Jess William Vriesema

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EDUCATION

2019 (anticipated)	**Ph.D.**	Planetary Science, University of Arizona (Tucson, AZ) Dissertation Advisors: Drs. Roger Yelle and Tommi Koskinen Dissertation Title (anticipated): "Modeling Anisotropic Magnetohydrodynamics in Saturn's Thermosphere"
2015	**M.Sc.**	Planetary Science, University of Arizona (Tucson, AZ)
2011	**M.Sc.**	Physics, University of Arizona (Tucson, AZ)
2009	**B.Sc.**	Physics, Calvin College (Grand Rapids, MI)

PUBLICATIONS

Vriesema, J. W., Koskinen, T. T. and Yelle, R. (2019). Electrodynamics in Saturn's Thermosphere at Low and Middle Latitudes. Submitted.

Dykhuis, M. J., Molnar, L. A., Gates, C. J., Gonzales, J. A., Huffman, J. J., Maat, A. R., Maat, S. L., Marks, M. I., Massey-Plantinga, A. R., McReynolds, N. D., Schut, J. A., Stoep, J. P. Stutzman, A. J., Thomas, B. C., Vander Tuig, G. W., **Vriesema, J. W.** and Greenberg, R. (2015). Efficient spin sense determination of Flora-region asteroids via the epoch method. *Icarus*, 267, 174–203.

Molnar, L. and **Vriesema, J.** (2006). *Minor Planet Observations*, *Minor Planet Circulars*, 56166, 1.

HONORS, AWARDS AND FELLOWSHIPS

Total Awards: $151,150 USD

2016–2019	$120,000	NASA Earth and Space Science Fellowship
2011	$750	William Bickel Award for Enthusiasm in Laboratory and Pedagogy
2008	—	Winner of the 2008 Lower Michigan Mathematics Contest (with two teammates)
2006–2009	$10,500	Calvin Faculty Honors Scholarship
2006–2007	$1500	Michigan Merit Award
2005–2009	$10,000	Howard Hughes Medical Institute Scholarship
2005	$3900	Michigan Competitive Scholarship
2005–2006	$4500	Calvin Dean's Scholarship

RESEARCH EXPERIENCE

2014–*present* **Research Associate**, LPL, University of Arizona
Advisors: Drs. Roger Yelle and Tommi Koskinen
Description: Developed, ran, analyzed magnetohydrodynamic models of Saturn's thermosphere, in part using the Saturn Thermosphere Ionosphere Model, a general circulation model.

2011–2014 **Research Assistant**, LPL, University of Arizona
Advisor: Dr. Tami Rogers
Description: Developed, ran, analyzed and visualized highly parallel 2D and 3D dynamo simulations of the solar interior.

2013 **NASA Intern**, NASA's Goddard Space Flight Center
Advisor: Dr. Thomas Clune
Description: Assisted Drs. Thomas Clune and Weiyuan Jiang in developing a highly scalable, spectral framework in Fortran 95+ for dynamo simulations at petascale on a NASA supercomputer.

2009, 2011 **Research Assistant**, Physics Dept., University of Arizona
Advisor: Dr. Doug Toussaint
Description: Developed serial and highly parallelized code for GPU analysis of lattice quantum chromodynamics calculations using C and CUDA.

2008 **Research Assistant**, Computer Science Dept., Calvin College
Advisors: Drs. Joel Adams and Keith Vander Linden
Description: Developed an extensible, object-oriented virtual reality engine and interface in C, C++ and Java for use in introductory computer science classes, developed demo applications, and gave tours.

2006–2007 **Research Assistant**, Physics Dept., Calvin College
Advisor: Dr. Paul Harper
Description: Developed ultra coarse-grained, object-oriented simulations of lipid bilayer phase transitions in Java and C++.

TEACHING EXPERIENCE

Lecturing Teaching Assistant, Physics Dept., University of Arizona

Introductory Physics I — Spring 2010, Fall 2010, Fall 2011

Duties: Prepared and delivered lectures 3x/week for up to 150 students, held office hours, proctored and graded exams.

Teaching Assistant/Associate, LPL, University of Arizona

Planet Earth: Evolution of the Habitable World — Spring 2014, Spring 2017
Our Golden Age of Planetary Exploration — Spring 2016, Fall 2016
The Universe and Humanity: Origin and Destiny — Fall 2014, Spring 2015, Fall 2015

Duties: (Varied by instructor) Held office hours, graded homework and exams, organized teams of undergraduate preceptors, monitored online discussion forums, designed and maintained online course content on D2L (e.g. monitoring online discussion sections, uploading

lectures and other content, creating/managing quizzes and gradebooks). Some courses involved running a Full Dome digital projection presentation in our planetarium.

Laboratory Teaching Assistant, Physics Dept., University of Arizona

Introductory Laboratory I — Summer 2010, Summer 2011
Introductory Laboratory II — Spring 2011
Introductory Mechanics — Fall 2009

Duties: (Varied by course) Prepared and taught lab sections, held office hours, monitored online course content via D2L (e.g. gradebooks) and graded homework, lab reports and exams.

ADDITIONAL WORK EXPERIENCE

2012–2014 **Private Tutor**, [self-employed]
Tutored undergraduate students in physics and calculus courses.

2007–2008 **Computer Lab Monitor**, Computer Science Dept., Calvin College
Helped computer science students in a computer lab with their homework for intro/intermediate computer science courses (primarily Java, C/C++).

2006–2009 **Physics Lab Assistant**, Physics and Astronomy Dept., Calvin College
Aided the instructor before and during lab sections, graded lab reports.

2005–2007 **Observatory Assistant**, Physics and Astronomy Dept., Calvin College
Opened/closed the on-campus telescopes, gave tours and did astrophotography. Also opened/monitored/closed a remote, robotic, optical telescope, programmed it to collect images in the evening and downloaded the data the next morning.

2005–2006 **Physics Grader**, Physics and Astronomy Dept., Calvin College
Graded physics homework.

SELECTED PRESENTATIONS

Vriesema, J. W., Koskinen, T. T. and Yelle, R. (2018). Electrodynamics in Saturn's Thermosphere at Low Latitudes. 2018 Magnetospheres of Outer Planets Conference, Boulder, CO. Oral presentation.

Vriesema, J. W., Koskinen, T. T. and Yelle, R. (2018). Electrodynamics in Saturn's Thermosphere. Cassini Science Symposium 2018, Boulder, CO. Poster.

Vriesema, J. W.. (13 April 2018). Resistive Heating in Saturn's Upper Atmosphere...and the Difficulties in Calculating It. SIAM Interdisciplinary Student Seminar. Invited oral presentation.

Vriesema, J. W., Koskinen, T. T. and Yelle, R. (2017). Resistive Heating and Ion Drag in Saturn's Thermosphere. 49th DPS Meeting, Provo, UT. Poster.

Vriesema, J. W., Koskinen, T. T. and Yelle, R. (2017). Resistive Heating in Saturn's Thermosphere. Lunar and Planetary Laboratory Conference, Tucson, AZ. Oral presentation.

Vriesema, J. W., Koskinen, T. and Yelle, R. (2016). Resistive Heating in Saturn's Thermosphere. 48th DPS Meeting, Pasadena, CA. Poster.

Vriesema, J. W. (2015). Resistive Heating in Saturn's Ionosphere. Lunar and Planetary Laboratory Conference 2015, Tucson, AZ. Oral presentation.

Vriesema, J. W. and Rogers, T. (2014). NASA@SC14: Simulating the Interior Rotation and Dynamics of Stars. Supercomputing 2014, New Orleans, LA. Oral presentation.

Vriesema, J. W. (2014). Analysis of Solar Simulation Data Using Spectral Coherence. Lunar and Planetary Laboratory Conference 2014, Tucson, AZ. Oral presentation.

Jiang, W., Clune, T., **Vriesema, J.** and Gutmann, G. (2013). SpF: Enabling Petascale Performance for Pseudospectral Dynamo Models. AGU Fall Meeting 2013, San Francisco, CA. Poster.

Vriesema, J., Clune, T., and Gutmann, G. (2013). Spectral Framework (SpF): A Scalable and Extensible Framework for Dynamo Simulation. NASA Summer 2013 Intern Poster Session, Greenbelt, MD. Poster.

Vriesema, J. W., Adams, J. and Vander Linden, K. (2008). Exploring Virtual Reality and 3D Visualization. Calvin College 2008 Science Division Summer Research Poster Fair, Grand Rapids, MI. Poster.

Vriesema, J. W., Harper, P. (2007). Ultra Coarse-Grained Computer Simulation of Lipid Bilayer Fusion in C++: Working Under Constant Pressure. Calvin College 2007 Science Division Summer Research Poster Fair, Grand Rapids, MI. Poster.

Vriesema, J. W., Harper, P. and VanderHill, J. (2006). Towards Computer Simulation of Hydrated Lipid Bilayer Fusion. Calvin College 2006 Science Division Summer Research Poster Fair, Grand Rapids, MI. Poster.

PROFESSIONAL ACTIVITIES AND SERVICE

2016–*present*	Member of the LPL Men's Auxiliary Group (male allies against sexism)
2015–*present*	Technical Consultant for the LPL Grads (website development and LaTeX support)
2017	Organizing committee member for the 2017 Lunar and Planetary Laboratory Conference in Tucson, AZ
2007–2009	Co-leader of the Society of Physics Students (an unofficial Calvin College chapter)

MEDIA COVERAGE

2018	"Ringed Dynamo", Episode 493 of the *Travelers in the Night* podcast by Dr. Al Brauer. Available at https://sites.google.com/site/travelersinthenight/programs-481-510#TOC-493-Ringed-Dynamo.
2014	"Simulating the Interior Rotation and Dynamics of Stars and Giant Planets", by NASA. References my 2014 presentation at SC14. Available at https://www.nas.nasa.gov/SC14/demos/demo28.html.
2009	"Light Solutions", by Lynn Rosendale. Describes a light pollution study and campaign from 2008 that I was involved in. Available at https://calvin.edu/news/archive/light-solutions.

PROFESSIONAL ASSOCIATIONS

2017–*present*	American Association for the Advancement of Science (AAAS) Student Member
2014–*present*	American Astronomical Society (AAS) Junior Member
2014–*present*	Division for Planetary Sciences (DPS) Junior Member
2005–2009	Society of Physics Students (SPS) (unofficial Calvin College chapter)

SELECTED VOLUNTEER EXPERIENCES

2017	Co-facilitator for inter-religious dialogue through the Voices of Discovery intergroup dialogue program
2013–2018	Leadership team member for my church's high school youth group
2010–*present*	Leadership team member for the University of Arizona chapter of the Graduate Christian Fellowship
2009	Math and science tutor with Job Corps
2004–2005	Calvinist Cadet Corps (boy scout) counselor
2000–2004	Calvinist Cadet Corps (boy scout) junior counselor