

Alessandro Valente

Aerospace Engineer

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EDUCATION

Bachelor of Science, Aerospace Engineering Sciences - 4-year BSc (ABET-accredited)

Minor in Engineering Management

College of Engineering and Applied Science

Colorado Engineer Magazine Scholarship Recipient

University of Colorado Boulder

Expected May 2027

A-Levels: Mathematics, Physics, Computer Science

St John the Baptist School, Woking, United Kingdom

TECHNICAL SKILLS

Relevant Coursework: Orbital Mechanics & Attitude Dynamics, Electronics & Communications, Propulsion, Thermodynamics & Heat Transfer, Structures, Aerospace Vehicle Design & Performance

Programming: MATLAB, Python, C++, Julia

Engineering Software: SolidWorks, CATIA, Blender, ANSYS, OpenRocket, MATLAB Simulink

Analysis Methods: Computational Fluid Dynamics, trajectory simulation, structural analysis, finite element analysis, control systems modelling, data analysis

Manufacturing & Laboratory: carbon fibre layup, vacuum bagging, CNC machining, laser cutting, hot-wire foam cutting, electronics prototyping, soldering, wind tunnel testing

ENGINEERING EXPERIENCE

Electronics Lead

Aug 2026 – May 2027

Space Debris Science Constellation, University of Colorado Boulder

- Member of a 23-person team designing, building, and subsystem-testing a science constellation to make in-situ measurements of sub-centimeter orbital debris between 600 and 1,000 km altitude.
- Project directly addresses a NASA Heliophysics priority at the intersection of orbital debris, plasma physics, and space weather.

Undergraduate Researcher

2026 – Present

Multi-Agent Reinforcement Learning for Differential Games, University of Colorado Boulder

- Developing a Julia package that trains multiple interacting agents via deep reinforcement learning to solve differential games; designed the interface mapping game dynamics, costs and constraints onto the learning algorithm.
- Implemented and unit-tested actor-critic training; demonstrated learned coordination on cooperative navigation and adversarial predator-prey pursuit-evasion with obstacle avoidance.
- Contributed a stochastic linear-quadratic game solver to the group's open-source package, validated on a satellite formation-flying problem.

Bioastronautics Researcher

May 2026 – Present

NASA Human Research Program, University of Colorado Boulder

- Conduct human subject physiological data collection, including participant instrumentation with wearable ECG/EMG electrode systems and data acquisition hardware.
- Contribute to the mechanical design of a human-rated centrifuge for altered-gravity human testing research.
- Design and 3D-print custom laboratory hardware, including a parametric hinged enclosure that houses a wearable physiological DAQ and clamps its electrode connector during subject testing.
- Analyse physiological datasets using MATLAB and Python to support ongoing NASA Human Research Program studies.

Founder & Chief Engineer

Oct 2025 – Present

Engineering Connections Design Team, University of Colorado Boulder

- Founded and lead a 20-member student engineering design team focused on hands-on aerospace and mechanical engineering projects.
- Lead development of a liquid propellant sounding rocket targeting a 10 km apogee using nitrous oxide and ethanol propulsion.
- Single-handedly developed an integrated engine burn and six-degree-of-freedom (6DOF) flight simulation tool in MATLAB, modelling combustion performance and full vehicle flight dynamics.
- Conduct propulsion performance analysis (NASA CEA, OpenRocket), structural analysis, and avionics architecture design.
- Manage project planning, design reviews, and technical coordination across propulsion, structures, and recovery subsystems.

Aerodynamics Team Member

Sep 2023 – Present

CU Boulder Racing Team (Formula SAE)

- Design and develop aerodynamic components for the Formula SAE race car.
- Lead sidepod development from concept through CAD design, analysis, and manufacturing.
- Conduct CFD simulations in ANSYS to evaluate aerodynamic performance and cooling airflow.
- Perform wind tunnel testing and correlate experimental results with simulation predictions.
- Design sidepod geometry to increase downforce and improve engine cooling performance.

Project Manager

Jan 2025 – May 2025

Aerospace Vehicle Design Laboratory, University of Colorado Boulder

- Led a multidisciplinary team designing and manufacturing a 1 m wingspan boost glider.
- Managed design iterations, manufacturing planning, and testing strategy.
- Final vehicle achieved one of the highest glide ranges in the cohort.

LEADERSHIP & PROFESSIONAL EXPERIENCE

Program Coordinator

Sep 2023 – Oct 2025

Engineering Connections, University of Colorado Boulder

- Planned and executed engineering workshops and events for first-year engineering students.
- Developed project-based learning activities that later evolved into the Engineering Connections Design Team.

Outreach Officer

Nov 2025 – Present

Society of Ethical Engineers

- Organize guest lectures and discussions with government and industry professionals on engineering ethics.