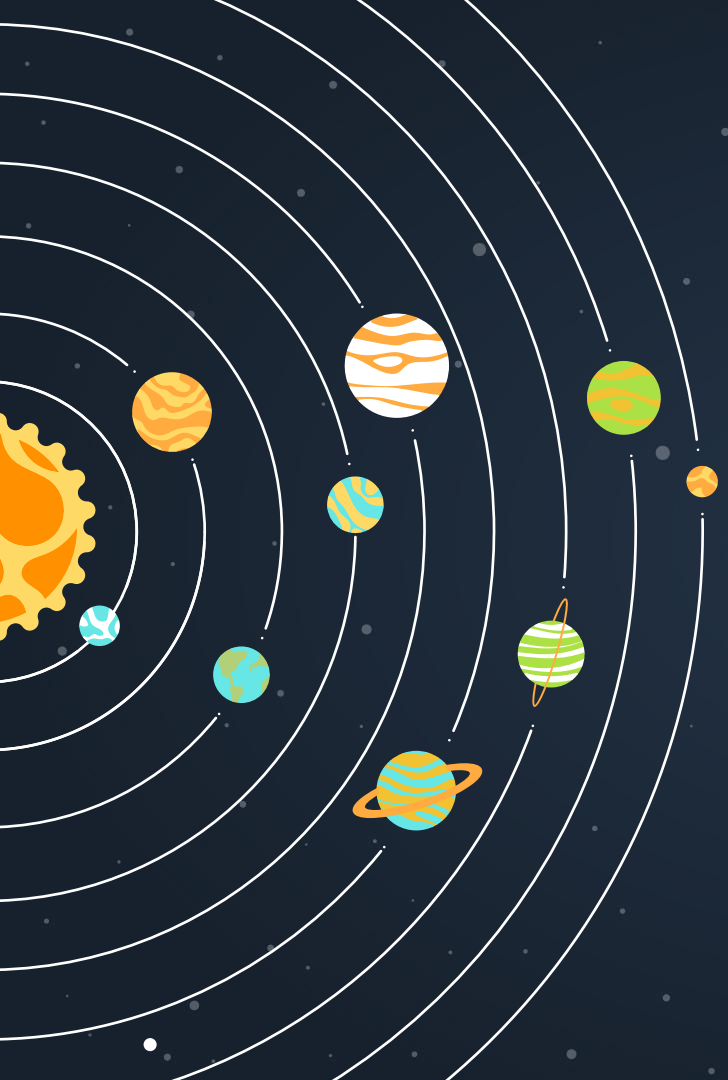


SPACE:

THE FINAL FRONTIER

Mentors:

- Sunny K. Bhagat
- Mubashshir Uddin
- Varun Singh

ABOUT THE PROJECT

This project lets us dive deep into the realms of Astrodynamics from analysing historical and futuristic space missions to Designing our very own missions on a simulation software.

PROGRESS REPORT

01 WEEK
- Design
- Structure
- History of rockets

02 WEEK
- Rocket Equation
- Re-Entry
- Heat Shields
- Assignment 1

03 WEEK
- Kerbal Space Program
- SSTO and DSTO
- Assignment 2A

04 WEEK
- Propellants
- Engines
- Assignment 2B

05 WEEK
- Aerodynamics
- Assignment 2C

06 WEEK
- Trajectory Optimization
- MOGA Modelling
- Assignment 3

07 WEEK
- Orbital Dynamics
- Unusual Methods of Propulsion
- Communication

08 WEEK
- Habitability
- Interstellar Voyage
- Sample Mission Reports

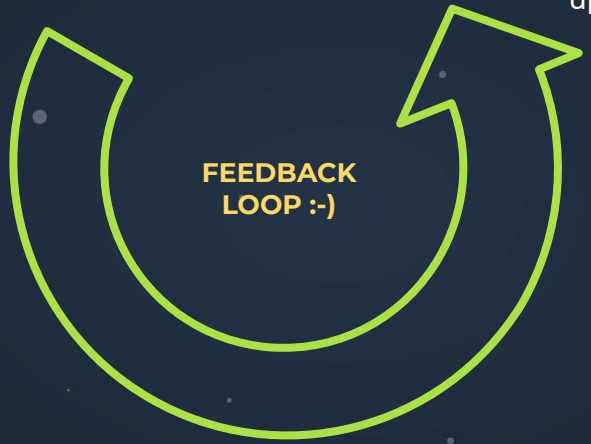
WHAT WE COVERED

1. We kicked off with History of Rockets.

2. Extensive discussion on design and structure of a rocket.

3. We were introduced to the ‘ROCKET EQUATION’ to understand about rocket dynamics and maneuvering.

4. Simulate mission launches in Kerbal Space Program



5. Introduction to Aerodynamics and Re-entry

6. Introduction to Rocket Engines and Propulsion (Even unusual methods)

7. Orbital Dynamics and Communications were covered

8. Discussing future prospects of the project, like Habitability and Interstellar Voyage and improve upon our knowledge

KERBAL SPACE PROGRAM

OF COURSE THEORETICAL KNOWLEDGE IS GOOD, BUT WHAT'S THE FUN WITHOUT IMPLEMENTING IT?

Kerbal Space Program is a Game-cum-Simulation software that allows us to get a deep insight into working of a spacecraft. If you haven't already used it, we seriously do recommend it. Here are a few screenshots of our mission to Mun (Kerbin equivalent of Earth's moon)

MOGA MODELLING

As rockets are costly, we gotta optimize ‘em to yield the best results. To do this, we employ the use of MOGA (Multi Objective Genetic Algorithm).

We do so to get the ‘best of the best’, or so to speak :-)

SAMPLE MISSION REPORTS

APOLLO II

It was the spaceflight launched by NASA that first landed humans on moon

MOM

Mars Orbiter Mission is ISRO's first interplanetary mission to planet mars

CREW DRAGON RESILIENCE

This is SPACEX's mission that launched astronauts to the ISS from United States.

ARTEMIS

It is a United States-led program with primary goal of returning humans to moon

RESOURCES

REGULAR LECTURES

Regular lectures by our mentors aided by presentation

WEEKLY ASSIGNMENTS

We were provided with weekly assignment for application part

DOUBT DISCUSSIONS

Doubt sessions were conducted so as to clear all our queries related to everything taught in sessions

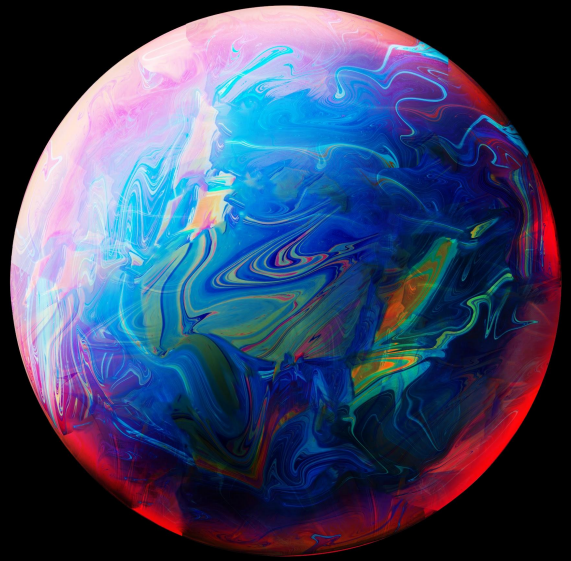
FUTURE GOALS

FUTURE MODELLING

Trying out new modelling techniques other than MOGA such as HCD to get more accurate results.

APPLICATION

In depth application of concepts and Orbital Perturbations to be studied



Cosmos is within us...

THANK YOU!

Space is for everybody. It's not just for a few people in science and math or a selected group of astronauts. That's our frontier out there and it's everybody's business to know about space.

- Christa McAuliffe