Brendan Keith

Contact: keith@ma.tum.de

Education

Ph.D. - UT Austin (2018).
Institute for Computational Engineering and Sciences
Computational Science, Engineering, & Mathematics

M.S. - UT Austin (2015).
Institute for Computational Engineering and Sciences
Computational Science, Engineering, & Mathematics

M.Sc. - McGill University (2013).
Department of Mathematics and Statistics
Applied Mathematics

B.Math - University of Waterloo (2011).
Department of Applied Mathematics &
Department of Physics
Honours Applied Mathematics with Physics Option

B.Math - University of Waterloo (2011).
Department of Pure Mathematics
Honours Pure Mathematics

Research

Postdoctoral Research Assistant - TU Munich
Supervisor: Barbara Wohlmuth (09/2018 - present)
Graduate Research Assistant - UT Austin
Supervisor: Leszek Demkowicz (08/2013 - 08/2018)
Graduate Research Assistant - McGill University
Supervisor: George Haller (09/2011 - 08/2013)

Teaching

Graduate Teaching Assistant - UT Austin
CSE 386M, Functional Analysis in Theoretical Mechanics (graduate course) Fall 2016
CSE 380, Tools and Techniques for Computational Science (graduate course) Fall 2015
M 408N, Differential Calculus for Science Fall 2014
Graduate Teaching Assistant - McGill University
Math 376, Honours Nonlinear Dynamics Fall 2012
Undergraduate Teaching Assistant - University of Waterloo
Math 124, Calculus and Vector Algebra for Kinesiology Fall 2010
Math 135, Algebra for Honours Mathematics Winter 2010 & Spring 2011
Math 136, Linear Algebra for Honours Mathematics Winter 2010 & Winter 2011
Math 137, Calculus 1 for Honours Mathematics Fall 2010
Math 138, Calculus 2 for Honours Mathematics Winter 2011
Math 239, Introduction to Combinatorics Fall 2009

Recent Awards

SIAM Student Certificate of Recognition for 2017
Computers and Mathematics with Applications Second Prize for "Best Mathematically Oriented Poster" at the 14th U.S. National Congress on Computational Mechanics, 2017.
University of Texas at Austin University Graduate Continuing Fellowship
University of Texas at Austin College Recruitment Fellowship Award

Publications

Peer-Reviewed Journal Articles

D. Drzisga, **B. Keith**, and B. Wohlmuth (2018) The surrogate matrix methodology: a priori error estimation. *Submitted.*

L. Demkowicz, J. Gopalakrishnan, and **B. Keith** (2018) The DPG-star method. *Submitted.*

A. Vaziri Astaneh, **B. Keith**, and L. Demkowicz (2018) On perfectly matched layers for discontinuous Petrov–Galerkin methods. *To appear in Comput. Mech.*

B. Keith, A. Vaziri Astaneh, and L. Demkowicz (2017) Goal-oriented adaptive mesh refinement for non-symmetric functional settings. *Submitted.*

B. Keith, S. Petrides, F. Fuentes, and L. Demkowicz (2017) Discrete least-squares finite element methods. *Comput. Methods Appl. Mech. Engrg.*, 327:226–255.

B. Keith, P. Knechtges, N. V. Roberts, S. Elgeti, M. Behr, and L. Demkowicz (2017) An ultraweak DPG method for viscoelastic fluids. *J. Non-Newton. Fluid Mech.*, 247:107–122.

F. Fuentes, **B. Keith**, L. Demkowicz, and P. Le Tallec (2017) Coupled variational formulations of linear elasticity and the DPG methodology. *J. Comput. Phys.*, 348:715–731.

B. Keith, F. Fuentes, and L. Demkowicz (2016) The DPG methodology applied to different variational formulations of linear elasticity. *Comput. Methods Appl. Mech. Engrg.*, 309:579–609.

Feuntes, F., **B. Keith**, and L. Demkowicz (2015) Orientation embedded high order shape functions for the exact sequence elements of all shapes. *Comput. Math. Appl.*, 70(4):353–458.

Other

B. Keith (2018) New ideas in adjoint methods for PDEs : A saddle-point paradigm for finite element analysis and its role in the DPG methodology. Ph.D. dissertation. Supervisor: Leszek Demkowicz. The University of Texas at Austin.

B. Keith, L. Demkowicz, and J. Gopalakrishnan (2017) DPG* method. *ICES Report 17-25, The University of Texas at Austin*.

B. Keith (2014) Lagrangian coherent structures in three-dimensional steady flows. Master's thesis. Supervisor: George Haller. McGill University.

B. K. Robison[†] (2011) The wave equation and multi-dimensional time. *The Waterloo Mathematics Review.* 1(1):32-42.

[†]Personal name legally changed by the Government of Ontario to Brendan Keith on February 22, 2012.

Academic Service

Journal Reviewer

Computer Methods in Applied Mechanics and Engineering
Computers and Mathematics with Applications
IMA Journal of Numerical Analysis
Mathematics of Computation

Grant Proposal Reviewer

National Science Center, Poland (Panel ST8)

Conference Organizer

Texas Applied Mathematics and Engineering Symposium (`tames.io`)

Student Societies

Vice-President: UT Austin SIAM chapter. (01/2018 - 08/2018)
President: UT Austin SIAM chapter. (09/2015 - 12/2017)
Treasurer: UT Austin SIAM chapter. (09/2013 - 08/2015)

Student Politics

Graduate Student Assembly Representative: UT Austin (09/2016 - 08/2017)
Graduate Student Council Member: McGill University (09/2012 - 08/2013)
Graduate Student Society Committee Member: McGill University (09/2012 - 08/2013)

Societal Membership

Canadian Applied and Industrial Mathematics Society
Society for Industrial and Applied Mathematics (SIAM)
United States Association for Computational Mechanics