

AGENCY

University students complete ESA's Human Space Physiology Training Course 2018

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What is it really like to live in space? What happens to the body in microgravity? How do astronauts adapt to the extreme conditions of space travel? These questions, and more, were investigated by students participating in the Human Space Physiology Training Course 2018. Covering four days from 20 – 23 March 2018, this innovative course was a collaboration between ESA's [Education Office](#) and the [Space Medicine Team](#).

Two host locations ran the course together via videoconference. ESA Academy's Training and Learning Centre, [European space Security and Education Centre \(ESEC, Redu\)](#) in Belgium hosted 22 university students from 14 different Member and Associate States. Meanwhile, 20 further students from European academic partner organisations (from 7 different Member States) participated from the [European Astronaut Centre \(EAC\)](#) in Cologne, Germany.

On-hand to offer guidance were 12 experts from [ESA](#), [DLR institute](#), the [Institute for Space Medicine and Physiology \(MEDES\)](#), and several European universities. A British student from Queen Mary University of London said, *"It was an honour to hear talks from speakers with such expertise; especially hearing about life in space from an astronaut! I would recommend applying for this course to any student interested in space."*

During the training course the students were introduced to:

— Students presenting their group project

- The history of human spaceflight.
- How the space environment differs from life on Earth, and the challenges it brings for current and future space exploration.
- How specific physiological systems respond to microgravity, including the underlying mechanisms and how these effects could be overcome.
- How the human body functions both in space and on Earth.
- The dangers of radiation. This was a new aspect of the training course, included in response to a suggestion made by students who participated in last year's course.

"The lectures of this week gave me a more complete knowledge of how human physiology is affected in space," explained an Italian student from Politecnico di Milan. *"I was positively impressed by discovering the high number of methods that can be used to study those modifications. I particularly appreciated that those themes were treated both for the current space flights and ground analogues, as well as for the future missions and technologies more oriented to longer duration space flights, topics not generally discussed in universities."*

During the week, the students were also split into teams of 4-

— Lecture from an expert

5 to work on group projects. Their challenge was to research future issues of human spaceflight. On the final day each team presented their findings to the others. Their topics, which demonstrated the variety of challenges we face, were as follows:

- **Female flyers.** As the gender mix of space crews becomes more balanced, how could/should female astronaut health be supported differently to that of males?
- **Elderly extra-terrestrials.** The average age of astronauts is currently in the late 30s, but is set to be older for exploration missions. Why might this be advisable, and what could the implications be of older crewmembers?
- **Floating forever.** What might be the major issues associated with long space missions of up to three years?
- **Head for heights.** Will there be psychological challenges of losing sight and real-time communication with Earth?