Casey Icenhour

Contact Information

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Research Interests

Computational Physics, High-Performance Computing, Radio-Frequency Plasma Sheaths, Plasma Material Interactions, Plasma Neutron Sources, Industrial Applications of Plasma Physics, Nuclear Security, Nuclear Policy

Education

PhD **North Carolina State University (NCSU)**, Nuclear Engineering **2012 - 2019 (expected)**
- Concentration in Plasma Physics and Nuclear Fusion
- Research Topic Area: Simulation of RF Sheaths in Magnetized Plasma
- Advisor: Dr. Steven C. Shannon

BS **Western Carolina University (WCU)**, Electrical Engineering **2008 - 2012**
- Honors College
- Concentration in Optics and Communications
- Minors: Mathematics, Physics

Honors and Awards

Idaho National Laboratory Graduate Fellowship	**2018 - 2020**
DOE Office of Science Graduate Student Research Program, Oak Ridge National Laboratory	**2016 - 2017**
NCSU College of Engineering Dean's Doctoral Fellowship	**2012 - 2013**
T. Ray and Frances Louise Gibbs Endowed Scholarship, WCU	**2008 - 2012**
Most Outstanding Upperclassman, WCU Electrical Engineering	**2011**

Research Experience

Idaho National Laboratory (INL), Idaho Falls, ID
INL Graduate Fellow, Nuclear Science & Technology, Modeling and Simulation **Jan 2018 - present**
Developing an INL-sponsored MOOSE Framework (see `https://mooseframework.org`) App for general electromagnetic simulation, in direct collaboration with the INL MOOSE Team

Oak Ridge National Laboratory (ORNL), Oak Ridge, TN
Graduate Student Intern, Fusion and Materials for Nuclear Systems Division **Jul 2016 - Dec 2017**
Developed EELS, a MOOSE Framework App for basic vacuum radio-frequency electromagnetic simulation (see `https://github.com/cticenhour/EELS`) and Matlab codes for self-education in finite-element methods (see `https://github.com/cticenhour/matlab-fem`)

North Carolina State University, Nuclear Engineering Dept., Raleigh, NC
Graduate Research Assistant, 4th State Applications Research Group **Jul 2013 - Jun 2016**
Utilized particle-in-cell codes to study capacitively-coupled RF plasma discharges
Dean's Doctoral Fellow, NCSU College of Engineering **Aug 2012 - Jun 2013**
Modeled proof-of-concept Z-pinch plasma neutron source for concrete interrogation

Scientific Computing Skills

Languages	C++, bash, Python
Mathematical Computing Environments	Matlab, Mathematica, Mathcad
Plasma Physics Codes	VSim, XPDP1
Version Control	git
Other Tools	MOOSE, LaTeX, Paraview, Gmsh

Conference Proceedings

(1) S. Shannon, A. Lindsay, D. Graves, **C. Icenhour**, D. Peterson, S. White, "Plasma Simulation in the Multiphysics Object Oriented Simulation Environment MOOSE", APS Gaseous Electronics Conference 2016

(2) **C. Icenhour**, A. Exum, E. Martin, D. Green, D. Smithe, S. Shannon, "PIC Simulation of RF Plasma Sheath Formation and Initial Validation of Optical Diagnostics using HPC Resources (Poster)", APS Division of Plasma Physics Meeting 2014

(3) **C. Icenhour**, T. Kummerer, D. Green, D. Smithe, S. Shannon, "Validation of RF CCP Discharge Model Against Experimental Data using PIC Method (Poster)", APS Gaseous Electronics Conference 2014