

EDUCATION	Department of Aerospace Engineering, University of Michigan <i>Ph.D. in Aerospace Engineering</i> • Advisor: Prof. Mirko Gamba	Ann Arbor, MI. Apr. 2026
	Department of Mechanical and Aerospace Engineering, UCLA <i>B.S. in Aerospace Engineering</i> • GPA: 3.94/4.00 • Honors: Summa Cum Laude • Awards: Outstanding B.S. in Aerospace Engineering 2020-2021	Los Angeles, CA. Mar. 2021
TEACHING EXPERIENCE	University of Michigan, Ann Arbor Graduate Student Instructor - Compressible Flow	Aug. 2022 - Dec. 2022
	Hispanic Heritage Foundation Teaching Fellowship - Intro to Aerospace Engineering	Nov. 2022 & Apr. 2024
RESEARCH EXPERIENCE	University of Michigan, Ann Arbor, MI. <i>Graduate Research Assistant</i>	Aug. 2021 - Present
	• Developed, validated, and demonstrated a MHz-rate laser absorption spectroscopy sensor to obtain time-resolved measurements of temperature and H₂O partial pressure in a rotating detonation combustor (RDC). • Introduced two novel methods for measuring combustion efficiency of RDCs using laser absorption spectroscopy and thrust stand measurements respectively. • Integrated combustion efficiency measurements with a reduced-order model to infer the first integrated heat release fractions associated with an RDC cycle.	
	Sierra Lobo Inc., Edwards AFB, CA. <i>Liquid Rocket Propulsion Intern Engineer II</i>	Apr. 2021 - Aug. 2021
	• Provided an initial assessment of accelerometer data from Space-X's SN10-SN15 Starship flights. The focus was to identify anomalies, and correlate sensor data to video footage. This was also done across test to identify changes.	
	Sierra Lobo Inc., Edwards AFB, CA. <i>Liquid Rocket Propulsion Intern Engineer</i>	Jun. 20 - Sept. 2020
	• High-speed pressure sensors installed in a recessed configuration during AFRL's Hydrocarbon Boost (HCB) technology demonstration program exhibited noise artifacts caused by the acoustic cavity. My work focused on implementing physics-informed filters to predict the cavity response and remove it, enabling accurate assessment of the combustion stability of the test.	
	University of California Los Angeles, Los Angeles, CA. <i>Undergraduate Research Assistant</i>	Sept. 2018 - Dec. 2019
	• Acoustically coupled micro-jet flame combustion was studied in a cylindrical cavity closed on both ends by speakers to form a standing wave, and the dynamics were analyzed using proper orthogonal decomposition (POD).	

SKILLS	Research: Shock waves and detonations, shock tubes, rotating detonation engines/combustors (RDEs/RDCs), combustion diagnostics including combustion efficiency and emissions, tunable diode laser absorption spectroscopy (TDLAS), scanned- wavelength-modulation spectroscopy (Scanned-WMS). Measurements: Laser absorption spectroscopy, OH* chemiluminescence imaging, high-speed and CTAP pressure measurements Process flow control: Mass flowrate and pressure control, oxygen service (CGA G-4.4) Design: Injector manufacturing using 3D-printing (DMLS), components with o-rings and optical access Testing: <i>Fuels:</i> Mixtures of H₂ and CH₄ with with air, <i>Diluents:</i> CO, N₂ Computer Programming and Software: MATLAB, Python, CANTERA, SolidWorks, L^AT_EX. Languages: English, Spanish.
HONORS & AWARDS	Rackham Merit Fellowship <i>University of Michigan</i> Aug. 2021 • "The Rackham Merit Fellowship is a highly competitive named fellowship awarded to students who have outstanding academic qualifications and show exceptional potential for scholarly success in their graduate program." Outstanding B.S. Aerospace Engineering Award <i>University of California, Los Angeles (UCLA)</i> Mar. 2021 • "The Mechanical and Aerospace Engineering Department annually issues the Outstanding BS, MS, and PhD awards to graduating students. The Awards and Honors Committee select the winner based on various criteria; including but not limited to the student's GPA, research activities, publications, extra-curricular activities, etc." Vishal Parikh Memorial Scholarship <i>University of California, Los Angeles (UCLA)</i> May. 2020 • This merit-based scholarship of \$2,200 is awarded to an undergraduate student with a demonstrated interest in rocket propulsion systems, in honor of Vishal Parikh, a 2009 graduate of the UCLA Aerospace Engineering program. In addition to the scholarship, the recipient participates in a paid summer internship at the Air Force Research Laboratory located at Edwards Air Force Base in California.
INVITED PRESENTATIONS	[1] Guerrero J. I., "The Quest for Positive Pressure Gain" <i>Fluid Mechanics Research Seminar</i>, University of Michigan, Ann Arbor, 03.26.2025.
JOURNAL PUBLICATIONS	[1] Guerrero J. I., Gamba M. "Simultaneous Thrust-Based Measurements of Combustion Efficiency, Pressure Gain, and Heat Release In Rotating Detonation Combustors" <i>AIAA Journal of Propulsion and Power</i>, 2026 (<i>under review</i>). [2] Guerrero J. I., Gamba M. "Quantifying Combustion Efficiency in Rotating Detonation Engines Using MHz-Rate Scanned-Wavelength-Modulation Spectroscopy" <i>Combustion and Flame</i>, 2025. [3] Guerrero J. I., Gamba M. "A Review of Theory and Practical Considerations of Tunable Diode Laser Absorption Spectroscopy Diagnostics" <i>arXiv:2512.18201</i>, 2025

CONFERENCE
PROCEEDINGS

- [1] **Guerrero J. I., Gamba M.** "Quantifying Deflagration Losses in Rotating Detonation Combustors" *AIAA SciTech Forum*, 2026.
- [2] **Guerrero J. I., Gamba M.** "Combustion Efficiency Measurements in a Rotating Detonation Engine Using Scanned-Wavelength-Modulation Spectroscopy" *AIAA SciTech Forum*, 2025.
- [3] **Guerrero J. I., Gamba M.** "Post-Incident Shock Wave Measurements of Gas Properties at 1 MHz Using Scanned-Wavelength-Modulation Spectroscopy" *AIAA SciTech Forum*, 2025.
- [4] **Guerrero J. I., Gamba M.** "Synthetic LAS Measurements of Combustion Efficiency in a Rotating Detonation Engine Using 3D-DNS Data" *AIAA SciTech Forum*, 2025.
- [5] **Guerrero J. I., Gamba M.** "A Method for Determining Combustion Efficiency from LAS Data and a CTAP Measurement" *International Workshop on Detonation for Propulsion*, 2024.