User Guide

Welcome to SkyView!

Upon launching the web app, you'll arrive at the **Home Page**. Here's what you can do:

1. Explore Built-in Simulations

View the built-in simulations to see the real movement of the planets and explore simulations that are integral to our study.

2. Create Your Own Simulations

Build your own planet simulation and customize parameters to explore interactions between planets.

3. Object Movement Detection

Upload an image, and our app will analyze it to detect and track object movements.

4. Discover Space with NASA

Our app integrates with the NASA API to bring you fascinating astronomical data and imagery.

5. Resources

Learn more about how our app can be utilized for educational purposes and more on the **Resources** page.

Installation

- Cloning the repository:

```
git clone https://github.com/mario99logic/SkyView.git
cd SkyView
```

- Create and activate a virtual environment:

```
python -m venv new-venv
source new-venv/bin/activate  # On Windows use `new-venv\Scripts\activate`
```

- Install the required libraries using:

```
pip install -r requirements.txt
```

- To run the application, execute:

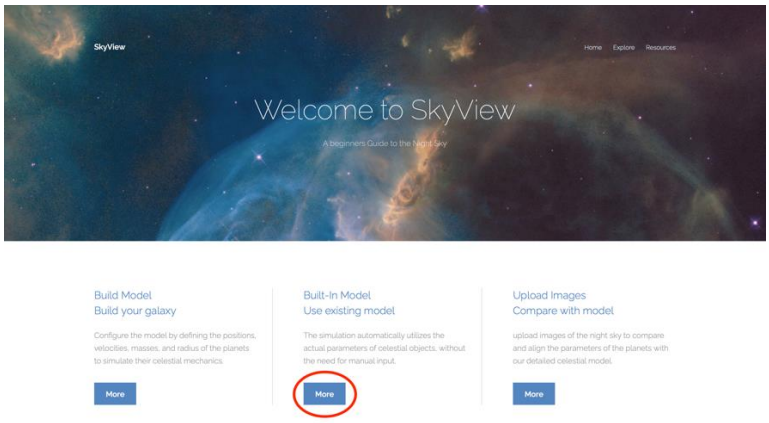
```
python src/app.py
```

- Click on the URL in the trerminal:

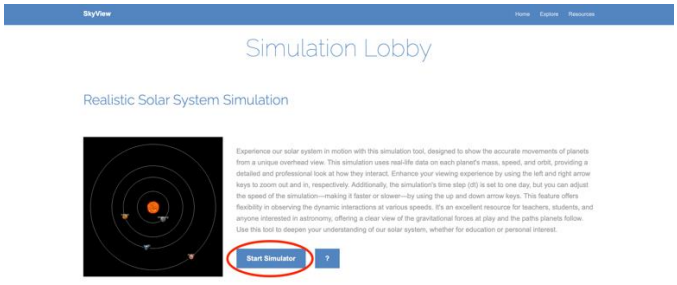
```
WARNING: This is a development server.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 469-670-935
```

1. Explore Built-in Simulations

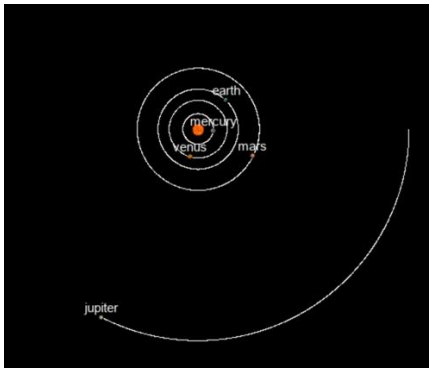
- Click on the middle "more" button on the Home Page.

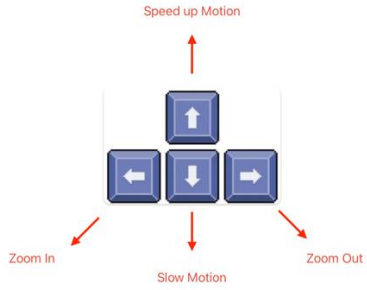


- This will take you to the Simulations Page where you can select from a list of two available simulations.
- Choose a simulation to to launch the simulation in a new Pygame window. see it in action and interact with the various elements to gain insights into celestial mechanics.

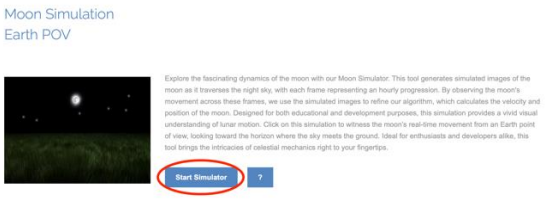


- When clicking the start simulation for the first simulation a pygame window will open for the built In simulation
- Zoom in and out using the left and right arrow button on your keyboard
- Slow and speedup motion using the up and down button on your keyboard



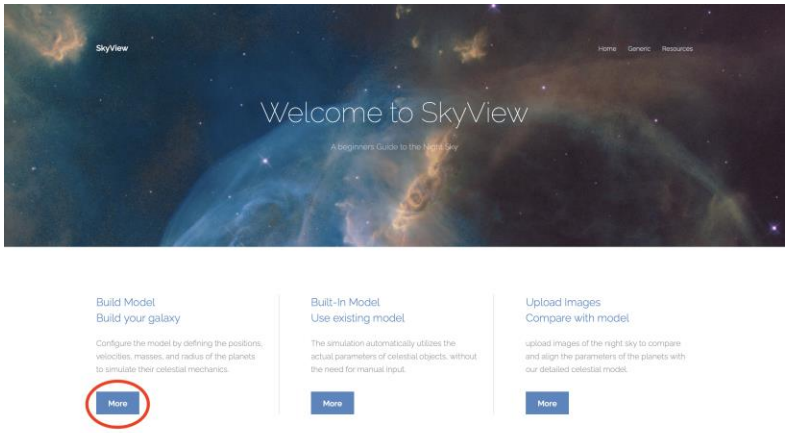


- When you click **"Start Simulation"** for the second simulation, a Pygame window will open, displaying the moon simulation. Here, you will see the real-time movement and position of the moon from Israel's point of view.

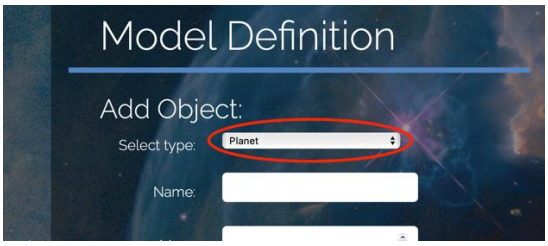


2. Create Your Own Simulations

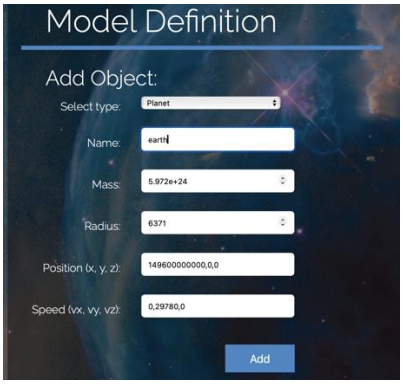
- Click on the left "more" button on the Home Page.



- Select Object Type: Begin by choosing whether you are adding a planet or a star.

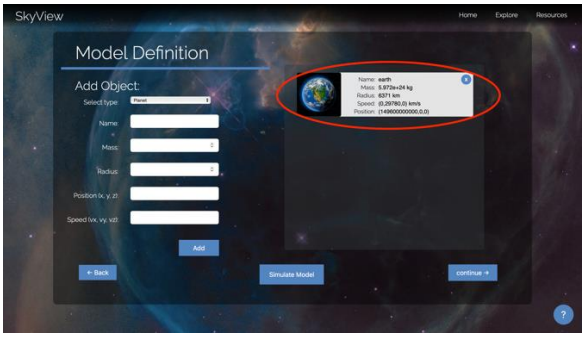


- Name Your Object: Assign a name to your new celestial body. If you type the name of an excisting planet the real stats will automaticly fill the fields
- Modify Parameters: Add or edit parameters such as mass, Radius, position, and speed to define the characteristics of your object.

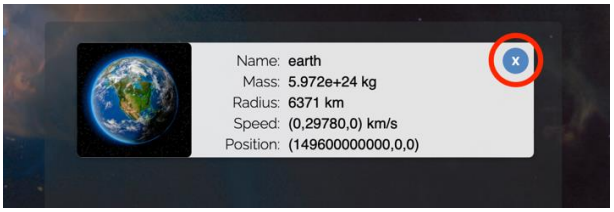


- Add to Object List: Once you are satisfied with the settings, click on the "Add" button to add your object to the list.

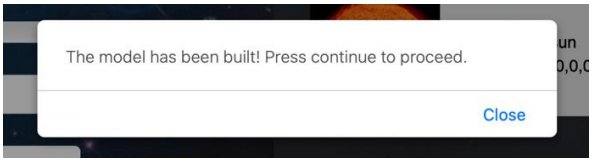
- The object will appear in the right box



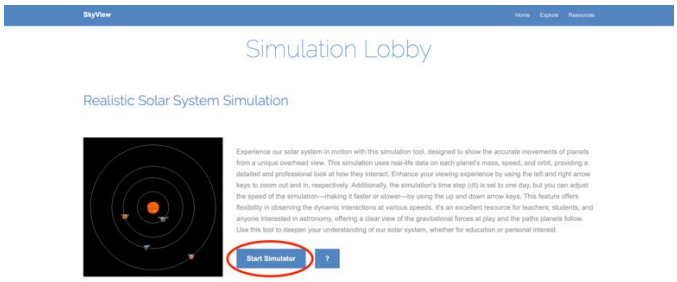
- Manage Objects: If you need to remove an object, simply click on the "X" button next to the object in the list.



- Simulate Model: After adding all desired objects, click the "Simulate Model" button. You will receive a confirmation message stating that the model has been successfully built.

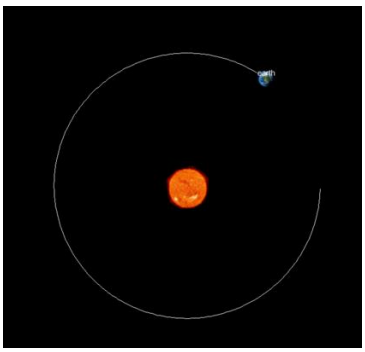


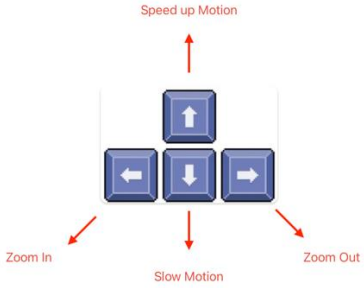
- Continue to Simulation: Click "Continue" to proceed to the simulation page.
- Choose and Start Simulation: On the simulation page, select from the available simulations. Click on "Start Simulation" to launch the simulation in a new Pygame window.



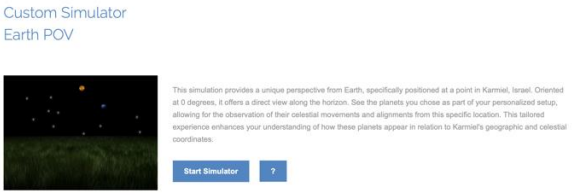
- When clicking the “Start Simulation” for the first simulation a pygame window will open for the custom simulation

- Zoom in and out using the left and right arrow button on your keyboard
- Slow and speedup motion using the up and down button on your keyboard





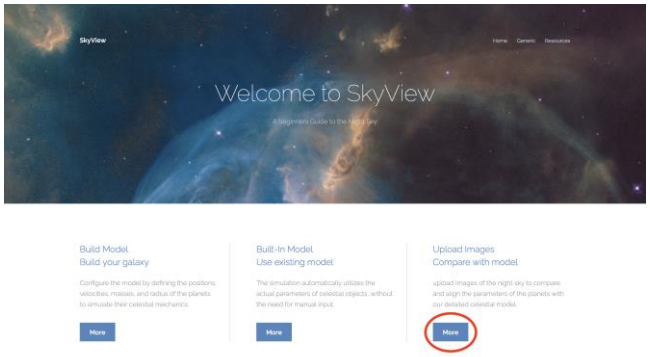
- When clicking the “Start Simulation” for the second simulation a pygame window will open for the custom simulation



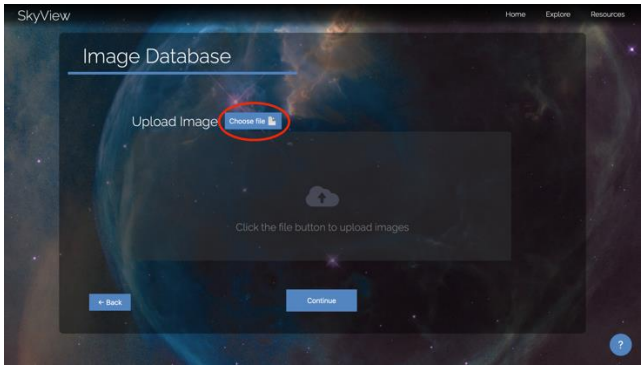
- Pov simulation will start and you will see the planets for the simulation you built from earth pov

3. Object Movement Detection

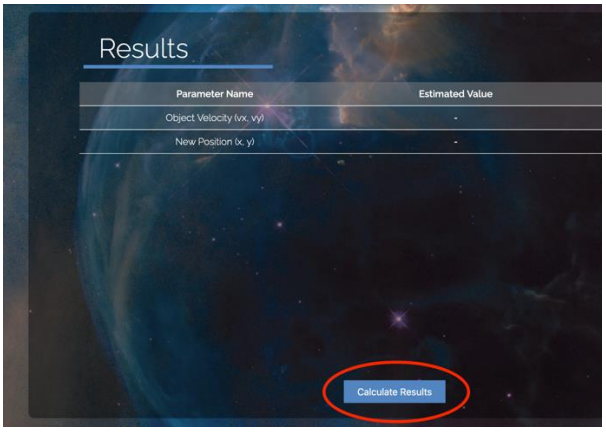
- Click on the right "more" button on the Home Page.



- Click on the “Choose File” button and upload the images of the object

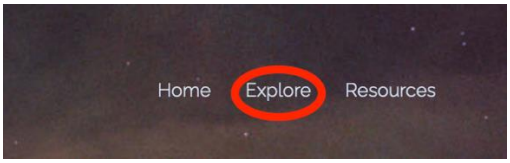


- Click on the “Continue” button, to go to the results page
- Click “Calculate Results” to see the results for the images you uploaded

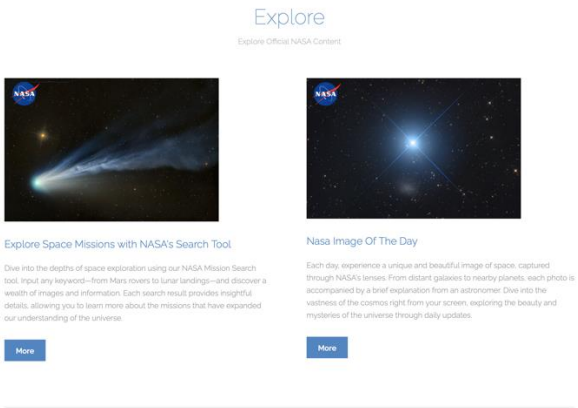


4. Discover Space with NASA

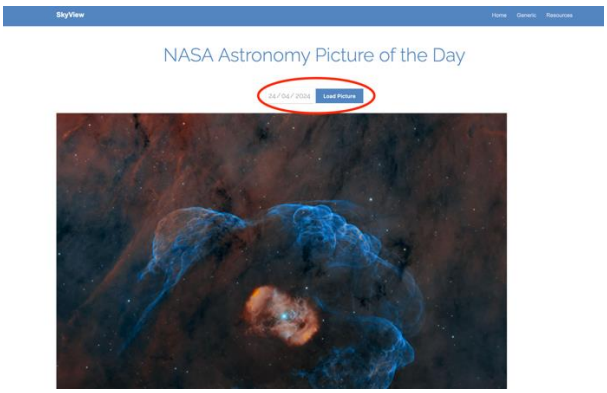
- Click on the “Explore” button, or scroll down in the home page



- Click on the “Explore” button, or scroll down in the home page
- Explore through two distinct features:

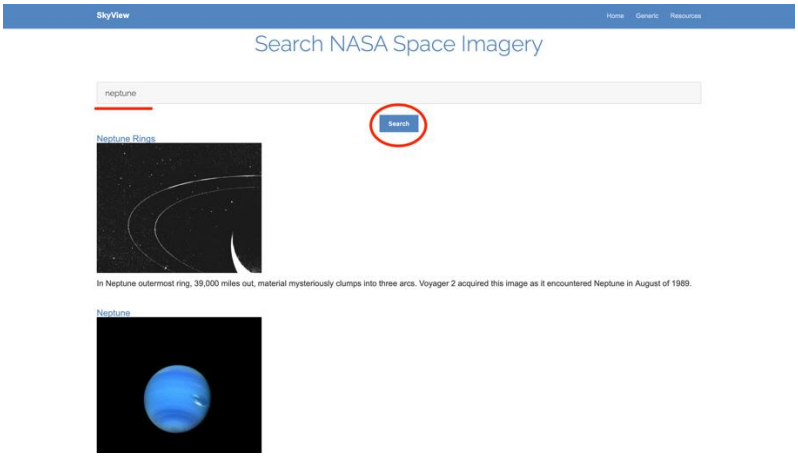


1. Daily Image: Select a date to view the image NASA has chosen for that specific day, showcasing captivating snapshots of the cosmos.
- Select a Date: Upon choosing a date, the corresponding NASA image of the day will be displayed.



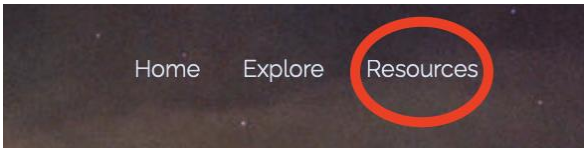
2. NASA Search: Quickly find information on anything related to NASA, from space missions to scientific discoveries.

- Enter Your Query: Type your search term into the designated field and click the **"Search"** button to initiate the search.



5. Resources

- Click on the "Resources" button from the home page or any page in the menu bar to view detailed information.



Important Notes

- Image Upload: When using the Object Movement Detection feature, ensure you upload images in the correct order. This helps the system accurately calculate the next position of the object.

- Planet Simulation: Note that stars are not included in the planet simulation from above. This simulation focuses exclusively on the movement of planets.

- Unknown Planets: If a planet within the simulation is not recognized, it will be assigned a unique image to distinguish it.

- Daily Image Feature: If you select a future date in the Daily Image feature, no image will be displayed, as it corresponds only to past or present dates.

Thank You for Using SkyView!

We appreciate your interest and engagement with SkyView. If you have any questions or need further assistance, please don't hesitate to contact our support team. Enjoy exploring the universe with us!