James C. Sutherland

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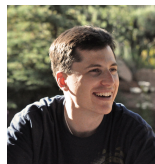
Education

May, 2004	Doctor of Philosophy in Chemical Engineering, The University of Utah GPA: 3.96 Dissertation: "Evaluation of Large-Eddy Simulation Mixing and Reaction Models for Nonpremixed Combustion using Direct Numerical Simulation"
June, 1999	Bachelor of Science in Chemical Engineering, The University of Utah GPA: 3.88, Cum Laude Thesis: "A Study of the Chemistry of NO Formation and Reduction Using Methane, Carbon Monoxide, and Hydrogen as Reburning Fuels"

Academic Appointments & Affiliations

July, 2012 - Present	Associate Professor of Chemical Engineering, The University of Utah
July, 2013 - Present	Adjunct Associate Professor - School of Computing, The University of Utah
October, 2006 - June, 2012	Assistant Professor of Chemical Engineering, The University of Utah
May, 2011 - July, 2013	Adjunct Assistant Professor, School of Computing, The University of Utah
Fall, 2010 - Present	Primary investigator, Center for Parallel Computing, The University of Utah
Fall, 2006 - Present	Primary investigator, Institute for Clean & Secure Energy, The University of Utah
August, 2004 – October, 2006	Post-doctoral research assistant – Thermal/Fluids Computational Engineering Sciences, Sandia National Laboratories (Albuquerque, NM).
August 1999 - July 2004	Ph.D. Student & Student Intern – Combustion Research Facility, Sandia National Laboratories (Livermore, CA) & The University of Utah.
1998-1999	Research Assistant - University of Utah Advanced Combustion Group.

Professional Service

National & International Service

Colloquium Co-Chair	38th International Symposium on Combustion, 2019-2020.
Minisymposium Organizer	17th International Conference on Numerical Combustion, 2019. "Algorithms, Applications and Software for Combustion Modelling on GPU and Hybrid Architectures"
Minisymposium Organizer	14th US National Congress on Computational Mechanics, 2017. "Complex Multi-Physics Coupling Techniques: Advances and Applications"
Board Member (2015-present)	Western States Section of the Combustion Institute
Minisymposium Organizer	SIAM Parallel processing conference, 2014. "Productivity, Portability, and Scalability through Domain-Specific Languages"
Chair (2010-2013)	Organizing committee, 8th U.S. National Combustion Meeting, 2013. (approximately 420 attendees)
Minisymposium Organizer	International Conference on Numerical Combustion, 2011. "Validation and Uncertainty Quantification in Highly Complex Systems"
Minisymposium Organizer	SIAM Parallel Processing Conference, 2010. "Software Design Patterns for Addressing Complexity in Large Scale Multiphysics Applications." Co-organizer with Roger Pawlowski and Pat Notz (Sandia National Laboratories)
Reviewer-Journals	Proceedings of the Combustion Institute, Combustion & Flame, Combustion Theory & Modeling, Flow, Turbulence & Combustion, Combustion Science & Technology, Theoretical and Computational Fluid Dynamics, Journal of Computational Physics, AIAA Journal, Combustion Science & Technology, Computers & Math with Applications, Chemical Engineering Science, Theoretical and Computational Fluid Dynamics, Chemical Engineering Science, Fuel, Journal of Thermal Science and Engineering Applications, International Journal of Computational Fluid Dynamics, Zeitschrift für Physikalische Chemie, Fuel Processing Technology, Applied Thermal Engineering, MethodsX, ACM Transactions on Mathematical Software
Reviewer-Agencies	U.S. Department of Energy - Basic Energy Sciences, National Science Foundation CBET Division, ACS Petroleum research fund, U.S. Civilian Research & Development Foundation Cooperative Grants Program, Indo-US Science & Technology Forum

University Service

Member (2018-2019)	Academic Senate Executive Committee
Member (2017-2020)	Academic Senate
Member (2017-2020)	College Council
Member (2016-2019)	Student Behavior Committee
Member (2013-2019)	Academic Appeals & Misconduct Committee
Member (2008-present)	Center for High Performance Computing User's Council
Editor (2010-2012)	Institute for Clean & Secure Energy Technical Reports
Member (2009-2013)	College of Engineering College Council Committee
Member (2008-2013)	Center for High Performance Computing Allocations Committee

Departmental Service

Chair (2007-2019)	Ph.D. qualifying examination sub-committee
Chair (2015-2016)	Faculty search committee
Member (2012-2014)	Meldrum endowed professorship search committee
Member (2007-present)	Chemical Engineering Graduate Committee

Academic Awards & Honors

2017	College of Engineering Outstanding Teacher award
2016-2017	Department of Chemical Engineering Outstanding Faculty award.
2016	Best lecturer award from Chemical Engineering class of 2016.
2014	Top 10% teaching in college of engineering (Spring semester)
1999-2004	Sandia Graduate Fellowship Recipient
2003	Outstanding Teaching Assistant Award - University of Utah College of Engineering
2001	John Zink Scholar
2001	Oblad Award (presented by the ChEn faculty to an outstanding senior each year)
1999	All-American Award in Pistol Shooting
1995-1999	Honors at Entrance Full Tuition Scholarship - University of Utah

Teaching Responsibilities

ChEn 1703	Intro. to Engineering Computing	2001, 2007, 2008
ChEn 2450	Numerical Methods in Chem. Eng.	Annually 2008-2016
ChEn 3603	Mass Transfer & Separations	Annually 2013-2019
ChEn 6603	Multicomponent Mass Transfer	2007, 2009, 2010, 2011, 2012
ChEn 6703	Advanced Numerical Methods in Chemical Engineering	2017, 2018

Contributions to Innovative Teaching

- I screencast each of my lectures so students can review material after class.

- Developed a wiki page with online tutorials for students, https://sutherland.che.utah.edu/wiki

- Participated in the "Integration of Simulation Technology into the Engineering Curriculum" workshop at Cornell University (Summer, 2008)

- Participated in development of an online thermodynamics course, (2001).

M.S. & Ph.D. Students Supervised

Name	Degree	Year
Hang Zhou	Ph.D.	(2021)
Elizabeth Armstrong	Ph.D.	(2021)
Joshua McConnell	Ph.D.	2019
Derek Cline	M.S.	2018
Mike Hansen	Ph.D.	2018
Siddartha Ravichandran	M.S.	2017
Michael Brown	M.S.	2017
Nathan Yonkee	M.S.	2015
Amir Biglari	Ph.D.	2015
Abhishek Bagusetty	M.S.	2014
Babak Goshayeshi	Ph.D.	2014
Christopher Earl	Ph.D.	2013
Devin Robison	M.S.	2013
Lyubima Simeonova	M.S.	2012
Naveen K, Punati	Ph.D.	2012
Alessandro Parente	Ph.D.	2008

Post-Doctoral Researchers Supervised

- Babak Goshayeshi (2015-2017)

- Christopher Earl (2013-2014)

- Tony Saad (2010-2012)

Funded Research Projects

2018-2020	DOE-SNL	$105,589	PI
2018-2022	DOE (EFRC)	$350,000	Senior personell (Sutherland's budget)
2017-2021	NSF	$493,300	PI
2016-2018	DOE-SNL	$171,462	PI
2014-2019	DOE-NNSA	$1,527,807	PSAAP-II (co-PI, Sutherland's budget)
2013-2016	NSF	$700,000	co-PI with M. Berzins and M. Might
2013-2015	DOE-SNL	$71,918	PI
2013-2014	NSF	$10,000	PI
2012-2017	DOE-BES	$449,652	PI
2010-2013	DOE-NNSA	$639,704	PI
2010-2015	NSF	$704,480	co-PI with V. Pascucci (Sutherland's budget)
2009-2010	University of Utah	$22,400	PI
2008-2011	DOE	$307,000	PI

Peer Reviewed Publications

View my Google Scholar profile or my Mendeley profile.

[1] Michael A. Hansen, Elizabeth Armstrong, and James C Sutherland. State space parameterization of explosive eigenvalues during autoignition. *Combustion and Flame*, 196:182–196, 2018.

[2] Michael A. Hansen and James C. Sutherland. On the consistency of state vectors and Jacobian matrices. *Combustion and Flame*, 193:257–271, 2018.

[3] Bradley Peterson, Alan Humphrey, Dan Sunderland, James C Sutherland, Tony Saad, Harish Kumar Dasari, and Martin Berzins. Automatic Halo Management for the Uintah GPU-Heterogeneous Asynchronous Many-Task Runtime. *International Journal of Parallel Programming*, accepted, 2018.

[4] Chris Earl, Matthew Might, Abhishek Bagusetty, and James C. Sutherland. Nebo: An efficient, parallel, and portable domain-specific language for numerically solving partial differential equations. *Journal of Systems and Software*, 125:389–400, March 2017.

[5] Michael A. Hansen and James C. Sutherland. Dual Timestepping Methods for Detailed Combustion Chemistry. *Combust. Theory Modelling*, 21(2):329–345, 2017.

[6] Josh Mcconnell, Babak Goshayeshi, and James C Sutherland. An Evaluation of the Efficacy of Various Coal Combustion Models for Predicting Char Burnout. *Fuel*, 201:53–64, 2017.

[7] Josh McConnell and James C. Sutherland. The effect of model fidelity on prediction of char burnout for single-particle coal combustion. *Proceedings of the Combustion Institute*, 36(2):2165–2172, 2017.

[8] Tony Saad, Derek Cline, James C. Sutherland, and R. Stoll. Scalable Tools for Generating Synthetic Isotropic Turbulence with Arbitrary Spectra. *AIAA journal*, 55(1):327–331, 2017.

[9] Tony Saad and James C Sutherland. Wasatch: An architecture-proof multiphysics development environment using a Domain Specific Language and graph theory. *Journal of Computational Science*, 17(3):639–646, may 2016.

[10] M A Hansen and J C Sutherland. Pseudo-transient continuation for combustion simulation with detailed reaction mechanisms. *SIAM Journal on Scientific Computing*, 38(2):B272–B296, April 2016.

[11] Naveen Punati, Haiou Wang, Evatt R. Hawkes, and James C. Sutherland. One-dimensional modeling of turbulent premixed jet flames - comparison to DNS. *Flow, Turbulence and Combustion*, pages 1–18, 2016.

[12] Tony Saad and James C Sutherland. Comment on "Diffusion by a Random Velocity Field" [Phys . Fluids 13 , 22 (1970)]. *Phys. Fluids*, 28(11), 2016.

[13] Nathan Yonkee and James C Sutherland. PoKiTT: exposing task and data parallelism on heterogeneous architectures detailed chemical kinetics, transport, and thermodynamics calculations. *SIAM Journal on Scientific Computing*, 38(5):S264–S281, 2016.

[14] Amir Biglari and James C Sutherland. An a-posteriori evaluation of principal component analysis-based models for turbulent combustion simulations. *Combustion and Flame*, 162(10):4025–4035, October 2015.

[15] Babak Goshayeshi and James C. Sutherland. A comparative study of thermochemistry models for oxy-coal combustion simulation. *Combustion and Flame*, 162(10):4016–4024, October 2015.

[16] Babak Goshayeshi and James C Sutherland. Prediction of Oxy-Coal Flame Stand-off Using High-Fidelity Thermochemical Models and the One-Dimensional Turbulence Model. *Proc. Combust. Inst.*, 35:2829–2837, 2015.

[17] Benjamin J. Isaac, Jeremy N. Thornock, James C. Sutherland, P. J. Smith, and A. Parente. Advanced regression methods for combustion modelling using principal components. *Combust. Flame*, 162(6):2592–2601, 2015.

[18] Babak Goshayeshi and James C. Sutherland. A comparison of various models in predicting ignition delay in single-particle coal combustion. *Combustion and Flame*, 161:1900–1910, February 2014.

[19] Alessandro Parente and James C. Sutherland. Principal component analysis of turbulent combustion data: Data pre-processing and manifold sensitivity. *Combustion and Flame*, 160(2):340–350, February 2013.

[20] John Schmidt, Martin Berzins, Jeremy Thornock, Tony Saad, and J. Sutherland. Large scale parallel solution of incompressible flow problems using uintah and hypre. In *Cluster, Cloud and Grid Computing (CCGrid), 2013 13th IEEE/ACM International Symposium on*, pages 458–465, 2013.

[21] Patrick K. Notz, Roger P. Pawlowski, and James C. Sutherland. Graph-Based Software Design for Managing Complexity and Enabling Concurrency in Multiphysics PDE Software. *ACM Transactions on Mathematical Software*, 39(1):1–21, November 2012.

[22] Amir Biglari and James C. Sutherland. A filter-independent model identification technique for turbulent combustion modeling. *Combustion and Flame*, 159:1960–1970, January 2012.

[23] A. Parente, J. C. Sutherland, B. B. Dally, L. Tognotti, and P. J. Smith. Investigation of the MILD combustion regime via Principal Component Analysis. *Proc. Combust. Inst.*, 33(2):3333–3341, 2011.

[24] N. Punati, J. C. Sutherland, A. R. Kerstein, E. R. Hawkes, and J. H. Chen. An Evaluation of the One-Dimensional Turbulence Model: Comparison with Direct Numerical Simulations of CO/H2 Jets with Extinction and Reignition. *Proc. Combust. Inst.*, 33(1):1515–1522, 2011.

[25] J. C. Sutherland, N. Punati, and A. R. Kerstein. A Unified Approach to the Various Formulations of the One-Dimensional Turbulence Model. Technical Report ICSE091201, Institute for Clean and Secure Energy, The University of Utah, Salt Lake City, UT, 2010.

[26] A. Parente, J. C. Sutherland, P. J. Smith, and L. Tognotti. Identification of Low-Dimensional Manifolds in Turbulent Flames. In *Proc. Combust. Inst.*, volume 32, pages 1579–1586. The Combustion Institute, 2009.

[27] J. Sutherland and A. Parente. Combustion modeling using principal component analysis. *Proc. Combust. Inst.*, 32(1):1563–1570, 2009.

[28] E. R. Hawkes, R. Sankaran, J. C. Sutherland, and J. H. Chen. Scalar Mixing in Direct Numerical Simulations of Temporally-Evolving Plane Jet Flames with Detailed CO/H2 Kinetics. In *Proc. Combust. Inst.*, volume 31, pages 1633–1640, 2007.

[29] J. C. Sutherland, P. J. Smith, and J. H. Chen. A Quantitative Method for A Priori Evaluation of Combustion Reaction Models. *Combust. Theory Modelling*, 11(2):287–303, 2007.

[30] J. C. Sutherland, P. J. Smith, and J. H. Chen. Quantification of Differential Diffusion in Nonpremixed Systems. *Combust. Theory Modelling*, 9(2):365–383, May 2005.

[31] E. R. Hawkes, R. Sankaran, J. C. Sutherland, and J. H. Chen. Direct Numerical Simulation of Turbulent Combustion - Fundamental Insights Towards Predictive Models. In *Journal of Physics: Conference Series*, volume 16, pages 65–79, 2005.

[32] J. C. Sutherland and C. A. Kennedy. Improved Boundary Conditions for Viscous, Reacting, Compressible Flows. *J. Comp. Phys.*, 191(2):502–524, 2003.

Book Chapters & Reports

[1] Eric C Cyr, Eric Phipps, Michael A Heroux, Jed Brown, Ethan T Coon, Robert C Kirby, Tzanio V Kolev, James C Sutherland, and R Trott. Algorithms and Abstractions for Assembly in PDE Codes : Workshop Report - SAND2015-1379. Technical report, Sandia National Laboratories, Albuquerque, NM, 2015.

[2] T. Echekki, A. R. Kerstein, and J. C. Sutherland. The One-Dimensional Turbulence (ODT) Model. In T. Echekki and E. Mastorakos, editors, *Turbulent Combustion Modeling: Advances, New Trends and Perspectives.*, chapter 11, pages 249–276. Springer, 2011.

[3] Yang Wang, Raghurama Reddy, Roberto Gomez, Junwoo Lim, Sergiu Sanielevici, Jaideep Ray, James Sutherland, and Jackie Chen. *Current Trends in High Performance Computing and Its Applications: Proceedings of the International Conference on High Performance Computing and Applications, August 8–10, 2004, Shanghai, P.R. China*, chapter A General Approach to Creating Fortran Interface for C++ Application Libraries, pages 145–154. Springer Berlin Heidelberg, Berlin, Heidelberg, 2005.

Invited Talks

[1] James C. Sutherland. A Review of the Current State of Coal Combustion. Baoding, China, December 2018.

[2] James C Sutherland. An Assessment of Coal Modeling Approaches: The Effects of Model Fidelity on Predictivity. Beijing, China, December 2018.

[3] James C. Sutherland. New Horizons for Coal? Number December. Baoding, China, December 2018.

[4] James C Sutherland. An Assessment of Coal Modeling Approaches: The Effects of Model Fidelity on Predictivity. Suttgart, Germany, July 2018.

[5] James C. Sutherland. Progress and Prospective for Extreme-Scale Reacting Flow Simulations. Albuquerque, NM, July 2018.

[6] James C Sutherland. Multiscale Physics, Algorithms & Computers. John Zink Company, Tulsa, OK, May 2018.

[7] James C Sutherland. Tools and Techniques for Multiscale Simulation of Reacting Flows. Shanghai Jiao Tong University, Shanghai, China, March 2018.

[8] James C Sutherland and Martin Rieth. Turbulence-Chemistry Interaction in Coal Flames. In *2nd Workshop on Measurement and Simulation of Coal and Biomass Conversion*, Orlando, FL, April 2017.

[9] James C. Sutherland. Tools and Techniques to Enable Extreme- Scale Simulation of Reacting Flows. Sandia National Laboratories, Albuquerque, NM, July 2016.

[10] James C. Sutherland. Tools and techniques for multiscale simulation of reacting flows. Anhui University of Technology, Ma'anshan, China, March 2016.

[11] James C. Sutherland. Models, Algorithms and Software for Next-Generation Combustion Simulation. In *NIST*, Gaithersburg, MD, May 2015.

[12] James C. Sutherland. Multiscale Modeling on Multiscale Computers. In *5th International Conference on Coupled Thermo-Hydro-Mechanical-Chemical (THMC) Processes in Geosystems*, Salt Lake City, UT, February 2015. Keynote Address.

[13] James C. Sutherland. High Fidelity Models for Tractable Simulation of Turbulent Reacting Flows. Sandia National Laboratories, Livermore, CA, September 2013.

[14] James C. Sutherland. Scalable Multiphysics Software Design for Emerging HPC Architectures. Sandia National Laboratories, Livermore, CA, September 2013.

[15] James C Sutherland. Low-Dimensional Techniques for Modeling Turbulent Reacting Flow. Sandia National Laboratories, Albuquerque, NM, July 2012.

[16] James C. Sutherland. Programming Paradigms for Scientific Computing at Exascale. Brussels, Belgium, 2012.

[17] James C. Sutherland. Software Design Paradigms for Massively Parallel Multiphysics Applications Acknowledgments. Sandia National Laboratories, Albuquerque, NM, July 2011.

[18] James C. Sutherland. Dimension Reduction in Combustion Modeling. DOE BES Combustion Contractor Meeting, Virginia, June 2011.

[19] James C Sutherland. Taming Complexity in Multiphysics Software Design Overview & Motivation. Sandia National Laboratories, Albuquerque, July 2009.

[20] James C. Sutherland. Combustion Modeling & Simulation : Challenges and Opportunities Challenges for Turbulent Combustion Modeling. In *23rd Annual ACERC Conference*, Provo, UT, 2009.

[21] James C. Sutherland and Alessandro Parente. Managing Thermochemical Complexity in CFD. In *Workshop on Fire Models & Validation*, Salt Lake City, UT, September 2007.

[22] James C. Sutherland. DNS & its Role in Validation of Mixing & Reaction Models. In *Workshop on Heat Transfer in Pool Fires*, Salt Lake City, UT, 2004.

Conference Presentations

[1] James C. Sutherland and Joshua Mcconnell. Combustion Simulation Software for Extreme-Scale Multiphysics Simulations on Emerging Platforms. In *17th International Conference on Numerical Combustion*, Aachen, Germany, May 2019.

[2] Elizabeth Armstrong and James C. Sutherland. Modified Kernel Regression for Building Low-dimensional Models of Complex Dynamical Systems. In *SIAM Computational Science and Engineering Conference*, Spokane, WA, February 2019.

[3] Mokbel Karam, Michael A. Hansen, James C. Sutherland, and Tony Saad. Efficient Multistage Time Integrators for Incompressible Flows using Projection Methods. In *SIAM Computational Science and Engineering Conference*, Spokane, WA, February 2019.

[4] Mokbel Karam, Fady M. Najjar, Ming Jiang, James C. Sutherland, and Tony Saad. Exploring the Predictibility of Random Forests for the Sedov-Von Neumann-Taylor Blast Wave Solution. In *SIAM Computational Science and Engineering Conference*, Spokane, WA, February 2019.

[5] Tony Saad and James C. Sutherland. Solving Evolutionary Differential Equations on Heterogeneous Architectures. In *SIAM Computational Science and Engineering Conference*, Spokane, WA, February 2019.

[6] James C Sutherland and Tony Saad. Tools and Techniques to Enable Multiphysics Applications on Heterogeneous Architectures. In *PASC18*, Basel, Switzerland, July 2018.

[7] Tony Saad, Mokbel Karam, and James Sutherland. An Explicit Variable-Density Projection Method for Low-Mach Reacting Flows on Structured Uniform Grids. In *48th AIAA Fluid Dynamics Conference*, volume accepted, Atlanta, GA, June 2018.

[8] Tony Saad, James Sutherland, and Austin Richards. A Fast Turbulence Generator using Graphics Processing Units. In *48th AIAA Fluid Dynamics Conference*, volume accepted, Atlanta, GA, June 2018.

[9] Elizabeth Armstrong and James C Sutherland. Attractive Manifolds : Progress in PCA Parameterization of Chemical Source Terms. In *Western States Section of the Combustion Institute*, pages 1–10, Bend, OR, March 2018.

[10] Michael A Hansen and James C Sutherland. Studying Explosive Modes and Cool Flames with Transient , Non-premixed Flamelets. In *Western States Section of the Combustion Institute*, pages 1–17, Bend, OR, March 2018.

[11] Josh Mcconnell and James C Sutherland. An a priori Analysis of Mixture Fraction-Based Modeling of Coal Combustion. In *Western States Section of the Combustion Institute*, pages 1–13, Bend, OR, March 2018.

[12] Siddartha Ravichandran, Michael Brown, Babak Goshayeshi, and James C Sutherland. Progress with Nebo : A portable, performant EDSL for multiphysics applications. In *Seventh International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing (WOLFHPC)*, Denver, CO, November 2017.

[13] Elizabeth Armstrong, Michael A. Hansen, and James C. Sutherland. A Web-Based Tool for Simulation and Numerical Analysis of Zero-Dimensional Combustion Problems. In *Sixteenth International Conference on Numerical Combustion*, Orlando, FL, April 2017. SIAM.

[14] Elizabeth Armstrong, Michael A Hansen, and James C Sutherland. Assessment of Stiffness Reduction in Chemical Reacting Systems Using Principal Component Analysis. In *10th US National Combustion Meeting*, College Park, MD, April 2017.

[15] Babak Goshayeshi and James C. Sutherland. Portable Tabulation for Thermochemical and Radiation Properties in Combustion Simulations. In *Sixteenth International Conference on Numerical Combustion*, Orlando, FL, April 2017. SIAM.

[16] Michael A Hansen and James C Sutherland. Matrix Analysis of the Flamelet Equations Balancing Diffusion and the Chemical Explosive Mode Flamelet equations. In *Sixteenth International Conference on Numerical Combustion*, Orlando, FL, April 2017. SIAM.

[17] Joshua Mcconnell, Tony Saad, and James C Sutherland. Coupling an explicit low- Mach projection scheme to various chemistry models and interphase source terms. In *10th US National Combustion Meeting*, College Park, MD, April 2017.

[18] Joshua Mcconnell and James C Sutherland. Identification of Low-Dimensional Manifolds in Coal Combustion. In *Sixteenth International Conference on Numerical Combustion*, Orlando, FL, April 2017. SIAM.

[19] Babak Goshayeshi and James C. Sutherland. Hybrid Computing In Large-Scale Multiphysics Simulation: Tabulated Properties and Particle-Cell Interpolations. In *SIAM Computational Science and Engineering Conference*, Atlanta, GA, February 2017. SIAM.

[20] James C. Sutherland and Tony Saad. Case Studies in Using a DSL and Task Graphs for Portable Reacting Flow Simulations. In *SIAM Computational Science and Engineering Conference*, Atlanta, GA, feb 2017.

[21] Tony Saad and James C. Sutherland. An Explicit Variable-Density Projection Method for Low-Mach Reacting Flows on Structured Uniform Grids. In *AIChE annual meeting*, San Francisco, CA, November 2016.

[22] Tony Saad and James C. Sutherland. Scalable Tools for Generating Synthetic Isotropic Turbulence with Arbitrary Spectra. In *AIChE annual meeting*, San Francisco, CA, November 2016.

[23] Babak Goshayeshi, Josh Mcconnell, and James C Sutherland. An Improved Model for Heat Transfer at Particle Surfaces During Heterogeneous Char Combustion. In *Western States Section of the Combustion Institute*, pages 1–14, Seattle, WA, March 2016.

[24] Michael A Hansen, Elizabeth Armstrong, and James C Sutherland. State Space Parameterization of Chemical Eigenvalues. In *Western States Section of the Combustion Institute*, pages 1–29, Seattle, WA, March 2016.

[25] James C. Sutherland, Joshua Mcconnell, and Babak Goshayeshi. An Assessment and Comparison of Various Coal Combustion Models. In *First International Workshop on OxyFuel Combustion*, Montabaur, Germany, February 2016.

[26] Bradley Peterson, Harish Kumar Dasari, Alan Humphrey, James Sutherland, Tony Saad, and Martin Berzins. Reducing Overhead in the Uintah Framework to Support Short-Lived Tasks on GPU-Heterogeneous Architectures. In *Fifth International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing*, Austin, TX, November 2015.

[27] Michael A. Hansen and James C. Sutherland. Preconditioning methods for acceleration of ignition solves with detailed chemistry. In *Western States Section of the Combustion Institute*, Provo, UT, October 2015.

[28] Joshua McConnell and James C. Sutherland. The effect of model fidelity on prediction of char burnout for single-particle coal combustion. In *Western States Section of the Combustion Institute*, Provo, UT, October 2015.

[29] Tony Saad and James C Sutherland. Nebo: an Embedded Domain-Specific Language for Platform-Agnostic PDE Solvers. In *The 24th International Conference on Parallel Architectures and Compilation Techniques*, San Francisco, CA, October 2015.

[30] Tony Saad and James C Sutherland. Wasatch : Addressing Multiphsyics and Hardware Complexity in a High-Performance Computing Environment. In *Workshop on Software Development Environments for High-Performance Computing*, San Francisco, CA, October 2015.

[31] Amir Biglari and James C Sutherland. An a-posteriori Evaluation of Principal Component Analysis-Based Models for Turbulent Combustion Simulations. In *9th US National Combustion Meeting*, Cincinnati, OH, May 2015.

[32] Michael Hansen and James Sutherland. Dual Time Integration Methods for Stiff, Explosive Combustion Kinetics. In *9th US National Combustion Meeting*, pages 1–12, Cincinnati, OH, May 2015.

[33] Michael A. Hansen and James C. Sutherland. Physics-based Preconditioning and Dual Timestepping for Stiff Combustion Problems. In *15th International Conference on Numerical Combustion*, Avignon, France, April 2015.

[34] James C. Sutherland. Efficient Abstractions for Exascale Software Design. In *15th International Conference on Numerical Combustion*, Avignon, France, April 2015.

[35] Nathan Yonkee and James C. Sutherland. PoKiTT: an Efficient, Platform Agnostic Package for Thermodynamics, Kinetics, and Transport Properties in Reactive Flow Simulations. In *15th International Conference on Numerical Combustion*, Avignon, France, April 2015.

[36] Amir Biglari, Tony Saad, and James C. Sutherland. An Efficient, Pressure Projection Method for Reacting Low-Mach Flow Simulations. In *SIAM Computational Science and Engineering Conference*, Salt Lake City, UT, March 2015.

[37] Tony Saad, Christopher Earl, Abhishek Bagusetty, Matthew Might, and James C. Sutherland. Uintah/Wasatch: Addressing Multiphsyics Complexity in a High-Performance Computing Environment. In *SIAM Computational Science and Engineering Conference*, Salt Lake City, UT, March 2015.

[38] James C. Sutherland and Abhishek Bagusetty. DAG-Based Efficient Scalable and Portable PDE Software. In *SIAM Computational Science and Engineering Conference*, Salt Lake City, UT, March 2015.

[39] James C. Sutherland and Babak Goshayeshi. Multiphase Turbulent Reacting Flow Simulations Using ODT. In *SIAM Computational Science and Engineering Conference*, Salt Lake City, UT, March 2015.

[40] Nathan Yonkee and James C. Sutherland. PoKiTT: an Efficient, Platform Agnostic Package for Thermodynamics, Kinetics, and Transport Properties within PDE Solvers. In *SIAM Computational Science and Engineering Conference*, Salt Lake City, UT, March 2015.

[41] James C. Sutherland, Matthew Might, Christopher Earl, Tony Saad, and Abhishek Bagusetty. Flexible, Efficient Abstractions for High Performance Computation on Current and Emerging Architectures. In *Algorithms and Abstractions for Assembly in PDE Codes Workshop*, Albuquerque, NM, may 2014.

[42] Christopher Earl, James C. Sutherland, and Matthew Might. Nebo: A DSL for numerical solution of pdes on current and emerging architectures. In *SIAM Parallel Processing Conference*, Portland, OR, February 2014.

[43] James C Sutherland, Matthew Might, Christopher Earl, and Tony Saad. Design Paradigms to Accommodate Architectural Uncertainty in Multiphysics Applications. In *SIAM Parallel Processing Conference*, Portland, OR, February 2014.

[44] Amir Biglari, Tony Saad, and James C. Sutherland. An Efficient and Explicit Pressure Projection Method for Reacting Flow Simulations. In *8th National US Combustion Meeting*, pages 1–14, Salt Lake City, UT, May 2013.

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