

ALEXANDER L. JEFFERSON

Honors Chemical Engineering Student

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EDUCATION

The Honors College at Lone Star College-University Park – Houston, TX

Expected May 2025

Chemical Engineering Honors Associate of Science

- GPA 3.94, Major GPA 4.0

RESEARCH INTERESTS

Computational Chemistry; Energy Storage; Computational Fluid Dynamics (CFD).

RESEARCH AND CONFERENCE EXPERIENCE

CFD Modeling of Biofilm Dynamics in a Costa Rican Montane Stream

Summer 2024

Texas A&M University; Civil and Environmental Engineering Department; Dr. YINUO Noah YAO.

- Competitively selected for an NSF-funded **Research Experience for Undergraduates (REU)** program
- Utilized Computational Fluid Dynamics (CFD) simulations using **OpenFOAM**, a C++ toolbox
- Investigated the **impact of nutrients** (e.g., nitrogen, phosphorus), organic carbon, and flow rate on biofilm growth
- Immersed in diverse ecological and cultural environments while engaging in **global research** at the Soltis Center
- Presented research at the (upcoming) 2024 **International Education Biennium** conference in Houston, TX, and (upcoming) **American Geophysical Union's** 2024 meeting in Washington D.C.

Drone-Based Analysis of Spearford Gully Erosion and Rainfall Correlation

Spring 2024

Lone Star College; Geology Department; Dr. Bryn Benford.

- Conducted detailed aerial surveys using a DJI Mavic 3 Multispectral Drone to assess small-scale erosion
- Developed **Digital Elevation Models (DEM)** for comparative analysis with data from previous drone flights
- Demonstrated the efficacy of drone mapping in monitoring erosion prevention techniques over short periods
- Presented research at Spring 2024 **Honors' Undergraduate Research Day** in Houston, TX, and (upcoming) **Gulf Coast Intercollegiate Council's** 2024 conference in Houston, TX

Pre-Drought Water Quality Dynamics Using the Spearford Gully

Fall 2023

Lone Star College; Geology Department; Dr. Bryn Benford.

- Collected and analyzed data on Chlorophyll α , specific conductivity, turbidity, and pH using an EXO2 water sonde
- Identified rapid deterioration in water quality (**Chlorophyll α and turbidity**) during the researched period
- Recommended **earlier implementation** of water and energy usage restrictions to reduce treatment costs
- Highlighted the concern over increasing drought frequency and intensity given the growing desire for surface water
- Presented research at the **Great Plains Honors Council's** 2024 conference in Stillwater, OK, and (upcoming) **Geological Society of America's** 2024 meeting in Anaheim, CA

COCURRICULAR ACTIVITIES

Honors College Leadership Program – Houston, TX

September 2023 -

Public Relations Coordinator

- Manages a team of **3 leads**, overseeing their development and ensuring alignment with project goals
- Builds and sustains relationships with schools to support **student recruitment** efforts
- **Leads workshops** to assist new students in various segments of the honors curriculum
- Coordinates **service opportunities** for students within the honors college

National Model United Nations (NMUN) – New York City, NY

September 2023 -

- Selected for The Honors College's NMUN 2023-2024 and 2024-2025 delegation
- Represented the Philippines in a committee focused on addressing the consequences of **increasing gas emissions**
- 2024 **Outstanding Delegation Award**, top honors for NMUN conferences

Academic Peer Coach**August 2024 -**

- Assists students with understanding course material, preparing for exams, and completing assignments
- Courses include Physical Geology, Environmental Geology, and **General Chemistries**
- Encourages critical thinking and problem-solving skills to **enhance student understanding** of scientific concepts
- Provides **data analysis and experimentation method consulting** for honors students in their research projects

NASA Community College Aerospace Scholars**August 2024 -**

- Mission I: Attended weekly subject matter expert meetings over a 5-week course followed by a knowledge assessment
- Mission II: One-week **career simulation** focused on creating and presenting a lunar mission
- Mission III: Two-week virtual preparation courses followed by a four-day **engineering design challenge**

Rice Take Flight STEM Pathway**September 2023 -**

- Program designed to **support and mentor** community college students aiming to transfer to four-year universities
- Worked with Rice faculty on co-curricular STEM activities, advancing **technical knowledge and research experience**

AWARDS

Lone Star Honors College Chancellor's Fellows Scholarship**Summer 2023 -**

- Full-ride scholarship with stipends and **developmental workshops** provided to exceptional honors students
- **60 hours of service learning** and funded international travel to (upcoming) **Rabat, Morocco**

GHCF Pi-Squared Scholarship**Summer 2023**

- Financial award granted to STEM scholars in the Greater Houston Region

Commitment to Excellence All-Star Student Award**Spring 2024**

- Award granted for demonstration of commitment to **personal growth and adaptability**

ADDITIONAL SKILLS

- Developing proficiency in **C++, Python, and Java**
- Experienced in data analysis software (e.g. **JMP and RStudio**)