

MATTHEW ALAN THOMPSON, PHD

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EDUCATION

1999-2007

University of Colorado at Boulder, Boulder, CO, USA

PhD, Chemistry

From Femtoseconds to Nanoseconds: Simulation of IBr^- Photodissociation Dynamics in CO_2 Clusters

1995-1999

The Colorado College, Colorado Springs, CO, USA

Otis A. and Margaret T. Barnes Chemistry Scholar

BA, *summa cum laude*, Chemistry

RESEARCH AND TEACHING EXPERIENCE

2009-Present

Senior Scientific Software Engineer

Science Applications International Corporation

Support of the Global Modeling and Assimilation Office at the NASA/Goddard Space Flight Center

- Adapted the GEOS-5 global atmospheric model for use with NVIDIA Tesla Graphics Processing Units (GPU).
- Investigated the use of the Portland Group's new PGI 9.0 Accelerator Compilers which allow for quick, efficient use of GPU resources.

2007-2009

National Research Council Postdoctoral Fellowship

Naval Research Laboratory (Advisor: Brett Dunlap)

Investigation on the use of genetic algorithms for optimization of analytic density functional theory (DFT)

- Constructed and integrated a genetic algorithm in Python with existing analytic DFT code leading to better results than previous efforts.
- Leveraged Parallel Python and MPI to rapidly parallelize genetic algorithm on a per-node and per-core basis for use on workstations and clusters.

2000-2007

Graduate Research Assistant

University of Colorado at Boulder (Advisor: Robert Parson)

Nonadiabatic molecular dynamics and high-level (MRCI and CR-CCSD(T)) electronic structure calculations of $\text{IBr}^- (\text{CO}_2)_n$ and $\text{ICl}^- (\text{CO}_2)_n$

- Predicted the later confirmed appearance and disappearance of a long-time absorption recovery process in near-infrared photodissociation of intermediate-size clusters.
- Mentored fellow students and researchers in installation and use of Linux and quantum chemistry programs on local workstations and clusters.

1999-2000

Teaching Assistantship

University of Colorado at Boulder

CHEM 4521/4561 - Physical Chemistry Laboratory

- Instructed and supervised Physical Chemistry experiments for Chemistry, Biochemistry, and Chemical Engineering students.
 - Evaluated laboratory notebook entries and reports of results for various experimental and theoretical activities.
- CHEM 4411/4431/5411/5431 - Physical Chemistry with Biochemistry Applications*
- Led recitation sessions and evaluated homework and tests in Physical Chemistry with examples and problems geared toward Biochemistry students.

COMPUTING SKILLS

Programming	Proficient in FORTRAN 77 and Fortran 90/95/2003 including Intel and PGI Compilers Proficient in Python, Parallel Python, and iPython Proficient with sed/awk, bash, and zsh shell scripts Experience in C, C++, Perl, and Ruby Experience with CVS, Subversion, and Trac version control software
Parallel Computing	Experience with PBS queueing system, Global Arrays, and MPI (MPICH, OpenMPI) and MPI-I/O Experience in integrating Parallel Python with varying multi-core workstation and multi-node cluster architectures Experience with CUDA including use of PGI Accelerator pragmas for Fortran 90/95/2003
Quantum Chemistry	Proficient with GAMESS-US and Molpro including modification of source code Experience with Gaussian 98 and Gaussian 03
Administration	Broad experience at both user and administrative level with Compaq Tru64 Alpha, various distributions of Linux (Red Hat, Fedora, Gentoo, Ubuntu), OS X, and Windows XP/Vista Proficient with PC, Apple, and printer hardware installation and troubleshooting
General	Proficient with Microsoft Office and OpenOffice products Proficient with TeX, LaTeX, and BibTeX Experience with HTML, XHTML, MathML and CSS

AWARDS AND SCHOLARSHIPS

2007	National Research Council Postdoctoral Fellowship
1999	Phi Beta Kappa
1999	Alpha Lambda Delta Book Award
1999	Merck Award in Chemistry
1996	CRC Press Freshman Chemistry Achievement Award
1996	Alpha Lambda Delta
1995-1999	Otis A. and Margaret T. Barnes Chemistry Scholar
1995-1999	Hach Scientific Foundation Scholar
1995-1999	First Bank System Foundation Scholar

ORGANIZATIONS

1995-Present	American Chemical Society
1999-Present	American Physical Society

POSTERS PRESENTED

2008	American Conference on Theoretical Chemistry 2008, Evanston, IL <i>Analytic Density-Functional Theory Optimization with a Parallel Genetic Algorithm</i>
2007	American Physical Society, March Meeting, Denver, CO <i>Nonadiabatic MD Simulations of $IBr^- (CO_2)_n$ Photodissociation</i>
2006	American Chemical Society, Fall Meeting, San Francisco, CA <i>Nonadiabatic MD Simulations of $IBr^- (CO_2)_n$ Photodissociation</i>

TALKS GIVEN

2006	JILA, Boulder, CO <i>Nonadiabatic MD Simulations of $IBr^- (CO_2)_n$ Photodissociation</i>
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PUBLICATIONS

L. Sheps, E. M. Miller, S. Horvath, M. A. Thompson, R. Parson, A. B. McCoy, and W. C. Lineberger.
Solvent-mediated electron leapfrogging: Long-range charge transfer during photodissociation of $\text{IBr}^-(\text{CO}_2)$.
Science.
submitted

M. A. Thompson, J. P. Martin, J. P. Darr, W. C. Lineberger, and R. Parson.
A combined experimental/theoretical investigation of the near-infrared photodissociation of $\text{IBr}^-(\text{CO}_2)_n$.
J. Chem. Phys., 129:224304, 2008

M. A. Thompson and B. I. Dunlap.
Optimization of analytic density functionals by parallel genetic algorithm.
Chem. Phys. Lett., 463:278–282, 2008

V. Dribinski, J. Barbera, J. P. Martin, A. Svendsen, M. A. Thompson, R. Parson, and W. C. Lineberger.
Time-resolved study of the solvent induced recombination in size-selected $\text{IBr}^-(\text{CO}_2)_n$ clusters.
J. Chem. Phys., 125:133405, 2006

T. Sanford, S.-Y. Han, M. A. Thompson, R. Parson, and W. C. Lineberger.
Photodissociation dynamics of $\text{IBr}^-(\text{CO}_2)_n$, $n < 15$.
J. Chem. Phys., 122:054307, 2005

T. Sanford, D. Andrews, J. Rathbone, M. Taylor, F. Muntean, M. Thompson, A. B. McCoy, R. Parson, and W. C. Lineberger.
Time resolved solvent rearrangement dynamics.
Faraday Discuss., 127:383–394, 2004

References available upon request.