The background is a dark blue space-themed illustration. On the left, a bright orange sun with a jagged, flame-like edge is partially visible. Several concentric white circles represent planetary orbits. Scattered throughout the scene are various stars: some are simple white dots, while others are multi-pointed white sparkles. On the right side, there are abstract, flowing shapes in shades of purple and dark blue, resembling nebulae or interstellar clouds.

# Three.js Solar System

**Artur Romão – 98470**

**Introduction to Computer Graphics – 2021/2022 – Project 1**

# Main ideas

User interactive solar system

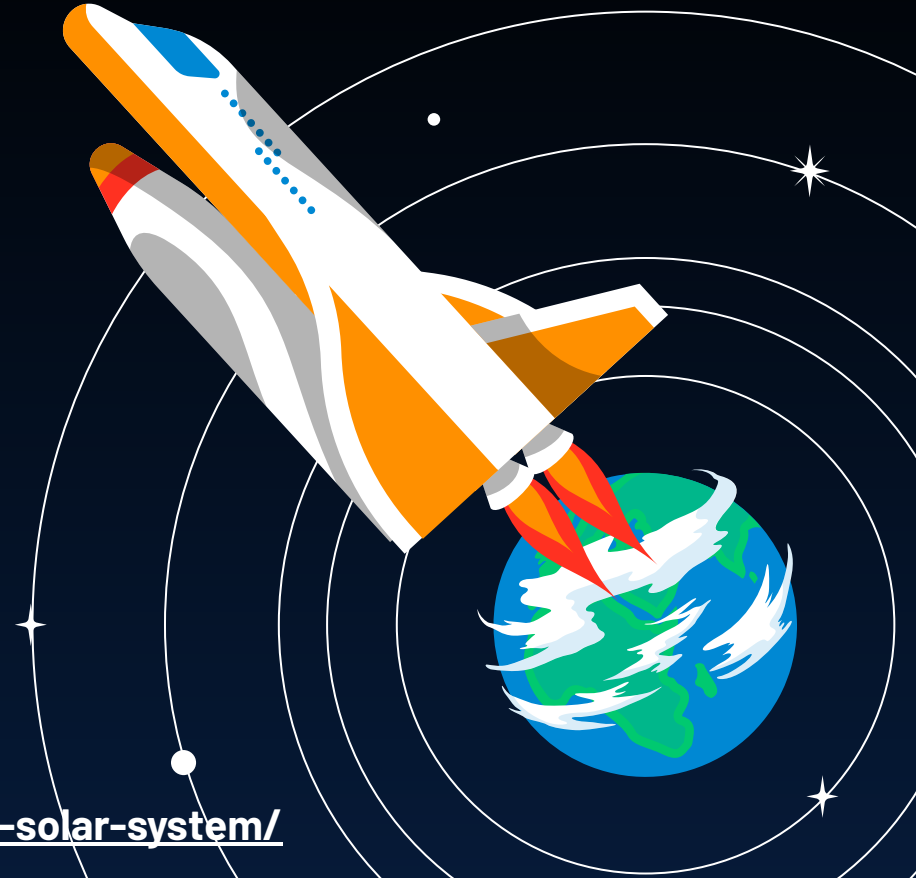
Possibility to stop the system elements

Option to hide/show the planets' orbits

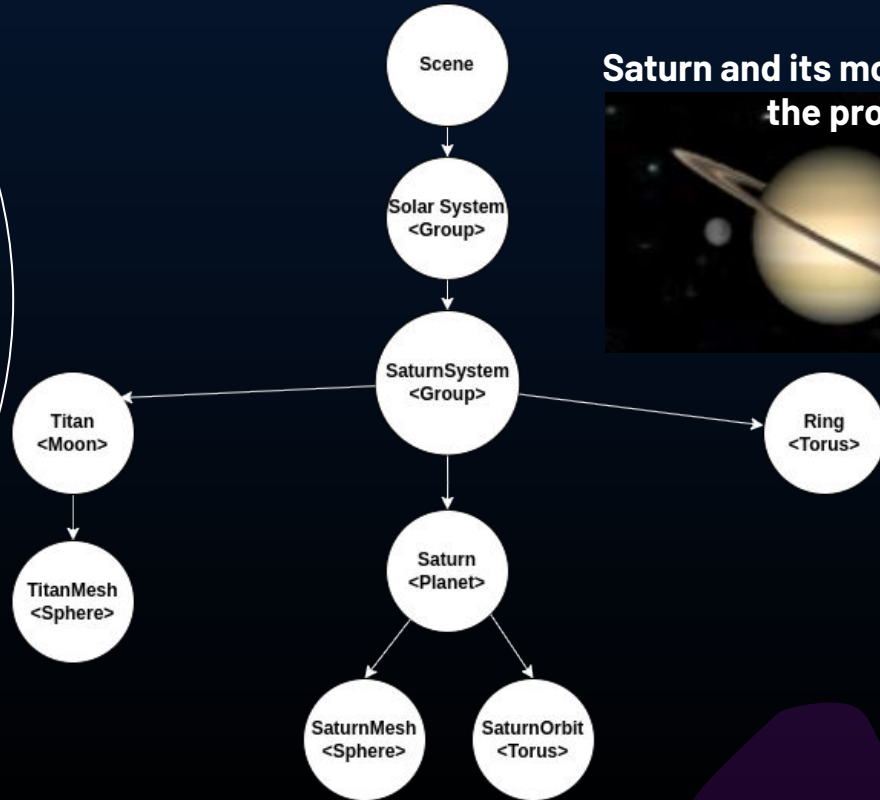
Zoom-in planet's and moon's surface

Use of the OrbitControls Three.js module

- URL: <https://artur-romao.github.io/three.js-solar-system/>



# Models and Scene Graph



Saturn and its moons display in the project



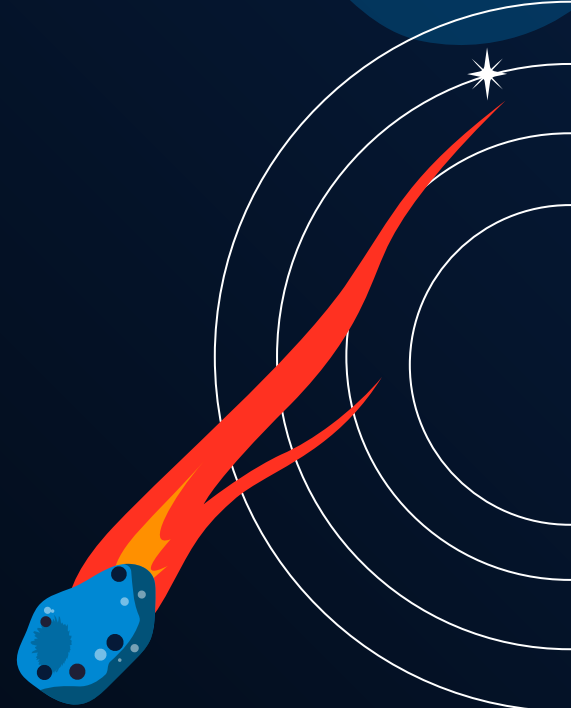
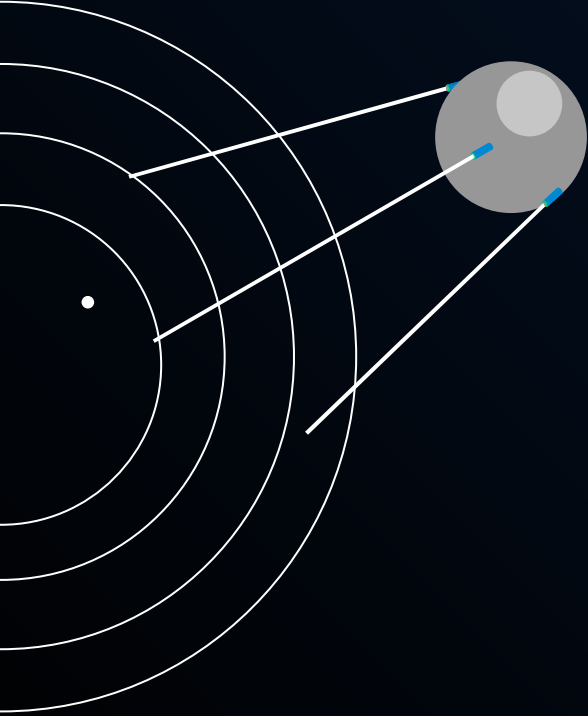
# Animations

**Sun, planets and moons self rotation**

**Planets and moons translation around the sun**

**Moon translation around the respective planet (through a mathematical expression)**

**Zoom-in planet's and moon's surface**

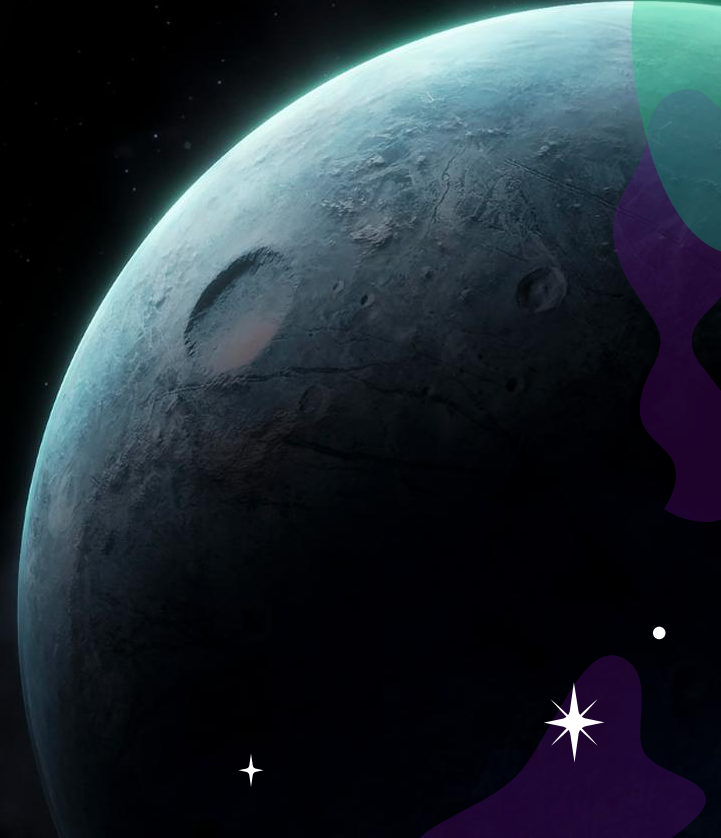


# **Illumination**

**PointLight located in the center of the sun**

**Simulation of day-night feature regarding the face towards the sun**

**Simulation of eclipses**



# User interaction



## Mouse

Exploring the environment  
(rotating the solar system,  
zooming into the planets)  
thanks to OrbitControls

Clicking in the “Show/Hide  
Planet Orbits” checkbox to  
interact with the orbits

Clicking in a planet or a moon  
translates the user next to it



## Keyboard

Stop the solar system motion  
when pressing the spacebar

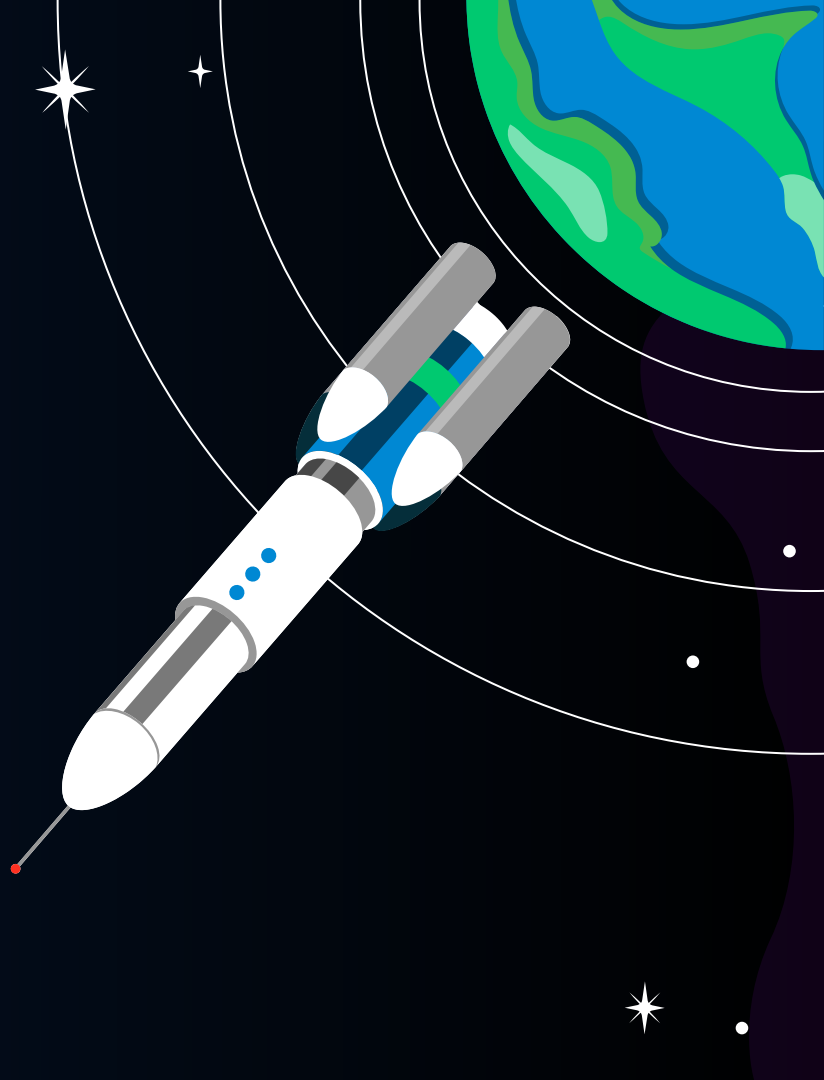
# Development and difficulties faced

Code organized in a folder "js" with 2 classes (Planet and Moon) and a module (OrbitControls) and 2 independent files (scene.js and index.html)

Had some struggles doing the moons translations around the planets

Difficulties while developing the zoom-in functionality

Saturn ring is not perfect, due to illumination



# References

Three.js documentation: <https://threejs.org/docs/>

Coding a 3D Solar System with JavaScript + Three.js: <https://www.youtube.com/watch?v=KOSMzSyiEiA>

And a lot of stackoverflow...



**Hope you enjoyed!**

