

AGENCY

Smooth operators: students complete Ladybird Guide to Spacecraft Operations Training Course 2019

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Spacecraft are complex machines requiring dedicated staff to maintain their operations over the entire duration of a mission. To help prepare the next generation of spacecraft operators, [ESA Academy](#) has run the Ladybird Guide to Spacecraft Operations Training Course 2019. From 3 – 6 September, 30 Bachelor, Master, and PhD students with a science or engineering background, from 13 different [ESA Member States](#) and Canada, attended at [ESA Academy's Training and Learning Facility](#), ESEC-Galaxia, Belgium. They were joined remotely by 23 university students participating online, watching lectures streamed live or playing them back later, and interacting with the tutor via a forum.

The objective of the training course was to introduce students to the world of operations, teaching them how to think like operators, and showing how each subsystem of a spacecraft influences the way it is operated. Leading the tuition was a senior engineer from ESA's European Space Operations Centre in Germany. Course delivery was in the "Ladybird" style: without technical or mathematical jargon, but giving a comprehensive view of spacecraft subsystems and operations. "*I feel like I learned as much during this four-day course as I would in a year at university*," enthused a British student from the University of Leicester. "*I want to use what I learned to explore areas of the aerospace industry I hadn't even considered before.*"

— Fundamental concepts gave participants a solid foundation of knowledge.

The course's foundations were delivered through lectures filled with real-life examples. What operational mistakes have been made in the past, and what can we learn from them? Students were challenged to examine scenarios, determine

what had gone wrong, and suggest practical ways of fixing problems – or, ideally, avoiding them altogether. Tips on how to be a good operator were offered, along with common pitfalls. Then, spacecraft subsystems were discussed in detail, delving into the advantages and problems of the technologies involved.

The students' new knowledge was put to the test in a group exercise. Split into three teams, the participants were tasked with devising basic designs for a space mission. On the final day, each team's design was put to the test as they were presented with a simulated scenario in which their spacecraft encountered difficulties. Could the students use their burgeoning operational skills to determine the issue and save their spacecraft? Happily, all three teams rose to the challenge and emerged victorious!

Explained a German student from the Technical University of Munich: "*These past four days at ESEC-Galaxia brought me an unforgettable experience that has deeply strengthened my wish to pursue a career in the space sector in future. One of the best parts about this course is that you will have the opportunity to understand what really matters when operating a spacecraft and how to maintain a strong mindset under the operational pressure. Aside from that, working on a space-related project with inspiring people from different countries was such a thrilling experience; it definitely belongs to those things that you wish to do for the rest of your life.*"

As a bonus during the week, the students had the opportunity to visit [ESEC-Redu](#) for a special tour of the site, including inside an antenna and the [PROBA](#) satellites'

— Learning valuable lessons from expert tutors.