Jackson R. Harter

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RESEARCH INTERESTS

Boltzmann transport, deterministic methods, thermal conductivity, computational methods, nuclear materials, high temperature materials, thermoelectric materials, multiphysics & multiscale environments, low-length scale physics

EDUCATION

Oregon State University, Corvallis, Oregon

- Doctor of Philosophy (Ph.D.) in Nuclear Engineering — Sep 2015 – Present
  - Adviser: Todd Palmer
  - Research areas: Deterministic phonon transport, lattice thermal conductivity, anharmonic phonon interaction, boundary resistance, transport theory
  - Minor: Materials Science
  - GPA: 3.45/4.00
- Master of Science (M.S.) in Nuclear Engineering — Sep 2013 – Sep 2015
  - Adviser: Todd Palmer
  - Thesis: "Predicting Thermal Conductivity in Nuclear Fuels using Rattlesnake-Based Deterministic Phonon Transport Simulations"
  - Minor: Materials Science
  - GPA: 3.39/4.00
- Bachelor of Science (B.S.) in Nuclear Engineering — Sep 2009 – Jun 2013

Western Culinary Institute, Portland, Oregon

- Associate of Arts (A.A.) in Culinary Arts — Aug 2003 – Nov 2004

WORK EXPERIENCE

Idaho National Laboratory, Idaho Falls, Idaho

- Intern, Reactor Physics & Analysis — Jul 2018 – Present
  - Developing nuclear data management capability in Rattlesnake: ACE file loader and parser, unionized energy grids, Doppler broadening of cross sections, neutron slowing-down solver
  - Implemented phonon transport capability into Rattlesnake for single group and decoupled multigroup transport, with diffuse mismatch thermal interface conditions. Development ongoing
  - Supervisor: Yaqi Wang

Los Alamos National Laboratory, Los Alamos, New Mexico

- Intern, Material Science and Technology (MST-8) — Jun 2017 – Oct 2017
  - Developed fission gas diffusion model in BISON using radiation cluster dynamics methods
  - Supervisor: Topher Matthews

Idaho National Laboratory, Idaho Falls, Idaho

- Intern, Fuel Modeling & Simulation — Jun 2016 – Sep 2016
  - Developed thermo-mechanical model of DISSECT irradiation experiment
  - Wrote thermal boundary resistance model for Rattlesnake
  - Supervisors: Daniel Schwen, Dan Wachs

Idaho National Laboratory, Idaho Falls, Idaho

- Intern, Fuel Modeling & Simulation — Jun 2015 – Sep 2015
  - Phonon transport, thermal conductivity, code development
  - Supervisor: Daniel Schwen

NuScale Power, Corvallis, Oregon

- Intern, Probabilistic Risk Assessment — Jul 2013 – Jan 2015
  - Work responsibilities: Severe accidents, safety analysis, SMR, RELAP-5, MELCOR
  - Supervisor: Bill Galyean

ACADEMIC EXPERIENCE

Oregon State University, Corvallis, Oregon

- Graduate Research Assistant — Sep 2014 – Jun 2015
  - Research areas: Deterministic phonon transport, thermal conductivity, UQ methods
  - Supervisor: Todd Palmer

Oregon State University, Corvallis, Oregon

- Graduate Teaching Assistant — Sep 2013 – Jun 2014
  - Classes: Neutronics I, Neutronics II, Nuclear Reactor Laboratory
  - Supervisors: Qiao Wu, Todd Palmer, Robert Schickler

ACADEMIC AWARDS

- Henry W. & Janice J. Schuette Graduate Fellowship — 2015 – 2018
- National Academy for Nuclear Training Fellowship — 2013 – 2014
- Best Graduate Presentation — Apr 2015
  American Nuclear Society Student Conference
  Math and Computation
- Best Senior Design Project, Nuclear Engineering — Jun 2013
  Oregon State University
  "Target Delivery System for ^{238}Pu Production"

TECHNICAL SKILLS

PROGRAMMING LANGUAGES

Novice in: C++, TEX, Python, MATLAB, Unix. Basic ability with: OpenMP, OpenCL, MPI

SOFTWARE

Proficient in: MOOSE, Rattlesnake, Cubit, MARMOT, BISON, ParaView, MCNP, LAMMPS, Git

PUBLICATIONS

JOURNALS

[1] J. Harter, S. Aria Hosseini, T. Palmer, and P.A. Greaney, "Prediction of thermal conductivity in dielectrics using fast, spectrally-resolved phonon transport simulations". *International Journal of Heat and Mass Transfer*, **144**, 118595 (2019). https://doi.org/10.1016/j.ijheatmasstransfer.2019.118595.

[2] S Nimmala, S. Aria Hosseini, J.Harter, T. Palmer, E. Lenz and P.A. Greaney, "Characterizing Macroscopic Thermal Resistance Across Contacting Interfaces Through Local Measures of Thermal Transport". *MRS Advances*, **3**(44), 2735-2741 (2018). doi:10.1557/adv.2018.485.

[3] J. Harter, L. de Sousa Oliveira, A. Truszkowska, T.S. Palmer and P.A. Greaney, "Deterministic Phonon Transport Predictions of Thermal Conductivity in Uranium Dioxide with Xenon Impurities" ASME. *Journal of Heat Transfer*, **140**(5), 051301-051301-11 (2018). https://doi.org/10.1115/1.4038554.

[4] J. Harter, P.A. Greaney and T. Palmer, "Quantifying the Uncertainty in Deterministic Phonon Transport Calculations of Thermal Conductivity using Polynomial Chaos Expansions", *Transactions of the American Nuclear Society*, **115**, 611–614 (2016).

[5] J. Harter, P.A. Greaney and T. Palmer, "Characterization of Thermal Conductivity using Deterministic Phonon Transport in Rattlesnake", *Transactions of the American Nuclear Society*, **112**, 829–832 (2015).

CONFERENCES & PRESENTATIONS

[1] J. Harter, N. Whitman, T.S Palmer and P.A. Greaney, "Deterministic phonon transport as a verification tool for spent nuclear fuel", INMM Discovery Workshop, *Pacific Northwest National Laboratory*, Richland, WA, May 2018.

[1] J. Harter, T.S Palmer and P.A. Greaney, "Deterministic phonon transport and applications in nanoscale heat transfer", *University of Arizona*, Tuscon, AZ, Apr 2018.

[2] J. Harter, T.S Palmer and P.A. Greaney, "Frequency dependence in deterministic phonon transport simulations", *Applied Mathematics and Computation Seminar*, Corvallis, OR, Mar 2018.

[3] J. Harter, T.S Palmer and P.A. Greaney, "Frequency dependence in deterministic phonon transport simulations", *International Conference on Transport Theory*, Monterey, CA, Oct 2017.

[4] J. Harter, Aria Hosseini, T. Palmer and P.A. Greaney, "Deterministic Simulation of Frequency Dependent Phonon Transport in Nuclear Materials", *Materials Research Society Spring Meeting*, Phoenix, AZ, Apr 2017.

[5] J. Harter, P.A. Greaney, and T. Palmer, "Quantifying the Uncertainty in Deterministic Phonon Transport Calculations of Thermal Conductivity using Polynomial Chaos Expansions", *American Nuclear Society Winter Meeting*, Las Vegas, NV, Nov 2016.

[6] J. Harter, L. de Sousa Oliveira, A. Hosseini, T. Palmer and P.A. Greaney, "Efficient Deterministic Simulation of Phonon Transport in Nuclear Materials", *Materials Science & Technology*, Salt Lake City, UT, Oct 2016.

[7] J. Harter, P.A. Greaney, and T. Palmer, "Thermal Conductivity Prediction using Deterministic Phonon Transport in Rattlesnake", *International Conference on Transport Theory*, Sicily, Italy, Sep 2015.

[8] J. Harter, P.A. Greaney, and T. Palmer, "Characterization of Thermal Conductivity using Deterministic Phonon Transport in Rattlesnake", *American Nuclear Society Professional Conference*, San Antonio, Texas, Jun 2015.

[9] J. Harter, P.A. Greaney, and T. Palmer, "Characterization of Thermal Conductivity using Deterministic Phonon Transport in Rattlesnake", *American Nuclear Society Student Conference*, College Station, Texas, Apr 2015.

[10] L. Oliveira, P. A. Greaney and J. Harter, "Application of a multiscale Boltzmann transport solver to characterize thermal resistance from irradiation induced morphological changes in graphite", *Materials Research Society Spring Meeting*, San Francisco, California, Apr 2015.

PROFESSIONAL AFFILIATIONS & ACTIVITIES

American Nuclear Society, Chicago, IL

- Member — 2009 – Present

CAMPUS ACTIVITIES

American Nuclear Society, Oregon State University Student Section

- President — Sep 2017 – Present
- President — Mar 2013 – Jun 2013
- Vice President — Sep 2012 – Jun 2013

OTHER WORK EXPERIENCE

Western Culinary Institute, Portland, Oregon

- Chef Instructor, Restaurant Bleu — Apr 2006 – May 2008
  - Taught culinary school in restaurant practicum
  - Taught practical basics of working in restaurant kitchens: time management, food preparation & utilization, menu development and costing, managing personal relationships
  - Oversaw classes of 6-80 students, rotating every 6 weeks