

# NASA SPACE APPS

## Challenge 2025



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Institute of Technology and Sciences

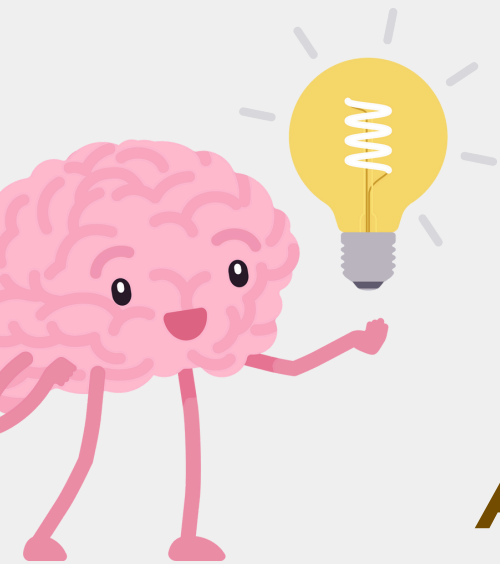
- **Problem ID: 02**
- **Problem : Build a Space Biology Knowledge Engine**
- **Theme:**
- **Ps Category: Software**
- **Team ID:UN00DW56**
- **Team Name: Steller Sparks**
- **Team Members: Apoorva Nema & Ayushi Rai**





# BioOrbit

*Unlocking Space Biology with AI*



***Dynamic AI Dashboard:***

A single interactive platform to explore NASA's space biology data.

***AI-Powered Summaries:***

Automatically convert long bioscience papers into concise, easy-to-understand summaries.

***Knowledge Graphs:***

Visualize experiments, species, and outcomes to uncover hidden relationships.

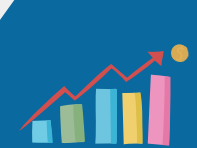
***Smart Search & Visualization:***

Natural language queries like “What happens to plants in microgravity?” with results in graphs, charts, and summaries.

# TECHNICAL APPROACH



## Frontend:



React.js (for dynamic UI). Plotly for interactive charts and visualizations.



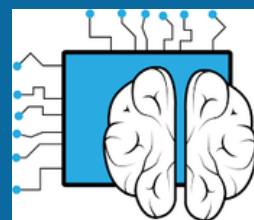
## Backend:



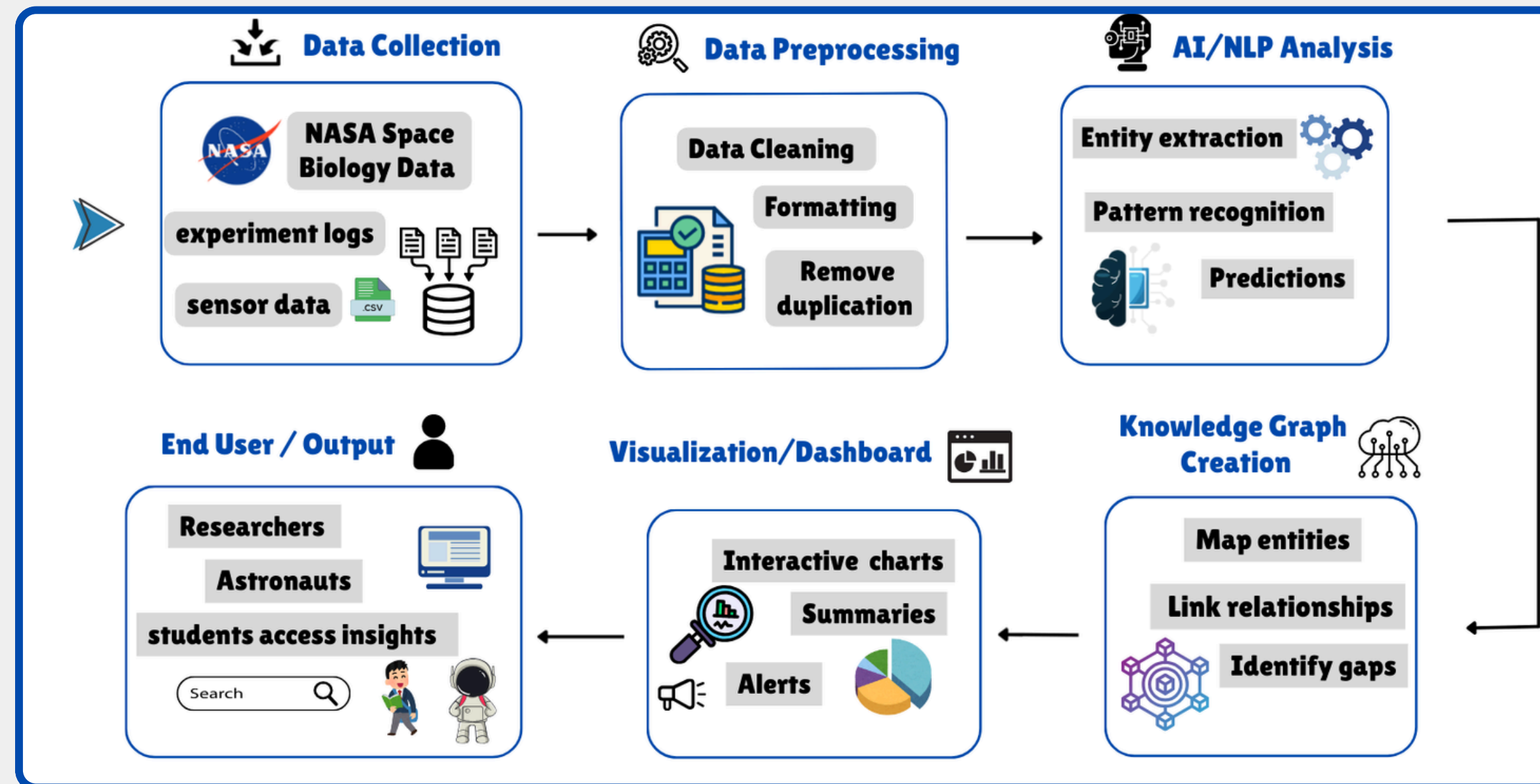
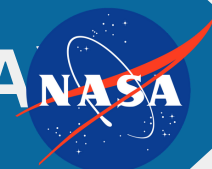
Flask/Django (to process AI models). for APIs and data processing.

**AI/NLP:**

- GPT APIs, Hugging Face transformers,
- SpaCy (summarization, NER, Q&A).



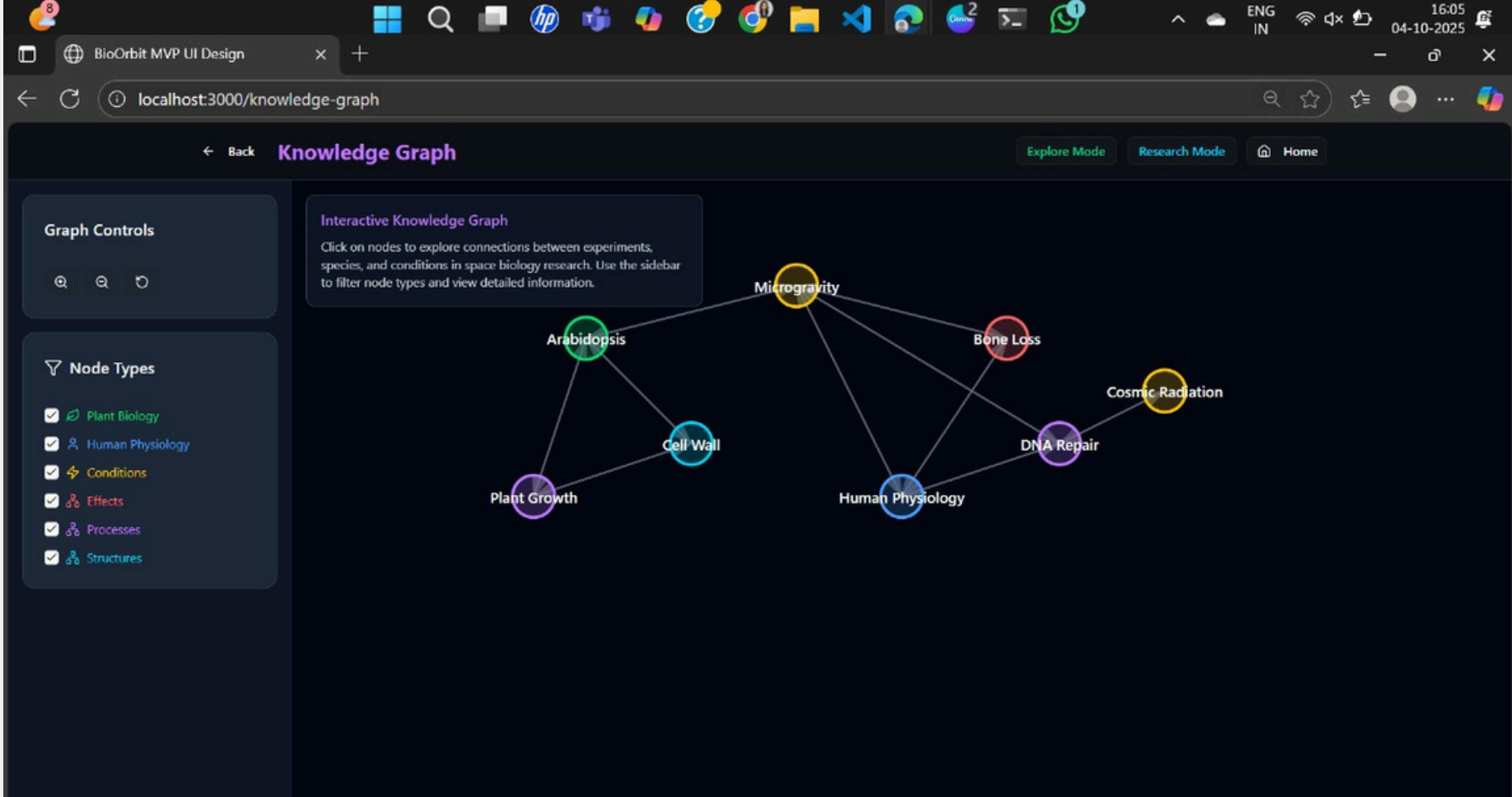
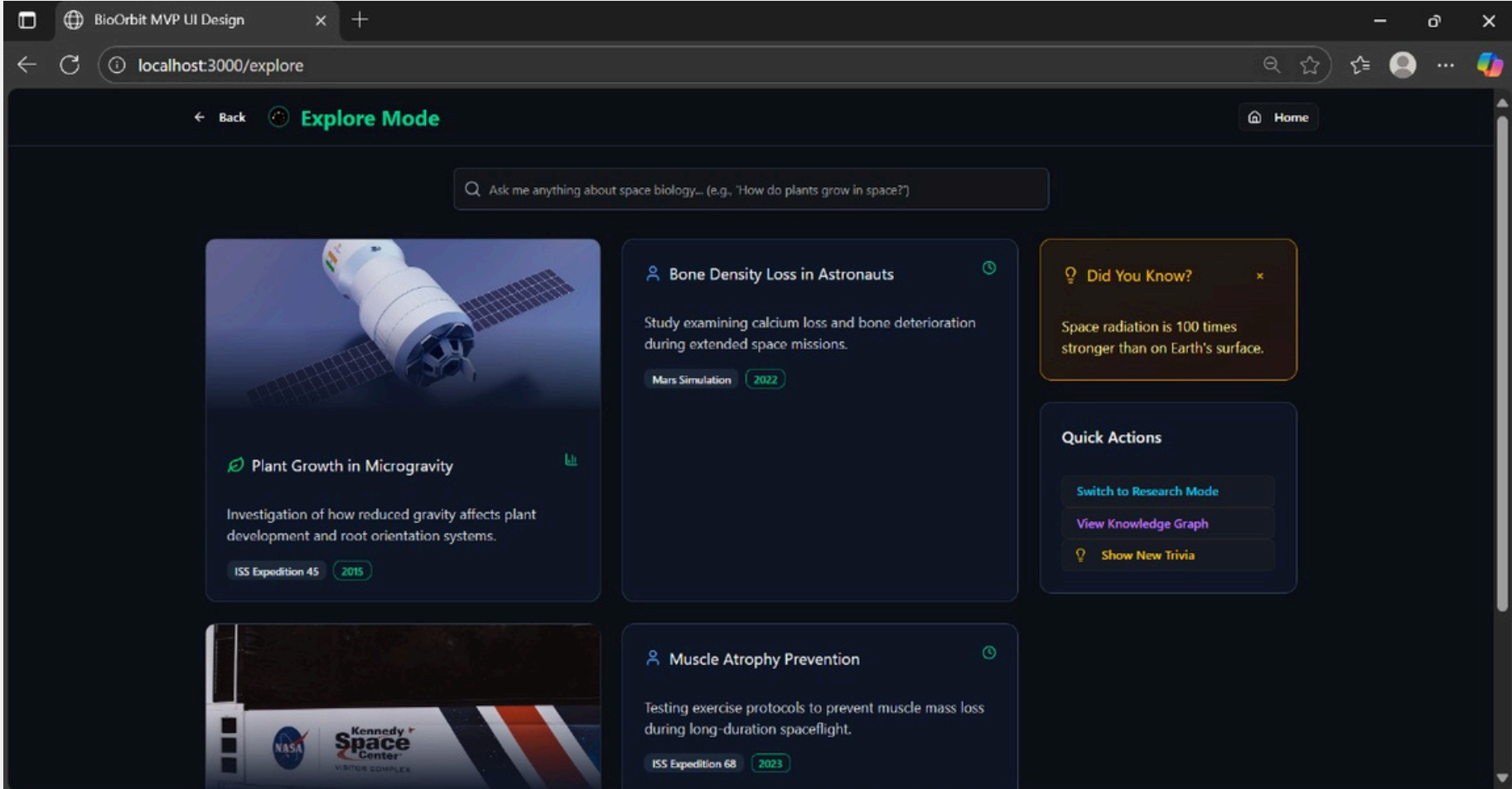
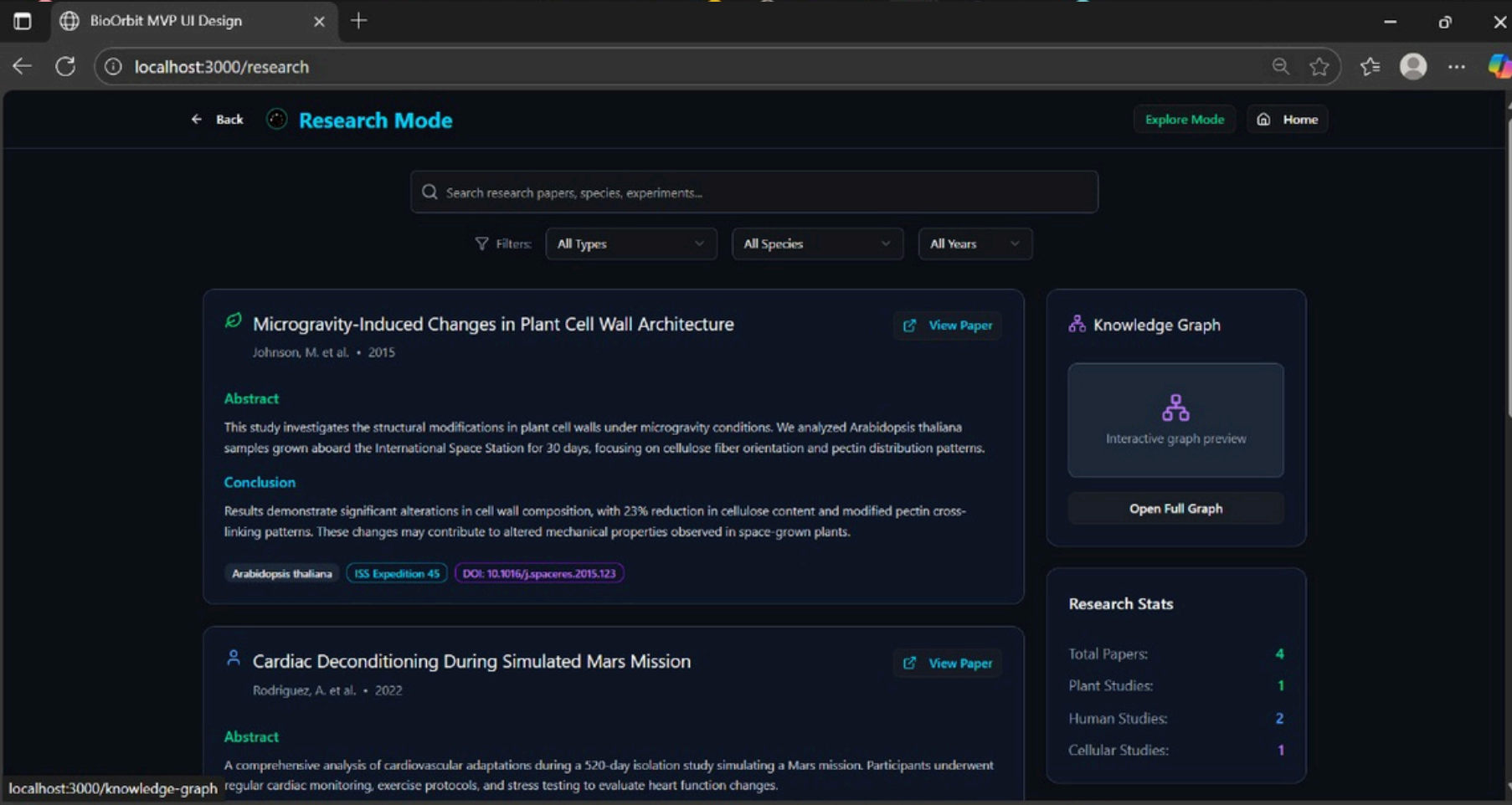
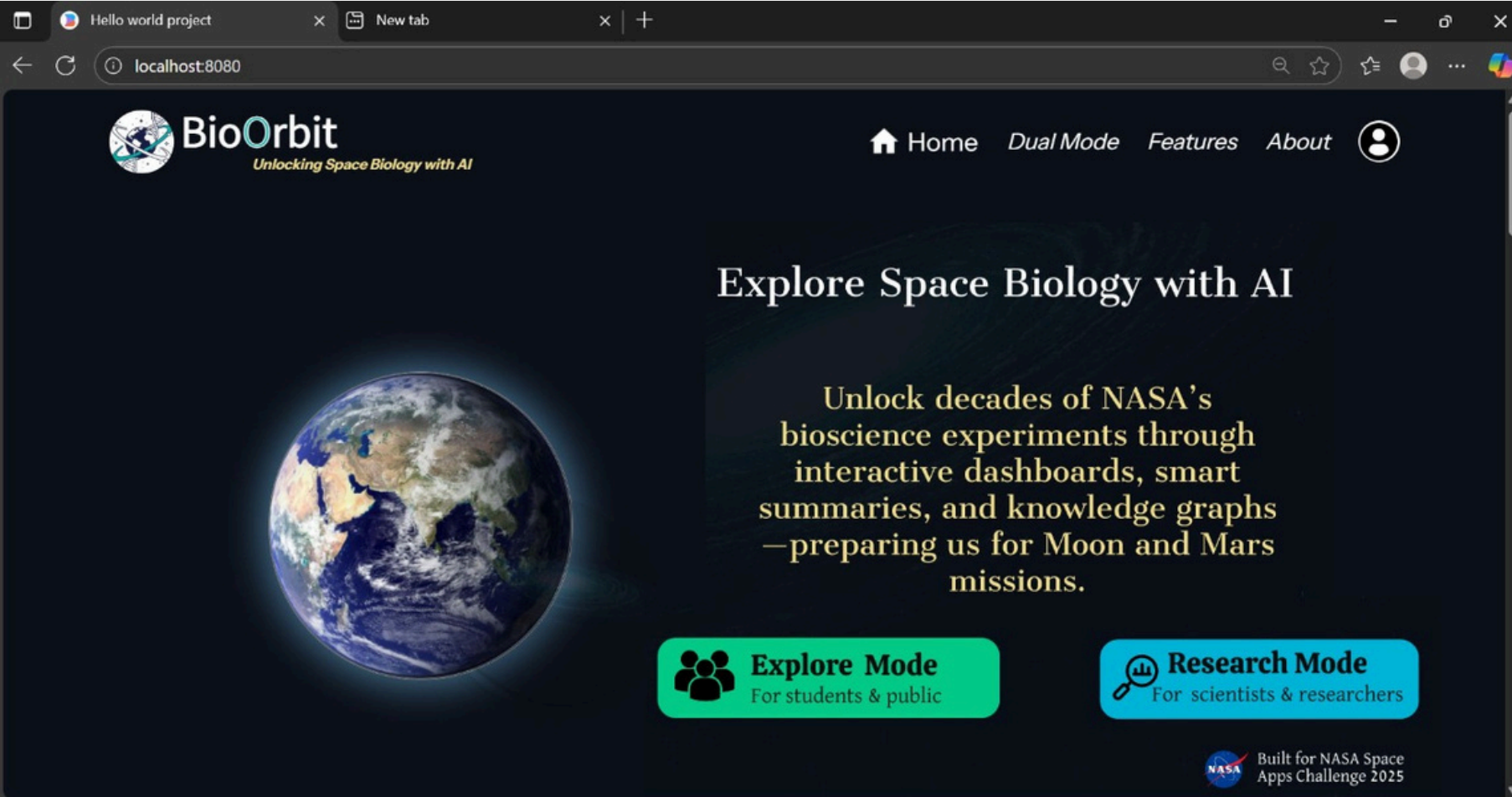
**Data Sources:** NASA Life Sciences Data Archive (LSDA) open bioscience datasets.



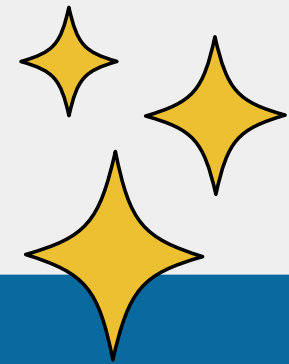
Demo Video: <https://drive.google.com/file/d/1rrpAWFkq-R8YibEk9hVoxkyGtccVBREg/view?usp=sharing>



# SCREENSHORTS



# FEASIBILITY AND VIABILITY



## Feasibility:

- Dashboard with search, summaries, and graphs.
- Uses public NASA datasets + existing NLP/AI tools → no need to reinvent from scratch.
- Scalable design: can expand to more datasets, real-time mission data, or predictive AI models.
- Practical + impactful → balances ambition with realism.

## Challenges:

- Large dataset may slow processing.
- Knowledge graph complexity.
- Limited hackathon time.

## Mitigation:

- Use a smaller dataset for MVP.
- Simplify knowledge graph initially.
- Focus on core features; extras only if time allows



# IMPACT AND BENEFITS



**NASA Scientists & Researchers: Access prior experiment data for mission planning.**



**Students & Academics: Learn from simplified summaries and interactive dashboards.**

**Space Medicine Experts: Study biological changes in humans and animals for long missions.**



**Private Space Companies: Gain insights for astronaut health and sustainable space travel.**

# RESEARCH AND REFERENCES



## Primary Sources:

- NASA Space Biology Publications – 608 full-text publications

NASA Open Science Data Repository(OSDR)

– <https://lsda.jsc.nasa.gov>

NASA Space Life Sciences Library (NSLSL) – Your paragraph text

NASA Task Book – <https://taskbook.nasaprs.com/public>

## Secondary Sources / Tools Used for Research:

- NLP and PythonLibraries for AI-based summarization (prototype).
- Knowledge graph visualization references: D3.js, Plotly.
- Figma and Canva for UI/UX prototyping.
- Python libraries: Pandas, NLTK, SpaCy for preprocessing and dataset handling.