

CONTACT INFORMATION	Assistant Professor Department of Mechanical Engineering The University of Texas at San Antonio One UTSA Circle San Antonio, TX 78249	E-mail: daniel.pineda@utsa.edu Web: www.danielipineda.com
RESEARCH INTERESTS	Energy Conversion, Spectroscopy, Propulsion, Chemical Kinetics, Air Quality and Public Health	
EDUCATION	University of California, Berkeley , Berkeley, CA Ph.D., Mechanical Engineering (Combustion) May 2017 <i>Minors: Chemistry, Environmental Engineering</i> M.S., Mechanical Engineering (Energy Science & Technology) December 2014	
	The University of Texas at Austin , Austin, TX B.S., Mechanical Engineering (Thermal-Fluid Systems), <i>with Honors</i> May 2012	
RESEARCH EXPERIENCE	The University of Texas at San Antonio , San Antonio, TX <i>Assistant Professor</i> Aug 2020 – Present	
	University of California, Los Angeles , Los Angeles, CA <i>Postdoctoral Scholar</i> Jul 2017 – Jul 2020	
	University of California, Berkeley , Berkeley, CA <i>Graduate Student Researcher</i> Aug 2012 – Jul 2017	
TEACHING EXPERIENCE	The University of Texas at San Antonio , San Antonio, TX <i>Instructor</i> , Propulsion Aug 2020 – Dec 2020	
	University of California, Los Angeles , Los Angeles, CA <i>Instructor</i> , Combustion and Energy Systems Jan 2019 – Mar 2019 <i>Postdoctoral Mentor</i> , The Rocket Project at UCLA Jul 2017 – Jul 2020	
	University of California, Berkeley , Berkeley, CA <i>Graduate Student Instructor</i> , Combustion Processes Aug 2015 – Dec 2016 <i>Graduate Student Instructor</i> , Advanced Combustion Jan 2014 – May 2015	
AWARDS	Editor's Pick, <i>Applied Optics</i> 59(7):2141–2148 2020 Outstanding Reviewer, <i>Journal of Physics D: Applied Physics</i> 2018 California Alliance Postdoctoral Fellow 2017–2020 Outstanding Graduate Student Instructor Award (Combustion Processes, Fall 2015) 2016 Ernest and Marjory Starkman Fellowship 2016 Best Student Paper, <i>The 3rd Laser Ignition Conference</i> , Argonne National Laboratory 2015 National Science Foundation Graduate Research Fellow 2012–2015 University of Texas Cockrell School of Engineering Merit Scholarship 2008–2012 San Antonio North East Independent School District Superintendent's Award 2008	
SKILLS	Topics of Study: <i>Combustion:</i> chemical kinetics, transport phenomena, ignition, internal combustion engines <i>Chemistry:</i> molecular spectroscopy, ab-initio computational chemistry, kinetic theory <i>Environmental engineering:</i> environmental policy, emissions, pollution mitigation, fluid mechanics Experimentation and Instrumentation: <i>Measurement:</i> absorption spectroscopy, high-speed imaging (vis., IR, schlieren), emissions analysis <i>Process flow control:</i> LABVIEW, flow, temperature, and pressure control, oxygen service <i>Manufacturing:</i> rocket injectors, propellant tanks, custom fittings & valve actuation <i>Propulsion field testing:</i> ethanol, kerosene, N ₂ O, cryogenic O ₂ & N ₂ , hydrazine / N ₂ O ₄ variants Computer Programming and Software: <i>Modeling & Computation:</i> CANTERA, CHEMKIN, GAMESS, Gaussian <i>Programming & Data Analysis:</i> MATLAB, Python, Fortran, C++, Bash, L ^A T _E X <i>Operating Systems:</i> Linux, UNIX, Windows, Mac OS X, Virtual Machines	

ADVOCACY AND OUTREACH	UCLA Undergraduate Research Fellows/Scholars Program, Application Reviewer	2017–2020
	Reaction Research Society (RRS), Member	2017–
	Promoting Diversity and Inclusion in Combustion Science, WSSCI Panelist	2017
	University of Michigan NextProf Workshop: <i>Changing the Face of Academia</i> , Participant	2016
	American Association for the Advancement of Science (AAAS), Member	2015–
	The Planetary Society, Member	2012–
	The University of Texas Student Engineers Educating Kids (SEEK), Student Mentor	2010–2011
PROFESSIONAL MEMBERSHIPS	American Institute of Aeronautics and Astronautics (AIAA), Member	2019–
	American Chemical Society (ACS), Member	2015–
	American Physical Society (APS), Member	2015–2018
	American Institute of Chemical Engineers (AIChE), Member	2013–
	American Society of Mechanical Engineers (ASME), Member	2012–
	The Combustion Institute (Western States Section), Member	2011–
ARTICLES IN PROGRESS	[1] C. Wei, K.K. Schwarm, D.I. Pineda , R.M. Spearrin, 3D tomographic laser absorption imaging of temperature, CO, and CO ₂ , in laminar flames using masked Tikhonov regularization.	
	[2] D.I. Pineda , F.A. Bendana, R.M. Spearrin, Competitive oxidation of C ₂ hydrocarbon mixtures discerned by multi-isotopologue laser absorption spectroscopy of carbon monoxide.	
	[3] R.M. Spearrin, D.I. Pineda , C.S. Goldenstein, Absorption spectroscopy in hydrocarbon-fueled propulsion flows: modeling and wavelength selection.	
PEER-REVIEWED ARCHIVAL PUBLICATIONS	[4] J. Li, A.P. Nair, K.K. Schwarm, D.I. Pineda , R.M. Spearrin, Temperature-dependent line mixing in the R-branch of the ν_3 band of methane. <i>J. Quant. Spectrosc. Radiat. Transfer.</i> (Submitted, 07/2020)	
	[5] D.I. Pineda , L. Paxton, N. Perakis, C. Wei, S. Luna, H. Kahouli, M. Ihme, F.N. Egolfopoulos, R.M. Spearrin. Carbon oxidation in turbulent premixed jet flames: a comparative experimental and numerical study of ethylene, <i>n</i> -heptane, and toluene. <i>Combust. Flame.</i> (Revision Submitted, 06/2020)	
	[6] A.P. Nair, D.D. Lee, D.I. Pineda , J. Kriesel, W.A. Hargus, J.W. Bennewitz, S.A. Danczyk, R.M. Spearrin, MHz laser absorption spectroscopy via diplexed RF modulation for pressure, temperature, and species in rotating detonation rocket flows. <i>Appl. Phys. B.</i> (In Press, 06/2020) doi:10.1007/s00340-020-07483-8	
	[7] F.A. Bendana, I.C. Sanders, J.J. Castillo, C.G. Hagström, D.I. Pineda , R.M. Spearrin, In-situ thermochemical analysis of hybrid rocket fuel oxidation via laser absorption tomography of CO, CO ₂ , and H ₂ O. <i>Exp. Fluids.</i> (In Press, 06/2020) doi:0.1007/s00348-020-03004-7	
	[8] D.D. Lee, F.A. Bendana, A.P. Nair, D.I. Pineda , R.M. Spearrin, Line mixing and broadening of carbon dioxide by argon in the ν_3 bandhead near 4.2 μm at high temperatures and high pressures. <i>J. Quant. Spectrosc. Radiat. Transfer.</i> 253:107135. 2020. doi:10.1016/j.jqsrt.2020.107135	
	[9] C. Wei, K.K. Schwarm, D.I. Pineda , R.M. Spearrin, Deep neural network inversion for 3D laser absorption imaging of methane in reacting flows. <i>Opt. Lett.</i> 45(8):2447–2450. 2020. doi:10.1364/OL.391834	
	[10] D.I. Pineda , J.L. Urban, R.M. Spearrin. Interband cascade laser absorption of hydrogen chloride for high-temperature thermochemical analysis of fire-resistant polymer reactivity. <i>Appl. Opt.</i> 59(7):2141–2148. 2020. doi:10.1364/AO.386536 (Editor's Pick)	
	[11] F.A. Bendana, D.D. Lee, C. Wei, D.I. Pineda , R.M. Spearrin, Line mixing and broadening in the $\nu(1 \rightarrow 3)$ first overtone bandhead of carbon monoxide at high temperatures and high pressures. <i>J. Quant. Spectrosc. Radiat. Transfer.</i> 239:106636. 2019. doi:10.1016/j.jqsrt.2019.106636	
	[12] K.K. Schwarm, C. Wei, D.I. Pineda , R.M. Spearrin, Time-resolved laser absorption imaging of ethane in unsteady partially premixed flames at 2 kHz. <i>Appl. Opt.</i> 58(21):5656–5662. 2019. doi:10.1364/AO.58.005656	
	[13] D.I. Pineda , F.A. Bendana, K.K. Schwarm, R.M. Spearrin, Multi-isotopologue laser absorption spectroscopy of carbon monoxide for high-temperature chemical kinetic studies of fuel mixtures. <i>Combust. Flame.</i> 207(9):379–390. 2019. doi:10.1016/j.combustflame.2019.05.030	
	[14] K.K. Schwarm, H. Dinh, C.S. Goldenstein, D.I. Pineda , R.M. Spearrin, High-pressure and high-temperature gas cell for absorption spectroscopy studies at wavelengths up to 8 μm . <i>J. Quant. Spectrosc. Radiat. Transfer.</i> 227:145–151. 2019. doi:10.1016/j.jqsrt.2019.01.029	

- [15] C. Wei, **D.I. Pineda**, C.S. Goldenstein, R.M. Spearrin, Tomographic laser absorption imaging of combustion species and temperature in the mid-wave infrared. *Opt. Express*. 26(16):20944-20951. 2018. doi:10.1364/OE.26.020944
- [16] C. Wei, **D.I. Pineda**, L. Paxton, F.N. Egolfopoulos, R.M. Spearrin. Mid-infrared laser absorption tomography for quantitative 2D thermochemistry measurements in premixed jet flames. *Appl. Phys. B*. 124(6):123. 2018. doi:10.1007/s00340-018-6984-z
- [17] **D.I. Pineda**, B. Wolk, T. Sennott, J.-Y. Chen, R.W. Dibble, D. Singleton. The role of hydrodynamic enhancement on ignition of lean methane-air mixtures by pulsed nanosecond discharges for automotive engine applications. *Combust. Sci. Technol.* 189(11):2023–2037. 2017. doi:10.1080/00102202.2017.1334647
- [18] **D.I. Pineda**, B. Wolk, J.-Y. Chen, R.W. Dibble. Application of corona discharge ignition in a boosted direct-injection single cylinder gasoline engine: Effects on combustion phasing, fuel consumption, and emissions. *SAE Int. J. Engines*. 9(3):1970–1988. 2016. doi:10.4271/2016-01-9045
- [19] **D.I. Pineda**, J.-Y. Chen. Modeling hydrogen inhibition in gasification surface reactions. *Int. J. Hydrogen Energy*. 40(18):6059–6071. 2015. doi:10.1016/j.ijhydene.2015.03.063
- [20] C.H. Smith, **D.I. Pineda**, C.D. Zak, J.L. Ellzey. Conversion of jet fuel and butanol to syngas by filtration combustion. *Int. J. Hydrogen Energy*. 38(2):879–889. 2013. doi:10.1016/j.ijhydene.2012.10.102
- [21] C.H. Smith, **D.I. Pineda**, J.L. Ellzey. Syngas production from burner-stabilized methane/air flames: The effect of preheated reactants. *Combust. Flame*, 160(3):557–564. 2013. doi:10.1016/j.combustflame.2012.10.022
- [22] A.P. Nair, D.D. Lee, **D.I. Pineda**, R.M. Spearrin, J. Kriesel, W.A. Hargus, J.W. Bennewitz, S.A. Danczyk. MHz mid-infrared laser absorption of CO and CO₂ for pressure, temperature, and species in rotating detonation rocket flows. Accepted, in *AIAA Propulsion and Energy Forum, New Orleans, LA*, Aug 24–26, 2020¹.
- [23] A.P. Nair, C. Jelloian, D.S. Morrow, F.A. Bendana, **D.I. Pineda**, R.M. Spearrin. MHz mid-infrared laser absorption sensor for carbon monoxide and temperature behind detonation waves. *AIAA SciTech, Orlando, FL*, Jan 6–10, 2020. doi:10.2514/6.2020-0733
- [24] R.M. Spearrin, A.P. Nair, **D.I. Pineda**. Progressive project-based learning program for collegiate rocket engineering. *AIAA SciTech, Orlando, FL*, Jan 6–10, 2020. doi:10.2514/6.2020-0066
- [25] A.P. Nair, **D.I. Pineda**, R.M. Spearrin, D.E. Crisalli. Low-cost student-manufacturable liquid oxygen-ethanol sounding rocket. *AIAA SciTech, San Diego, CA*, Jan 7–11, 2019. doi:10.2514/6.2019-0613
- [26] C. Wei, **D.I. Pineda**, R.M. Spearrin. Mid-infrared laser absorption tomography for quantitative temperature, CO, and CO₂ in turbulent flames. *OSA Imaging and Applied Optics Congress, Orlando, FL*, Jun 25–28, 2018. doi:10.1364/LACSEA.2018.LTu2C.4
- [27] **D.I. Pineda**, B. Wolk, T. Sennott, J.-Y. Chen, R.W. Dibble, D. Singleton. Nanosecond Pulsed Discharge Ignition in a Lean Methane-Air Mixture. *3rd Laser Ignition Conference, Argonne National Laboratory*, Apr 27–30, 2015. doi:10.1364/LIC.2015.T5A.2
- [1] C. Wei, K.K. Schwarm, **D.I. Pineda**, R.M. Spearrin. 3D laser absorption imaging of combustion gases assisted by deep learning. *OSA Optical Sensors and Sensing Congress, Vancouver, British Columbia*, Jun 22–26, 2020¹.
- [2] **D.I. Pineda**, J.L. Urban, R.M. Spearrin. Assessing fire toxicant formation in solid fuel combustion using laser absorption tomography. Presentation, in: *2020 Spring Technical Meeting, Western States Section of the Combustion Institute, Stanford, CA*, March 22–24, 2020².
- [3] **D.I. Pineda**, F.A. Bendana, R.M. Spearrin. Competitive oxidation of methane/ethylene fuel mixtures discerned by multi-isotopologue laser absorption spectroscopy. Presentation, in: *2020 Spring Technical Meeting, Western States Section of the Combustion Institute, Stanford, CA*, March 22–24, 2020².
- [4] **D.I. Pineda**, A.P. Nair, R.M. Spearrin, D.E. Crisalli. Analysis of reduced-order chemical kinetic mechanisms for pressure-gain combustion of hypergolic propellants. Invited talk, in: *13th JANNAF Modeling and Simulation Meeting, Tampa Bay, FL*, December 9–13, 2019.

ARCHIVAL
CONFERENCE
PROCEEDINGS

SELECTED
SCHOLARLY
PRESENTATIONS,
CONFERENCE
PAPERS, AND
POSTERS

¹Conference moved online due to the COVID-19 pandemic

²Paper accepted but meeting canceled due to the COVID-19 pandemic

- [5] **D.I. Pineda**, F.A. Bendana, K.K. Schwarm, R.M. Spearrin. Multi-isotope spectroscopy of CO for shock tube oxidation studies of fuel blends. Presentation, in: *11th U.S. National Combustion Meeting, Pasadena, CA*, March 24–27, 2019.
- [6] K.K. Schwarm, C. Wei, **D.I. Pineda**, R.M. Spearrin. 2-kHz laser absorption imaging of ethane in unsteady partially premixed flames. Presentation, in: *11th U.S. National Combustion Meeting, Pasadena, CA*, March 24–27, 2019.
- [7] L. Paxton, C. Wei, **D.I. Pineda**, S. Luna, R.M. Spearrin, F. Egolfopoulos. A Comparative Study of Hydrodynamic Effects in Turbulent Premixed Jet Flames. Presentation, in: *11th U.S. National Combustion Meeting, Pasadena, CA*, March 24–27, 2019.
- [8] A. Nair, S. Lewis, N. Kuenning, **D. Pineda**, M. Spearrin, D. Crisalli. Student Developed Liquid Rocket Propulsion Systems at UCLA. *65th JANNAF Propulsion Meeting, Long Beach, CA*, May 23, 2018.
- [9] C. Lessard-Clouston, A. Lima, A. Smolyanov, **D. Pineda**, M. Spearrin, D. Crisalli. Student Developed Hybrid Rocket Propulsion Systems at UCLA. Presentation 3P6, in: *65th JANNAF Propulsion Meeting, Long Beach, CA*, May 23, 2018.
- [10] **D.I. Pineda**, C. Wei, L. Paxton, F.N. Egolfopoulos, R.M. Spearrin. Thermochemical tomography of premixed jet flames. *The 12th S. Calif. Flow Physics Symp., Los Angeles, CA*, April 14, 2018.
- [11] **D.I. Pineda**, T.A. Casey, X. Shi, J.-Y. Chen. Uncertainty of transport parameters in flame models: A database from virial coefficient measurements. *2017 Fall Technical Meeting, Western States Section of the Combustion Institute, Laramie, WY*, October 2, 2017.
- [12] **D.I. Pineda**, X. Shi, T.A. Casey, J.-Y. Chen. Analysis of the errors associated with molecular transport parameters in combustion modeling and their effects on one-dimensional flame simulations. *10th U.S. National Combustion Meeting, College Park, MD*, April 24, 2017.
- [13] M.S. Aznar, **D.I. Pineda**, B.S. Cage, X. Shi, J.P. Corvello, J.-Y. Chen, R.W. Dibble. Working fluid replacement in gaseous direct-injection internal combustion engines: A fundamental and applied investigation. Presentation 2F09, in: *10th U.S. National Combustion Meeting, April 25, 2017*.
- [14] **D.I. Pineda**. Update on oxyfuel internal combustion engine program at UC Berkeley. Presentation, in *International Partnership for Carbon Neutral Combustion Meeting, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*, March 5, 2017.
- [15] **D.I. Pineda**. Advanced ignition for internal combustion engine applications. Poster, in *NextProf Workshop: Changing the Face of Academia, University of Michigan*, September 27–30, 2016.
- [16] **D.I. Pineda**, X. Shi, B. Wolk, D. Vuilleumier, S. Saxena, J.-Y. Chen, R.W. Dibble. Advancing Low Temperature Combustion and Lean Burning Engines for Light- and Heavy-Duty Vehicles with Advanced Spark Ignition and Fuel Stratification. *Advanced Engine Consortium Meeting, U.S. Council of Automotive Research, Southfield, MI*, August 19, 2016.
- [17] **D.I. Pineda**, T.A. Casey, J.-Y. Chen. Transport properties of excited singlet oxygen species and their effects on one-dimensional combustion simulations. Poster 8517, in: *36th International Symposium on Combustion, Seoul, South Korea*, August 5, 2016.
- [18] **D.I. Pineda**, J.-Y. Chen, R.W. Dibble. Corona discharge ignition in a single cylinder research engine under boosted conditions. Paper 139EN-0014 & Presentation 2A06, in: *2016 Spring Technical Meeting, Western States Section of the Combustion Institute, Seattle, WA*, March 22, 2016.
- [19] **D.I. Pineda**, B. Wolk, T. Sennott, J.-Y. Chen, R.W. Dibble, D. Singleton. Nanosecond Pulsed Discharge Ignition in Lean Methane-Air Mixtures at Near-Atmospheric Pressures. Paper & Poster, in: *High Pressure & High Reynolds Combustion Workshop, King Abdullah University of Science and Technology, Saudi Arabia*, March 24–26, 2015.