

Chirag Ullas Kumar Pandya

Student | Aerospace Engineer | Propulsion Systems | Astrophysics Enthusiast

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📍 Mumbai, India

🌐 Chirag Pandya

📅 4th April 2000



👤 Profile

A visionary **Aerospace Engineer** with a proven track record in advancing space exploration and propulsion technologies, I thrive at the intersection of innovation and technical precision. Armed with a robust academic background and extensive hands-on experience, I have spearheaded high-impact projects in aerospace design, propulsion systems, and space robotics, collaborating with industry leaders to push the envelope of what's possible. From pioneering research on alien technosignatures and exoplanet habitability to engineering next-generation propulsion systems, my expertise lies in solving complex problems with cutting-edge simulations and analysis. Driven by an insatiable curiosity for the cosmos and a relentless pursuit of breakthroughs, I am the catalyst you need to redefine the future of space travel and interstellar exploration.

🎓 Education

Master's Degree in Astrophysics

Vilnius University, Faculty of Physics

September 2022 – September 2023

Specializations: **Cosmology, Astrobiology, MPI Programming, Stellar Astrophysics**(Terminated due to family health related issue)

Bachelor's Degree in Aerospace Engineering

SRM Institute of Science and Technology

August 2018 – May 2022

CGPA: 8.93 **Key Courses:** **Propulsion Systems, CFD, Cryogenic Propulsion, Numerical Simulations, Aircraft Structures**

📁 Projects

Electron Transport Through Hall Thruster's Acceleration Channel

Major Project(SRMIST)

December 2021 – May 2022

- Developed a simulation for electron transport in **Hall Thrusters**, reducing power consumption by 10%.
- Improved deep space propulsion design through **FEA analysis and fluid-structure interaction**.

Orbital Transfer Mission Design for Titan

Minor Project(SRMIST)

July 2021 – November 2021

- Optimized a trajectory using **gravitational slingshot** techniques, reducing fuel consumption by 25%.

📅 Professional Experience

Intern (Space Mission Design & Orbital Mechanics)

Space Technology and Aeronautical Rocketry (STAR)

August 2024 – September 2024

- Designing space missions from **Earth to the lunar surface** using **General Mission Analysis Tool (GMAT)**.
- Simulating **orbital transfers, trajectory optimization**, and lunar landing sequences.
- Developed mission parameters using **orbital mechanics** principles for efficient **fuel usage** and **mission timeline optimization**.
- Assessed mission feasibility and potential for lunar surface exploration, considering spacecraft **delta-V requirements, gravitational assist**, and **landing strategies**.

Intern (Design and Manufacturing Domain)

Prime Toolings

July 2024 – August 2024

- Led **Aeroelasticity Effect Analysis** on gas turbine blades, optimizing cooling systems through **numerical simulations**.
- Improved **high-torque BLDC motors** for **UAVs and CNC machines**, refining design and manufacturing processes for increased performance.
- Conducted **CFD-based investigations** on turbine blade arrays, enhancing thermal efficiency by 15%.

Intern (Deep Space Propulsion Systems)

Aeroin SpaceTech

May 2024 – June 2024

- Developed models for various **deep space propulsion systems**, focusing on **ion propulsion** for rapid interplanetary exploration.
- Optimized spacecraft **navigation and trajectory** using **gravitational assist techniques**, reducing mission time by 20%.
- Assisted in analyzing the **mechanical design** of ion propulsion systems and improving **thrust efficiency**.

Intern (Rocket Propulsion and Deep Space Exploration)

Aeroin SpaceTech

May 2024 – June 2024

- Worked on advanced **rocket propulsion systems**, including **swarm robotics** and **deep space mission analysis**.
- Assisted in the design and testing of various **propulsion systems**, with an emphasis on **ion propulsion** and its application in **gravitational assist maneuvers**.
- Analyzed mission feasibility for exploration missions targeting **Proxima Centauri b**.

Publications

Exploring the Intersection of Alien Megastructures and Multidimensional Spaces

July 2024

Gravitational Slingshot: Rapid Exoplanetary Exploration using Ion Propulsion

July 2024

Robotics and Swarm Intelligence: The Future of Deep Space

July 2024

Certificates

- Machine Learning with Python
- AI for Everyone
- Quantum Mechanics
- Mechanical Engineering Design with Fusion 360
- Python

Technical Skills

Design & Simulation — Aeroelasticity Analysis | Thermal Analysis (Turbines, Spacecraft, CubeSats) | CFD (Computational Fluid Dynamics) Simulations | Finite Element Analysis (FEA) | Antenna Design and Optimization | Gas Turbine Blade Design | BLDC Motor Design | Electromagnetic Simulation • **Aerospace & Propulsion Systems** — Gravitational Assist Maneuvers | Ion Propulsion Systems | Hall Effect Thrusters | Cryogenic Propulsion Systems | UAV Propulsion Design | CubeSat Design | Rocket Engine Design and Fabrication | Gimbal Systems and GNC (Guidance, Navigation & Control) • **Software Tools & Programming** — ANSYS Fluent | MATLAB & Simulink | SolidWorks | Fusion 360 | CATIA | OpenRocket | FEKO (for antenna and electromagnetic simulations) | Python (for simulations and machine learning applications in aerospace) | C/C++ (for embedded systems in space technology) | MPI Programming (for parallel processing and large-scale simulations) | General Mission Analysis Tool (GMAT) • **Numerical & Analytical Methods** — Orbital Mechanics (Trajectory optimization, Orbital transfer missions) | Thermal Management (Active cooling in aerospace applications) | Aerodynamics | Failure Mode and Effects Analysis (FMEA) | Fluid-Structure Interaction Analysis **Manufacturing & Fabrication** — Advanced Manufacturing Techniques | PCB Design (for CubeSats and space systems) | System Design and Fabrication for UAVs and Spacecraft | Embedded Systems Design (for rocket propulsion and spacecraft systems)

Intern

Prime Toolings

January 2024 – June 2024

- Performed a **numerical investigation** on the **aeroelasticity effects** of gas turbine blades with an active cooling system.
- Designed and manufactured **high-torque BLDC motors** for UAV and CNC applications.
- Conducted analysis on the **secondary flow interface effect** on a **series gas turbine blade array**, improving overall system efficiency.

Intern (CubeSat & Antenna Design)

Brahmastra Aerospace and Defence Pvt. LTD

November 2023 – December 2023

- Designed and optimized **CubeSat PCB** and **antenna systems** for small satellite missions.
- Used **ANSYS Fluent** and **CATIA** for **thermal analysis** and **structural design**, improving satellite performance and communication by 20%.
- Collaborated on **small-scale propulsion system design** for CubeSat missions.

Intern (System Design & GNC)

Omspace Rocket and Explorations Pvt. LTD

January 2021 – March 2021

- Developed **Gimbal System Designs** and **GNC Schematics** for satellite systems, ensuring precision in attitude control.
- Optimized **satellite design** to increase **maneuverability** and fuel efficiency in low Earth orbit missions.
- Assisted in simulation and analysis of **system control architecture** for small satellite missions.

Intern

Vaayusastra Aerospace PVT. LTD

October 2019 – December 2019

Throughout my internship, I worked on level 1 rocket engine design and fabrication, open rocket design, teamwork exercises, and built rocket candy

Soft Skills

Problem Solving | Analytical Thinking | Innovation | Attention to Detail | Critical Thinking | Time Management | Team Collaboration | Leadership | Communication | Adaptability | Research-Oriented Mindset | Creativity | Technical Writing | Interdisciplinary Collaboration

Interests

Interstellar Travel | Spacecraft Design | Alien Technosignatures | Propulsion Systems | Multidimensional Theories | Exoplanet Habitability | Aerospace Innovation