

IAF SYMPOSIUM ON FUTURE SPACE ASTRONOMY AND SOLAR-SYSTEM SCIENCE MISSIONS
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Author: Mr. Bram de Winter
VU Amsterdam, The Netherlands

Prof. Bernard Foing
ESA/ESTEC, ILEWG & VU Amsterdam, The Netherlands

Mr. Marc Heemskerk
VU Amsterdam, The Netherlands

Mrs. Marjolein Daeter
VU Amsterdam, The Netherlands

Mrs. Amanda Kruijver
VU Amsterdam, The Netherlands

Ms. Dieke Beentjes
VU Amsterdam, The Netherlands

Mr. Bram Albers
VU Amsterdam, The Netherlands

Mrs. Arlene Dingemans
VU Amsterdam, The Netherlands

Ms. Tinka Clement
VU University Amsterdam, The Netherlands

VUSE, VU AMSTERDAM UNIVERSITY/EUROMOONMARS 2018/2019 ACTIVITIES: VU SCIENCE
EXPERIMENTS AT IGLUNA MOON-ICE SIMULATION HABITAT.**Abstract**

As focus point of ILEWG Euromoonmars 2018/2019, an independent team of 13 VU Amsterdam students and Euromoonmars members, called VUSE (VU Science Experiments), is preparing a science experiment showcase at IGLUNA, a human Habitat in ice. This student based project is the first ESALab precursor, organized by Swiss Space Center to investigate a human settlement near the South Pole craters on the Moon. Because in the nearby future it is almost certain that a Moon habitat will be built, it is an crucial part to investigate the possibilities to improve science data from the Moon. An analysis laboratory in a habitat could collect crucial moon data.

The VUSE team is investigating the possibilities for a science habitat within a habitat, at equatorial locations and polar regions with the possibility of water ice. To demonstrate Moon-Ice science experiments and data analysis, VUSE will participate in IGLUNA to focus on performing glaciology and geology experiments in a Moon simulation habitat. Performing glaciology experiments requires a change to the laboratory equipment and structure. The working space for ice samples must be below 0 degrees and kept in a anticontamination room. The VUSE team collaborates with ILEWG IGLUNA team to design and build an anticontamination working space at low temperatures for IGLUNA campaign in June 2019.

At the Zermatt glacier, ice samples will be collected following strict astronaut sampling procedures. A ground control center and remote support team will communicate with the analog astronauts collecting these samples. The samples will be chemically and biological analyzed, as well as observed on a polarized

microscope to detect deformation in ice crystals. This laboratory data will be combined with remote support satellite data, drone footage and field observations to detect the full recent history of the Zermatt glacier.

The set-up of building a laboratory that includes an ice samples analysis working place is being tested at Exohab in ESA ESTEC, the Netherlands. The added ice sample analysis module includes a polarizing microscope, that also can be used for observing moon rock samples, minION DNA sequencer for investigating microbes in ice, microscopes and a VIS-NIR spectrometer.

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