



## Task Description Bachelor's Thesis

### Research on state-of-the-art sensing instruments and their application for the IRS Life Support System Laboratory

#### Motivation:

The next generation of human space exploration missions will take crews farther away from Earth than ever before. This results in increasingly sophisticated life support systems to keep the astronauts alive, happy and healthy. Mission scenarios of this kind therefore require greater autonomy, relying on sensing instruments to detect off-nominal behaviour.

In order to be able to simulate these Environmental Control and Life Support Systems (ECLSS) at the IRS a small-scale laboratory is going to be constructed. To be able to analyse the inner workings of the different systems, their parameters have to be measured. Various techniques and sensors can be used for this. In the future these sensors should be used to extract data from the laboratory and feed a Digital Twin of the LSS in the Virtual Habitat (V-HAB) model. The aim of this thesis is to investigate possible sensor solutions for the IRS ECLSS laboratory, conduct a trade study as well as outline the individual sensors' behaviour and problems.

#### Task Description:

- Familiarization with life support system technologies and sensor systems
- Research on ECLSS laboratories and the sensors used
- Identification of the different sensor types
- Development of a recommendation for sensors to be used in the LSS laboratory
- Outline of possible problems for each recommended sensor
- Documentation

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#### Start date:

Choose Date

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