



# Carson R. Cook

**Graduate Institution:** University of Wisconsin-Madison

**Graduate Discipline:** Plasma Physics

**Hometown:** Chippewa Falls, WI

**Relevant SC Research:** Fusion Energy Sciences

## Research Interest:

My research interests include theoretical and computational plasma physics, magnetohydrodynamics, stellarator/tokamak/RFP confinement, astrophysics, black holes, Hamiltonian systems, partial differential equations, and differential geometry. In general I am intrigued by almost all areas of theoretical and mathematical physics. I am also very interested in the history of physics, in particular the development of quantum mechanics and particle physics.

## About Me:

I am a graduate student in the Physics Department at the University of Wisconsin. My research advisor is Professor David Anderson, and my academic advisor is Professor Carl Sovinec. I am working on computational aspects of my project with Drs. Steve Hirshman and Don Spong of Oak Ridge National Lab and Dr. Raul Sanchez of the Universidad Carlos III de Madrid. I am working on the accompanying theory with Professor Chris Hegna of the University of Wisconsin. My dissertation topic is on the effects of magnetic islands on the shear Alfvén continua in toroidal confinement devices. In particular I am looking at how islands can create and

modify gaps in the continuum, which can result in discrete Alfvén eigenmodes that can be driven unstable by energetic particles. The SIESTA code (Scalable Iterative Equilibrium Solver for Toroidal Applications) that I work on with Steve Hirshman and Raul Sanchez will be used as a tool along with Don Spong's STELLGAP/AE3D code to determine the shear Alfvén spectrum in the presence of magnetic islands and stochasticity. I am a member of the American Physical Society, the American Association of Physics Teachers, IEEE, and Eta Kappa Nu. I hope to be a professor or a research scientist in theoretical plasma physics in the future. In my free time I enjoy lifting weights, running, reading, and fishing.

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