The Gordon Research Conference (GRC) on MOLECULAR ELECTRONIC SPECTROSCOPY was held at Colby-Sawyer from 7/30/00 thru 8/4/00. The Conference was well-attended with 89 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In designing the formal speakers program, emphasis was placed on current unpublished research and discussion of the future target areas in this field.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 As you know, in the interest of promoting the presentation of unpublished and frontier-breaking research, Gordon Research Conferences does not permit publication of meeting proceedings.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,

ROBERT W FIELD
MIT
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MOLECULAR ELECTRONIC SPECTROSCOPY

Final Progress Report

For Period June 1, 2000-May 31, 2001

PI: Dr. Robert W. Field

Gordon Research Conferences
PO Box 984
West Kingston, RI 02892-0984

June 7, 2001

Prepared for

THE U.S. DEPARTMENT OF ENERGY
AWARD NO. DE-FG02-00ER15054
## Gordon Research Conferences

### Molecular Electronic Spectroscopy and Dynamics

Colby Sawyer College  
New London, New Hampshire, USA  
7/30/00 - 8/4/00

Robert W. Field, Chair  
Elliot R. Bernstein, Co-Vice Chair  
James L. Skinner, Co-Vice Chair

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<tr>
<th>Sunday Evening</th>
<th>Herzberg Session</th>
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<tr>
<td>July 30</td>
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<tr>
<td>Chair:</td>
<td>Boris Stoicheff, Department of Physics, University of Toronto, Canada</td>
</tr>
</tbody>
</table>
| Speakers:      | - Christian Jungen, Laboratoire Aimé Cotton du CNRS, Université de Paris-Sud, France  
                  - Frederic Merkt, Department of Chemistry, ETH, Zurich  
                  - Frederic Merkt, Department of Chemistry, ETH, Zurich  
                  - Frederic Merkt, Department of Chemistry, ETH, Zurich |
|                | High Resolution in the Frequency and Time Domains: from Hyperfine Interactions to Wavepacket Motion in Molecular Rydberg States  
                  - New High Resolution Spectroscopic Measurements on Some of Herzberg's Favorite Molecules |

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<tr>
<th>Monday Morning</th>
<th>From Atom-in-Molecule to Supercritical Fluids I</th>
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<tr>
<td>July 31</td>
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<tr>
<td>Chair:</td>
<td>Giacinto Scoles, Department of Chemistry, Princeton University</td>
</tr>
</tbody>
</table>
| Speakers:     | - Robert Lipson, Department of Chemistry, University of Western Ontario, Canada  
                  - Wolfgang Ketterle, Department of Physics, MIT  
                  - Andrej Vilesov, Department of Physical Chemistry, Ruhr-University-Bochum, Germany |
|                | Excited Rare Gas Dimers in Low n* Rydberg States: A Different Take on the Concept of United Atoms  
                  - Optical Properties of a Bose-Einstein Condensate and Phase-Coherent Matter Wave Amplification  
                  - Spectroscopy of Molecules Dissolved in Liquid Helium Droplets |

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<thead>
<tr>
<th>Monday Evening</th>
<th>From Atom-in-Molecule to Supercritical Fluids II</th>
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<tr>
<td>July 31</td>
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<tr>
<td>Chair:</td>
<td>Majed Chergui, Institute de Physique de la Matière Condensée, Université de Lausanne, Switzerland</td>
</tr>
</tbody>
</table>
| Speakers:     | - Takamasa Momose, Department of Chemistry, Kyoto University, Japan  
                  - Joan F. Brennecke, Department of Chemical Engineering, University of Notre Dame |
|                | High-Resolution Spectroscopy of Rovibrational and Electronic Transitions of Molecules Embedded in Para-hydrogen Crystals  
                  - Local Solvation and Its Effects on Spectroscopy and Reactivity in Supercritical Fluids |
<table>
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<tr>
<th>Tuesday Morning</th>
<th>Imaging and Control I</th>
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</thead>
<tbody>
<tr>
<td>Chair:</td>
<td>Richard Dixon, School of Chemistry, University of Bristol, United Kingdom</td>
</tr>
</tbody>
</table>
| Speakers:       | Carl Hayden, Sandia National Laboratory  
Femtosecond Time-Resolved Photoelectron/Photoion Coincidence Imaging  
Christophe Blondel, Laboratoire Aimé Cotton du CNRS,  
Université de Paris-Sud, France  
Photodetachment Microscopy, a 1 μeV Accurate Electron Spectrometry Method?  
Thomas Weinacht, Department of Physics, University of Michigan  
Using Feedback to Control Quantum Dynamics in Rydberg Atoms and Molecular Liquids |

<table>
<thead>
<tr>
<th>Tuesday Evening</th>
<th>Imaging and Control II</th>
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</thead>
<tbody>
<tr>
<td>Chair:</td>
<td>Regina de Vivie-Riedle, Max Planck Institut für Quantenoptik, Garching, Germany</td>
</tr>
</tbody>
</table>
| Speakers:       | Stephen Leone, Quantum Physics Division, JILA, Boulder  
Ultrafast Phase Control in Wave Packet Dynamics  
Jianshu Cao, Department of Chemistry, MIT  
Quantum Coherence in Nonlinear Optical Processes |

<table>
<thead>
<tr>
<th>Wednesday Morning</th>
<th>Quantum Dots</th>
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<tr>
<td>Chair:</td>
<td>Shuming Nie, Indiana University</td>
</tr>
</tbody>
</table>
| Speakers:         | Uri Banin, Department of Physical Chemistry, The Hebrew University of Jerusalem, Israel  
Molecular (and Atomic) Electronic Spectroscopy of Semiconductor Clusters and Nanocrystals  
Martin Moskovits, Department of Chemistry, University of Toronto, Canada  
Enormous Optical Field Enhancements on Fractal Surfaces - The Prospect of Single Molecule Raman Spectroscopy and Other High Field Effects  
Paul McEuen, Department of Physics, University of California, Berkeley  
Electrons in Carbon Nanostructures |

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<tr>
<th>Wednesday Evening</th>
<th>A Little of This and a Little of That</th>
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<tr>
<td>Chair:</td>
<td>Robert Jones, Department of Physics, University of Virginia</td>
</tr>
</tbody>
</table>
| Speakers:         | H. Floyd Davis, Department of Chemistry and Chemical Biology, Cornell University  
Dynamics of Neutral Transition Metal Atom Reactions with Simple Hydrocarbons  
Martin Gruebele, Department of Chemistry, University of Illinois, Urbana-Champaign  
Using Wavelength- and Time-Resolved Fluorescence Spectroscopy to Study the Folding of Proteins and Synthetic Structure-Seekers |
Thursday Morning
August 3:

**Light Harvesting Antenna Systems**

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<tr>
<th>Chair:</th>
<th>Graham R. Fleming, Department of Chemistry, University of California, Berkeley</th>
</tr>
</thead>
</table>
| Speakers: | • Rienk Van Grondelle, Faculteit der Exacte Wetenschappen Afdeling Biofysica en Fysica van Complexe Systemen, Vrije Universiteit, Amsterdam, The Netherlands  
The Spectroscopy of Bacterial Light-Harvesting Complexes  
• Klaus J. Schulten, Department of Chemistry, University of Illinois, Urbana-Champaign  
Migration of Electronic Excitation in Photosynthetic Chlorophyll-Carotenoid Aggregates  
• Silvia L. Völker, Molecular Physics, University of Leiden, The Netherlands  
Unraveling the photophysics of Green and Red Fluorescent Proteins |

Thursday Evening
August 3:

**Time vs. Frequency Domain**

<table>
<thead>
<tr>
<th>Chair:</th>
<th>James L. Skinner, Department of Chemistry, University of Wisconsin, Madison</th>
</tr>
</thead>
</table>
| Speakers: | • David M. Jonas, Department of Chemistry & Biochemistry, University of Colorado, Boulder  
Frequency Domain Pictures of Femtosecond Spectroscopy  
• Albert Stolow, Steacie Institute for Molecular Sciences, National Research Council of Canada  
Issues of Time, Phase & Intensity in Femtosecond Spectroscopy  
• Eliot Bernstein & James Skinner  
Central Issues, Recurrent Themes, and Future Directions of Molecular Electronic Spectroscopy and Dynamics |

Acknowledgements: The Chair and Co-Vice-Chairs wish to graciously thank the following for their generous contributions to this conference.


 Funds for refreshments during the Poster Sessions were provided by Harcourt Brace (Academic press) and Coherent, Inc.
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