

E. Alec Johnson

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Research Interests: plasma modeling and numerical methods for space weather forecasting

Education

- Ph.D. Mathematics (computational focus), UW-Madison, December 2011.
- Budapest Semesters in Mathematics, spring 2003.
- B.A. Mathematics, St. Olaf College, 1997, *summa cum laude*.

Awards

- VIGRE Fellowships, UW-Madison, Spring 2008 (accepted), Summer 2010 (declined).
- Wisconsin Space Grant Consortium Graduate Fellowships, 2006-07, 2007-08, 2008-09.

Selected Publications

- E.A. Johnson and J.A. Rossmannith, *Outflow Positivity Limiting for Hyperbolic Conservation Laws. Part 1: Framework and Recipe*, <http://arxiv.org/abs/1212.4695>, submitted to SINUM.
- E.A. Johnson, *Gaussian-Moment Relaxation Closures for Verifiable Numerical Simulation of Fast Magnetic Reconnection in Plasma*, dissertation, UW-Madison, September 2011
- E.A. Johnson and J.A. Rossmannith, *Ten-moment two-fluid plasma model agrees well with PIC/Vlasov in GEM problem*, proceedings for HYP2010, November 2010.
- E. Alec Johnson and James A. Rossmannith, *Simulation of Fast Magnetic Reconnection using a Two-Fluid Model of Collisionless Pair Plasma without Anomalous Resistivity*, Proceedings of the 19th Annual Wisconsin Space Conference, 2009.

History

- **Postdoctoral Researcher**, KU Leuven (2012 – now)
- **Long program core participant**, IPAM (UCLA) (spring 2012)
- **Teaching Assistant**, UW-Madison (2003 – 2011)
- **Copy Editor**, *Communications in Mathematical Sciences*, edited by Shi Jin (June 2007 – May 2008)
- **High School Teacher**, Trinity School at River Ridge, Bloomington, MN (2001-2002)
- **Software Developer**, CES International, Plymouth, MN (1998–2001)
- **High School Teacher**, Walnut Ridge Baptist Academy, Waterloo, IA (1997–1998)
- **Summer Research**, Center for Geophysical Studies of Ice and Climate, St. Olaf College (1994–97)

Accomplishments

- Taught fluid component of introductory plasma physics course under Giovanni Lapenta (fall 2012).
- Contributed to DOGPACK (Discontinuous Galerkin Package, created by my advisor J.A. Rossmannith): restructured and modularized the core library and user interface; accelerated general execution speed of code by an order of magnitude.
- Traveled around the world visiting educational institutions and community centers in China, Thailand, India, Ethiopia, and Uganda, June 14 – Aug 18, 2010.