

Dr. T. Everett Ellis

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| CONTACT INFORMATION | 525 Madison Place SE Albuquerque, NM 87108 | <i>Phone:</i> +1-512-814-8304 <i>Email:</i> t.everett.ellis@gmail.com <i>LinkedIn:</i> teverettellis |
| SUMMARY OF QUALIFICATIONS | Computational scientist with a background in aerospace engineering and an emphasis on advanced numerical methods. Exposure to a variety of simulation domains including solid mechanics, electromagnetics, heat transfer, and plasma physics. Experience running commercial CFD/CAE solvers as well as developing research codes for a wide range of applications. Well developed programming and development skills (C++ and Python) with an affinity for clean, elegant solutions. Excellent spoken and written communication skills with a keen interest in project management and team dynamics. | |
| PROFESSIONAL EXPERIENCE | <p>Postdoctoral Scientist – <i>Computational Plasma Physics</i> 2016 to present Electromagnetic Theory Group, Sandia National Laboratory</p> <ul style="list-style-type: none">• Developing a highly scalable plasma physics code using the Trilinos Project.• Performed electromagnetic simulations of radar cross-sections using commercial and research software as part of a code verification study.• Contributed to a test harness for stochastic simulation codes using a new theory of Richardson extrapolation implemented in Python.• Involvement with experimental analysis of electromagnetic pulses.• Took leadership of project management roles including running code review meetings and developing a hybrid Scrum/Kanban agile development process. <p>Graduate Research Assistant – <i>Advanced FEM for Fluids</i> 2010 to 2016 Institute for Computational Engineering and Sciences, University of Texas at Austin</p> <ul style="list-style-type: none">• Developed space-time discontinuous Petrov-Galerkin finite element methods for fluid flow applications.• Designed and implemented a conservative DPG formulation through Lagrange multipliers.• One of the primary developers of Camellia, a parallel C++ library built on Trilinos for rapid development of DPG simulations.• Contributed to open source libMesh finite element library.• Organized and lead group meetings.• Frequently presented research at national and international meetings. <p>Graduate Student Researcher – <i>Shock Hydrocodes</i> 2008 to 2013 Institute for Scientific Computing Research, Lawrence Livermore National Laboratory</p> <ul style="list-style-type: none">• Worked in a small research group developing advanced finite element discretization methods for Lagrangian hydrodynamics.• Improved staggered grid hydro algorithms in multi-material Arbitrary Lagrangian Eulerian codes.• Prototyped code in Matlab to explore the benefits of high order finite elements.• Extended the C++ shock physics code Blast to axisymmetric problems.• Implemented a smoothness indicator to isolate artificial viscosity to shocked and under-resolved flow regions.• Developed a Python-scriptable plotting tool to interface with Blast.• Contributed to open source MFEM finite element library.• Took initiative in developing new features and research directions. | |

Undergraduate Student Researcher – Shock Tube Experiments Summer 2007
Research Experience for Undergraduates, Aerospace Engineering,
University of Illinois at Urbana-Champaign

- Designed a series of experiments and set up a lab to study the Mount St. Helens lateral blast.
- Developed CAD designs of experimental apparatus and assisted with assembly.
- Performed numerical predictions of experimental results.

EDUCATION

The University of Texas, Austin

GPA: 3.92

Ph.D. Computational Science Engineering and Mathematics, April 2016

- Thesis Topic: *Space-time Discontinuous Petrov-Galerkin Finite Elements for Transient Computational Fluid Dynamics*
- Advisors: Leszek Demkowicz, Robert Moser

California Polytechnic State University, San Luis Obispo

GPA: 3.93

M.S. Aerospace Engineering, June 2010

- Thesis Topic: *High Order Finite Elements for Lagrangian Computational Fluid Dynamics*
- Advisors: Tzanio Kolev, Robert Rieben, Faysal Kolkailah
- *Summa cum Laude*, With Highest Honors in Engineering

B.S. Aerospace Engineering, June 2010

- Aeronautics specialization
- *Summa cum Laude*, With Highest Honors in Engineering

REFEREED
JOURNAL
PUBLICATIONS

T.E. Ellis, J. Chan, and L. Demkowicz (2016),
Robust DPG Methods for Transient Convection-Diffusion.
Lecture Notes in Computational Science and Engineering,
doi:10.1007/978-3-319-41640-3_6

T.E. Ellis, and L. Demkowicz (2014),
Locally Conservative Discontinuous Petrov-Galerkin Finite Elements for Fluid Problems.
Computers & Mathematics with Applications, doi:10.1016/j.camwa.2014.07.005

V. Dobrev, T.E. Ellis, Tz. Kolev and R. Rieben (2012),
High-order Curvilinear Finite Elements for Axisymmetric Lagrangian Hydrodynamics.
Computers & Fluids, doi:10.1016/j.compfluid.2012.06.004

V. Dobrev, T.E. Ellis, Tz. Kolev and R. Rieben (2011),
Curvilinear Finite Elements for Lagrangian Hydrodynamics.
International Journal for Numerical Methods in Fluids, doi:10.1002/fld.2366

SOFTWARE SKILLS

Computer Programming:

- C++, Python, Lua, MATLAB, Mathematica, and others

Scientific Computing Libraries:

- Trilinos, FEniCS, libMesh, MFEM, NumPy, SciPy, and others

CFD / Engineering Software:

- Fluent, Gambit, SolidWorks, Pro/ENGINEER, and others

SELECTED
CONFERENCES
AND WORKSHOPS

- New Mexico EPSCoR Post-Doc Leadership Workshop, January 2017 – La Joya, NM
- Minimum Residual and Least Squares Finite Element Methods Workshop, November 2015 – Delft, The Netherlands
- Minimum Residual and Least Squares Finite Element Methods Workshop, November 2013 – Austin, TX
- Advanced Numerical Methods in the Mathematical Sciences, May 2015 – College Station, TX
- Parallel CFD, May 2014 – Trondheim, Norway
- MultiMaterial Hydrodynamics Conference, September 2013 – San Francisco, CA
- U.S. National Congress on Computational Mechanics, July 2015 – San Diego, CA
- U.S. National Congress on Computational Mechanics, July 2013 – Raleigh, NC
- U.S. National Congress on Computational Mechanics, July 2011 – Minneapolis, MN
- Finite Element Rodeo, February 2016 – College Station, TX
- Finite Element Rodeo, February 2015 – Dallas, TX
- Finite Element Rodeo, February 2014 – Austin, TX
- Finite Element Rodeo, February 2013 – Baton Rouge, LA
- Conference on Analysis of Partial Differential Equations, December 2013 – Lake Buena Vista, FL

PROFESSIONAL
DEVELOPMENT

- How to Effectively Mentor as a PI/Team Lead – Sandia, 2017
- Agile for Research and Development – Sandia, 2017
- Life of an Idea – Sandia, 2017
- New Mexico EPSCoR Post-Doc Leadership Workshop – Sandia, 2017

AWARDS AND
HONORS

- Awarded Computational Applied Math Fellowship – UT Austin, 2010 - 2014
- Graduated *Summa cum Laude* – Cal Poly, 2010
- Elected to President’s Honors List – Cal Poly, 2005 - 2007
- Elected to Dean’s List – Cal Poly, 2005 - 2008
- Litton Industries in Engineering Scholarship – Cal Poly, 2007 - 2008
- Accenture Outstanding AERO Award – Cal Poly, 2007
- Reinhold Aerospace Engineering Scholarship – Cal Poly, 2007
- Elected to Dean’s List – Ventura College, 2002 - 2005
- Howe Heywood Mathematics Prize – Ventura College, 2005
- James and Ida Iliff Memorial Scholarship – Ventura College, 2005
- Alexis Dember Scholarship – Ventura College, 2005
- Alpha Gamma Sigma Scholastic and Service Award – Ventura College, 2003

RESEARCH
INTERESTS

Computational fluid dynamics, shock physics, multi-phase flows, turbulence modeling, finite element methods, Lagrangian hydrocodes, computational plasma dynamics, magnetohydrodynamics, computational mechanics