MITCHELL A. WOOD

School of Materials Engineering and Birk Nanotechnology Center
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EDUCATION

Purdue University, West Lafayette, IN
Ph.D. in Materials Science and Engineering **2011 - Current**
"Energy Transfer, Localization and Chemical Initiation in High Energy Density Materials"
Areas of Concentration: Atomistic simulation techniques, Materials physics, Statistical mechanics
Advised by Alejandro Strachan

Michigan State University, East Lansing, MI
B.S. in Physics **2007 - 2011**
Areas of Concentration: Condensed Matter and Computational Physics
Advanced STEM and humanities curriculum through the Lyman Briggs College at MSU

AWARDS

Outstanding Presentation Award
Materials Research Society Fall 2014 Meeting, Session VV Recent Advances in Reactive Materials **December 2014**
Outstanding Presentation Award
Los Alamos National Lab Student Symposium, Chemistry Section **August 2013**
Graduate Teaching Excellence Award
Purdue University Committee for the Education of Teaching Assistants, for work in MSE 230 **April 2012**
Herbert T. Graham Fellowship
Michigan State University Physics and Astronomy Department, support for undergraduate teaching assistants **August 2010**

TEACHING EXPERIENCE

Purdue University, West Lafayette, IN
Teaching Assistant – MSE 370 "Electrical, Optical and Magnetic Properties of Materials" **2014**
Lead recitation lectures and held office hours. Graded and administered all homework assignments.

Teaching Assistant – MSE 230 "Structure and Properties of Materials Engineering" **2011**
Lead multiple sections of recitation lectures and office hours. Graded and administered all course material.

Michigan State University, East Lansing, MI
Teaching Assistant – PHY 251 "Undergraduate Physics Laboratory" **2010-2011**
Lead lab sections, held weekly office hours and administered all grades.

RELATED EXPERIENCE

Theoretical Division, Los Alamos National Lab, Los Alamos, NM
Graduate Research Assistant **2012 – Current**
Developed and tested ab initio simulation tools to capture complex behavior of molecular solids and interfaces between dissimilar materials. Advised by Marc Cawkwell (T-1), Anders Niklasson (T-1) and Dave Moore (WX-9).

Purdue University College of Engineering, West Lafayette, IN
Graduate Student Recruiter **2012 – Current**
Representative for the Materials Science and Engineering Department for on and off-campus recruiting events. Chair of the Recruitment Committee for the Materials Science and Engineering Graduate Student Association.

Michigan State University Condensed Matter Physics Group, East Lansing, MI
Undergraduate Researcher **2010 – 2011**
Model development and code testing done on the ground state properties and configurations of frustrated Ising modeled systems. Advised by Dr. S.D. Mahanti.

National Superconducting Cyclotron Laboratory, East Lansing, MI
Undergraduate Researcher **2009-2010**
Maintained and updated an online database for nucleosynthesis reaction rates. Wrote and performed Monte Carlo simulations of beta-delayed proton emission using the FORTRAN programming language. Advised by Dr. R. Cyburt and H. Shatz.

Michigan State University Cystic Fibrosis Laboratory
Undergraduate Researcher **2009-2010**
Studied, planned and carried out original research into the applications of PCR to detect genetic mutations. Work published into undergraduate biology II (LB145) course pack.

PUBLICATIONS

"Coupled Thermal and Electromagnetic Induced Decomposition in the Molecular Explosive αHMX; A Reactive Molecular Dynamics Study" M. A. Wood, A. C. van Duin and A. Strachan, Journal of Physical Chemistry A, **2014**, 118 (5). DOI: *10.1021/jp406248m*

"Computation of the Density Matrix in Electronic Structure Theory in Parallel on Multiple Graphics Processing Units" M. J. Cawkwell, M. A. Wood, A. M. N. Niklasson and S. M. Mniszewski, Journal of Chemical Theory and Computation, **2014**, 10 (12). DOI: *10.1021/ct5008229*

"Atomistic picture of the shock to deflagration transition in a solid explosive: ultra-fast chemistry under non-equilibrium" M. A. Wood, M. J. Cherukara, E. M. Kober and A. Strachan, Physical Review Letters (Submitted)

"Reaction Kinetics and Vibrational Energy Transfer in Molecular Energetics" M. A. Wood and A. Strachan (In preparation)

"Role of Interface Characteristics for Resonant Acoustic Heating of Plastically Bonded Explosives" M. A. Wood and A. Strachan (In preparation)

PRESENTATIONS

"Molecular Dynamics Simulations of Shock Initiation of Energetic Materials" M. A. Wood, M. Cherukara, E. M. Kober and A. Strachan. Materials Research Society Fall Meeting and Exhibit. Boston, MA. November 30 – December 5 2014

"Molecular Dynamics Simulations of Chemistry Induced by Void Collapse in RDX" M. A. Wood, M. Cherukara, E. M. Kober, D. S. Moore, A. Strachan and M. J. Cawkwell. Los Alamos National Laboratory Student Symposium. Los Alamos, NM. August 6-7 2014.

Poster: *"Pore Collapse, Hot-Spot Formation and Propagation in Shocked RDX"* M. A. Wood, M. Cherukara, E. M. Kober and A. Strachan. Defense Threat Reduction Agency Basic Research Technical Review. Springfield, VA July 21 - August 1 2014

Poster: *"Reactive molecular Dynamics Simulations of Vibrational Energy Relaxation and Hot Spot Formation in Energetic Materials"* M. A. Wood, M. Cherukara and A. Strachan. Gordon Research Conference on Energetic Materials. Newry, ME. June 14-20 2014

"Vibrational Energy Relaxation in Common High Energy Density Materials through Reactive Molecular Dynamics Simulations" M. A. Wood and A. Strachan. American Physical Society March Meeting. Denver, CO. March 3-7 2014

"Spectroscopic Characterization of Explosive-Binder Interfaces via Quantum Molecular Dynamics" M. A. Wood, M. J. Cawkwell, A. M. N. Niklasson, A. Strachan and D. S. Moore. Los Alamos National Laboratory Student Symposium. Los Alamos, NM. July 26-27 2013

"Vibrational Energy Relaxation in Common High Energy Density Materials through Reactive Molecular Dynamics Simulations" M. A. Wood and A. Strachan. American Chemical Society National Meeting and Exposition. Indianapolis, IN. September 8-12 2013

Poster: "*Vibrational Spectra via Quantum-based Molecular Dynamics*" M. A. Wood, M. J. Cawkwell, A. Strachan and D. S. Moore. Los Alamos National Laboratory Student Symposium. Los Alamos, NM. August 7-8 2012.

Poster: *"Electromagnetic and Thermal Induced Chemical Decomposition in the Molecular Explosive HMX via Reactive Molecular Dynamics Simulation"* M. A. Wood and A. Strachan. Materials Research Society Fall Meeting and Exhibit. Boston, MA. November 25-30 2012

"Value Matrix Theorem and its Applications to Two-Person Matrix Games" M. A. Wood and A. Zelekee The Michigan Section of the Mathematical Association of America 87th Annual Meeting. Western Michigan University. Kalamazoo, MI. May 6-7, 2011

MEMBERSHIPS

American Physical Society
Materials Research Society
American Chemical Society