

New ideas for humans to survive far from Earth

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Credit: AI-generated image ([disclaimer](#))

How can we build a habitat on an ice-covered planet? The Swiss Space Center (SSC) has entered a partnership with the European Space Agency (ESA) to prepare ESA_Lab@CH and is inviting students in Switzerland and elsewhere in Europe to share their ideas through a dedicated website.

Can students, looking at the world from a fresh perspective, come up with innovative solutions? The Swiss Space Center (SSC) thinks so. The SSC, based at EPFL, has just launched the "My idea for [space](#)" website, which invites students from all universities in Switzerland and elsewhere in Europe to share their ideas. This new platform, in addition to attracting all kinds of ideas regarding space technologies, is the home of a major pilot project, in preparation of ESA_Lab@CH.

The project, whose theme is how to create a human habitat in ice, is related to the European Space Agency (ESA) "ESA_Lab@" initiative. That initiative consists of educational activities that aim to foster closer contact and interaction between the [space industry](#) and universities. The aim of these activities is to encourage R&D and the discovery of [innovative solutions](#). This first project will serve, in some ways, as a proof of concept.

"The space industry has entered a new era," says Tobias Bandi, the SSC engineer in charge of the project. "In the past, only a few of the world's major powers had space-related activities, but the industry is now seeing the arrival of new participants such as private-sector companies, developing countries, academic institutions, industries and private individuals. So it needs to take a more open approach. There are 40,000 people working in the space industry but more than a million students gaining technical qualifications each year in Europe, so initiatives like this could potentially make a huge contribution."

The Moon Village



Credit: AI-generated image ([disclaimer](#))

Participants in the project are being asked to devise all solutions required for humans to live, long-term, far from Earth in a habitat carved from ice. "Many planets are either partly or fully covered by an ice cap," says Bandi. "So the project's theme is highly relevant to future space exploration. Ice also has a number of advantages, since it provides plenty of water and can protect people from radiation and meteorites."

The project will consider all aspects of human life and our day-to-day requirements – such as excavation, architecture, energy systems, sanitation infrastructure, waste management, water treatment and the production and preservation of food – and how they interact. In this, the project is taking a page from the ESA's Moon Village concept, which aims to solve problems by encouraging people from different disciplines to share their skills and ideas. An example of the type of solution the

project is seeking is the design of a pyrolysis reactor that converts organic material (human and other waste) into a form of carbon that can be used either to generate energy or fertilize plants.

Ideas that are also useful for life on Earth

For this project – and for subsequent ones if successful – the idea is to bring together around 30 participants from four to eight different countries. They will form small local groups, each of which will deal with a different aspect while working towards the common goal. Their work will last for one or two years, in line with standard academic timeframes. For participants, the project is an opportunity to work in a team, enhance their technological skills and gain experience in the space industry. For universities, it is a way for them to raise their profile, enhance their students' education and build new networks and collaborations.

Bandi also notes that the competitive element of the project could well produce ideas that are useful for life on Earth. It is also entirely possible that ideas that turn out to be impractical in space can be usefully applied in a different area, as is often the case with scientific discoveries. "In Europe, we have huge amounts of skills, knowledge and motivation that could benefit the space industry, and vice-versa. With this [project](#), we want to open doors between these various communities."

Provided by Ecole Polytechnique Federale de Lausanne

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