



TECHNISCHE UNIVERSITÄT  
CHEMNITZ

# Joint Systems & Control Seminar and Physikalisches Kolloquium

26th April 2023 at 11:15, Room 2/N013

Everyone is invited for coffee outside the auditorium at 11:00



## Dr. Daniel Schubert

DLR Institute of Space Systems

### From the South Pole into Space – Vegetable Cultivation in Antarctica

A greenhouse in Antarctica provides insights for future plant cultivation on the moon and Mars. Heavy snowstorms with wind speeds of up to 150 km/h, temperatures below  $-40\text{ }^{\circ}\text{C}$ , total isolation cut off from civilization, including 10 weeks in complete darkness and no rescue capsule like on the International Space Station (ISS), with which a quick return home is possible. These are just some of the challenges faced by the EDEN ISS team during the space test mission at the German Neumayer Station III of the Alfred Wegener Institute in Antarctica. The research project, funded by the EU and led by the German Aerospace Center (DLR), is investigating how plants can be grown in future habitats on the moon and Mars. The longer-term presence of humans in space requires the development of new regenerative technologies to support food and oxygen production, waste recycling, carbon dioxide reduction, waste management, water purification and to keep the crew healthy and psychologically fit. EDEN ISS partners developed for the project the following components: Novel nutrient supply, high-power LED lighting system, biodetection and decontamination, imaging systems to monitor healthy plant growth. During the test mission in Antarctica, the greenhouse system provided various fresh vegetables for the 10 members of the hibernating crew. Project leader Dr. Daniel Schubert presents a general overview of the project in his talk.

**About the speaker:** Dr.-Ing. Daniel Schubert studied at the Technical University of Berlin and has an engineering diploma in industrial engineering with an emphasis on aerospace and production techniques. In 2011, he initiated the EDEN group at the DLR Institute of Space Systems for research on Bio-regenerative Life Support Systems and since served as the team leader of this group. His research expertise is set on habitat interface analysis and plant accommodation and dynamic plant production planning. In the same field he accomplished his PhD at the University of Bremen in 2018. Throughout many projects for ESA, EU, Bundesministerium für Bildung und Forschung, Wirtschaftsförderung Bremen, Dr. Schubert and his team developed many greenhouse concepts, vertical farming feasibility studies, and habitat technologies. Outstanding is the EDEN ISS project. He led this project with 15 international partners, including the organization of the deployment mission of the greenhouse system at the Antarctic research station Neumayer III in 2017/18.

**Time** Wednesday, 26th April 2023, 11:15 am

**Place** Reichenhainer Str. 90, Zentrales Hörsaalgebäude, Room 2/N013

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