Matthew Thomas Beidler, Ph.D. Curriculum Vitae

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EDUCATION

West Virginia University August 2008 - September 2015
Morgantown, West Virginia
Degree: Ph.D. in Physics
Dissertation: "Theory and Simulations of Incomplete Reconnection During Sawteeth Due to Diamagnetic Effects"
Degree: M.S. in Physics (August 2011)
Advisor: Paul A. Cassak

Johns Hopkins University August 2004 - May 2008
Baltimore, Maryland
Degree: B.S. in Physics

POSITIONS HELD

R&D Associate October 2018 - Present
Theory and Modeling Group, Fusion Energy Division, Nuclear Science & Engineering Directorate, Oak Ridge National Laboratory

US DOE FES Postdoctoral Research Program Appointment November 2016 - October 2018
Department of Engineering Physics, University of Wisconsin, Madison, Wisconsin
Advisor: Chris C. Hegna

Postdoctoral Research Associate October 2015 - October 2016
Department of Engineering Physics, University of Wisconsin, Madison, Wisconsin
Advisor: Chris C. Hegna

INVITED TALKS

"Spatially-dependent simulations of runaway electron mitigation experiments on DIII-D" November 2020
62st Annual Meeting of the APS Division of Plasma Physics, Virtual

"Nonlinear Mode Penetration Caused by Transient Magnetic Perturbations" April 2018
Sherwood Fusion Theory Conference, Auburn, Alabama

"Nonlinear Modeling of Mode Locked States Induced by Transient Magnetic Perturbations" November 2017
22nd Annual MHD Stability Control Workshop, Madison, Wisconsin

"A Self-Consistent Mechanism for Incomplete Reconnection in Sawteeth" April 2012
Sherwood Fusion Theory Conference (APS April Meeting), Atlanta, Georgia

REFEREED PUBLICATIONS

M. T. Beidler, D. del-Castillo-Negrete, L. R Baylor, D. Shiraki, and D. A. Spong, "Spatially dependent modeling and simulation of runaway electron mitigation in DIII-D." *Phys. Plasmas* **27**, 112507 (2020). *Editor's Choice*

E.E. Peterson, D.A. Endrizzi, **M. Beidler**, K.J. Bunkers, M. Clark, J. Egedal, K. Flanagan, K.J. McCollam, J. Milhone, J. Olson, C.R. Sovinec, R. Waleffe, J. Wallace, and C.B. Forest, "A laboratory model for the Parker spiral and magnetized stellar winds." *Nature Physics.* **15**, pg. 1095–1100 (2019).

M. T. Beidler, J. D. Callen, C. C. Hegna, and C. R. Sovinec, "Mode penetration induced by transient magnetic perturbations," *Phys. Plasmas* **25**, 082507 (2018).

M. T. Beidler, J. D. Callen, C. C. Hegna, and C. R. Sovinec, "Nonlinear Modeling of Forced Magnetic Reconnection in Slab Geometry with NIMROD," *Phys. Plasmas* **24**, 052508 (2017).

M. T. Beidler, P. A. Cassak, S. C. Jardin, and N. M. Ferraro, "Local properties of magnetic reconnection in nonlinear resistive- and extended-magnetohydrodynamic toroidal simulations of the sawtooth crash," *Plasma Phys. Control. Fusion* **59**, 025007 (2017).

P. A. Cassak, R. N. Baylor, R. L. Fermo, **M. T. Beidler**, M. A. Shay, M. Swisdak, J. F. Drake, and H. Karimabadi, "Fast Magnetic Reconnection Due to Anisotropic Electron Pressure," *Phys. Plasmas* **22**, 020705 (2015).

M. T. Beidler and P. A. Cassak, "Model for Incomplete Reconnection in Sawtooth Crashes," *Phys. Rev. Lett.* **107**, 255002 (2011).

REPORTS

J. D. Callen, R. Nazikian, C. Paz-Soldan, N. M. Ferraro, **M. T. Beidler**, C. C. Hegna, and R. J. La Haye, "Model of n=2 RMP ELM suppression in DIII-D," report UW-CPTC 16-4 December 19, 2016.

SELECTED CONTRIBUTED POSTERS

"Modeling and Simulation of Runaway Electron Dissipation by Impurity Injection Using KORC" — October 2019
M.T. Beidler, D. del-Castillo-Negrete, D.A. Spong, L.R. Baylor, and D. Shiraki,
61st Annual Meeting of the APS Division of Plasma Physics, Fort Lauderdale, FL

"NIMROD Simulations of Forced Magnetic Reconnection in DIII-D Limited L-mode Plasmas," — November 2018
M.T. Beidler, J.D. Callen, T.E. Evans, C.C. Hegna, M.W. Shafter, and C.R. Sovinec,
60th Annual Meeting of the APS Division of Plasma Physics, Portland, OR

"Nonlinear Modeling Benchmarks of Forces Magnetic Reconnection with NIMROD and M3D-C1," — May 2017
M.T. Beidler, J.D. Callen, C.C. Hegna, C.R. Sovinec, and N.M. Ferraro,
Sherwood Fusion Theory Conference, Annapolis, MD

"Measuring Properties of Magnetic Reconnection in Nonlinear Resistive and Two-Fluid Toroidal Simulations of Sawteeth," — November 2015
M.T. Beidler, P. A. Cassak, S.C. Jardin, and N.M. Ferraro,
57th Annual Meeting of the APS Division of Plasma Physics, Savannah, Georgia

"A Model for Incomplete Reconnection in Sawtooth Crashes," — November 2011
M.T. Beidler and P.A. Cassak
53rd Annual Meeting of the APS Division of Plasma Physics, Salt Lake City, Utah

TECHNICAL SKILLS

Languages: Fortran, C++, Matlab, Python, IDL, Unix, Latex
Software: KORC, NIMROD, M3D-C1, F3D, P3D, Enthought: Canopy, VisIt, SLURM, Microsoft/Macintosh Office
Numerical Methods: Monte Carlo, Explicit/implicit evolution, finite difference/element discretization, MPI, OpenMP

HONORS AND AWARDS

Fort LeBoeuf High School Wall of Fame	September 2017
Travel Scholarship International ITER School in Hefei, China	December 2015
WVU University Provost Fellowship	September 2014 - May 2015
Student Poster Prize Sherwood Fusion Theory Conference	April 2013
Travel Scholarship International ITER School in Ahmedabad, India	December 2012
Attended the 62nd Lindau Nobel Laureate Meeting in Lindau, Germany	July 2012
Jefimenko Fellowship for Outstanding Graduate Performance in Physics	April 2012

LEADERSHIP EXPERIENCE

Member, International Sherwood Fusion Theory Conference Executive Committee	April 2018
Founder and President, WVU Physics and Astronomy Graduate Student Organization	October 2013