BLUE ATOMS

TEAM BLUE ATOMS
Centre of Science and Technology (COSAT), Khayelitsha

Beyond Earth: Designing the Next Space Mission

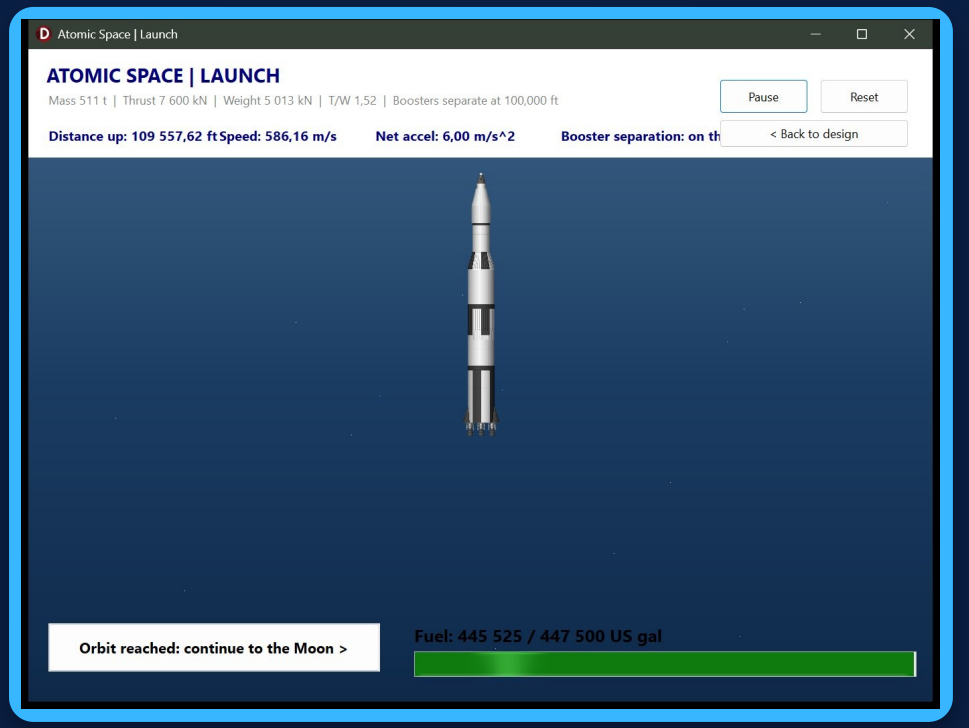
Explore aerospace engineering. Make the decisions mission teams make. See how your spacecraft, your rocket and your limited budget decide whether you reach the Moon.

OUR OBJECTIVE

Turn space engineering into something students experience, not just study.

ATOMIC SPACE

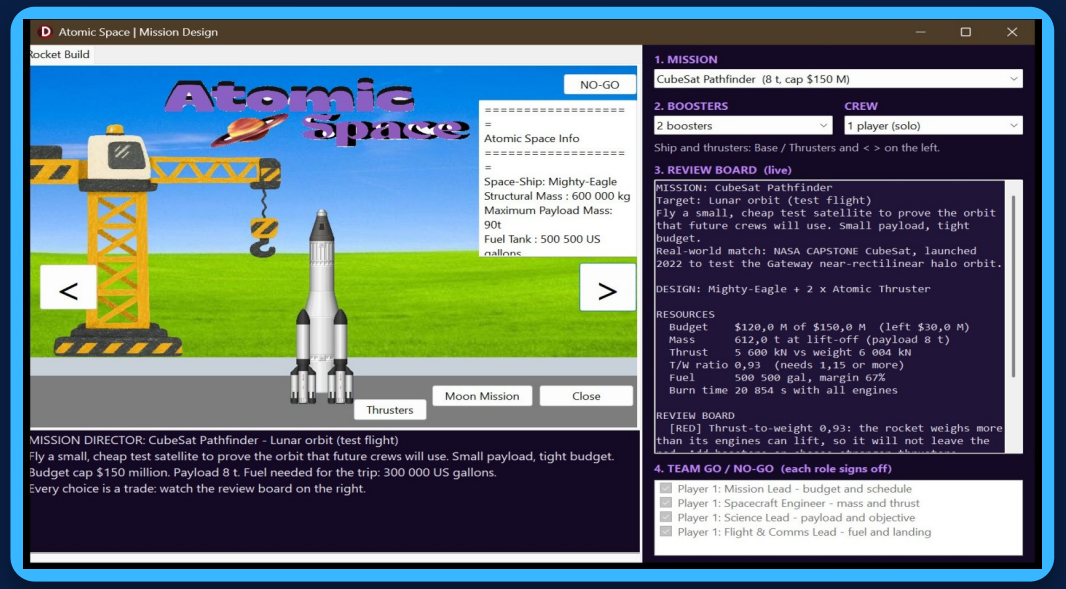
A space mission design game, written in Delphi



Every choice has a price

Your mission: get a spacecraft beyond Earth. The catch: a cost cap, a payload to carry and a fuel bill for the trip. Too weak a rocket and you never leave the pad. Too much hardware and the mass climbs. Too many boosters and the budget is gone.

On screen: thrust-to-weight 0.93, so the review board says NO-GO.



01 MISSION

Pick a mission. Each has a payload, a cost cap and a fuel need.

02 DESIGN

Choose a ship, thrusters and 2 or 4 boosters. That gives 18 designs.

03 REVIEW

The board checks mass, thrust, budget and fuel. The whole team signs off.

04 LAUNCH

Count down, stage the boosters, reach orbit and land on the Moon.

Connected to real NASA science

Atomic Space is built on NASA resources. In the browser edition, live NASA data drives what happens in each mission.

EONET
Earth Observatory Natural Event Tracker

Real wildfires, storms and floods happening now become the targets of the Earth mission.

DONKI
Space Weather Database

Real solar flares and geomagnetic storms strike your spacecraft on their real dates.

NeoWs · JPL
Near-Earth Object Web Service

The real 2029 flyby of asteroid Apophis sets the deadline of the asteroid mission.

GIBS
Global Imagery Browse Services

Satellite imagery of Earth from above, the map every event is plotted on.

MODELLED ON REAL MISSIONS

CubeSat Pathfinder
NASA CAPSTONE, 2022

Lunar Science Orbiter
NASA LRO, 2009

Cargo Lander
NASA CLPS and Artemis

Designed with the NASA guides from the challenge: Design and Develop Science Missions, Concept Maturity Levels and the Mission Design Lab.

The physics behind your mission

1.15

minimum thrust-to-weight to pass review

100,000 ft

where the boosters separate

1.62 m/s²

Moon gravity you brake against to land



LAUNCH & PROPULSION **Thrust ÷ weight > 1**

The engines must push harder than the rocket weighs. Heavier ships need more boosters. In the browser edition, further destinations need more launch energy (C3), so the rocket carries less.



COMMUNICATION **Data rate ∝ power × antenna ÷ distance²**

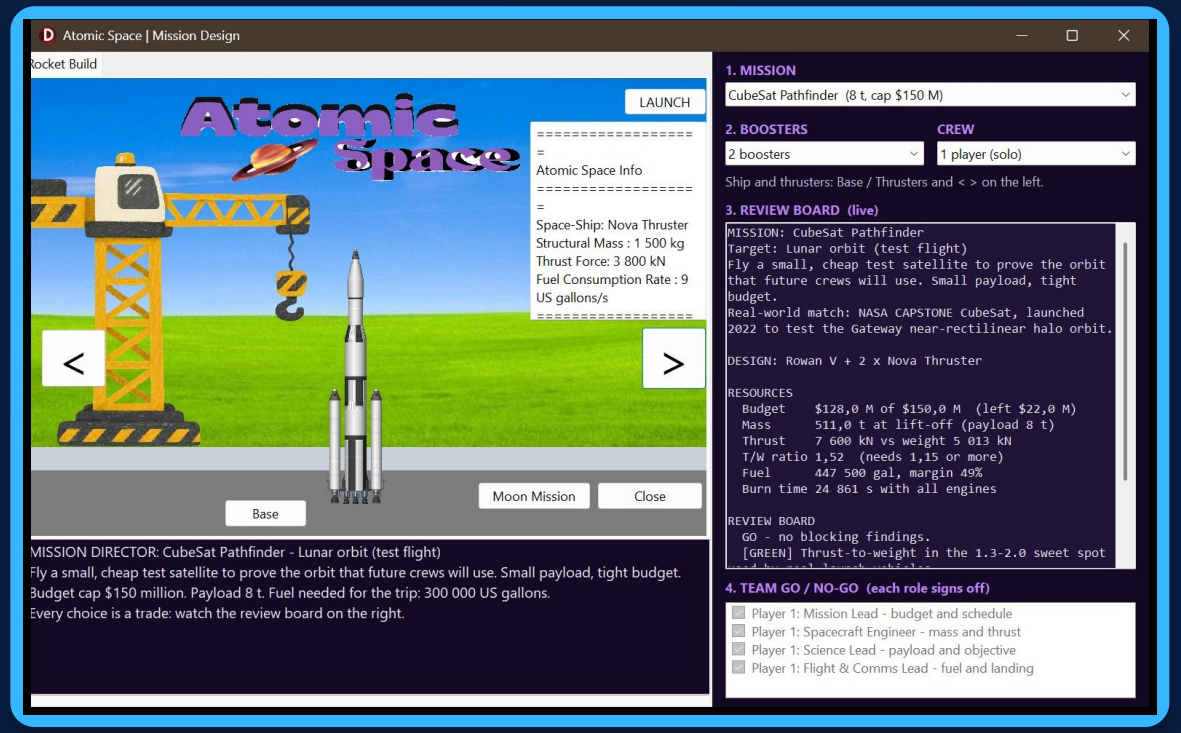
Twice as far means a quarter of the data. A radio that works at the Moon is 200 times weaker at Mars.

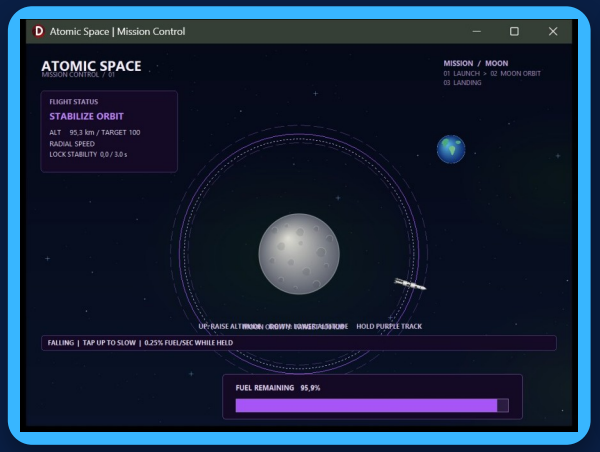


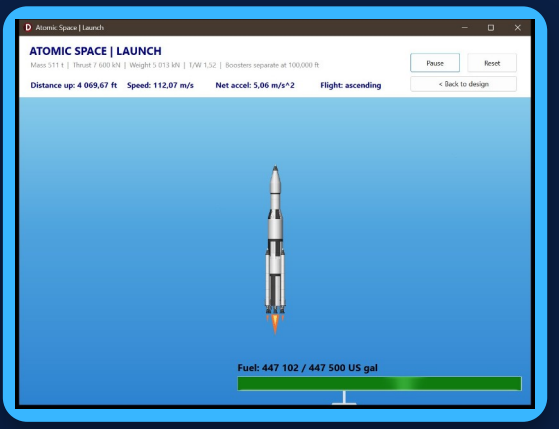
SCIENCE **Diminishing returns**

Science piles up fast at first, then levels off. Longer missions cost more and find less each week. When have you done enough?

Design it. Manage it. Launch it.







You become the mission designer: choose the parts, manage the budget, pass the review, then fly the launch and the Moon landing yourself. The mission report scores your design out of 100 and explains why it worked or failed.

WHY DELPHI

We learn Delphi in IT at school, so we built in the language we know.

Object Pascal written in Delphi → **Windows .exe** desktop edition → **HTML + JavaScript** via pas2js, on Vercel

Five minds, one mission

Team Blue Atoms: five learners from the Centre of Science and Technology (COSAT) in Khayelitsha, competing in the 2026 NASA Space Apps Challenge in Cape Town.

BLUE ATOMS

01
Inam Lubisi

02
Mehluko Mseleni

03
Bokamoso Mbakaza

04
Siqhamo Malashe

05
Onako Peteni

Will your mission succeed?

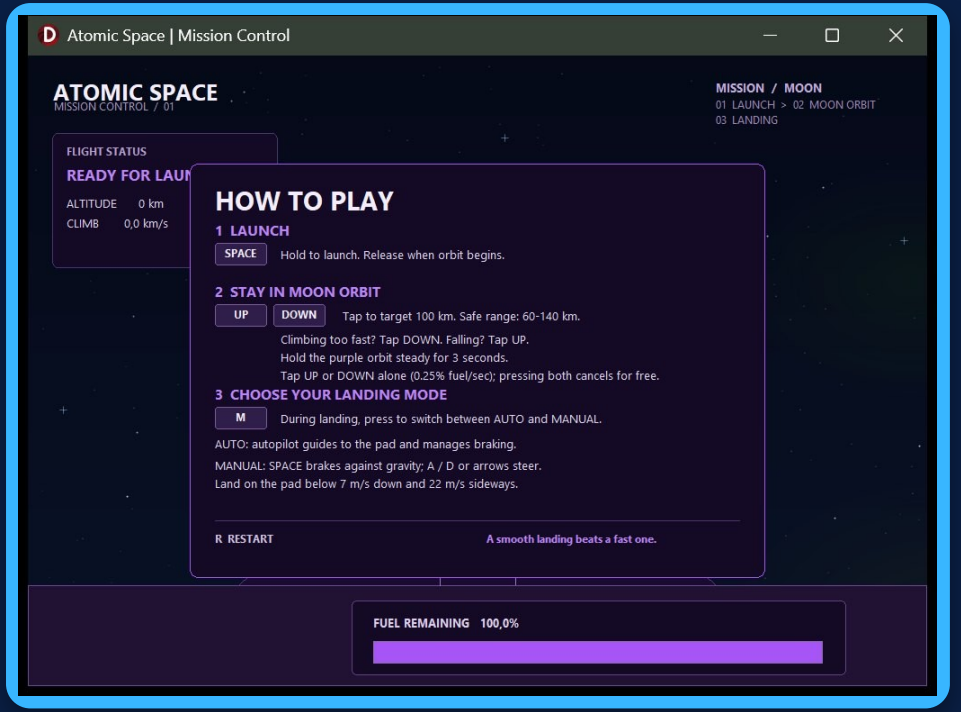
Think beyond. Design beyond. Explore beyond.

Space exploration is not just about reaching the stars. It is about the science, the choices and the engineering that get us there.

PLAY IN THE BROWSER
cosatblueatoms.earth

DOWNLOAD FOR WINDOWS
cosatblueatoms.earth/desktop

SOURCE CODE
github.com/King-Daniel123/NASA-Space-App-Challenges---BLUE-ATOMS



Thank you, judges.

Your mission starts here.

Not affiliated with or endorsed by NASA.