

# JUSTIN THOMAS SELF

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## OBJECTIVE

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Results-oriented. Passionate. Unwavering commitment to excellence and integrity. Master's degree graduate (June 2025) with research experience; comfortable solving challenging problems using both experimental/lab-based and software/analytical methods. Very comfortable with MATLAB and Simulink; numerical and experimental methods. Excellent leadership and people skills. Specific areas of interest include space environments, orbital mechanics, thermal control, and hypersonic reentry systems. Available for relocation and work Summer 2025.

## EDUCATION

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**Master of Science in Aerospace Engineering** Expected: June 2025  
*Investigation into Silicone-Silicate Conversion Mechanism Due to Atomic Oxygen in Low Earth Orbit*  
California Polytechnic State University, San Luis Obispo, CA  
Current Cal Poly GPA: 4.000

**Bachelor of Science in Aerospace Engineering, *Summa cum laude*** May 2021 - June 2024  
California Polytechnic State University, San Luis Obispo, CA  
GPA: 3.905; *Outstanding Scholar and Researcher (2022)*

**Associate of Science in Physics, *High Honors*** August 2018 - May 2021  
Cuesta Community College, San Luis Obispo, CA  
*Engineering Student of the year (2021)*  
*Physics Student of the year (2021)*

**Associate of Science in Mathematics, *High Honors*** August 2018 - May 2021  
Cuesta Community College, San Luis Obispo, CA;

## RELATED COURSEWORK

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**Advanced Orbital Mechanics; Advanced Spacecraft Dynamics and Control; Numerical Methods in Applied Mathematics; Orbital Mechanics I-II; Space Environments I-II; Reentry Aerodynamics; Spacecraft Electrical Systems; Design and Analysis of Experiments; Spacecraft Propulsion Systems; Sensors, Actuators, and Ctrl.; Advanced Methods in Applied Mathematics**

## PUBLICATIONS

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Self, Justin and Abercromby, Kira. *Investigation into Silicone-Silicate Conversion Mechanism and Atomic Oxygen Fluence Threshold in Low Earth Orbit Environment* **2025 AAS/AIAA Spaceflight Mech. Mtg., Lihue, HI.**

Hiremath, Nandeesh, Justin Self, and Nathan Eller. *System Architecture for De-orbiting Spacecrafts as a Platform for Experimental Aerodynamics Studies.* **2024 IEEE Aerospace Conference, Big Sky, MT.**

Hiremath, Nandeesh, and Justin Thomas Self. *Virtual Aperture Multispectral Imaging for Atmospheric Reentry Studies Using High-Altitude Reflective Arrays.* **102nd Am. Met. Society Annual Mtg. AMS, 2022.**

## RESEARCH EXPERIENCE

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**Investigation into Silicone-Silicate Conversion Mechanism Due to Atomic Oxygen in Low Earth Orbit — Master's Thesis (9/2024 - 06/2025)**

- Investigated relationships between two space-grade silicone RTV compounds flown on the Europa Clipper spacecraft through ground-based atomic oxygen exposure testing and optical microscopy methods.
- Developed image processing algorithms to quantify changes in surface morphologies after atomic oxygen exposure.
- Developed mathematical model for the Cal Poly Space Environments Laboratory that estimates time on orbit correlation with atomic oxygen exposure by run time.

- Developed on-orbit (ISS orbit and altitude) time estimation before surface silicate formation for two RTV silicones using logistic regression statistical techniques.
- Presented work at the 2025 AAS/AIAA Spaceflight Mechanics Meeting (January 2025).

### **Virtual Aperture Multispectral Imaging for Atmospheric Reentry Studies Using High Altitude Reflective Arrays (9/2021 - 9/2024)**

- Developed framework for a system architecture for high-altitude aerial optics system that aims to capture IR signatures of hypersonic reentry objects.
- Responsible for collaboration, presentation, and technical communication with interdisciplinary research team and scientific community

### **NASA Community College Aerospace Scholars — Mechanical Engineer (8/2019 - 8/2020)**

- Developed and organized mission concept proposal collaboratively with award-winning team.
- Presented mission concept proposal to NASA judges panel, taking first place in team division.

### **Clark College Aerospace Engineering Club — Team Lead (9/2017 - 6/2018)**

- Designed, manufactured, and bench tested 3D printed models of passive roll stabilization system.
- Developed airframe components for the 2018 Clark College rocket for the Experimental Sounding Rocket Association (ESRA) 10,000 ft apogee collegiate rocketry competition.

## **WORK EXPERIENCE**

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### **Cal Poly Space Environments Laboratory (February 2024 - present)**

#### **Student Test Engineer**

Responsible for running “fee for service” tests for aerospace industry space environments and materials research. Comfortable with vacuum chamber laboratory equipment including thermodynamic characterization and testing, CCP plasma asher used for atomic oxygen attack ground simulation, and UV radiation for synergistic effects studies.

### **Cal Poly Spacecraft Design Sequence (September 2024 - present)**

#### **Student Assistant Teacher**

Responsible for grading and assisting students with technical design and mission concept solutions for the Spacecraft Design capstone sequence for fourth-year students.

### **California Polytechnic State University (December 2024 - present)**

#### **AERO 355 Lab Instructor**

Responsible for teaching AERO 355 (Space Environments I) laboratory section for third-year aerospace engineering students. Duties include facilitating student lab experiments using vacuum chambers, thermodynamic systems, contamination, and atomic oxygen exposure.

### **Kainos Global 501(c)(3) (March 2023 - present)**

#### **Founder**

Responsible for leadership of nonprofit organization focuses on humanitarian assistance in Kenya, Africa.

### **Kainos Creative Solutions (April 2019 - March 2023)**

#### **Owner, lead designer**

Established freelance graphic design, web design, and content writing company that serves clients nationwide.

### **Kainos Tutoring, LLC (April 2019 - March 2023)**

#### **Owner, lead tutor**

Spearheaded private tutoring company for math and science content. Grew company and held several contracted employees.

## **TOOLS AND SKILLS**

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MATLAB  
ImageJ

Simulink  
L<sup>A</sup>T<sub>E</sub>X

SolidWorks  
JMP Pro

SEM, FTIR, TGA  
Arduino IDE

Optical Microscopy  
Laboratory Testing

## PROJECTS

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AAS/AIAA Spaceflight Mechanics Meeting Paper Presentation and Publication	January 2025
IEEE Aerospace Conference Paper Presentation and Publication	March 2024
STEM-NET SoCalGas Student Fellowship Research Program	October 2022
LSAMP (Cal Poly STEM organization) Summer Research Fellowship	June-August 2022
Virtual Aperture...Research presentation — AIAA Student Paper Conference, Merced, CA.	March 2022

## REFERENCES

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Dr. Kira Abercromby, PhD. <i>Graduate Advisor, California Polytechnic State University, San Luis Obispo.</i>	kabercro@calpoly.edu
John Hofman, PE <i>Senior Advisor at Quanta Technology, LLC</i>	360-561-8054 (Cell)
Kyall Barrows <i>Senior Unity Developer, Maurader Tech</i>	kyallb@gmail.com
Ryan Risor <i>CEO, Pilot, J&amp;R Imaging Logistics, Inc.</i>	360-624-8195 (Cell)