THE UNIVERSITY OF TEXAS AT AUSTIN
Cockrell School of Engineering
Standard Resume

FULL NAME: John T. Foster **TITLE:** Assistant Professor

DEPARTMENT: Petroleum and Geosystems Engineering
Aerospace Engineering and Engineering Mechanics (by courtesy)

EDUCATION

Purdue University	Aeronautics & Astronautics	PhD	December 2009
Texas Tech University	Mechanical Engineering	MS	December 2004
Texas Tech University	Mechanical Engineering	BS	December 2002

PROFESSIONAL REGISTRATION

Professional Engineer, Texas, #118233

CURRENT AND PREVIOUS ACADEMIC POSITIONS

The University of Texas at Austin	Assistant Professor	August 2014 – Present
The University of Texas at San Antonio	Assistant Professor	August 2011 – August 2014
The University of New Mexico	Adjunct Professor	September 2010 – May 2011

OTHER PROFESSIONAL EXPERIENCE

Sandia National Laboratories	Senior Member of the Technical Staff	January 2006 – August 2011
Sandia National Laboratories	Member of the Technical Staff	August 2004 – January 2006

CONSULTING

Curl, Stahl, Geis	Engineering analysis / expert witness	November 2014 – February 2015

AWARDS & HONORS

2015 SPE Petroleum Engineering Innovative Teaching Award

2013 Air Force Office of Scientific Research Young Investigator Award

2013 '40 Under 40' - San Antonio Business Journal

REFEREED JOURNAL ARTICLES

†*Underlined name indicates student or postdoctoral co-authors under primary supervision*

Published

1. **J.T. Foster**, A.A. Barhorst, C.N. Wong, and M.T. Bement. Modeling Loose Joints in Elastic Structures–Experimental Results and Validation. *Journal of Vibration and Control*, 15(4):549–565, 2009. doi:10.1177/1077546307082908.

2. **J.T. Foster**, S.A. Silling, and W.W. Chen. Viscoplasticity using peridynamics. *International Journal for Numerical Methods in Engineering*, 81(10):1242–1258, 2010. doi:10.1002/nme.2725.

3. **J.T. Foster**, W. Chen, and V.K. Luk. Dynamic crack initiation toughness of 4340 steel at constant loading rates. *Engineering Fracture Mechanics*, 78(6):1264 – 1276, 2011. doi:10.1016/j.engfracmech.2011.02.019.

In rank of Assistant Professor at UTSA

4. **J.T. Foster**, S.A. Silling, and W. Chen. An energy based failure criterion for use with peridynamic states. *International Journal of Multiscale Computational Engineering*, 9(6):675–688, 2011. doi:10.1615/IntJMultCompEng.2011002407.

5. **J.T. Foster**, D.J. Frew, M.J. Forrestal, E.E. Nishida, and W. Chen. Shock testing accelerometers with a Hopkinson pressure bar. *International Journal of Impact Engineering*, 46:56–61, August 2012. doi:10.1016/j.ijimpeng.2012.02.006.

6. **J.T. Foster**. Comments on the validity of test conditions in Kolsky bar experiments of elastic-brittle materials. *Experimental Mechanics*, 52(9):1559–1563, Brief Technical Note 2012. doi:10.1007/s11340-012-9592-6.

7. R. Rahman, **J.T. Foster**, and A. Haque. Molecular dynamics simulation and characterization of graphene-cellulose nanocomposites. *The Journal of Physical Chemistry A*, 117(25):5344–5353, 2013. doi:10.1021/jp402814t.

8. E.E. Nishida, **J.T. Foster**, and P.E. Briseno. Constant-strain-rate testing of a G10 laminate composite through optimized Kolsky bar pulse shaping techniques. *Journal of Composite Materials*, 47(23):2895–2903, 2013. doi:10.1177/0021998312460263.

9. A. Katiyar, **J.T. Foster**, H. Ouchi, and M.M. Sharma. A peridynamic formulation of pressure driven convective fluid transport in porous media. *Journal of Computational Physics*, 261:209–229, March 2014. doi:10.1016/j.jcp.2013.12.039.

10. R. Rahman and **J.T. Foster**. Deformation mechanism of graphene in amorphous polyethylene: A molecular dynamics based study. *Computational Material Science*, 87:232–240, May 2014. doi:10.1016/j.commatsci.2014.02.023.

11. R. Rahman, **J.T. Foster**, and A. Haque. A multiscale modeling scheme based on peridynamic theory. *International Journal of Multiscale Computational Engineering*, 12(3):223–248, 2014. doi:10.1615/IntJMultCompEng.2014007954.

12. R. Rahman and **J.T. Foster**. Bridging the length scales through nonlocal hierarchical multiscale modeling scheme. *Computational Material Science*, 92:401–415, September 2014. doi:10.1016/j.commatsci.2014.05.052.

13. M.D. Brothers, **J.T. Foster**, and H.R. Millwater. A comparison of different methods for calculating tangent-stiffness matrices in a massively parallel computational peridynamics code. *Computer Methods in Applied Mechanics and Engineering*, 279:247—267, September 2014. doi:10.1016/j.cma.2014.06.034.

14. M. Bessa, **J.T. Foster**, T. Belytschko, and W.K. Liu. A meshfree unification: Reproducing kernel peridynamics. *Computational Mechanics*, 53(6):1251–1264, 2014. doi:10.1007/s00466-013-0969-x.

In rank of Assistant Professor at UT-Austin

15. J.T. O'Grady and **J.T. Foster**. Peridynamic beams: A non-ordinary state-based model. *International Journal of Solids and Structures*, 51(18):3177–3183, 2014. doi:10.1016/j.ijsolstr.2014.05.014.

16. J.T. O'Grady and **J.T. Foster**. Peridynamic plates and flat shells: A non-ordinary state-based model. *International Journal of Solids and Structures*, 51(25–26):4572–4579, 2014. doi:10.1016/j.ijsolstr.2014.09.003.

17. H. Ouchi, A. Katiyar, J.R. York, **J.T. Foster**, and M.M. Sharma. A fully coupled porous flow and geomechanics model for fluid driven cracks: a peridynamics approach. *Computational Mechanics*, 55(3):561–576, March 2015. doi:10.1007/s00466-015-1123-8.

18. R. Rahman and **J.T. Foster**. A molecular dynamics based investigation of thermally vibrating graphene under different boundary conditions. *Physica E: Low-dimensional Systems and Nanostructures*, 72:25–47, August 2015. doi:10.1016/j.physe.2015.04.007.

19. R. Rahman and **J.T. Foster**. Peridynamic theory of solids from the perspective of classical statistical mechanics. *Physica-A*, 437:162–183, November 2015. doi:10.1016/j.physa.2015.05.099.

20. R. Rahman and **J.T. Foster**. Onto resolving spurious wave reflection problem with changing nonlocality among various length scales. *Communications in Nonlinear Science and Numerical Simulation*, 34:86–122, 2016. doi:10.1016/j.cnsns.2015.10.003.

21. **J.T. Foster**. A variationally consistent approach to constrained motion. *ASME. J. Appl. Mech.*, 83(5), May 2016. doi:10.1115/1.4032856.

22. J.T. O'Grady and **J.T. Foster**. A meshfree method for bending and failure in non-ordinary peridynamic shells. *Computational Mechanics*, 57(6):921–929, June 2016. doi:10.1007/s00466-016-1269-z.

BOOKS EDITED

In press

1. F. Bobaru, **J.T. Foster**, P. Guebelle, and S.A. Silling, editors. *The Handbook of Peridynamics*. Taylor & Francis/CRC Press, Publication date: September 7, 2016

BOOK CHAPTERS

In press

1. **J.T. Foster**. *The Handbook of Peridynamics*, chapter Constitutive Modeling in Peridynamics. Taylor & Francis/CRC Press, Publication date: September 7, 2016

CONFERENCE PROCEEDINGS

1. **J.T. Foster**, A.A. Barhorst, C.N. Wong, and M.T. Bement. Modeling and Experimental Verification of Frictional Contact-Impact in Loose Bolted Joint Elastic Structures. In *Proceedings of IDETC'05*, number DETC2005-85465. IDETC, 2005.

2. J.G. Averett, J.D. Cargile, **J.T. Foster**, and V.K. Luk. Projectile Deceleration Due to Perforation Through Layers of Unreinforced Concrete Targets. In *Limited Proceedings of 76th Shock and Vibration Conference*, number U-045. SAVIAC, 2006.

3. J.G. Averett, J.D. Cargile, **J.T. Foster**, and V.K. Luk. Oblique Perforation of Unreinforced Concrete Targets: Experiments and Numerical Simulations. In *Limited Proceedings of 77th Shock and Vibration Conference*, 2007.

4. D.A. Dederman, D. Burnett, **J.T. Foster**, and J.A. Dykes. In Situ Penetration Testing of Darts with 16-Inch Mobile Gas Gun. In *Proceedings of 24th International Symposium on Ballistics*, number TB149, 2008.

5. **J.T. Foster**, V.K. Luk, and W. Chen. Dynamic initiation fracture toughness of high strength steel alloys. In *Proceedings of the XIth International Congress and Exposition. Orlando, Florida Society for Experimental Mechanics Inc*, volume 77, 2008.

6. **J.T. Foster**, S.A. Silling, and W.W. Chen. State based peridynamic modeling of dynamic fracture. In *SEM 2009 Conference on Experimental and Applied Mechanics*, number 33. SEM, 2009.

7. **J.T. Foster**, S.A. Silling, and W.W. Chen. State based peridynamic modeling of dynamic fracture. In *DYMAT 2009-9th International Conference on the Mechanical and Physical Behaviour of Materials under Dynamic Loading*, volume 2, pages 1529–1535, 2009. doi:10.1051/dymat/2009216.

8. **J.T. Foster**, W. Chen, and V.K. Luk. Dynamic fracture initiation toughness of high strength steel alloys. In *DYMAT 2009-9th International Conference on the Mechanical and Physical Behaviour of Materials under Dynamic Loading*, volume 1, pages 407–412, 2009. doi:10.1051/dymat/2009058.

9. **J.T. Foster**, D.J. Frew, M.J. Forrestal, E.E. Nishida, and W. Chen. Shock testing accelerometers with a Hopkinson pressure bar. *Experimental and Applied Mechanics, Volume 6*, pages 229–237, 2011. doi:10.1007/978-1-4614-0222-0_29.

In rank of Assistant Professor at UTSA

10. **J.T. Foster** and E.E. Nishida. *A priori* pulse shaper design for constant-strain-rate tests of elastic-brittle materials. In V. Chalivendra, B. Song, and D. Casem, editors, *Dynamic Behavior of Materials, Volume 1*, Conference Proceedings of the Society for Experimental Mechanics Series, pages 379–386. Springer New York, 2013. doi:10.1007/978-1-4614-4238-7_49.

11. J.R. York, **J.T. Foster**, E.E. Nishida, and B. Song. A novel torsional Kolksy bar for constant-strain-rate materials testing. In B. Song, D. Casem, and J. Kimberly, editors, *Dynamic Behavior of Materials, Volume 1*, Conference Proceedings of the Society for Experimental Mechanics Series. Springer New York, 2013. doi:10.1007/978-3-319-00771-7_36.

In rank of Assistant Professor at UT-Austin

12. J.T. O'Grady and **J.T. Foster**. Peridynamic beams and plates: A non-ordinary state-based model. In *ASME 2014 International Mechanical Engineering Congress and Exposition*, number IMECE2014-39887, 2014. doi:10.1115/IMECE2014-39887.

13. H. Ouchi, A. Katiyar, **J.T. Foster**, and M.M. Sharma. A Peridynamics Model for the Propagation of Hydraulic Fractures in Heterogeneous, Naturally Fractured Reservoirs. In *SPE Hydraulic Fracturing Technology Conference*, number SPE-173361-MS. Society of Petroleum Engineers, February 2015. doi:10.2118/173361-MS.

14. E.A. Lynd, **J.T. Foster**, and Q.P. Nguyen. An application of the Isogeometric Analysis Method to reservoir simulation. In *78th EAGE Conference and Exhibition*, number SPE-180110-MS. Society of Petroleum Engineers, 2016. doi:10.2118/180110-MS.

TECHNICAL REPORTS

1. **J.T. Foster**. Scale Modeling of Earth Penetrators for In Situ Targets. Technical Report SAND2006-4273, Sandia National Laboratories, 2006.

2. J.A. Dykes and **J.T. Foster**. Discrete-ULL 1-C Final Test Report. Technical Report SAND2007-4273, Sandia National Laboratories, 2007.

3. **J.T. Foster** and A.J. Webb. Penetration Simulations for Angle-of-Attack (AoA) Experiments into Low Strength Concrete Targets. SAND2007-5256, Sandia National Laboratories, 2007.

4. R.J. Fogler, J.W. Giron, J.A. Jacob, W.P. Wolfe, R.W. Greene, R.D. Tucker, A.E. Fortier, **J.T. Foster**, D.M. Van Zuiden, W.T. O'Rourke, H.D. Nguyen, E. Ollila, and J.R. Phelan. Guided miniature air-deliverable sensor dart. Technical Report SAND2007-6528, Sandia National Laboratories, 2007.

5. P.D. Coleman, R.A. Bates, M.T. Buttram, S.B. Dron, **J.T. Foster**, R.J. Franco, C.O. Landron, G.M. Loubriel, J.E. Lucero, A. Mar, T.L. Martinez, F.E. Reyes, and B.J. Welch. Void Sensor for Penetrators. Technical Report SAND2007-6528, Sandia National Laboratories, 2007.

6. **J.T. Foster**, A.J. Webb, A.E. Fortier, V.K. Luk, and D.A. Dederman. Penetration Code Study for Angle-of-Obliquity (AoO) Experiments into High-Strength Concrete Targets. Technical Report SAND2008-1162, Sandia National Laboratories, 2008.

7. **J.T. Foster**, A.E. Fortier, J.G. Averett, J.D. Cargile, V.K. Luk, and D.A. Dederman. Predictive Simulation for Perforation Through Layers of Unreinforced Concrete Targets. Technical Report SAND2008-113, Sandia National Laboratories, 2008.

8. E.E. Nishida, **J.T. Foster**, E.W. Klamerus, and D. Burnett. Dynamic behavior of shock isolation/ mitigation materials by kolsky bar experiments. Technical Report SAND2011-8266, Sandia National Laboratories, 2011.

9. J.V. Cox, G.W. Wellman, J.M. Emery, J.T. Ostien, **J.T. Foster**, T.E. Cordova, T.B. Crenshaw, A. Mota, J.E. Bishop, S.A. Silling, D.J. Littlewood, J.W. Foulk III, K.J. Dowding, K. Dion, B.L. Boyce, J.H. Robbins, and B.W. Spencer. Ductile Failure X-prize. Technical Report SAND2011-6801, Sandia National Laboratories, 2012. doi:10.2172/1029764.

In rank of Assistant Professor at UT-Austin

10. Peridynamics Capabilities Review Panel. Peridynamics capabilities review panel report. SAND Report 2015-1921, Sandia National Laboratories, Albuquerque, NM and Livermore, CA, 2015.

TECHNICAL PRESENTATIONS

Invited Talks

1. "Peridynamic modeling of viscoplasticity and dynamic fracture." University of New Mexico, Mechanical Engineering. February 2010.

2. "Peridynamic modeling of viscoplasticity and dynamic fracture." University of Nebraska, Engineering Mechanics. April 2010.

In rank of Assistant Professor at UTSA

3. "Unifying the mechanics of continuous and discontinuous media." 2011 International Workshop on Intensive Loading and its Effects. State Key Laboratory of Explosion Science and Technology, Beijing Institute of Technology. Beijing, China. December 2011.

4. "Hydraulic fracturing and its environmental impact: a short address of major public concerns." Presentation for the Center for Simulation, Visualization, and Real-Time Prediction participation in UTSA Earthweek 2012. April 2012.

5. "Unifying the mechanics of continuous and discontinuous media." Texas Tech University, Mechanical Engineering. April 2012.

6. "Unifying the mechanics of continuous and discontinuous media." The Johns Hopkins University, Center for Advanced Ceramics and Metallic Systems. July 2012.

7. "Unifying the mechanics of continuous and discontinuous media." Army Research Laboratory. February 2013.

8. "Peridynamics as a unified theory for heterogenous media, anomalous porous flow, and fracture." The University of Texas at Austin, Department of Petroleum & Geosystems Engineering. October 2013.

9. "Nonlocal multiphysics for heterogeneous materials, anomalous diffusion, and fracture." Northwestern University, Department of Mechanical Engineering. January 2014.

10. "Nonlocal multiphysics for heterogeneous materials, anomalous diffusion, and fracture." The University of Texas at Austin, Department of Petroleum & Geosystems Engineering. March 2014.

11. "A model for nonlocal diffusion and fluid-driven fracture." USACM/IUTAM Symposium on Connecting Multiscale Mechanics to Complex Material Design. Northwestern University. May 2014.

12. "Nonlocal multiphysics for heterogeneous materials, anomalous diffusion, and fracture." ExxonMobil - Corporate Strategic Research. July 2014.

In rank of Assistant Professor at UT-Austin

13. “Nonlocal multiphysics for heterogeneous materials, anomalous diffusion, and fracture.” Center for Mechanics of Solids, Structures and Materials, The University of Texas at Austin, Department of Aerospace Engineering and Engineering Mechanics. September 2014.

14. “Nonlocal multiphysics for heterogeneous materials, anomalous diffusion, and fracture.” University of Illinos – Urbana-Champaign, Department of Aerospace Engineering. September 2014.

15. “Nonlocal multiphysics for heterogeneous materials, anomalous diffusion, and fracture.” Institute for Computational Engineering Science, The University of Texas at Austin. October 2014.

16. “Nonlocal multiphysics for heterogeneous materials, anomalous diffusion, and fracture.” Graduate Aerospace Laboratories, California Institute of Technology. January 2015.

17. “Nonlocal multiphysics for heterogeneous materials, anomalous diffusion, and fracture.” Total. March 2015.

18. “A multiphysics model for hydraulic fracture simulation.” Eighth International Workshop Meshfree Methods for Partial Differential Equations. Universität Bonn. September 2015.

19. “Isogeometric peridynamics.” USACM Thematic Workshop on Nonlocal Models in Mathematics, Computation, Science, and Engineering. Oak Ridge National Laboratory. October 2015.

20. “Nonlocal models for anamalous transport” Schlumberger EUREKA Fluid Mecahnics Mini-Workshop. Schlumberger-Doll Research Center. July 2016.

Conferences

1. “Viscoplasticity using peridynamics.” (with S.A. Silling and W. Chen) 10th US National Congress on Computational Mechanics. July 2009.

In rank of Assistant Professor at UTSA

2. “Peridynamic Modeling of Localization in Ductile Metals.” (with D.J. Littewood and B.L. Boyce) International Workshop on Computational Mechanics of Materials IWCMM XXII. September 2012.

3. “Implicit time integration of an ordinary state-based peridynamic plasticity model with isotropic hardening.” (with D.J. Littlewood, J.A. Mitchell, M.L. Parks). SiViRT Simulation and Vizualization Symposium. November 2012.

4. “Implicit time integration of an ordinary state-based peridynamic plasticity model with isotropic hardening.” (with D.J. Littlewood, J.A. Mitchell, M.L. Parks). ASME IMECE 2012. November 2012.

5. “A Peridynamics Formulation of the Coupled Mechanics-Fluid Flow Problem”. (with A. Katiyar, H. Ouchi, M.M. Sharma). USACM Workshop on Nonlocal Damage and Failure: Peridynamics and other nonlocal methods. March 2013.

6. “Lessons Learned in Modeling Ductile Failure with Peridynamics”. (with D.J. Littlewood). USACM Workshop on Nonlocal Damage and Failure: Peridynamics and other nonlocal methods. March 2013.

7. “A Peridynamics Based Hierarchical Multiscale Modeling Framework Between Continuum and Atomistic Scales”. (with R. Rahman, A. Haque). USACM Workshop on Nonlocal Damage and Failure: Peridynamics and other nonlocal methods. March 2013.

8. “Two-Dimensional Semi-Analytic Solutions to the Linearized State-Based Peridynamic Equilibrium Equation”. (with J.T. O’Grady). USACM Workshop on Nonlocal Damage and Failure: Peridynamics and other nonlocal methods. March 2013.

9. “A novel hierarchical multiscale modeling framework for polyethylene systems using Peridynamics and molecular dynamics”. (with R. Rahman). 2013 Mach Conference, Annapolis, MD. April 2013.

10. “A non-local formulation for fluid flow and mass transport in porous media based on peridynamic theory”. (with A. Katiyar and M. Sharma). 12th US National Congress on Computational Mechanics. July 2013.

11. “Regularizing numerical simulations of strain-localization using a peridynamics-based plasticity formulation”. (with Md.I. Kahn, D.J. Littlewood, and J.A. Mitchell). International Workshop on Computational Mechanics of Materials, IWCMM XXIII. October 2013

12. “Bridging the length scales by linking the atomistic model with coarser peridynamic models through molecular dynamics simulation of Polyethylene”. (with R. Rahman). Mach Conference 2014. April 2014.

13. “A nonlocal poroelastic approach to fluid driven fracture.” (with J.R. York, A. Katiyar, H. Ouchi, M. Sharma). US National Congress on Theoretical and Applied Mechanics. June 2014.

14. “Reproducing Continuum Dynamics”. (with M. Bessa, W.K. Liu, T. Belytschko). World Congress on Computational Mechanics 2014. July 2014.

15. “A nonlocal poroelastic approach to fluid driven fracture.” (with J.R. York, A. Katiyar, H. Ouchi, M. Sharma). World Congress on Computational Mechanics XI. July 2014.

In rank of Assistant Professor at UT-Austin

16. “An Overview of the Progress of Meshfree Particle Methods: From SPH to EFG to RKPM to Meshfree Peridynamics.” (with W.K. Liu, M. Bessa). Meshfree Methods for Large-Scale Computational Science and Engineering. October 2014.

17. “Fracture in plates and shells with peridynamic non-ordinary state-based models.” Meshfree Methods for Large-Scale Computational Science and Engineering. October 2014.

18. “An Ordinary State Based Plasticity Model For Peridynamics.” (with J.A. Mitchell). ASME 2014 International Mechanical Engineering Congress and Exposition. November 2014.

19. “Regularizing numerical simulations of shear-banding using a peridynamics-based plasticity formulation.” (with Md.I.H. Kahn). ASME 2014 International Mechanical Engineering Congress and Exposition. November 2014.

20. “Mesoscale Simulations Investigating the Effects of Shock Wave Stability in Granular Materials with Peridynamics.” (with R. Rahman, A. Peterson, T. Vogler). 13th US National Congress on Computational Mechanics. July 2015.

21. “Bending Failure in Peridynamic Plates.” (with J. O’Grady). ASME 2015 International Mechanical Engineering Congress and Exposition. November 2015.

22. “A peridynamic model for hydraulic fracture.” (with H. Ouchi, J.R. York, M.M. Sharma). Engineering Mechanics Institute Conference 2016. May 2016.

23. “A peridynamic model for hydraulic fracture.” (with H. Ouchi, J.R. York, M.D. Brothers, M.M. Sharma). SIAM Annual Conference. July 2016.

Student Delivered

1. “Intragranular fracture and frictional effects in granular materials under pressure-shear loading.” (with A.M. Peterson and T.J. Vogler) 18th Biennial Intl. Conference of the APS Topical Group on Shock Compression of Condensed Matter held in conjunction with the 24th Biennial Intl. Conference of the Intl. Association for the Advancement of High Pressure Science and Technology (AIRAPT). July 2013.

2. “A complex-step method for tangent-stiffness calculation in a massively parallel computational peridynamics code.” (with M.D. Brothers and H.R. Millwater). 12th US National Congress on Computational Mechanics. July 2013.

3. “A peridynamic model of diffusive fluid flow through a deformable media.” (with J.R. York). 2013 SACNAS National Conference. October 2013.

4. “The Next Generation Model for Predicting the Growth of Complex Fracture Networks.” (with J.R. York). 2014 Hydraulic Fracturing and Sand Control Joint Industry Program Technical Review. April 2014.

5. “Peridynamic beams, plates, and shells: a non-ordinary state-based model.” (with J. O’Grady). Society of Engineering Science 2014. October 2014.

6. “Peridynamic beams, plates, and shells: a non-ordinary state-based model.” (with J. O’Grady). ASME 2014 International Mechanical Engineering Congress and Exposition. November 2014.

7. “A Peridynamic Model for Hydraulic Fracture.” (with H. Ouichi, A. Katiyar, M. Sharma). 13th US National Congress on Computational Mechanics. July 2015.

8. “Mesh-Free Non-ordinary Peridynamic Bending.” (with J. O’Grady). 13th US National Congress on Computational Mechanics. July 2015.

9. “Modeling of Contact and Non-Local Friction in a Peridynamic Framework.” (with J.R. York). 13th US National Congress on Computational Mechanics. July 2015.

Poster

1. “Intragranular fracture and frictional effects in granular materials under pressure-shear loading.” (with A.M. Peterson and T.J. Vogler) 18th Biennial Intl. Conference of the APS Topical Group on Shock Compression of Condensed Matter held in conjunction with the 24th Biennial Intl. Conference of the Intl. Association for the Advancement of High Pressure Science and Technology (AIRAPT). July 2013.

2. "A Peridynamic Model for Hydraulic Fracture." (with J.R. York) USACM Thematic Workshop on Nonlocal Models in Mathematics, Computation, Science, and Engineering. Oak Ridge National Laboratory. October 2015.

SOFTWARE

Core developer for *Peridigm* open source peridynamics software

Website: http://peridigm.sandia.gov

Source Code: http://github.com/peridigm/peridigm

Various other projects developed and contributed to

Source Codes: http://github.com/johntfoster

BLOG

Contains various useful code snippets, examples, and resources primarly targeted to assist in students working under my supervision and other researchers in scientific computation.

Website: http://johntfoster.github.io/

GRANT PROPOSALS

Externally Funded – ***PI Total: $2.44M, co-PI Total: $10.29M***

In rank of Assistant Professor at UTSA

1. Sandia X-Prize Necking Challenge. Sandia National Laboratories, 2012. *PI* $44,700.

2. Peridynamic Simulation of Granular Materials Undergoing Shock Compression. Sandia National Laboratories, 2012. *PI* $32,597

3. Statistical coarse-graining of molecular dynamics into peridynamics. *Subaward* from Army Reasearch Laboratories Materials in Extreme Dynamic Environments Cooperative Research Agreement. The Johns Hopkins University, 2012. *PI* $91,925.

4. Fracture Design, Placement And Sequencing In Horizontal Wells. National Energy Technology Laboratory 2012-2016, DE-FOA-0000724 *co-PI w/ M. Sharma (UT-Austin)* Total Award: $1,592,451, Foster Award: $275,250.

5. Peridynamic simulation of pressure-shear experiments on granular media. Sandia National Laboratories, 2013. *PI* $29,071

6. Towards a multiscale failure modeling paradigm for polymers: statistical coarse-graining of molecular dynamics into peridynamics. *Subaward* from Army Reasearch Laboratories Materials in Extreme Dynamic Environments Cooperative Research Agreement. The Johns Hopkins University, 2013. *PI* $91,925.

7. Predictive simulation of material failure using peridynamics-advanced constitutive modeling, verification, and validation. Air Force FY2013 Young Investigator Program. BAA-AFOSR-2012-0001, AFOSR, 2013-2015. *PI* $360,000.

8. MURI Center for Material Failure Prediction Through Peridynamics. Air Force Office of Scientific Research, 2013-2018. ONRBAA12-020, *co-PI w/ E. Madenci (Arizona), F. Bobaru (Nebraska), N. Chawla (Arizona State), Q. Du (Columbia)* Total Award $7,500,000. Foster Award: $959,153.

9. Fiber failure modeling with peridynamics. *Subaward* from Army Reasearch Laboratories Materials in Extreme Dynamic Environments Cooperative Research Agreement. The Johns Hopkins University, 2014. *PI* $101,306.

In rank of Assistant Professor at UT-Austin

10. Nonlocal and fractional order methods for near-wall turbulence, large-eddy simulation, and fluid–structure interaction. Army Research Office, 2015-2018. ONRFOA14-012, *PI* $345,000.

11. Pulse Fracture Simulation. GE Global Research, 2016. *PI* $100,000.

Internally Funded

1. Application of Peridynamics to Hydraulic Fracture Modeling. The University of Texas at San Antonio – Office of the Vice President for Research, 2012. *PI* $18,927.

Pending

1. CAREER: A nonlocal approach to fluid driven fracture with applications in energy production and environmental assessment. National Science Foundation, 2016-2020. Requested $500,000.

COURSES TAUGHT

PGE 334 - Reservoir Geomechanics (UT S2015)

PGE 383 - Advanced Geomechanics (UT F2014, F2015)

PGE 323M - Reservoir Engineering III (UT F2015)

Introduction to High-Performance Computing (UTSA F2012, F2013, S2014)

ME 6043 – Continuum Mechanics (UTSA F2012, F2014)

ME 4603 – Finite Element Analysis (UTSA F2011)

ME 400/500 – Numerical Methods (UNM F2010)

ADVISING AND RELATED STUDENT SERVICES

Graduate Students (Graduated)

PhD

1. James O'Grady, Ph.D.M.E. 2014 (UTSA, now at Army Research Lab)

MS

1. Amanda Peterson, M.S.M.E 2014 (UTSA)
2. Md. Imran Khan, M.S.M.E. 2014 (UTSA)
3. Michael Brothers, M.S.M.E 2013 (UTSA)
4. Jason York, M.S.M.E 2012 (UTSA)
5. Arron Werthiem, M.S.M.E 2012 (UTSA)

Graduate Students (In Progress)

PhD - Passed qualifying examination

1. Jason York (UT-PGE)
2. Mingyaun Yang (UT-PGE)
3. Yu Leng (UT-PGE)

PhD

1. Michael Brothers (UT-EM)
2. Eric Lynd (UT-PGE) *co-advised with Q.Nguyen*
3. Rambod Yousefzadeh Tabasi (UT-EM)
4. Masoud Behzadinasab (UT-EM)
5. Sai Uppati (UT-PGE)

MS

1. Xiao Xu (UT-PGE)

Postdoctoral Researcher's Supervised

1. James O'Grady, Ph.D. (UT)
2. Rezwanur Rahman, Ph.D. (UTSA/UT)
3. Shamima Yasmin, Ph.D. (UTSA)

Undergraduate Research Assistants

1. P. Eric Briseno, B.S.M.E. 2013
2. Robert Knobles, B.S.M.E. 2014 (Baker-Hughes)
3. Robert Brothers
4. Jason Crandall
5. Sam Petzold – Moncrief Summer Intern

Graduate Commitee Member

Hisanao Ouchi, Ph.D. PGE, Yongcun Feng, Ph.D. PGE 2016
Sarah Boukris, Ph.D. BME, Daniel Sparkman, Ph.D. M.E., 2014
Khaled Mahmud, Saurav Kumar, M.S.M.E. 2013
Miguel Cortina, Carlos Acosta, David Wagner, M.S.M.E 2012

External Commitee Member

Md. Essack, University of Cape Town, South Africa 2014

Undergraduate Research Assistants

1. P. Eric Briseno, B.S.M.E. 2013
2. Robert Knobles, B.S.M.E. 2014 (Baker-Hughes)
3. Robert Brothers
4. Jason Crandall

ACADEMIC-RELATED PROFESSIONAL AND PUBLIC SERVICE

Conferences/Workshops Organized

1. US National Congress on Computational Mechanics 15

   Conference Chair

   To be held in Austin, TX, July 28-August 1, 2019

2. Workshop on Isogeometric Analysis and Meshfree Methods

   Sponsered by the US Association for Computational Mechanics.

   To be held at UCSD, October 10-12, 2016

   http://iga-mf.usacm.org

3. Workshop on Meshfree Methods for Computational Science and Engineering

   Sponsered by the US Association for Computational Mechanics.

Held at UCF, October 27-28, 2014

http://mmlcse2014.usacm.org

4. Workshop on Nonlocal Damage and Failure: Peridynamics and other nonlocal models.

   Sponsered by the US Association for Computational Mechanics.

   Held at UTSA Downtown Campus, March 11-12, 2013

   http://ndf2013.usacm.org

Mini-symposia Organized

1. Modeling of Material Failure Using Approaches Beyond Locality: A Celebration of Dr. Stewart Silling's 60^{th} Birthday, *To be held* ASME IMECE2016
2. Advances in Galerkin and Collocation Meshfree Methods, WCCM 2016.
3. Corrosion Damage and Stress Corrosion Cracking: Experiments, Modeling, and Computations, ASME IMECE2015
4. Advances in nonlocal/peridynamic modeling: Symposia in honor of Dr. Stewart Silling's 55^{th} birthday, ASME IMECE2012.
5. Multiscale methods and nonlocal theories for complex material behavior. USACM USNCCM12.
6. Multiscale Modeling of Dynamic Material Behavior, SEM Annual Conference 2014.
7. Multiscale Modeling of Dynamic Material Behavior, SEM Annual Conference 2013.
8. Multiscale Modeling of Dynamic Material Behavior, SEM Annual Conference 2012.

ADMINISTRATIVE AND COMMITTEE SERVICE

Committee Assignments

Department

PGE Undergraduate Studies 2015-2016

PGE Graduate Admissions Committee 2015-2016

PGE Department Awards Committee 2014-2016

Graduate Committee 2013-2014 (UTSA)

Faculty Search Committee 2013-2014 (UTSA)

Department Promotional Activities 2012-2013 (UTSA)

Seminar 2011-2012 (UTSA)

University

Cockrell School Engineering Honors 2015-2016

Undergraduate Research Day Planning Committee 2013-2014 (UTSA)

Student Organization Advisor

Programming for Engineers & Scientists 2016

Tau Beta Pi 2013-2014 (UTSA)

Formula SAE Car Team 2013-2014 (UTSA)

REVIEWER FOR

Journals

Computational Geosciences, Journal of Applied Mechanics, Computational Methods in Applied Mechanics and Engineering, Journal of Computational Particle Mechanics, Journal of Microelectromechanical Systems, Computational Mechanics, Int. Journal of Fracture, Applied Mathematics & Computation, Int. Journal of Impact Engineering, Engineering Fracture Mechanics, Experimental Mechanics, Review of Scientific Instruments, Int. Journal of Multiscale Computational Engineering, Int. Journal of Solids and Structures, CMC: Computers, Materials, & Continua, Journal of Mechanics of Materials and Structures.

Books

Split Hopkinson (Kolsky) Bar. W. Chen and B. Song. Springer 2010.

Book Proposals

CRC Press

ORGANIZATIONS

Society of Petroleum Engineers, US Association for Computational Mechanics, Pi Tau Sigma - Mechanical Engineering Honor Fraternity, Tau Beta Pi - National Engineering Honor Society, American Society of Mechanical Engineers, American Institute of Aeronautics and Astronautics, Society for Experimental Mechanics – Dynamic Behavior of Materials Technical Division Committee Member, DYMAT, American Society for Engineering Education

VITA

John T. Foster is an assistant professor in the Departments of Petroleum and Geosystems Engineering and Aerospace Engineering and Engineering Mechanics (by courtesy) at the University of Texas at Austin. He received his BS and MS in mechanical engineering from Texas Tech University and PhD from Purdue University. He is a registered Professional Engineer in the State of Texas. During his career in research he has been involved in many projects ranging from full scale projectile penetration field tests, to laboratory experiments using Kolsky bars, to modeling and simulation efforts using some of the world's largest computers. His research interests are in experimental and computational mechanics and multi-scale modeling with applications to geomechanics, impact mechanics, fracture mechanics, and anamolous transport processes. Additionally, he has interest in fundamental theoretical advancement of the peridynamic theory of solid mechanics. His teaching interests are in all areas of theoretical and computational mechanics.

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