



## The Department of MECHANICAL ENGINEERING



HOME

ABOUT US

NEWS

EVENTS

UNDERGRADUATE STUDIES

GRADUATE STUDIES

FACULTY & STAFF

RESEARCH

ALUMNI

GIVING

EMPLOYMENT

PHOTO GALLERIES

CANVAS LOGIN

MAKE A GIFT

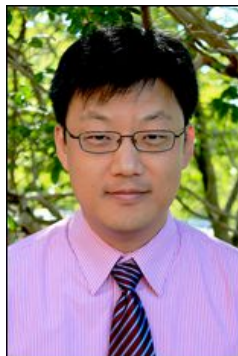


Mechanical Engineering

Undergraduate Studies

[Return to Faculty Directory](#)

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#### Research Interests

Problems solved at the intersection of mechanics, physics, materials science, and computing  
Multiscale simulations and computational approaches that connect nano-to-meso-to-micro/macro scales  
Mesostructure and microstructure modeling  
Multiscale science and engineering of matter across space and time scales  
Computational science and high performance computing

#### Education

Ph.D., Mechanical Engineering, University of Minnesota, December, 1999  
M.S., Mechanical Engineering, University of Minnesota, December, 1996  
B.S., Aerospace Engineering w/ High Honors, University of Virginia, May, 1994

#### Honors and Awards

2010 Army Science Conference Best Paper Award (w/ S. Izvekov and B. M. Rice)  
2008 ICCES Outstanding Young Investigator Award in Computation  
2004 U.S. Army, Research, Development and Engineering Command, Outstanding Young Scientist & Engineer  
2003 Department of the Army, Superior Civilian Service Award  
2003 Baltimore Federal Executive Board, Excellence in Federal Career Award, Bronze Medal  
22nd Army Sciences Conference Best Paper Award, 2000 (w/ R Namburu)

#### Professional Memberships and Service

American Society of Mechanical Engineers (ASME) (1998)  
Editorial Boards: International Journal for Computational Multiscale Engineering (current)

#### Selected Publications

2013

J. Crone, K. Leiter, J. Knap, P. W. Chung, A. Arsenlis, S. Aubry, M. Tang, G. Hommes, "A Massively Parallel Coupled Finite Element Discrete Dislocation Dynamics Simulator." in review, 2013.  
L. B. Munday, R. Mitchell, J. Knap, and P. W. Chung, "The importance of molecule flexibility on the nucleation of dislocations in molecular crystals." in review, 2013.

M. M. Shahzamanian, T. Tadeipalli, A. M. Rajendran, R. Mohan, W. Hodo, R. Valisetty, P. W. Chung, and J. J. Ramsey, "Representative Volume Element Based Modeling of Cementitious Materials." in review, 2013.

J. J. Ramsey and P. W. Chung, "Massively Parallel Asymptotic Expansion Homogenization for Complex Microstructures." in review, 2013.

J. Solomon, P. W. Chung, D. Srivastava, E. Darve, "Method and Advantages of Genetic Algorithms in Parameterization of Interatomic Potentials: Metal-Oxides." arXiv preprint arXiv:1306.1196, 2013.

N. Mathew, C. Picu, P. W. Chung, "Peierls Stress of Dislocations in Molecular Crystal Cyclotrimethylene Trinitramine." *The Journal of Physical Chemistry A*, 117, 5326, 2013.

N. S. Weingarten and P. W. Chung, "a-Type edge dislocation mobility in wurtzite GaN using molecular dynamics." *Scripta Materialia*, 69, 311, 2013.

B. Kraczek and P. W. Chung, "Investigation of direct and indirect phonon-mediated bond excitation in alpha-RDX." *The Journal of Chemical Physics*, 138, 074505, 2013.

Chi-Chin Wu, Peter W. Chung, Sylvie Aubry, Lynn B. Munday, Athanasios Arsenlis, "On the strength of binary junctions in hexagonal close-packed crystals." *Acta Materialia*, 61, 3422, 2013.

## 2012

L. Munday, S. Solares, P. W. Chung, "Generalized stacking fault energy surfaces in the molecular crystal alpha-RDX." *Philosophical Magazine*, 92, 3036, 2012.

## 2011

B. J. Henz, P.W. Chung, J. W. Andzelm, T.L. Chantawansri, J.L. Lenhart, and F.L. Beyer, "Determination of Binding Energy and Solubility Parameters for Functionalized Gold Nanoparticles by Molecular Dynamics Simulation." *Langmuir*, 27, 7836, 2011.

Z. Zhang, A. Chatterjee, C. Grein, A. J. Ciani, P. W. Chung, "Atomic-scale modeling of In<sub>x</sub>Ga<sub>1-x</sub>N quantum dot self-assembly." *Journal of Vacuum Science*, 29, 03C133, 2011.

S. Izvekov, P. W. Chung, and B. M. Rice, "Non-equilibrium molecular dynamics simulation study of heat transport in RDX", *International Journal of Heat and Mass Transfer*, 54, 5623, 2011.

S. Izvekov, P. W. Chung and B. M. Rice, "Particle-based multiscale coarse graining with density-dependent potentials: Application to molecular crystals." *Journal of Chemical Physics*, 135, 044112, 2011.

J. Crone, J. Knap, P. W. Chung, and B. M. Rice, "Role of Microstructure in the Initiation of Ni-Al Reactive Multilayers." *Applied Physics Letters*, 98, 141910, 2011.

L. Munday, P. W. Chung, B. M. Rice, and S. Solares, "Simulations of High Pressure Phases in RDX." *The Journal of Physical Chemistry B*, 115, 4378-4386, 2011.