**Scientific Abstract – GalacticPioneers Team**

**Introduction:** This project focuses on creating an orrery web app to display Near-Earth Objects (NEOs), addressing the need for virtual models of celestial bodies. An orrery traditionally models the solar system, showing the orbits of planets and NEOs, including Near-Earth Asteroids (NEA), Near-Earth Comets (NEC), and Potentially Hazardous Asteroids (PHA). By utilizing Keplerian parameters such as eccentricity, semi-major axis, and inclination, the app simulates the elliptical orbits of these objects. The goal is to develop an interactive 3D model that accurately depicts their positions over time.

**Materials and Methodology:** The web app is built using modern tools like Font Awesome, Bootstrap v5, JavaScript’s Three.js library, React.js, Node.js, and Express.js to create the dynamic model. UI/UX design is handled through Canva, while development tools like VS Code, Git/GitHub, MySQL, Postman, and XAMPP are used for version control and data management.

**Results:** The app will provide real-time visualizations of NEOs and planetary orbits, offering users an engaging way to explore celestial mechanics and understand the movements of celestial bodies in relation to the Sun.

**Discussion:** This web app offers a powerful educational tool for visualizing NEO orbits, with future potential for expanding its capabilities to include more complex astronomical simulations.

**Resources:** [**Create an Orrery Web App that Displays Near-Earth Objects**](https://www.spaceappschallenge.org/nasa-space-apps-2024/challenges/create-an-orrery-web-app-that-displays-near-earth-objects/))