Eric Anthony Comstock
notme1962@tamu.edu cell: (832) 971-3219 ericanthonycomstock.com

Graduating senior, aerospace engineering honors student and undergraduate researcher
Texas A&M University-College Station

SUMMARY OF QUALIFICATIONS:

- Research experience in optical systems analysis of Raman rovibrational spectroscopy of gases for analysis of the chemistry of hypersonic combustion. Creation of a Python simulation of Raman spectroscopy.
- Research experience in the context of beamed propulsion involved creation of a Python computational model simulating supersonic gaseous flows through an apparatus designed to test potential laser/particle beam coupling behavior, incorporating collisionless flow and interactions of a laser with the flow
- Current research (beginning fall, 2022) involves computational modeling and optical spectrum analysis of high enthalpy flows in hypersonic conditions with the National Aerothermochemistry and Hypersonics Lab at Texas A&M University – College Station, nal.tamu.edu.
- Substantial programming experience creating numerical simulations using Python, and experience using C++ and MATLAB
- Minor fields of study in both chemistry and mathematics, including a class in chemical quantitative analysis, chemical equilibria, nuclear chemistry, and a class in physical chemistry giving experience in the study of rotational, vibrational, and electronic atomic and molecular states
- **3.87/4.0 Cumulative GPA** as of August, 2022

TECHNICAL SKILLS:

Languages:	Python, C++
Software:	Solidworks 3D Modeling, Maple, MATLAB, General Mission Analysis Tool (GMAT)
Applied Math:	Finite Difference Method, Finite Element Analysis, Rigid Body Dynamics, Runge-Kutta 4, Least Squares Method, Control Systems Analysis (Laplace transfer functions and state-space systems)

CURRENT RESEARCH (Fall, 2022)

- Research in fall of 2022 will involve data analysis and high fidelity modeling and simulation of high enthalpy flows in hypersonic conditions which can be used to better model the operation of the Hypersonic Expansion Tunnel (HXT). This research will be directed by Dr. Rodney Bowersox with the National Aerothermochemistry and Hypersonics Lab at Texas A&M University - College Station, nal.tamu.edu.

RESEARCH / PROFESSIONAL EXPERIENCE:

Undergraduate Research Assistant - Aerospace Engineering September, 2022 – present
Texas A&M University – College Station

- Research Assistant for Dr. Rodney Bowersox, Director of the National Aerothermochemistry and Hypersonics Lab at Texas A&M University, nal.tamu.edu

Undergraduate Summer Research Assistant - Aerospace Engineering June, 2022 – August, 2022
Texas A&M University – College Station

- Research Assistant for Dr. Chris Limbach, Director of the Laser Diagnostics and Plasma Devices Lab at Texas A&M University – College Station, ldpdl.engr.tamu.edu, Funded by a highly selective research grant (USRG, mentioned below under Honors, Awards and Leadership). This is a continuation of the previous model created in the spring, adding a model of a section of the apparatus containing collisionless flow and modeling the interactions of a laser with this flow. This will be used to compare to the result obtained in the experiment.

Undergraduate Research Assistant - Aerospace Engineering January, 2022 – May, 2022
Texas A&M University – College Station

- Research Assistant for Dr. Chris Limbach, Director of the Laser Diagnostics and Plasma Devices Lab at Texas A&M University – College Station, ldpdl.engr.tamu.edu, Characterization of the refraction and diffraction of monochromatic directed energy through media of changing particle densities, accomplished by superimposing a laser and a rubidium supersonic jet to create a hybrid beam. This was then analyzed through absorption spectroscopy to determine the magnitudes and types of interactions involved.
- Research involved creation of a Python computational model of a supersonic flow of argon and rubidium through the initial parts of an apparatus designed to test potential laser/particle beam coupling behavior.

Student Assistant for Aerospace Engineering January, 2021 – May, 2021
Texas A&M University – College Station

- Graded papers for senior level class in Finite Difference and Finite Element Analysis (AERO 430)

Undergraduate Research Assistant - Aerospace Engineering January, 2021 – May, 2021
Texas A&M University – College Station

- Research Assistant for Dr. Adonios Karpetis, Associate Professor, Aerospace Engineering Department. Research involved creating a simulation program in Python simulating rotational vibrational spectra for use in supersonic flow spectroscopy.

Undergraduate Research Assistant - Organic Chemistry January, 2020 – May, 2020
Texas A&M University – College Station

- Research Assistant for Dr. Quentin Michaudel, Director of the Michaudel Lab at Texas A&M University – College Station, michaudellab.org. Research conducted in organic chemistry which resulted in a departmental paper entitled "Bottom-Up synthesis of n-doped Polycyclic Aromatic Hydrocarbons."

SYSTEMS ENGINEERING EXPERIENCE:

Individual School Project: Reverse-engineering of the design process of the New Horizons space probe

- Stakeholder identification and CONOPS generation
- Mission-level systemic and technical requirements identification
- Mapping mission-level requirements to subsystems
- Systems validation against requirements

Team School Project: Senior capstone design project – design of a cis-lunar navigational satellite constellation designed to provide high quality navigational data to objects in cis-lunar space, and allow for communication between these objects and Earth

- Lifetime budgetary validation for launch, operations, and component costs
- Verification that the deorbiting procedure complies with regulations
- Validation of navigational system accuracy
- Validation of component and system lifetime
- Pareto analysis and tradespace optimization, written in Python, of the designs generated
- Analysis of the limitations of the simulator being used for performance validation and design generation and simulation

HONORS, AWARDS AND LEADERSHIP:

- Awarded the Undergraduate Summer Research Grant (USRG) at Texas A&M - College Station. This is a highly selective grant for the summer of 2022 funded by the College of Engineering, open to STEM students from all over the country who plan to attend graduate school. Awarded March, 2022
- Dean's Honor Award, Spring, 2022, Fall, 2021, Fall 2020
- Engineering Honors Program
- Tau Beta Pi, Engineering Honor Society, November, 2020
- National Chemistry Olympiad, Honors designation in 2018 and in 2019 (top 150 students nationwide)
- President, Chemistry Club, Lone Star College – Montgomery, 2017

EDUCATION: **Texas A&M University – College Station, Bachelor of Science in Aerospace Engineering, December, 2022,** Minors: chemistry and mathematics, **GPA: 3.87/4.0**