

AGENCY

Concurrent Engineering takes students to Venus!

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In brief

30 university students from 13 different [ESA Member States and Malta](#) have attended [ESA Academy's Concurrent Engineering Workshop 2022](#). Held from 18 to 21 October 2022, the event took place at [ESA Academy's Training and Learning Facility](#), ESA-ESEC, Belgium – which is also home to ESA's educational Concurrent Design Facility (CDF). Providing tuition and technical expertise were two ESA Systems Engineers, supported by a National Trainee as a Systems Engineering Assistant, all from [ESA's Systems and Concurrent Engineering Section](#).

In-depth

— [ESA Experts](#) giving a lecture to the students

The workshop aimed to familiarise students with the [Concurrent Engineering](#) approach and its many benefits for spacecraft design. Participants would also gain experience with the [COncurrent Model-based dEsign Tool \(COMET\)](#) used in ESA's CDF.

On the first day, the students received their challenge: to use Concurrent Engineering to design a mission and send a floating platform and a spacecraft to Venus. Since Venus exhibits similar properties as Earth in size and density, it provides a natural laboratory for studying how habitability evolved in the Solar System. To make this ambitious task even more difficult, the mission – named LOVE (Large Orbiter Venus Explorer) by the students - had to be designed to handle the thermal challenges of Venus, while carrying the large floating platform and still fitting in the mass constraints of a single Ariane 6.2 launch. Could the students work together to complete their design in just four days?

A Spanish Master's student from the Technical University of Madrid (UPM) mentioned: *"This workshop was an unforgettable experience that allowed me to really see how every design decision can have a great impact on the whole mission. Working concurrently has taken the design process to another level, and it has allowed me to bond with my colleagues and to learn more from them."*

The participants got to work right away, splitting into different teams to cover the vital aspects:

1. Configuration
2. Structures/Mechanisms
3. Trajectory Analysis
4. Propulsion
5. Attitude and Orbit Control Subsystems (AOCS)
6. Power
7. Thermal
8. Communications & Data Handling
9. Optics & Sensors