pm	General Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session
6:00 pm	Dinner
7:00 pm - 7:30 pm	Business Meeting
	Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair
7:30 pm - 9:30 pm	New Theoretical Methods for Strong Correlations
	Discussion Leader: Jan Zaanen (Leiden University, The Netherlands)
7:30 pm - 7:45 pm	Introduction by Discussion Leader
7:45 pm - 8:10 pm	Garnet Chan (Princeton University, USA) "Model and <i>Ab-Initio</i> Studies of the Cuprates"
8:10 pm - 8:20 pm	Discussion
8:20 pm - 8:45 pm	Shinsei Ryu (University of Illinois at Urbana-Champaign, USA) "Crystalline Topological Insulators and Superconductors: Classification and Bulk-Boundary Correspondence"
8:45 pm - 8:55 pm	Discussion
8:55 pm - 9:20 pm	Mukund Rangamani (University of California, Davis, USA) "Emergent Symmetries in Hydrodynamic Effective Theories"
9:20 pm - 9:30 pm	Discussion
Thursday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Topological Four-Letter Words: FQHE, QSHE and QAHE
	Discussion Leader: Siddharth Ashok Parameswaran (University of California, Irvine, USA)
9:00 am - 9:15 am	Introduction by Discussion Leader
9:15 am - 9:40 am	David Goldhaber-Gordon (Stanford University, USA)
	"The Quantum Anomalous Hall Effect and the Quest for Perfect 1D Conduction"

9:40 am - 9:55 am	Discussion
9:55 am - 10:20 am	Jennifer Cano (Princeton University, USA)
	"Surprising New Edge Phases of Quantum Hall States"
10:20 am - 10:35 am	Discussion
10:35 am - 11:05 am	Coffee Break
11:05 am - 11:30 am	Gabor Csathy (Purdue University, USA)
	"Observation of a Transition from a Topological to a Traditional Broken Symmetry Phase in the Two-Dimensional Electron Gas"
11:30 am - 11:45 am	Discussion
11:45 am - 12:10 pm	Pablo Jarillo-Herrero (Massachusetts Institute of Technology, USA)
	"Quantum Transport in Van der Waals Heterostructures"
12:10 pm - 12:25 pm	Discussion
12:25 pm - 12:30 pm	General Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session
6:00 pm	Dinner
7:30 pm - 9:30 pm	Late-Breaking Topics
7:30 pm - 9:30 pm	Late-Breaking Topics         Discussion Leader: Joseph Orenstein (University of California, Berkeley, USA)
7:30 pm - 9:30 pm 7:30 pm - 7:45 pm	
	Discussion Leader: Joseph Orenstein (University of California, Berkeley, USA)
7:30 pm - 7:45 pm	Discussion Leader: <b>Joseph Orenstein</b> (University of California, Berkeley, USA) Introduction by Discussion Leader
7:30 pm - 7:45 pm	Discussion Leader: Joseph Orenstein (University of California, Berkeley, USA) Introduction by Discussion Leader Nandini Trivedi (The Ohio State University, USA)
7:30 pm - 7:45 pm 7:45 pm - 8:10 pm	Discussion Leader: Joseph Orenstein (University of California, Berkeley, USA) Introduction by Discussion Leader Nandini Trivedi (The Ohio State University, USA) "Orbital Frustration and Entanglement in d4 Systems"
7:30 pm - 7:45 pm 7:45 pm - 8:10 pm 8:10 pm - 8:20 pm	Discussion Leader: Joseph Orenstein (University of California, Berkeley, USA) Introduction by Discussion Leader Nandini Trivedi (The Ohio State University, USA) "Orbital Frustration and Entanglement in d4 Systems" Discussion
7:30 pm - 7:45 pm 7:45 pm - 8:10 pm 8:10 pm - 8:20 pm	Discussion Leader: Joseph Orenstein (University of California, Berkeley, USA) Introduction by Discussion Leader Nandini Trivedi (The Ohio State University, USA) "Orbital Frustration and Entanglement in d4 Systems" Discussion Philip Moll (Max Planck Institute for Chemical Physics of Solids, Germany)
7:30 pm - 7:45 pm 7:45 pm - 8:10 pm 8:10 pm - 8:20 pm 8:20 pm - 8:45 pm	<ul> <li>Discussion Leader: Joseph Orenstein (University of California, Berkeley, USA)</li> <li>Introduction by Discussion Leader</li> <li>Nandini Trivedi (The Ohio State University, USA)</li> <li>"Orbital Frustration and Entanglement in d4 Systems"</li> <li>Discussion</li> <li>Philip Moll (Max Planck Institute for Chemical Physics of Solids, Germany)</li> <li>"Hydrodynamic Electron Flow in PdCoO2"</li> </ul>
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7:30 pm - 7:45 pm 7:45 pm - 8:10 pm 8:10 pm - 8:20 pm 8:20 pm - 8:45 pm 8:45 pm - 8:55 pm 8:55 pm - 9:20 pm 9:20 pm - 9:30 pm	<ul> <li>Discussion Leader: Joseph Orenstein (University of California, Berkeley, USA)</li> <li>Introduction by Discussion Leader</li> <li>Nandini Trivedi (The Ohio State University, USA)</li> <li>"Orbital Frustration and Entanglement in d4 Systems"</li> <li>Discussion</li> <li>Philip Moll (Max Planck Institute for Chemical Physics of Solids, Germany)</li> <li>"Hydrodynamic Electron Flow in PdCoO2"</li> <li>Discussion</li> <li>James Analytis (University of California, Berkeley, USA)</li> <li>"Weyl Wiggles: Exotic Quantum Oscillatory Phenomena in Weyl and Dirac Semi-Metals"</li> </ul>

9:00 am

Departure

### **Correlated Electron Systems (GRS)**

Gordon Research Seminar Developments at the Frontier of Quantum Many-Electron Physics June 25-26, 2016 Mount Holyoke College South Hadley, MA Chairs: <u>Cassandra R. Hunt</u> & <u>Siddharth Ashok Parameswaran</u>

Contributors









#### Meeting 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 by the GRS Conference Chair
3:45 pm - 4:30 pm	Keynote Session: Pair Density Wave State in a Cuprate Superconductor
	Discussion Leader: Cassandra Hunt (University of California, Berkeley, USA)
3:45 pm - 4:25 pm	Stephen Edkins (Cornell University, USA)
	"Detection of a Cooper-Pair Density Wave in Bi2Sr2CaCu2O8 Using Scanned Josephson Tunneling"
4:25 pm - 4:30 pm	Discussion
4:30 pm - 6:00 pm	Poster Session
6:00 pm	Dinner
7:30 pm - 9:30 pm	Competing Orders in Complex Oxides
	Discussion Leader: Samuel Lederer (Massachusetts Institute of Technology, USA)
7:30 pm - 7:55 pm	Xiaoqian Chen (Brookhaven National Laboratory, USA)
	"Direct Observation of Charge Stripes Locked to the La2-xBaxCuO4 Lattice"
7:55 pm - 8:00 pm	Discussion
8:00 pm - 8:15 pm	Xi Chen (University of Michigan, USA)

	"Superconducting Fluctuations in the Normal State of the Two-Dimensional Hubbard Model"
8:15 pm - 8:20 pm	Discussion
8:20 pm - 8:40 pm	Gregory Affeldt (University of California, Berkeley, USA)
	"Pseudogap Analogue in the Spin-Orbit Mott Insulator $(Sr_{1-x}La_x)_3Ir_2O_7$ "
8:40 pm - 8:45 pm	Discussion
8:45 pm - 9:05 pm	Joosung Oh (Seoul National University, South Korea)
	"Spontaneous Decays of Magnetoelastic Excitations in Triangular Antiferromagnets RMnO <sub>3</sub> "
9:05 pm - 9:10 pm	Discussion
9:10 pm - 9:25 pm	Guanghua Zhang (Iowa State University, USA)
	"Two Stage Nematic Transitions Near Double-Stripe Magnetism"
9:25 pm - 9:30 pm	Discussion
Sunday	
7:30 am - 8:30 am	Breakfast
9:00 am - 11:00 am	Topological States of Matter
	Discussion Leader: Liang Wu (University of California, Berkeley, USA)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:30 am	Fahad Mahmood (Massachusetts Institute of Technology, USA)
	"Floquet-Bloch and Volkov States on the Surface of a Topological Insulator"
9:30 am - 9:35 am	Discussion
9:35 am - 9:50 am	Hossein Dehghani (New York University, USA)
	"Floquet Chern Insulators"
9:50 am - 9:55 am	Discussion
9:55 am - 10:15 am	Shreyas Patankar (University of California, Berkeley, USA)
	"Enhanced Optical Second Harmonic Generation in Inversion Breaking Weyl Semimetal TaAs"
10:15 am - 10:20 am	Discussion
10:20 am - 10:35 am	Onur Erten (Rutgers University, USA)
	"Topological Kondo Insulators"
10:35 am - 10:40 am	Discussion
10:40 am - 10:55 am	Timothy Hsieh (Kavli Institute for Theoretical Physics, USA)
	"Bulk Topological Proximity Effect"
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	Lunch
1:30 pm - 2:30 pm	Mentorship Component: Career Panel
	Discussion Leader: Sid Parameswaran (University of California, Irvine, USA)
1:30 pm - 2:30 pm	Panel Discussion
	"Careers in Industry, Academia, and National Labs"
	<ul> <li>Andrew Held (Coherent, Inc., USA)</li> </ul>
	<ul> <li>Shankar Iyer (Quora, USA)</li> </ul>
	• Kelly Reidy (Museum Hack, USA)
2:30 pm - 3:00 pm	Evaluation Period
	Fill in GRS Evaluation Forms
3:00 pm	Seminar Concludes

## Correlated Electron Systems GRC – Registration List

Name	Organization	Participation	Status
Abbamonte, Peter	University of Illinois	Chair	Registered
Ahn, Ken	New Jersey Institute of Technology	Poster Presenter	Registered
Allan, Milan P	Leiden University	Poster Presenter	Registered
Alpichshev, Zhanybek	Massachusetts Institute of Technology	Poster Presenter	Registered
Analytis, James G	University of California, Berkeley	Speaker	Registered
Aronson, Meigan	Texas A&M University	Discussion Leader	Registered
Ashok Parameswaran, S	University of California, Irvine	Discussion Leader	Registered
Assaf, Badih A	Ecole Normale Supérieure	Poster Presenter	Registered
Bednik, Grigory	University of Waterloo	Poster Presenter	Registered
Broholm, Colin	Johns Hopkins University	Speaker	Registered
Burch, Kenneth S	Boston College	Attendee	Registered
Busemeyer, Brian D	University of Illinois, Urbana-Champaign	Poster Presenter	Registered
Cano, Jennifer	Princeton University	Speaker	Registered
Carlson, Erica W	Purdue University	Discussion Leader	Registered
Carroll, Chris J F	University of St Andrews	Poster Presenter	Registered
Chacon Roldan, Alfonso	Technische Universität München, Physik Department	Poster Presenter	Registered
Chan, Garnet	Princeton University	Speaker	Registered
Chen, Xi	University of Michigan	Poster Presenter	Registered
Chen, Jyong-Hao	Condensed Matter Theory Group, Paul Scherrer Institute	Poster Presenter	Registered
Chen, Tianran	West Chester University of Pennsylvania	Poster Presenter	Registered
Ciudad, David	Nature Materials	Attendee	Registered
Cohn, Joshua L	University of Miami	Poster Presenter	Registered
Colbert, Jacob R	Massachusetts Institute of Technology	Attendee	Registered
Coleman, Piers	Rutgers University	Vice Chair	Registered
Comin, Riccardo	Massachusetts Institute of Technology	Speaker	Registered
Csathy, Gabor	Purdue University	Speaker	Registered
Dai, Zhehao	Massachusetts Institute of Technology	Poster Presenter	Registered
Dalla Torre, Emanuele G	Bar-Ilan University	Attendee	Registered
Davis, J.C. Seamus	Cornell University / Brookhaven National Laboratory	Speaker	Registered
Dehghani, Hossein	New York University	Poster Presenter	Registered
Demler, Eugene	Harvard University	Speaker	Registered
Drichko, Natalia	Johns Hopkins University	Poster Presenter	Registered
Dumitrescu, Philipp	University of California, Berkeley	Poster Presenter	Registered
Eberlein, Andreas	Harvard University	Poster Presenter	Registered
Edkins, Stephen D	Cornell University	Poster Presenter	Registered
Erten, Onur	Rutgers University	Poster Presenter	Registered
Essin, Andrew M	California Institute of Technology	Attendee	Registered
Flint, Rebecca A	Iowa State University	Discussion Leader	Registered
Fortune, Nathanael A	Smith College	Poster Presenter	Registered

Coorcean Alexandry D	Vola University	Poster Presenter	Decistand
Georgescu, Alexandru B Geraedts, Scott D	Yale University	Poster Presenter	Registered Registered
	Princeton University Paul Scherrer Institute		U
Gerber, Simon M Goldhaber-Gordon, David		Speaker	Registered
	•	Speaker	Registered
Goldman, Hart J	University of Illinois at Urbana-Champaign	Attendee	Registered
Goswami, Pallab	University of Maryland	Poster Presenter	Registered
Halasz, Gabor J	University of California, Santa Barbara	Poster Presenter	Registered
Heinz, Tony F	Stanford University	Speaker	Registered
Hoffman, Jennifer	University of British Columbia	Speaker	Registered
Hsieh, Timothy H	Kavli Institute for Theoretical Physics	Poster Presenter	Registered
Hu, Wenjun	Rice University	Poster Presenter	Registered
Hunt, Cassandra R	University of California, Berkeley	Poster Presenter	Registered
Husain, Ali	University of Illinois at Urbana-Champaign	Poster Presenter	Registered
Hussey, Nigel	Radboud University Nijmegen	Vice Chair	Registered
Iadecola, Thomas	Boston University	Poster Presenter	Registered
Ippoliti, Matteo	Princeton University	Poster Presenter	Registered
Ishizuka, Hiroaki	The University of Tokyo	Poster Presenter	Registered
Isobe, Hiroki	Massachusetts Institute of Technology	Poster Presenter	Registered
Jang, Sooyoung	Lawrence Berkeley National Lab	Poster Presenter	Registered
Jarillo-Herrero, Pablo	Massachusetts Institute of Technology	Speaker	Registered
Juricic, Vladimir	Stockholm University and KTH	Poster Presenter	Registered
Kargarian, Mehdi	University of Maryland	Poster Presenter	Registered
Kemper, Alexander F	North Carolina State University	Poster Presenter	Registered
Kim, Bumjoon	Max Planck Institute for Solid State Research	Speaker	Registered
Kimchi, Itamar	Massachusetts Institute of Technology	Poster Presenter	Registered
Klironomos, Alexios D	National Science Foundation	Attendee	Registered
Kogar, Anshul	University of Illinois / Argonne National Laboratory	Speaker	Registered
Kozii, Vladyslav	Massachusetts Institute of Technology	Poster Presenter	Registered
Krockenberger, Yoshiharu	NTT Basic Research Laboratories	Poster Presenter	Registered
Kumar, Prashant	Stanford University	Attendee	Registered
Kung, Hsianghsi	Rutgers University	Poster Presenter	Registered
Lai, Hsin-Hua	Rice University	Poster Presenter	Registered
Lederer, Samuel S	Massachusetts Institute of Technology	Poster Presenter	Registered
Lee, Kyungmin	Cornell University	Poster Presenter	Registered
Lee, Minhyea	University of Colorado	Speaker	Registered
Lee, Wei-Cheng	Binghamton University	Poster Presenter	Registered
Leiner, Jonathan C	Seoul National University	Poster Presenter	Registered
Lemonik, Yonah S	New York University	Poster Presenter	Registered
Li, Yangmu	University of Minnesota	Poster Presenter	Registered
Li, Yuan	Peking University	Poster Presenter	Registered
			•
Liu, Jianpeng	UCSB	Poster Presenter	Registered

Liu, Chia-Chuan Ma, Eric Yue MacDougall, Gregory Madhavan, Vidya Mahmood, Fahad McCormick, Timothy M Melikyan, Ashot Merino, Jaime Moll, Philip Moore, Joel E Morice, Corentin Mukherjee, Shantanu Mydosh, John A Nagler, Stephen E Nakatsuji, Satoru Nevidomskyy, Andriy O'Farrell, Eoin Oh, Joosung Orenstein, Joseph W Park, Kisoo Patankar, Shreyas G Patel, Aavishkar A Pirie, Harris Pixley, Jedediah H Plumb, Kemp W Ouinn, Eoin Raghu, Srinivas Rak, Melinda S Randeria, Mallika Rangamani, Mukund Ross, Kate Rossnagel, Kai Roy, Bitan Ruhman, Jonathan Ryu, Shinsei Schmidt, Johann Sebastian, Suchitra Sochnikov, Ilya Sodemann, Inti A Stajic, Jelena Taillefer. Louis

**Rice University** Stanford University University of Illinois at Urbana-Champaign University of Illinois at Urbana-Champaign Massachusetts Institute of Technology The Ohio State University Physical Review B Universidad Autónoma de Madrid Max Planck Institute for Chemical Physics of Solids University of California, Berkeley University of Cambridge BINGHAMTON UNIVERSITY Leiden University Oak Ridge National Laboratory University of Tokyo **Rice University** National University of Singapore Seoul National University University of California, Berkeley Seoul National University University of California, Berkeley Department of Physics, Harvard University Harvard University University of Maryland Johns Hopkins University University of Amsterdam Stanford University University of Illinois, Urbana-Champaign Princeton University University of California, Davis Colorado State University University of Kiel University of Maryland Massachusetts Institute of Technology University of Illinois at Urbana-Champaign Uppsala University University of Cambridge University of Connecticut Massachusetts Institute of Technology Science Université de Sherbrooke

Poster Presenter Registered Speaker Registered Registered Speaker Discussion Leader Registered Poster Presenter Registered Poster Presenter Registered Poster Presenter Registered Poster Presenter Registered Speaker Registered Chair Registered Registered Poster Presenter Poster Presenter Registered Attendee Registered Speaker Registered Speaker Registered Poster Presenter Registered Speaker Registered Registered Poster Presenter Discussion Leader Registered Poster Presenter Registered Registered Poster Presenter Discussion Leader Registered Poster Presenter Registered Poster Presenter Registered Speaker Registered Speaker Registered Discussion Leader Registered Poster Presenter Registered Registered Poster Presenter Speaker Registered Poster Presenter Registered Registered Speaker Poster Presenter Registered Poster Presenter Registered Attendee Registered Speaker Registered

Takagi, Hidenori Max Planck Institute for Solid State Research Speaker Registered Registered Torchinsky, Darius H Temple University Attendee The Ohio State University Registered Trivedi, Nandini Speaker Registered Uchoa, Bruno University of Oklahoma Attendee Van Wezel, Jasper University of Amsterdam Speaker Registered Varjas, Daniel UC Berkeley Poster Presenter Registered Varma, Chandra M University of California, Riverside Registered Speaker Venderbos, Jorn W F Massachusetts Institute of Technology Poster Presenter Registered Registered Wagner, Lucas K University of Illinois at Urbana-Champaign Poster Presenter Poster Presenter Registered Wu, Liang University of California, Berkeley Xu, Yiming American Physical Society Attendee Registered Discussion Leader Registered Zaanen, Jan Leiden University Zhang, Guanghua Iowa State University Poster Presenter Registered Zhao, Liuyan Caltech Poster Presenter Registered Zhong, Shudan UC Berkeley Attendee Registered Zhou, Yuanjun Columbia University Poster Presenter Registered

#### **Correlated Electron Systems GRS – Registration List**

Name				
Affeldt, Gregory				
Alpichshev, Zhanybek				
Ashok Parameswaran, S				
Assaf, Badih A				
Bednik, Grigory				
Carroll, Chris J F				
Chacon Roldan, Alfonso				
Chen, Xi				
Chen, Xiaoqian M				
Chen, Jyong-Hao				
Colbert, Jacob R				
Dai, Zhehao				
Dehghani, Hossein				
Dumitrescu, Philipp				
Edkins, Stephen D				
Erten, Onur				
Georgescu, Alexandru B				
Halasz, Gabor J				
Held, Andrew				
Hsieh, Timothy H				
Hunt, Cassandra R				
Iadecola, Thomas				
Ippoliti, Matteo				
Isobe, Hiroki				
Iyer, Shankar				
Jang, Sooyoung				
Kargarian, Mehdi				
Kung, Hsianghsi				
Lederer, Samuel S				
Lee, Kyungmin				
Li, Yangmu				
Liu, Jianpeng				
Mahmood, Fahad				
Oh, Joosung				
Park, Kisoo				
Patankar, Shreyas G				
Patel, Aavishkar A				
Quinn, Eoin				
Randeria, Mallika				

ems GRS – Registration List	
Organization	Р
University of California, Berkeley	S
Massachusetts Institute of Technology	P
University of California, Irvine	С
Ecole Normale Supérieure	P
University of Waterloo	P
University of St Andrews	P
Technische Universität München, Physik Department	P
University of Michigan	S
Brookhaven National Laboratory	S
Condensed Matter Theory Group, Paul Scherrer Institute	P
Massachusetts Institute of Technology	P
Massachusetts Institute of Technology	P
New York University	S
University of California, Berkeley	P
Cornell University	S
Rutgers University	S
Yale University	P
University of California, Santa Barbara	P
Coherent, Inc.	P
Kavli Institute for Theoretical Physics	S
University of California, Berkeley	С
Boston University	P
Princeton University	P
Massachusetts Institute of Technology	P
Quora	S
Lawrence Berkeley National Lab	P
University of Maryland	P
Rutgers University	P
Massachusetts Institute of Technology	D
Cornell University	P
University of Minnesota	P
UCSB	P
Massachusetts Institute of Technology	S
Seoul National University	S
Seoul National University	P
University of California, Berkeley	S
Department of Physics, Harvard University	P
University of Amsterdam	P
Princeton University	P
-	

Participation Status Speaker Registered Poster Presenter Registered Chair Registered Poster Presenter Registered Registered Poster Presenter Poster Presenter Registered Registered Poster Presenter Registered Speaker Speaker Registered Registered Poster Presenter Poster Presenter Registered Poster Presenter Registered Speaker Registered Poster Presenter Registered Speaker Registered Registered Speaker Poster Presenter Registered Poster Presenter Registered Poster Presenter Registered Speaker Registered Chair Registered Poster Presenter Registered Registered Poster Presenter Poster Presenter Registered Speaker Registered Poster Presenter Registered Poster Presenter Registered Poster Presenter Registered Discussion Leader Registered Poster Presenter Registered Poster Presenter Registered Poster Presenter Registered Speaker Registered Speaker Registered Poster Presenter Registered Speaker Registered Registered Poster Presenter Registered Poster Presenter Poster Presenter Registered

Reidy, Kelly E	Museum Hack	Speaker	Registered
Schmidt, Johann	Uppsala University	Poster Presenter	Registered
Varjas, Daniel	UC Berkeley	Poster Presenter	Registered
Wu, Liang	University of California, Berkeley	Discussion Leader	Registered
Zhang, Guanghua	Iowa State University	Speaker	Registered