ITHERYON

Mission ‘Oumuamua

Catch the first visitor
from another star.



AI-generated

The challenge and our answer

‘Oumuamua, the first known interstellar object,
is leaving the Solar System.

The player designs a real mission to catch it.

NASA’s mission segments become a connected system.

User
Science goal

Space
Spacecraft and payload

Launch
Route and launch

Ground
Support and data return

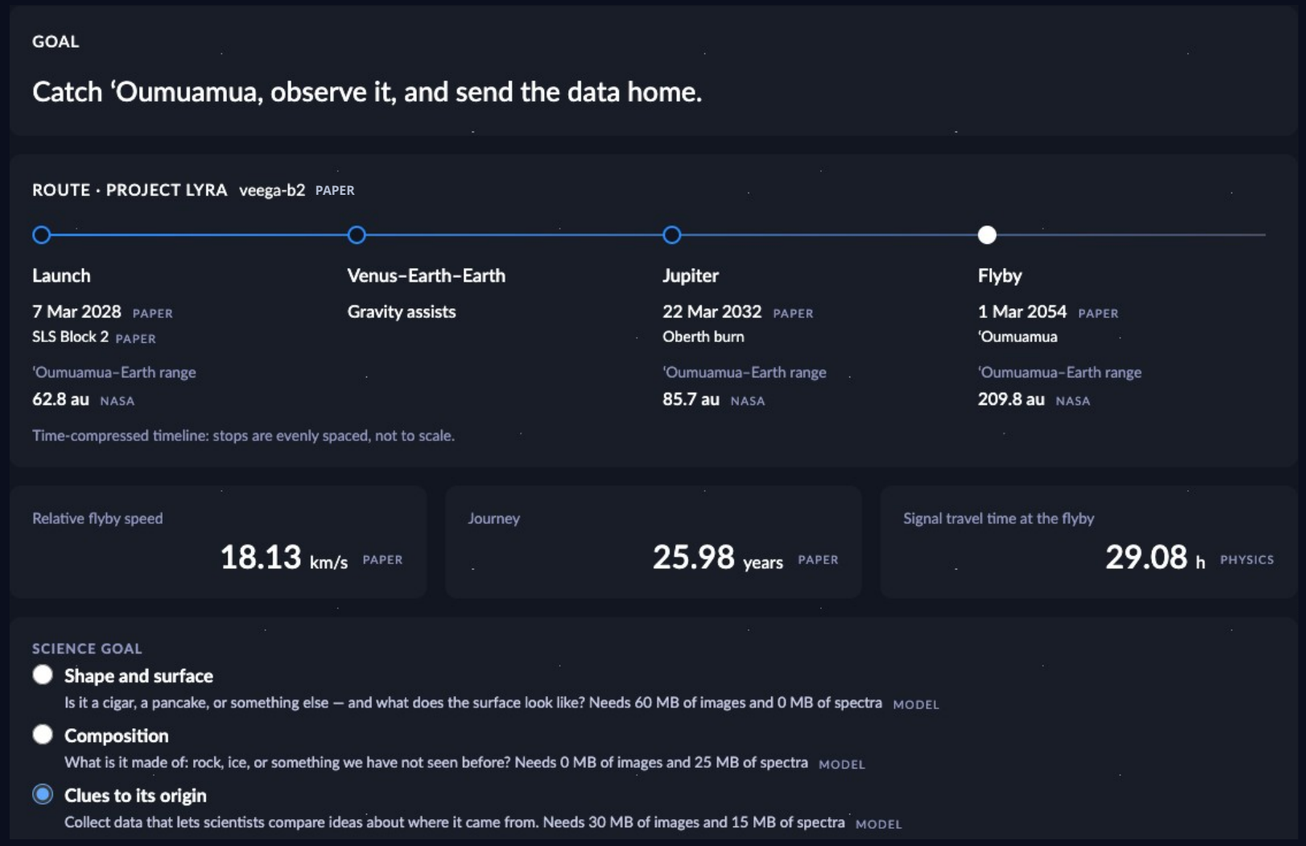
18.13 km/s PAPER
Relative flyby speed

209.8 au NASA
Earth distance at flyby

29.08 h PHYSICS
Signal travel time

Design the mission

Choose a science goal, a route and Deep Space Network support.



Mission brief · AI-generated game art

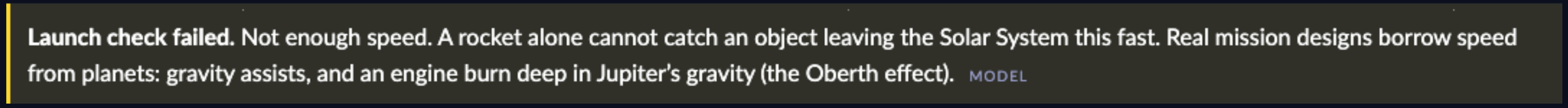
8 MODEL routes to try

7 PAPER routes from Project Lyra

The direct route fails on purpose in the game model, teaching why real missions use gravity assists.

Direct route: launch check failed

AI-generated game art



Build the spacecraft

Fit the science inside the limits.

Camera, spectrometer, power unit, antenna and recorder.

Mass. Power. Budget.

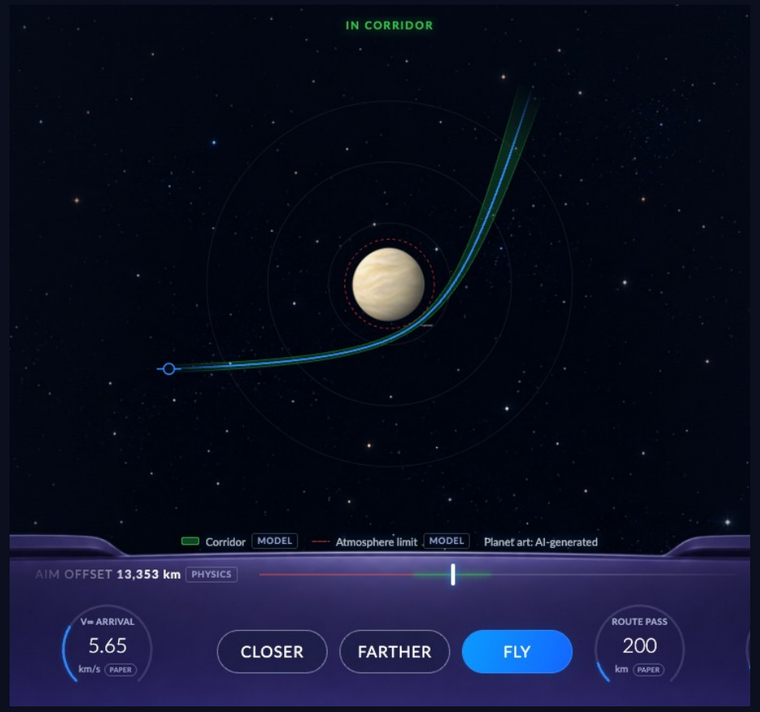
Launch stays locked until every check closes.



Game screenshot · AI-generated artwork

Fly it by hand

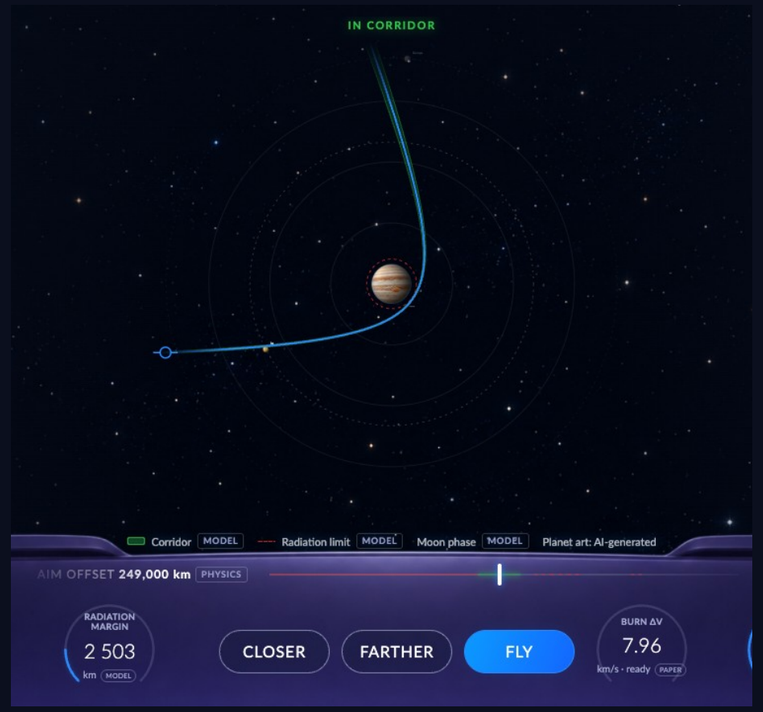
Catch the launch window, then guide the spacecraft by hand.



AI-generated game art

Venus and Earth assists

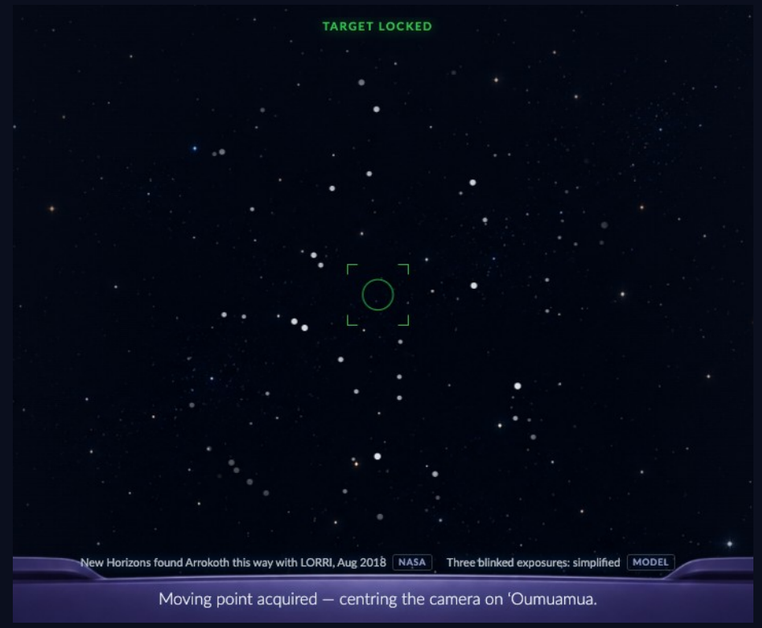
Choose the aim point
and commit to the pass.



AI-generated game art

Jupiter Oberth burn

Fire at closest approach
to gain speed.



AI-generated game art

Blink search

Find the moving point beyond
the Kuiper belt. Inspired by
New Horizons' search for Arrokoth.

Too close or too far reveals the physical consequence. Retry the stage.

The flyby and what reaches Earth

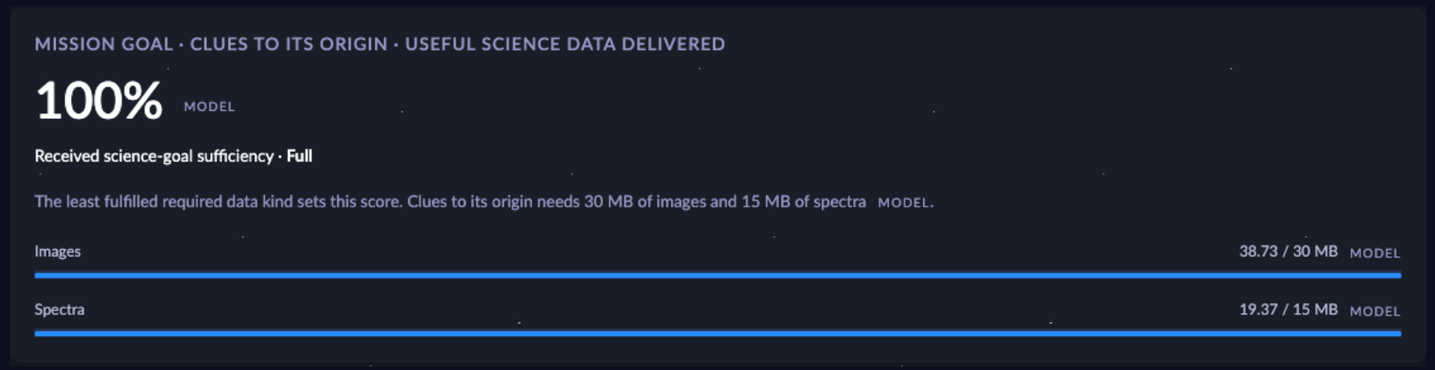
Only captured frames can be sent home.

Captured at the flyby



Captured frames · AI-generated game art

Received on Earth



AI-generated game art

The radio link decides the result.

1.0 m MODEL dish

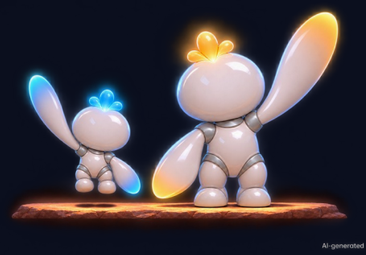
29.3% MODEL

of the science goal reaches Earth

2.1 m MODEL dish, retry

100% MODEL

The inhabitants are fiction.
‘Oumuamua is real.



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Team, data and tools



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Mike Lenval — technical lead and developer (mission calculations, NASA data, game implementation).



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Liudmyla Doroshenko — design director (visual direction, screen reviews, revision decisions).



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"Our youngest member" — the original idea.

Data and mission references

NASA/JPL Horizons

NASA NSSDCA fact sheets

NASA Design and Develop Science Missions

JPL Concept Maturity Levels

Project Lyra papers

arXiv:2201.04240 PAPER arXiv:2305.03065 PAPER

AI tools

Code with Claude and OpenAI Codex under the team's direction.
Images with OpenAI image generation.
Goodbye clip with Google Flow.

Play https://mission-oumuamua.vercel.app/landing.html

Code https://github.com/MikeLenval/mission-oumuamua (MIT)

Educational simulation.
NASA does not endorse this game.

Team ITHERYON · NASA Space Apps Challenge 2026 NASA · Space Mission Design Game