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Title

UCI Rocket Project

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UCI ROCKET PROJECT

PROJECT ADVISOR: PROF. MARK WALTER

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BACKGROUND

- The UCI Rocket Project is an undergraduate, student-led team pushing the boundaries of collegiate rocketry through the design and fabrication of liquid fueled rockets
- Developing skills and experience needed to excel in the aircraft, launch vehicle, and spacecraft industries
- Develop an alumni network through the aerospace industry, in companies such as Blue Origin, Northrop Grumman, Maxar, Raytheon, NASA, Boeing, and many more to come

GOALS

- Launch a liquid bipropellant rocket to 30,000 feet
- Break the altitude record for collegiate liquid rocketry
- Successfully fire the most powerful methalox rocket engine developed by undergraduate students

OBJECTIVES

- Manufacture and test a modular test stand for liquid bipropellant rocket engines up to 10,000 lbf
- Reliably manufacture and assemble multiple PTE engines for multiple test fires and launch
- Design lightweight launch vehicle structure to launch a 2.2 lb payload to 30,000 ft and recover safely
- Develop a reliable test stand data acquisition and control system
- Develop launch vehicle avionics system for valve actuation, flight data acquisition, and telemetry

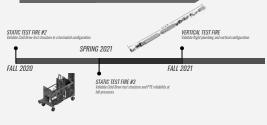


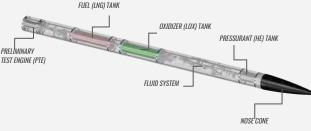


TEAM ORGANIZATION



PROJECT TIMELINE

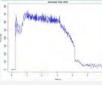




PROGRESS

- Conducted UCIRP's first static test fire (STF1) producing an average of 750 lbf of thrust for 3 seconds

- Redesigned and assembled an improved test stand to improve fluid system design and test operations
- Redesigned test stand electronics to include new avionics bay, improved wiring, intuitive LabView VI, and manual control box
- Manufactured and purchased components to assemble multiple PTE engine for next two test fires (STF#3 and VTF)
- Finalized critical design of launch vehicle structures, vehicle propulsion system, and recovery system
- Finalized design of ground support equipment and infrastructure associated with vertical test fire and launch



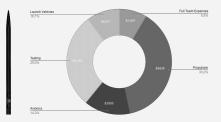
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Thrust data collected at the Static Test Fire #1 Static Test Fire of PTE

PRELIMINARY TEST ROCKET COST



Our Preliminary Test Rocket (PTR) is designed to break the current altitude record of 13,000 ft for university-built liquid rockets. Propelled by our PTE engine, its lightweight aluminum/carbon fiber body will soar to an estimated 30,000 feet and be safely recovered on the ground using a two-stage parachute system. The launch of PTR is currently scheduled to occur in 2022.