

## **Testimony of Nicholas Barbara**

**Undergraduate student, University of Sydney, Australia**

Research internship at ISAE-SUPAERO, Toulouse, France.

**Topic:** *Mission analysis for Geostationary Orbit recycler satellite*

**Department of Aerospace Vehicles Design and Control (DCAS)**

**Nicholas Barbara** is a 21-year-old undergraduate student at the University of Sydney, Australia. He's studying a combined B Engineering (Honours)/B Science (Advanced) degree, and is specialising in Aerospace Engineering, Physics, and Applied Mathematics. He will soon begin his fourth of five years in this course. This combined degree at the University of Sydney has allowed him to pursue his passions in both space mission engineering and astrophysics, offering plenty of opportunity for exciting research:

*"My project was to perform a feasibility study into the design of a spacecraft which could repurpose components in high-demand from satellites in Geostationary Orbit (GEO). This involved extensive research into the compatibility and failure rates of GEO satellite components, and defining a suitable mission operations architecture for the spacecraft (named "The Recycler"). I followed this with the development of a MATLAB mission analysis tool based on low-thrust orbit transfer mechanics to estimate the performance of the Recycler under various mission scenarios.*

*In undertaking this project, I was given the chance to design and manage my own work, using my meetings with my fantastic supervisor, Dr. Stéphanie Lizy-Destrez, to discuss points of contention in the mission design, and always push the project forward. This independence, and the necessary professionalism required to organise and manage all meetings with representatives from my industry partner, Airbus Defence and Space, has helped me to develop my professional skills as an engineer. I hope to build on the professional and technical skills that I have developed during my time at ISAE-SUPAERO in all of my future work and study".*

## What would you say to an Australian student if he came to do an Internship at ISAE-SUPAERO?

*“My advice to all future Australian students coming to ISAE-SUPAERO would be this: make the most of the amazing opportunities this university has to offer. Take on the most interesting projects you can, and if you work hard, you will be noticed, and you will find yourself making valuable lifelong connections with professionals in the aerospace industry, and future colleagues. While in Toulouse, don't be afraid to talk to everyone and try and improve your French. So many people in this city are very accommodating to an Australian who tries their best!”*

For the selection, we received a large number of files that were sent to us by the Embassy of France. We ranked them according to expected competencies and selected those that best matched the proposed topics.

Nicholas has been integrated into the SaCLaB team with the other trainees and PhD students” **Stéphanie Lizy-Destrez supervisor and head of the Chair for Advanced Space Concepts (SaCLab).**