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GORDON RESEARCH CONFERENCES *frontiers of science*
512 Liberty Lane, West Kingston, RI 02892
Phone: 401-360-1519 Fax: 401 783-7644
E-Mail: lirwin@grc.org
World Wide Web: <http://www.grc.org>

Nancy Ryan Gray, Ph.D.
Director

2009 GORDON RESEARCH CONFERENCE
on
Electronic Spectroscopy and Dynamics
FINAL PROGRESS REPORT
DOE
DE-SC0000584

The Gordon Research Conference (GRC) on Electronic Spectroscopy and Dynamics was held at Colby College, Waterville, NH from 07/19/2009 thru 07/24/2009. The Conference was well-attended with participants (attendees list attached). The attendees represented the spectrum of endeavor in this field coming from academia, industry, and government laboratories, both U.S. and foreign scientists, senior researchers, young investigators, and students.

In designing the formal speakers program, emphasis was placed on current unpublished research and discussion of the future target areas in this field. There was a conscious effort to stimulate lively discussion about the key issues in the field today. Time for formal presentations was limited in the interest of group discussions. In order that more scientists could communicate their most recent results, poster presentation time was scheduled. Attached is a copy of the formal schedule and speaker program and the poster program. In addition to these formal interactions, "free time" was scheduled to allow informal discussions. Such discussions are fostering new collaborations and joint efforts in the field.

I want to personally thank you for your support of this Conference. As you know, in the interest of promoting the presentation of unpublished and frontier-breaking research, Gordon Research Conferences does not permit publication of meeting proceedings. If you wish any further details, please feel free to contact me. Thank you.

Sincerely,

Mark Maroncelli
Penn State
University

Registration List		
Name	Organization	Participation
Mark Maroncelli	PENN STATE UNIVERSITY	Chair
Timothy S. Zwier	PURDUE UNIVERSITY	Chair
Edward R. Grant	UNIVERSITY OF BRITISH COLUMBIA	Vice Chair
Bern Kohler	OHIO STATE UNIVERSITY	Vice Chair
Jeffrey A. Cina	UNIVERSITY OF OREGON	Discussion Leader
Yehuda Haas	HEBREW UNIVERSITY	Discussion Leader
Sam Leutwyler	UNIVERSITY OF BERN	Discussion Leader
Donald H. Levy	UNIVERSITY OF CHICAGO	Discussion Leader
Piotr Piotrowiak	RUTGERS UNIVERSITY	Discussion Leader
Paul F. Barbara	UNIVERSITY OF TEXAS AT AUSTIN	Speaker
David A. Blank	UNIVERSITY OF MINNESOTA	Speaker
Laurie J. Butler	UNIVERSITY OF CHICAGO	Speaker
Takayuki Ebata	HIROSHIMA UNIVERSITY	Speaker
Robert W. Field	MIT	Speaker
Carl C. Hayden	SANDIA NATIONAL LABORATORIES	Speaker
James T. Hynes	UNIVERSITY OF COLORADO	Speaker
David M. Jonas	UNIVERSITY OF COLORADO	Speaker
Scott Kable	UNIVERSITY OF SYDNEY	Speaker
John P. Maier	UNIVERSITY OF BASEL	Speaker
Richard A. Mathies	UNIVERSITY OF CALIFORNIA, BERKELEY	Speaker
Spiridoula Matsika	TEMPLE UNIVERSITY	Speaker
Frederic Merkt	ETH ZURICH	Speaker
David F. Plusquellic	NIST	Speaker
Hanna Reisler	UNIVERSITY OF SOUTHERN CALIFORNIA	Speaker
Gregory D. Scholes	UNIVERSITY OF TORONTO	Speaker
Benjamin J. Schwartz	UNIVERSITY OF CALIFORNIA, LOS ANGELES	Speaker
Lyudmila Slipchenko	PURDUE UNIVERSITY	Speaker
Timothy P. Softley	UNIVERSITY OF OXFORD	Speaker
John F. Stanton	UNIVERSITY OF TEXAS AT AUSTIN	Speaker
Jaime A. Stearns	AIR FORCE RESEARCH LAB	Speaker
Toshi Suzuki	KYOTO UNIVERSITY	Speaker
Wim Ubachs	VRIJE UNIVERSITEIT AMSTERDAM	Speaker
Thomas Udem	MAX PLANK INSTITUTE FOR QUANTENOPTIK	Speaker
Xiaoyang Zhu	UNIVERSITY OF TEXAS	Speaker
Leonardo Alvarez-Valtierra	UNIVERSIDAD DE GUANAJUATO	Poster Presenter
Jason D. Biggs	UNIVERSITY OF OREGON	Poster Presenter
Arthur E. Bragg	UCLA	Poster Presenter
Ksenia B. Bravaya	UNIVERSITY OF SOUTHERN CALIFORNIA	Poster Presenter
Kristin A. Briney	UNIVERSITY OF WISCONSIN - MADISON	Poster Presenter
Wybren J. Buma	UNIVERSITY OF AMSTERDAM	Poster Presenter

Chandrima Chatterjee	YALE UNIVERSITY	Poster Presenter
Trevor L. Courtney	UNIVERSITY OF COLORADO	Poster Presenter
Kimberly D. De La Harpe	THE OHIO STATE UNIVERSITY	Poster Presenter
Mark Dethlefsen	UNIVERSITY OF OXFORD	Poster Presenter
Joseph J. Dillon	JOHNS HOPKINS UNIVERSITY	Poster Presenter
Michael B. Doyle	WAYNE STATE UNIVERSITY	Poster Presenter
Masaaki Fujii	TOKYO INSTITUTE OF TECHNOLOGY	Poster Presenter
Jakob Grilj	UNIVERSITY OF GENEVA	Poster Presenter
Brianna R. Heazlewood	UNIVERSITY OF SYDNEY	Poster Presenter
Leslie V. Herman	UNIVERSITY OF WISCONSIN - MADISON	Poster Presenter
Anat Kahan	THE HEBREW UNIVERSITY OF JERUSALEM , ISRAEL	Poster Presenter
Tim Kowalczyk	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	Poster Presenter
Jan PHILIP. Kraack	PHILIPPS-UNIVERSITY OF MARBURG	Poster Presenter
Ryoji Kusaka	HIROSHIMA UNIVERSITY	Poster Presenter
Adrian W. Lange	OHIO STATE UNIVERSITY	Poster Presenter
Elin ANN. McCormack	OXFORD UNI	Poster Presenter
Jonathan P. Morrison	UNIVERSITY OF BRITISH COLUMBIA	Poster Presenter
Natalia S. Nagornova	EPFL	Poster Presenter
Josh J. Newby	PURDUE UNIVERSITY	Poster Presenter
Jaime Ortega Arroyo	UBC	Poster Presenter
Yoonsoo Pang	UNIVERSITY OF CALIFORNIA, BERKELEY	Poster Presenter
Lorena Piticco	ETH ZURICH	Poster Presenter
David Pratt	UNIVERSITY OF PITTSBURGH	Poster Presenter
Thomas J. Preston	UNIVERSITY OF WISCONSIN - MADISON	Poster Presenter
Christopher J. Rennick	UBC	Poster Presenter
Christian Rensing	UNIVERSITY OF KARLSRUHE	Poster Presenter
Chirantha P. Rodrigo	PURDUE UNIVERSITY	Poster Presenter
Durba Roy	THE PENNSYLVANIA STATE UNIVERSITY	Poster Presenter
Eric So	OXFORD UNIVERSITY	Poster Presenter
Daniel Sprecher	ETH ZURICH	Poster Presenter
Joseph E. Subotnik	TEL AVIV UNIVERSITY	Poster Presenter
Alexander N. Tarnovsky	BOWLING GREEN STATE UNIVERSITY	Poster Presenter
Mohamad Toutounji	UAE UNIVERSITY	Poster Presenter
Tyler P. Troy	UNIVERSITY OF SYDNEY	Poster Presenter
Alexander Vdovin	UNIVERSITY OF AMSTERDAM	Poster Presenter
Cesar R. Viteri	GEORGIA INSTITUTE OF TECHNOLOGY	Poster Presenter
Hailing Wang	ARIZONA STATE UNIVERSITY	Poster Presenter
Xiaolei Zhu	JOHNS HOPKINS UNIVERSITY	Poster Presenter
Xiujuan Zhuang	ARIZONA STATE UNIVERSITY	Poster Presenter
Peter C. Chen	SPELMAN COLLEGE	Attendee
Ezra Daniel	TEL AVIV UNIVERSITY	Attendee
John M. Herbert	OHIO STATE UNIVERSITY	Attendee

Richard Hildner	ICFO - THE INSTITUTE OF PHOTONIC SCIENCES	Attendee
Timothy W. Schmidt	UNIVERSITY OF SYDNEY	Attendee
Timothy C. Steimle	ARIZONA STATE UNIVERSITY	Attendee

The GRC on Electronic Spectroscopy & Dynamics showcases some of the most recent experimental and theoretical developments in electronic spectroscopy that probes the structure and dynamics of isolated molecules, molecules embedded in clusters and condensed phases, and bulk materials. Electronic spectroscopy is an important tool in many fields of research, and this GRC brings together experts having diverse backgrounds in physics, chemistry, biophysics, and materials science, making the meeting an excellent opportunity for the interdisciplinary exchange of ideas and techniques.

Topics covered in this GRC include high-resolution spectroscopy, biological molecules in the gas phase, electronic structure theory for excited states, multi-chromophore and single-molecule spectroscopies, and excited state dynamics in chemical and biological systems.

Active participation of postdoctoral researchers and graduate students is encouraged.

SUNDAY

2:00 pm - 9:00 pm	Arrival and Check-in (Office Closed 6:00 pm - 7:00 pm)
6:00 pm	Dinner
7:30 pm - 7:40 pm	Welcome / Introductory Comments by GRC Site Staff
7:40 pm - 9:10 pm	Electronic Spectroscopy at High Resolution 1: Few-Atom Systems
	Discussion Leader: Ed Grant (The University of British Columbia)
7:40 pm - 8:15 pm	Thomas Udem (Max Planck Institute for Quantum Optics) "Femtosecond Frequency Combs and High Resolution Spectroscopy"
8:15 pm - 8:25 pm	Discussion
8:25 pm - 9:00 pm	Wim Ubachs (Free University of Amsterdam) "Rydberg Spectroscopy in a Heavy Bohr Atom: H ⁺ H ⁻ "
9:00 pm - 9:10 pm	Discussion

MONDAY

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Electronic Spectroscopy at High Resolution 2: Larger Molecules & Interactions
	Discussion Leader: Elliot Bernstein (Colorado State University)
9:00 am - 9:35 am	Frédéric Merkt (ETH Zurich) "High-Resolution Spectroscopic Investigations of High Rydberg States and Electrostatic Trapping Experiments"
9:35 am - 9:45 am	Discussion
9:45 am - 10:20 am	Tim Softley (Oxford University) "Molecular Rydberg States Interacting with Solid Surfaces: Dynamics and Field Effects"
10:20 am - 10:30 am	Discussion
10:30 am - 11:00 am	Coffee Break
11:00 am - 11:35 am	Robert Field (MIT) "Acetylene: Just Large Enough"

11:35 am - 11:45 am Discussion

11:45 am - 12:20 pm **John Maier** (University of Basel)
"Electronic Spectra of Carbon Chain Radicals and Ions"

12:20 pm - 12:30 pm Discussion

12:30 pm Group Photo / Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session A-1

6:00 pm Dinner

7:30 pm - 9:05 pm **Theory for Electronically Excited States**
Discussion Leader: **Jeffrey Cina** (University of Oregon)

7:30 pm - 8:05 pm **John Stanton** (University of Texas at Austin)
"Photoelectron Spectroscopy and Dynamics in the Nitromethane Anion"

8:05 pm - 8:15 pm Discussion

8:15 pm - 8:35 pm Hot Topic Talk: **Ksenia Bravaya** (University of Southern California)
"The Effect of H-bonding and π -Stacking Interactions on Ionization Energies of DNA Bases"

8:35 pm - 8:40 pm Discussion

8:40 pm - 9:00 pm Hot Topic Talk: **Lyudmila Slipchenko** (Purdue University)
"Electronic Excitations in the Condensed Phase: Theoretical Insights"

9:00 pm - 9:05 pm Discussion

TUESDAY

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Excited-State Dynamics**
Discussion Leader: **Samuel Leutwyler** (University of Bern)

9:00 am - 9:35 am **Laurie Butler** (University of Chicago)
"Radical Intermediates of Bimolecular Reactions: Electronic and Nuclear Dynamics"

9:35 am - 9:45 am Discussion

9:45 am - 10:20 am **Hanna Reisler** (University of Southern California)
"Photodissociation Dynamics of Nitrogen Rich Molecules"

10:20 am - 10:30 am Discussion

10:30 am - 11:00 am Coffee Break

11:00 am - 11:35 am **Scott Kable** (University of Sydney)
"Reaction Dynamics in Aldehydes"

11:35 am - 11:45 am Discussion

11:45 am - 12:20 pm **Toshi Suzuki** (Kyoto University)
"Time-Resolved Photoelectron Imaging of Ultrafast Internal Conversion"

12:20 pm - 12:30 pm Discussion

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session A-2

6:00 pm Dinner

7:30 pm - 9:30 pm **Biological Molecules in the Gas Phase**
Discussion Leader: **Donald Levy** (University of Chicago)

7:30 pm - 8:05 pm **Jaime Stearns** (Air Force Research Lab)

8:05 pm - 8:15 pm Discussion

8:15 pm - 8:50 pm **Takayuki Ebata** (Hiroshima University)
"Laser Spectroscopy Studies of Functional Molecules"

8:50 pm - 9:00 pm Discussion

WEDNESDAY

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Single-Molecule and Multi-Chromophore Systems**

Discussion Leader: **Piotr Piotrowiak** (Rutgers University)

9:00 am - 9:35 am **Carl Hayden** (CRF Sandia)
"Time-Resolved Multi-Spectral Single Molecule Spectroscopy"

9:35 am - 9:45 am Discussion

9:45 am - 10:20 am **Paul Barbara** (University of Texas at Austin)
"Single Molecule Spectroscopy Studies of the Charging and Discharging of Conjugated Polymers"

10:20 am - 10:30 am Discussion

10:30 am - 10:50 am Coffee Break

10:50 am - 11:25 am **David Blank** (University of Minnesota)
"Excited State Dynamics in Thiophene Oligomers, Dendrimers, and Polymers"

11:25 am - 11:35 am Discussion

11:35 am - 11:55 am Hot Topic Talk: **Richard Hildner** (ICFO Spain)
"Ultrafast Phase Controlled Excitation of Single Molecules"

11:55 am - 12:00 pm Discussion

12:00 pm - 12:20 pm Hot Topic Talk: **Timothy Schmidt** (University of Sydney)
"The Identification and Characterization of Resonance-Stabilized Hydrocarbon Radicals"

12:20 pm - 12:25 pm Discussion

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session B-1

6:00 pm Dinner

7:00 pm - 7:30 pm Business Meeting

(Nominations for the next Vice Chair; Fill out Conference Evaluation Forms;
Discuss future Site & Scheduling preferences; Election of the next Vice Chair)

7:30 pm - 9:00 pm **Multi-Chromophore Systems & Exciton Dynamics**

Discussion Leader: **Mark Maroncelli** (Penn State)

7:30 pm - 8:05 pm **Gregory Scholes** (University of Toronto)
"Electronic Coherence Despite Fast Dephasing: Energy Transfer and Two Exciton States"

8:05 pm - 8:15 pm Discussion

8:15 pm - 8:50 pm **Xiaoyang Zhu** (University of Minnesota)
"Exciton Formation and Dissociation at Semiconductor Interfaces"

8:50 pm - 9:00 pm Discussion

THURSDAY

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm	Electronic Coupling & Conical Intersections
	Discussion Leader: Yehuda Haas (Hebrew University of Jerusalem)
9:00 am - 9:35 am	David Plusquellic (NIST) "Excitonic Interactions in Flexible Bichromophores"
9:35 am - 9:45 am	Discussion
9:45 am - 10:20 am	Spiridoula Matsika (Temple University) "The Role of Conical Intersections in the Photophysics of Biologically Relevant Molecules"
10:20 am - 10:30 am	Discussion
10:30 am - 11:00 am	Coffee Break
11:00 am - 11:35 am	James Hynes (University of Colorado / Ecole Normale Supérieure, Paris) "Polar Environmental Effects on Conical Intersection Structure and Dynamics"
11:35 am - 11:45 am	Discussion
11:45 am - 12:20 pm	David Jonas (University of Colorado) "Electronic Dynamics via Conical Funnel and Intersections"
12:20 pm - 12:30 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session B-2
6:00 pm	Dinner
7:30 pm - 9:25 pm	Excited-State Dynamics in Solution
	Discussion Leader: Bern Kohler (Ohio State University)
7:30 pm - 7:50 pm	Hot Topic Talk: John Herbert (Ohio State University) "Excited-State Quantum Chemistry for Macromolecules and Condensed Phases"
7:50 pm - 7:55 pm	Discussion
7:55 pm - 8:30 pm	Benjamin Schwartz (University of California at Los Angeles) "Watching the Solvation of Atoms in Liquids, One Solvent Molecule at a Time"
8:30 pm - 8:40 pm	Discussion
8:40 pm - 9:15 pm	Richard Mathies (University of California at Berkeley) "Femtosecond Stimulated Raman Spectroscopy (FSRS) of Excited State Photochemistry in Phytochrome and Green Fluorescent Protein (GFP): Picking Apart the Reaction Coordinate"
9:15 pm - 9:25 pm	Discussion
FRIDAY	
7:30 am - 8:30 am	Breakfast
9:00 am	Depart