2024

NASA INTERNATIONAL SPACE APPS CHALLENGE™

EXO ADVENTURES

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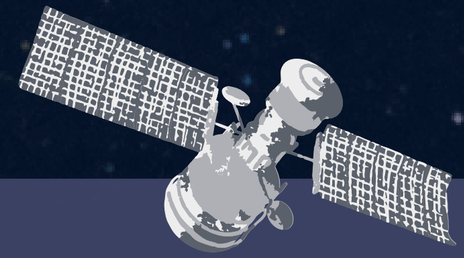
The Need for Innovation in Space *Education*

Hands-on Learning: Research shows that **interactive tools**, like simulations and experiments, **help students better visualize and understand abstract concepts** (Solomon, 2008; Howe & Durr, 1982).

Lack of Interactivity:
Traditional science materials are often **hard to understand** and **fail to engage** students, especially in complex topics like exoplanet discovery.

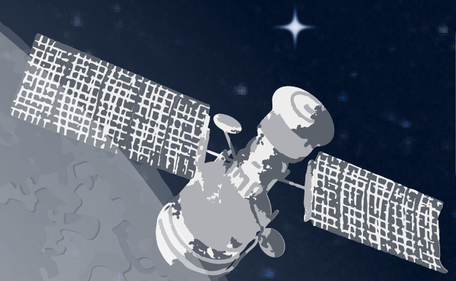
Technology Integration: Tools like virtual labs and simulations foster **inquiry-based learning**, making complex subjects like exoplanet characteristics more accessible (Milner-Bolotin, 2012; Malloy & Jensen, 2001)



Our Solution:
We bridge this gap with a personalized, interactive tool that generates AI-based exoplanet postcards.

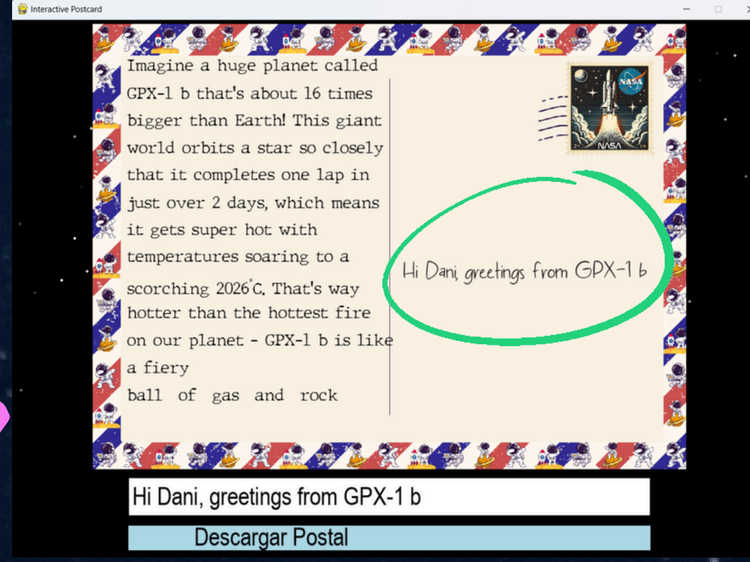
Our Solution

Interactive Exoplanet Postcards



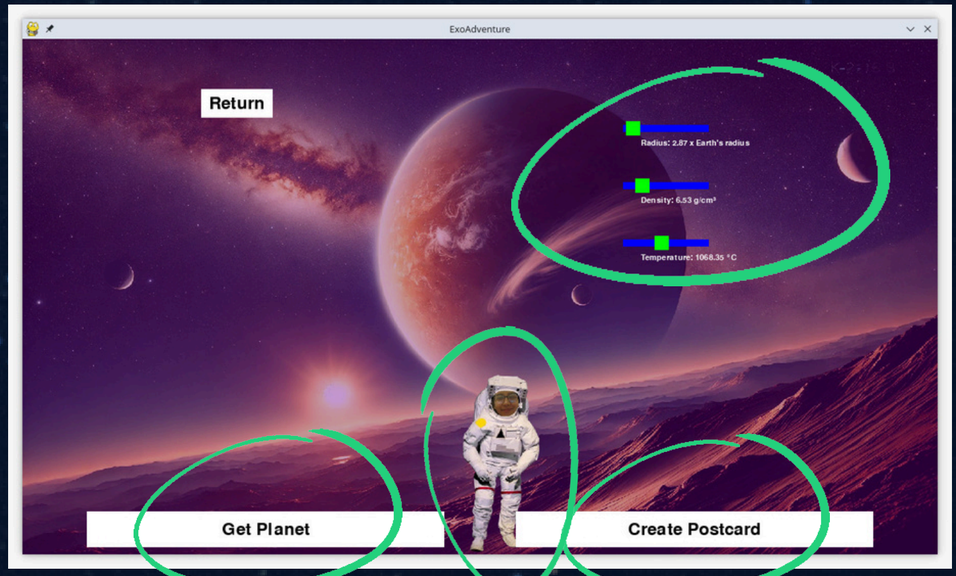
1

A fun and interactive tool where students create and personalize postcards of exoplanets.



2

Generative AI helps visualize selected planets based on scientific parameters (radius, density, temperature).



3

Students can download the personalized postcards and share them.

How It Works

Interactive Learning through Creativity

1

Student Selects Parameters
radius, density, and temperature

2

Gravity Simulation with Personalized Astronaut
Based on the selected planet’s gravity, a custom astronaut (with the student’s face) jumps to visualize the effect.

3

AI Matches Parameters
An AI algorithm (KNN) uses the input data to find the closest exoplanet in the database.

4

Generate Postcard

- AI generates* the exoplanet's image and description.
- Students add a custom message.

5

Download Postcard
Students can download their personalized exoplanet postcard with their astronaut and message.

Technology Integration

Technology Powering Our Solution

- **Generative AI:** Prompt LLM’s to describe exoplanets characteristics in easy to undertand way. And then, generate creative representations of those distant worlds to engage students with the wonders of the universe.
- **KNN Algorithm:** Matches student-selected parameters (radius, density, temperature) with real exoplanet data from a subset of a NASA database, as their “Travel Destination”.
- **Python & Pygame:** An interactive astronaut simulation where students see their avatar jump based on the planet’s gravity, visually demonstrating scientific concepts. Also, they can share their space journey with a post card.

Empowering the Next Generation of Space Explorers

- **Engage Students Globally:** Help us ***inspire curiosity and creativity*** in students by providing them with an ***interactive tool*** that brings exoplanetary wonders to life.
- **Join Us in Our Mission:** We are committed to making science education engaging, fun, and meaningful.

Whether you're an educator, space enthusiast, or technology advocate, there are ways you can contribute.

Next Steps

1. Share our platform with schools and educators.
2. We are open to partnerships with educational organizations and space institutions.
3. **Expand Our Prototype:** Our current tool showcases a small subset of planets. We aim to integrate data from the broader exoplanet archive.