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CITIZENSHIP	U.S. Citizen
RESEARCH INTERESTS	<ul style="list-style-type: none"> • Solar Astrophysics • Magnetohydrodynamics • Massively parallel numerical modeling • 3D visualization techniques • Observational data analysis and image processing
EDUCATION	<p>University of Hawaii at Manoa, Honolulu, Hawaii USA</p> <p>Ph.D., Astronomy, Dec 2011 – completed Oct 2011, officially conferred December 17, 2011</p> <ul style="list-style-type: none"> • Dissertation Topic: “Exploring Dynamic Events in the Solar Corona” • Advisor: Ilia I. Roussev <p>M.S., Astronomy, Dec 2008</p> <p>University of California, Santa Cruz, Santa Cruz, California USA</p> <p>B.S., Physics (Astrophysics), June, 2006</p> <ul style="list-style-type: none"> • Awarded with highest honors and a minor in Mathematics
ACADEMIC EXPERIENCE	<p>Institute for Astronomy, Honolulu, Hawaii USA</p> <p><i>Graduate Student</i> August, 2006 - Present</p> <ul style="list-style-type: none"> • Full time Ph.D. research, including reporting of results, and conference attendance. • Ph.D. and Masters level coursework. <p><i>Team Member, Center for Advancing Systemic Heliophysics Education</i> Jan 2010 - Present</p> <ul style="list-style-type: none"> • NASA EPO grant (P.I. Mary Kadooka) aimed at developing a Heliophysics education and outreach program for middle and high schools in Hawaii. • Lectured educators and students in areas of Heliophysics. • Worked with educators to synthesize research for educational purposes. <p><i>Participant, CfAO Professional Development Program</i> May - October 2009</p> <ul style="list-style-type: none"> • Program featuring a teaching development workshop focused on inquiry-based learning methods followed by hands on teaching experience. • Gained valuable training in modern science education theory and methods. • Worked with a team to develop and teach an inquiry-based lesson for an electronics course at Maui Community College. <p><i>Teaching Assistant</i> August, 2006 - September, 2007</p> <ul style="list-style-type: none"> • Assistant for introductory Astronomy lab and lecture classes. • Duties included providing office hours, grading, and co-teaching weekly observing/lab exercises. <p>University of California, Santa Cruz, Santa Cruz, California USA</p> <p><i>Student Lab Assistant, Bridges Lab</i> March, 2004 - July 2006</p> <ul style="list-style-type: none"> • Part-time position in a Solid State Physics group. • Lab duties included sample preparation, equipment design and maintenance, and data-analysis. • Ran experiment shifts several times a year at the Stanford Synchrotron Radiation Laboratory.

- HONORS AND AWARDS
- NASA Earth and Space Science Fellowship in Heliophysics, **September 2008 - Present**.
 - Competitive, 3 year graduate research fellowship award (\$30,000 support per year).
 - Allowed for independent self-management of research goals and day-to-day tasks.
 - Gained experience managing funds as well as writing proposals and annual research reports.
 - Outstanding Student Paper Award, Fall Meeting of the American Geophysical Union, **2010**.
- PROFESSIONAL AFFILIATIONS
- Reviewer for The Astrophysical Journal, **2011**.
 - Student Member, American Geophysical Union, **2009 - Present**.
- COMPUTER SKILLS
- **Languages:** Extensive experience with Fortran 90, MPI parallel processing, and IDL (a scripting language for data-analysis). Some use of python, C, C++, Perl, and Unix shell scripts.
 - **Applications:** Tecplot 360 (a CFD visualization tool), L^AT_EX, Adobe Photoshop and Illustrator, cvs version control, common Windows/Linux/Apple spreadsheet and presentation software.
 - **Algorithms:** Finite volume methods for computational fluid dynamics, explicit and implicit solution schemes, AMR grid structures, parallel message passing.
- PUBLICATIONS
- C. Downs**, I. I. Roussev, B. van der Holst, N. Lugaz, I. V. Sokolov, and T. I. Gombosi, **2011**, “Studying EUV Wave Transients with a Digital Laboratory: Direct Comparison of EUV Wave Observations to Global Magnetohydrodynamic Simulations”, *The Astrophysical Journal*, 728, 2.
- C. Downs**, I. I. Roussev, B. van der Holst, N. Lugaz, I. V. Sokolov, and T. I. Gombosi, **2010**, “Toward a Realistic Thermodynamic Magnetohydrodynamic Model of the Global Solar Corona”, *The Astrophysical Journal*, 712, 1219.
- Lugaz, N., **Downs, C.**, Shibata, K., Roussev, I. I., Asai, A., & Gombosi, T. I. **2011**, “Numerical Investigation of a Coronal Mass Ejection from an Anemone Active Region: Reconnection and Deflection of the 2005 August 22 Eruption”, *Astrophysical Journal*, 738, 127
- K. Morzinski, O. Azucena, **C. Downs**, T. Favaloro, J. Park, V. U., **2010**, “Circuit Design: An Inquiry Lab Activity at Maui Community College”, *ASP Conference Series*, 436, 295.
- O. Cohen, G. D. R. Attrill, N. A. Schwadron, N. U. Crooker, M. J. Owens, **C. Downs**, and T. I. Gombosi, **2010**, “Numerical Simulation of the May 12, 1997 CME Event - the Role of Magnetic Reconnection”, *Journal of Geophysical Research*, 115, A10104.
- F. Bridges, **C. Downs**, T. O’Brien, Il-K. Jeong, T. Kimura, **2007**, “Limitations on the extent of off-center displacements in TbMnO₃ from EXAFS measurements”, *Physical Review B*, 76, 092109.
- PAPERS IN PREPARATION
- C. Downs**, I. I. Roussev, B. van der Holst, N. Lugaz, and I. V. Sokolov, “Understanding SDO/AIA Observations of the 2010 June 13 EUV Wave Event: Direct Insight From a Global Thermodynamic Magnetohydrodynamic Simulation”.
- SELECTED CONFERENCE PRESENTATIONS
- “FORWARD modeling from Global MHD Simulations”, CIAS Workshop: Topology of the magnetic field of Solar Prominences and Associated Cavities, Paris, France, March, **2011**.
- “Interpreting SDO/AIA Observations of EUV waves: A Preliminary Analysis Using Direct Comparison to Global MHD Simulations”, Fall Meeting of the American Geophysical Union, San Francisco, CA, December, **2010**.
- “Studying EUV Wave Transients with a Digital Laboratory: Direct Comparison of EUV wave observations to Global MHD Simulations”, Advanced Computational Capabilities for Exploration in Heliophysical Science (ACCEHS) workshop, Boulder, CO, August, **2010**.