

CONTACT INFORMATION	Research Assistant Department of Mechanical Engineering University of California, Berkeley 246 Hesse Hall Berkeley, CA 94720-1740	Mobile: +1(786)474-6332 Fax: +1(510)642-1850 E-mail: dpineda@berkeley.edu Web: www.danielipineda.com
QUALIFICATIONS AND INTERESTS	Ignition, Chemical Kinetics, Plasma-Aided Combustion, Fuel Reformation, Heterogeneous Chemistry	
EDUCATION	<b>University of California, Berkeley, Berkeley, CA</b>	
	Ph.D., Mechanical Engineering (Combustion), May 2017 <i>Minors: Chemistry, Environmental Engineering</i> Dissertation: <i>Advanced ignition for automotive engines</i> Advisor: Professor Jyh-Yuan Chen	GPA: 3.61
	M.S., Mechanical Engineering (Energy Science & Technology), December 2014 Thesis: <i>Modeling Biomass Gasification Surface Reactions: The Effect of Hydrogen Inhibition</i>	
	<b>The University of Texas at Austin, Austin, TX</b>	
	B.S., Mechanical Engineering (Thermal-Fluid Systems), <i>with Honors</i> , May 2012	GPA: 3.81
RESEARCH EXPERIENCE	<b>University of California, Berkeley</b> <span style="float: right;">Berkeley, CA</span>	
	<u>Graduate Student Researcher</u>	<b>Aug 2012 – present</b>
	<b>Combustion Modeling Laboratory</b> <span style="float: right;"><i>Principal Investigator: Professor Jyh-Yuan Chen</i></span> <ul style="list-style-type: none"> <li>• Performing uncertainty quantification techniques on molecular transport properties in tandem with combustion simulations to determine associated uncertainty in flame speed and structure</li> <li>• Performed quantum chemistry calculations using open-source computational chemistry software to determine transport properties of excited-state species in plasma-assisted combustion</li> <li>• Investigated and modeled the kinetics of char gasification surface reactions using CHEMKIN</li> <li>• Administer and maintain the lab's cluster of high performance computing servers</li> </ul>	
	<b>Combustion Analysis Laboratory</b> <span style="float: right;"><i>Principal Investigator: Professor Robert W. Dibble</i></span> <ul style="list-style-type: none"> <li>• Coordinating and conducting single-cylinder research engine experiments using both gasoline and natural gas with both large and small industrial collaborators to determine the practical effectiveness of non-thermal plasma ignition strategies</li> <li>• Designed, built, and conducted fundamental constant-volume ignition experiments with schlieren and pressure measurements to investigate fuel injection strategies and stratified fuel-air charges</li> </ul>	
	<b>The University of Texas at Austin</b> <span style="float: right;">Austin, TX</span>	
	<u>Undergraduate Research Assistant</u>	<b>Oct 2010 – Aug 2012</b>
	<b>Ellzey Combustion Group</b> <span style="float: right;"><i>Principal Investigator: Professor Janet L. Ellzey</i></span> <ul style="list-style-type: none"> <li>• Conducted experiments focused on ultra-rich combustion for syngas production</li> <li>• Designed, constructed, and operated flat flame burners and filtration combustion reactors for use with methane, ethylene, jet fuel, ethanol, and butanol</li> <li>• Developed a method to detect, measure, and use the chemiluminescence of premixed laminar flat flames to determine stability in preheating environments using LABVIEW and MATLAB</li> </ul>	
	<b>University of Texas Health Science Center at San Antonio</b> <span style="float: right;">San Antonio, TX</span>	
	<u>Clerk Associate</u>	<b>Jan 2009 – Jul 2012</b>
	<b>Dental Dean's Office of External Affairs</b> <span style="float: right;"><i>Supervisor: Prof. M. Elaine Neenan, DDS, MPH</i></span> <ul style="list-style-type: none"> <li>• Visited and documented community health centers across central and south Texas as part of the dental school's community-based clinical training outreach program</li> <li>• Designed and maintained the Dental Education Outreach Network website</li> <li>• Processed patient data from community health centers in San Antonio to provide city council members with constituent visit information</li> </ul>	

TEACHING  
EXPERIENCE

**University of California, Berkeley**

Berkeley, CA

Graduate Student Instructor

**Jan 2014 – Present**

**MEC ENG 140 / MEC ENG 255: Combustion Processes**

**(Fall 2015, Fall 2016)**

*Instructor of Record: Prof. Carlos Fernandez-Pello*

*Outstanding Graduate Student Instructor Award (2016)*

- Led weekly laboratory sessions to introduce upper division undergraduate students and first year graduate students to physical demonstrations of fundamental combustion experiments
- Held computational laboratory sessions in the form of recorded screen capture tutorials to instruct students how to use the chemical kinetics software suite CANTERA
- Developed challenging homework problems and solutions with applications of kinetic modeling and lecture concepts to real-world combustion processes
- Developed balanced grading rubrics for both homework assignments and exams
- Gave substitute lectures on droplet evaporation and combustion phenomena
- Held weekly office hours for discussion and help with assignments

**MEC ENG 256: Combustion**

**(Spring 2014, Spring 2015)**

*Instructor of Record: Prof. Jyh-Yuan Chen*

- Instructed graduate students how to understand and use CHEMKIN II modeling applications related to combustion and troubleshoot problems
- Administered the HPC accounts of students for their use of CHEMKIN II modeling software
- Gave substitute lectures for students in both chemical kinetics and CHEMKIN II applications
- Helped students apply modeling skills to fundamental combustion concepts

**The University of Texas at Austin**

Austin, TX

Student Mentor

**Jan 2010 – Dec 2011**

**Student Engineers Educating Kids (SEEK)**

- Mentored students weekly after the end of their school day at Lamar, Dobie, Kealing and Webb Middle Schools of Austin Independent School District
- Conducted and guided laboratory demonstrations with students to help them understand the applications of basic science and engineering concepts

SKILLS

**Coursework and Topics of Study:**

*Combustion:* chemical kinetics, transport phenomena, ignition, internal combustion engines

*Chemistry:* vibrational spectroscopy, ab-initio computational chemistry, kinetic theory

*Environmental engineering:* environmental policy, emissions, pollution mitigation, fluid mechanics

**Experimentation and Instrumentation:**

*Measurement:* chemiluminescence, schlieren photography, gas chromatography, oscilloscopes, pressure transducers, engine emissions analysis

*Process flow control:* LABVIEW, flow, temperature, and pressure control, oxygen service

*Machining:* lathes, mills, drill presses

**Computer Programming and Software:**

*Modeling & Computation:* CANTERA, CHEMKIN, GAMESS, Gaussian

*Programming & Data Analysis:* MATLAB, Python, Fortran, C++, Bash, L<sup>A</sup>T<sub>E</sub>X

*Operating Systems:* Linux, UNIX, Windows, Mac OS X, Virtual Machines

*Office & Design:* Solidworks, Photoshop, Dreamweaver, Flash, Excel, PowerPoint

AWARDS

Outstanding Graduate Student Instructor Award (Combustion Processes, Fall 2015)	2016
Ernest and Marjory Starkman Fellowship	2016
UC Berkeley Graduate Division Block Grant Award	2012, 2016
Best Student Paper, <i>The 3rd Laser Ignition Conference</i> , Argonne National Laboratory	2015
National Science Foundation Graduate Research Fellow	2012–2015
California Legislative Grant Award	2012
University of Texas Cockrell School of Engineering Merit Scholarship	2008–2012
Shell Minority Scholarship	2008–2010
San Antonio North East Independent School District Superintendent's Award	2008
AP Scholar with Distinction	2008
National AP Scholar	2007
National Hispanic Scholar	2007

PROFESSIONAL MEMBERSHIPS	American Chemical Society (ACS), Member	2015–present
	American Physical Society (APS), Member	2015–present
	American Institute of Chemical Engineers (AIChE), Member	2013–present
	American Society of Mechanical Engineers (ASME), Member	2012–present
	The Combustion Institute (Western States Section), Member	2011–present

ADVOCACY AND OUTREACH	University of Michigan NextProf Workshop: <i>Changing the Face of Academia</i> , Participant	Fall 2016
	American Association for the Advancement of Science (AAAS), Member	2015–present
	The Planetary Society, Member	2012–present
	The University of Texas Student Engineers Educating Kids (SEEK), Student Mentor	2010–2011

GRANT INVOLVEMENT

**Maximizing Efficiency of Natural Gas Engines Through Argon Power Cycle**  
 California Energy Commission: Energy Innovations Small Grant, Grant No. 58074A/14-07G  
*Principal Investigator:* Professor Jyh-Yuan Chen, University of California Berkeley  
*Awarded Amount:* \$135,000.00  
*Role(s):* Progress report contributor, researcher  
*Involvement Period:* 2016–present

**Extension of Lean Flammability Limit by Plasma Enhancement in Stratified Flames**  
 National Science Foundation, Award No. 1510709  
*Principal Investigator:* Professor Jyh-Yuan Chen, University of California Berkeley  
*Awarded Amount:* \$300,000.00  
*Role(s):* Initial proposal writing, progress report contributor, researcher  
*Involvement Period:* 2014–present

**Advancing Low Temperature Combustion and Lean Burning Engines for Light- and Heavy-Duty Vehicles with Advanced Spark Ignition and Fuel Stratification**  
 NSF/DOE Partnership on Advanced Combustion Engines, Award No. 1258653  
*Principal Investigator:* Professor Robert W. Dibble, University of California Berkeley  
*Awarded Amount:* \$1,070,008.00  
*Role(s):* Progress report contributor, researcher  
*Involvement Period:* 2014–2017

**Non-Catalytic Reforming with Applications to Portable Power**  
 U.S. Army Research Office, Grant No. W911NF-09-1-017  
*Principal Investigator:* Professor Janet L. Ellzey, The University of Texas at Austin  
*Role(s):* Researcher  
*Involvement Period:* 2010–2012

ARCHIVAL PUBLICATIONS

[1] **D.I. Pineda**, T.A. Casey, X. Shi, J.-Y. Chen. Analysis of the errors associated with molecular transport parameters in combustion modeling. In preparation.

[2] **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. *Combustion Science and Technology*. In Press, June 2017. doi:10.1080/00102202.2017.1334647

[3] **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 International Journal of Engines*. 9(3):1970–1988. 2016. doi:10.4271/2016-01-9045

[4] **D.I. Pineda**, J.-Y. Chen. Modeling hydrogen inhibition in gasification surface reactions. *International Journal of Hydrogen Energy*. 40(18):6059–6071. 2015. doi:10.1016/j.ijhydene.2015.03.063

[5] C.H. Smith, **D.I. Pineda**, C.D. Zak, J.L. Ellzey. Conversion of jet fuel and butanol to syngas by filtration combustion. *International Journal of Hydrogen Energy*. 38(2):879–889. 2013. doi:10.1016/j.ijhydene.2012.10.102

[6] C.H. Smith, **D.I. Pineda**, J.L. Ellzey. Syngas production from burner-stabilized methane/air flames: The effect of preheated reactants. *Combustion and Flame*, 160(3):557–564. 2013. doi:10.1016/j.combustflame.2012.10.022

SELECTED  
SCHOLARLY  
PRESENTATIONS,  
CONFERENCE  
PAPERS, AND  
POSTERS

- [7] **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. Presentation 1D12, in: *10th U.S. National Combustion Meeting, College Park, MD*, April 24, 2017.
- [8] 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, College Park, MD*, April 25, 2017.
- [9] **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.
- [10] **D.I. Pineda**. Advanced ignition for internal combustion engine applications. Poster, in *NextProf Workshop: Changing the Face of Academia, University of Michigan, Ann Arbor, MI*, September 27–30, 2016.
- [11] **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. Presentation, in *Advanced Engine Consortium Meeting, U.S. Council of Automotive Research, Southfield, MI*, August 19, 2016.
- [12] **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.
- [13] **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.
- [14] **D.I. Pineda**, J.-Y. Chen. Effects of updated transport properties of singlet oxygen species on steady laminar flame simulations. Paper 139LF-0021 & Presentation 1B01, in: *2016 Spring Technical Meeting, Western States Section of the Combustion Institute, Seattle, WA*, March 21, 2016.
- [15] **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. Paper 2215623 and Oral Presentation T5A.2, in: *3rd Laser Ignition Conference, Argonne National Laboratory*, April 27–30, 2015. doi:10.1364/LIC.2015.T5A.2
- [16] C.H. Smith, **D.I. Pineda**, J.L. Ellzey. Effect of Preheating on Rich Combustion for Syngas Production: Experiments and Modeling of Burner-Stabilized Flames. Paper 11F-29, in: *2011 Fall Technical Meeting, Western States Section of the Combustion Institute, Riverside, CA*, October 17–18, 2011.

OTHER  
PUBLICATIONS

- [17] J.-Y. Chen, **D.I. Pineda**, M. Sierra Aznar, X. Shi. Maximizing Efficiency of Natural Gas Engines Through Argon Power Cycle. 2016. Final Report, California Energy Commission EISG Grant No. 58074A/14-07G.
- [18] R. Tran, **D.I. Pineda**, J. Lozano-Pineda, J. Schoolfield, D. Cappelli. Caries Prevalence in South Texas Schoolchildren by Insurance Status. 2011 Mar. (*J. Dent Res*; Issue 90; Sp Iss A; Abst # 1212).

REFeree  
SERVICE

- *International Journal of Hydrogen Energy*
- *Journal of Physics D: Applied Physics*
- *Measurement Science and Technology*

REFERENCES

Available upon request.