

# Alexander Amadeo-Ranch

## Aerospace Engineering Undergraduate | Structures Design & Simulation

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### Education:

> Aerospace Engineering Undergraduate, University of California, Irvine [GPA: 3.686] Sep 2023 - Mar 2027

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### Skills:

- > **Design & Analysis:** FEA, ANSYS (static & modal), SolidWorks (CSWA), AutoCAD, Altium Designer.
  - > **Manufacturing & Fabrication:** 3D Printing, Laser Cutting, Soldering, Mechanical Assembly.
  - > **Computation & Software:** MATLAB, GitHub, LabVIEW, Visual Studio, AI-Assisted Workflows
  - > **Programming:** Python, Java, JavaScript, HTML/CSS
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### Projects:

- > **UCI CubeSat, Structural Engineer** Sep 2023 - Present
    - > Used Altium Designer to support mechanical-PCB integration, defining bore holes for standoffs.
    - > Designed and analyzed spacecraft structural components supporting internal subsystem integration.
    - > Performed static and modal FEA in ANSYS to assess stiffness and dynamic response under ... launch-relevant loading conditions.
    - > Conducted frequency-domain analysis, identifying resonant modes to inform structural design.
    - > Evaluated components with GD&T; implemented designs for manufacturability and cost reduction.
  - > **Independent Project, Photons Near a Black Hole in MATLAB** Jan 2026 - Present
    - > Created physics engine using Paczyński-Wiita potential to approximate general relativity effects.
    - > Visualized photon scattering and critical capture limit to demonstrate orbital mechanics of black holes.
    - > Enables dynamic scaling of black hole mass and simulation resolution for interactive analysis.
  - > **UCI ENGR 54, Lunar Micrometeoroid Impact Mitigation** May 2025 - June 2025
    - > Designed and executed controlled impact experiments of pure ice and ice-based composite materials.
    - > Quantified damage trends and evaluated reinforcement strategies for lunar application.
    - > Performed energy balance and scaling analyses to assess the feasibility of passive shielding concepts.
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### Experience:

- > **Town of Danville, Department of Recreation, Aquatics Manager** Jun 2016 - Sep 2024
    - > Supervised a staff of 65+ people and over 120+ patrons at one time.
    - > Planned logistics for events and served as the main supervisor for select events.
    - > Lead several emergency responses to facility emergencies.
  - > **Sole Proprietorship, Swim Instructor/Tutor** May 2021 - Oct 2024
    - > Delivered one-on-one instruction in technical subjects and aquatic skills across diverse client needs.
    - > Managed scheduling of 50+ clients, communication, and service delivery independently.
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### Awards:

- > Eagle Scout + Bronze & Gold Palms, Troop 36, Scouts BSA Aug 2010 - Apr 2022
- > 1st Dan Black Belt, Tao Sports Taekwondo Mar 2012 - Feb 2017