

# Bachelor & Master theses or other student projects: Satellite Operations, Orbit Simulation and Collision Avoidance Process

## Background:

- An increasing number of man-made residues in orbit (space debris) pose a significant threat to satellites and crewed spacecraft.
- In order to be able to continue spacefaring with justifiable technical and economic effort, it is imperative to avoid collisions between objects in space, which is one of the main sources of debris.
- Due to new applications, business models and lower launch costs the number of operational satellites in earth orbit will increase drastically in the next years, which will lead to a higher collision risk.
- In order to be able to perform efficient and safe collision avoidance even in this changed environment, new operational procedures are being developed at ESA/ESOC and TU Darmstadt.

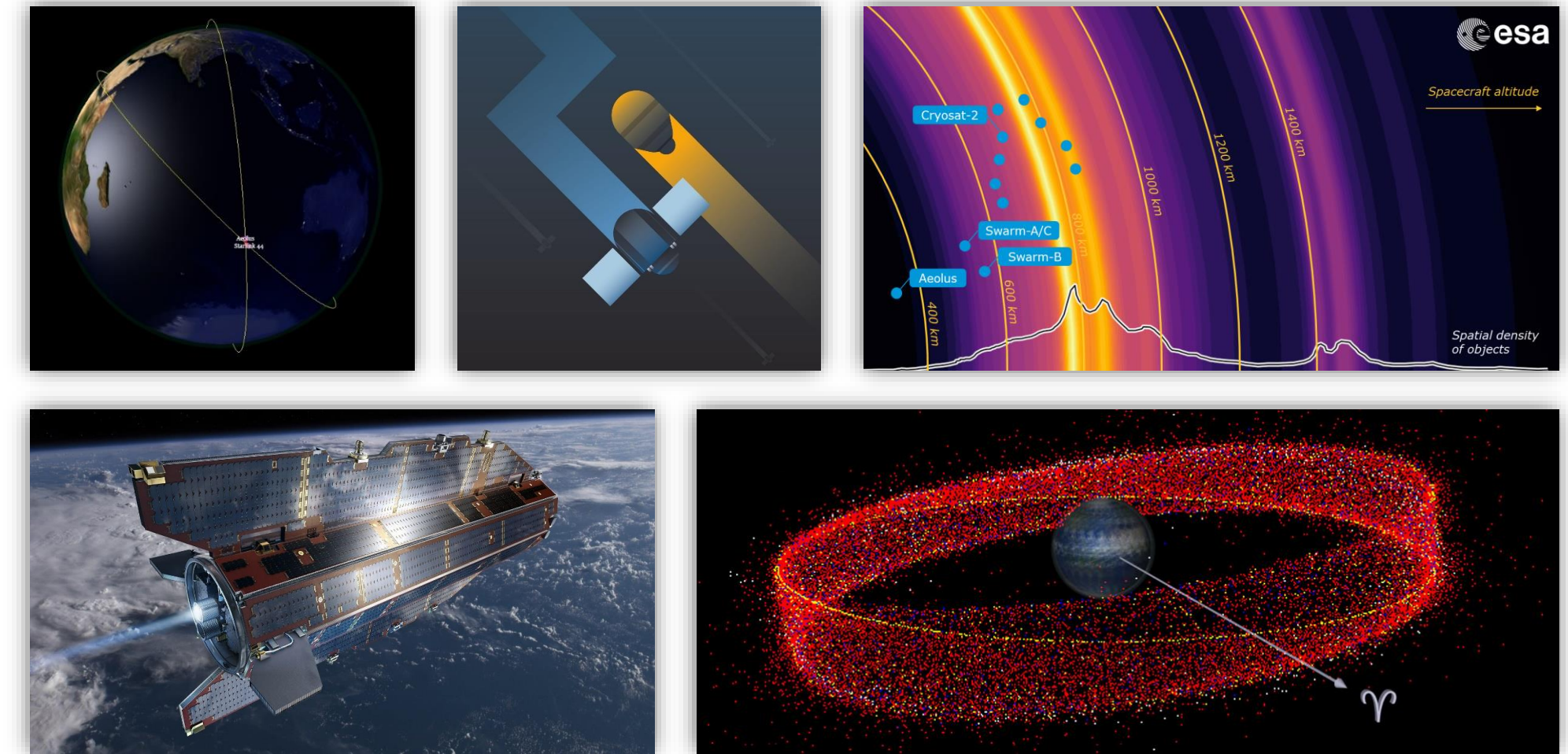
## Possible topics for Bachelor & Master theses or other student projects:

- Development and implementation of modules for an orbit simulation
- Characterization of the future satellite population (constellations) and generation of a database
- Analysis of the regulatory framework regarding space operations and space debris
- Development and assessment of new satellite collision avoidance processes
- many more...

## Required Skillset:

- Interest and enthusiasm for space topics
- Knowledge about orbital mechanics (mandatory) and satellite operations
- Experience in programming with python (for some of the topics)

If you are interested in one of these topics and have the required skillset just contact me and we will figure out if there is an open topic for you.



credit: ESA

