



Press Release, July 2017

Antarctic Greenhouse

EDEN ISS

Don't miss this opportunity to view the EU-funded mobile greenhouse, capable of growing plants without sunlight and soil!

14 leading European, Canadian and US-American universities, research institutes, corporations and SMEs collaborate to develop and build a facility that can grow healthy fruits and vegetables in a controlled environment.

Aeroponics is used to deliver essential nutrients directly to the exposed root system of plants, and light is provided by artificial LED lighting. The surrounding environment is monitored and controlled, to maintain target temperature, humidity, and carbon dioxide levels, and an advanced ventilation system cleanses the air of fungal spores and bacteria and sterilizes it using UV radiation.

The facility is now complete! Interested persons of the press and public can visit EDEN ISS and see how, cucumbers, radishes, peppers, lettuce, herbs and even strawberries can be grown in enclosed and confined areas.

The EDEN ISS facility will be shipped to Antarctica in Fall 2017, and can be viewed before at the DLR campus in Bremen in August 2017.

In Antarctica, the EDEN ISS test facility will undergo a one-year test campaign, led by DLR scientist Paul Zabel, and will provide fresh food to the over-wintering crew of the Neumayer III Antarctic station, operated by the Alfred Wegener Institute (AWI).

The knowledge that will be gained during the test campaign, will pave the way for growing food in space, and in other environments with limited or insufficient resources. The systems and technologies that will be tested in EDEN ISS, can hopefully contribute to short-term and long-term solutions for addressing global food shortages and changing environmental parameters due to climate change, and can potentially create spin-offs for Vertical Farming in cities.

Closed-loop technologies can be used to produce nutritious fruits and vegetables in deserts, arctic regions, or other extreme environments, and will be essential for supporting humankind on the moon and on Mars in the future.

A greenhouse as life support system for living on the moon and Mars

Track the progress of EDEN ISS on <http://eden-iss.net>, [Instagram](#) and [Facebook](#) using #MadeInAntarctica



Or come to visit the EDEN ISS greenhouse in person before it embarks on its Antarctic mission.

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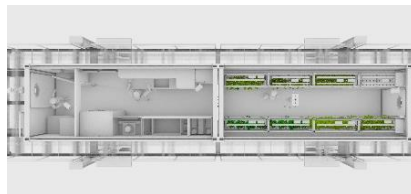
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The Full Press Kit and images are available at <http://eden-iss.net/index.php/press/>

Upon request, we are happy to provide you with TV-ready b-roll, with topics covering the exterior/interior of the Mobile Test Facility, Future Exploration Greenhouse, and Mission Control



EDEN ISS Mobile Test Facility, Rendering: LSG



EDEN ISS three distinct sections, Rendering: LSG



EDEN ISS external platform, Photo: Alfred-Wegener-Institute

EDEN ISS focuses on ground demonstration of plant cultivation technologies that can be applied to future exploration in space. EDEN ISS will provide fresh food for the crew at Neumayer III Antarctic station, February thru December 2018.

EDEN ISS is a Mobile Test Facility, designed and constructed by the EDEN ISS team and is comprised of three distinct sections; cold porch/airlock, service section, and Future Exploration Greenhouse.

The Mobile Test Facility will be placed on top of an external platform located approximately 400m south of Neumayer Station III.



EDEN ISS service section, Photo: Bruno Stubenrauch



EDEN ISS experiment prototype for the International Space Station, Photo: Bruno Stubenrauch



EDEN ISS nutrient delivery system, Photo: Bruno Stubenrauch

The service section of the EDEN ISS Mobile Test Facility, houses the main support subsystems, including: thermal, power, air management and nutrient/water subsystems and provides working space for pre- and post-harvest procedures.

Located in the service section, is the International Standard Payload Rack (ISPR) with small greenhouse in preparation of flying the experiment to the International Space Station.

A nutrient delivery subsystem allows different nutrient solutions to be applied directly into the root zone of the growing plants. Access nutrient solution is collected and re-cycled through the system.



EDEN ISS Future Exploration Greenhouse, Photo: Bruno Stubenrauch

The Future Exploration Greenhouse is the main plant growth area of the EDEN ISS Mobile Test Facility and consists of a highly adaptable multi-shelf growth system.

Plants are grown in 60cmx40cm plastic boxes and the entire Future Exploration Greenhouse offers about 12.5m² of cultivation area.



EDEN ISS crops, Photo: Bruno Stubenrauch

Pepper, Cucumber, Tomato, Swiss Chard, Radish, Herbs, Spinach, three varieties of Lettuce, and Strawberries are cultivated in the Future Exploration Greenhouse.



EDEN ISS LED light, Photo: Bruno Stubenrauch

The Future Exploration Greenhouse uses LED lights. LED's can be programed to emit different wavelengths; red, blue, magenta (red + blue), and white in color, to effect plant growth.



EDEN ISS atmosphere, Photo: Bruno Stubenrauch

The atmosphere is managed through a centralized system which circulates air through the Future Exploration Greenhouse, through a system of air ducts and louvers. During the Antarctic mission, samples of all cultivated food will be collected and labeled for research purposes. The quality content of the samples will be compared to the respective growth parameters that were used to cultivate the samples.



EDEN ISS sensing and monitoring, Photo: Bruno Stubenrauch

Thirty cameras and six sensing devices are distributed throughout the Future Exploration Greenhouse to monitor atmospheric conditions, and plant growth. Images and data sets will be transferred to partner institution, DLR in Germany, for study and analysis purposes.

EDEN ISS has developed imagery programs for analyzing plant health and for forecasting harvest time and amount. Images can also be used to detect plant growth, as well as the presence of mold, mildew and disease in the growth environment.



EDEN ISS Mission Control at DLR, Bremen, Photo: Bruno Stubenrauch

The EDEN ISS mission in Antarctica will be monitored and supported from the DLR in Bremen. A special Mission Control Centre was installed to provide efficient communication between the EDEN ISS MTF in Antarctica and project partners in Europe and North America.