

# Jose Guerrero

Joseguer@umich.edu

U.S. Citizen

LinkedIn: [in](#) Google Scholar: [g](#) ORCID: [id](#)

## EDUCATION

<b>Department of Aerospace Engineering, University of Michigan</b>	Ann Arbor, MI.
<i>Ph.D. in Aerospace Engineering</i>	Mar. 2026 ( <i>expected</i> )
• Advisor: Prof. Mirko Gamba	
<b>Department of Mechanical and Aerospace Engineering, UCLA</b>	Los Angeles, CA.

<i>B.S. in Aerospace Engineering</i>	Mar. 2021
• GPA: 3.94/4.00	
• Honors: Summa Cum Laude	
• Awards: Outstanding B.S. in Aerospace Engineering 2020-2021	

## TEACHING EXPERIENCE

<b>University of Michigan, Ann Arbor</b>	
<i>Graduate Student Instructor - Compressible Flow</i>	Aug. 2022 - Dec. 2022
<b>Hispanic Heritage Foundation</b>	
<i>Teaching Fellowship - Intro to Aerospace Engineering</i>	Nov. 2022 & Apr. 2024

## RESEARCH EXPERIENCE

<b>University of Michigan, Ann Arbor, MI.</b>	
<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 H <sub>2</sub> O 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:** Fuels: Mixtures of H<sub>2</sub> and CH<sub>4</sub> with air, Diluents: CO, N<sub>2</sub>

**Computer Programming and Software:** MATLAB, Python, CANTERA, SolidWorks, L<sup>A</sup>T<sub>E</sub>X.

**Languages:** English, Spanish.

## HONORS & AWARDS

### Rackham Merit Fellowship

*University of Michigan*

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

*University of California, Los Angeles (UCLA)*

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

*University of California, Los Angeles (UCLA)*

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" *Fluid Mechanics Research Seminar*, University of Michigan, Ann Arbor, 03.26.2025.

## JOURNAL PUBLICATIONS

- [1] Guerrero J. I., Gamba M. "Quantifying Combustion Efficiency in Rotating Detonation Engines Using MHz-Rate Scanned-Wavelength-Modulation Spectroscopy" *Combustion and Flame*, 2025. (*under review*)
- [2] Guerrero J. I., Gamba M. "A Review of Theory and Practical Considerations of Tunable Diode Laser Absorption Spectroscopy Diagnostics" *arXiv*, 2025.

- [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.

- [1] Guerrero J. I., Gamba M. "Quantifying Deflagration Losses and Their Influence on Pressure Gain In Rotating Detonation Combustors" *AIAA Journal of Propulsion and Power*, 2026.