

## IGLUNA: ILEWG BTU Smart Ice Lab

**Anna Sitnikova (1)**, Lyubov Dimova (3), Ariane Wanske (3), Bernard Foing (2) and ILEWG IGLUNA team (G vd Sanden (1), M. Grosjean (1), D. Moritz (3), M. Löffler (3), I. Schlacht (1), E. Glukhova (1), D. Kozhina (1) et al)  
(1) ILEWG International Lunar Exploration Working Group (annesitnikova@gmail.com), (2) ESA ESTEC, (3) BTU Cottbus

### Abstract

We will give an update on tests we run at ESTEC simulation site, EuroMoonMars Iceland mission and report on the results, lessons learned during IGLUNA field campaign.

### 1.Introduction

IGLUNA is the first ESA\_Lab demonstrator project lead by Swiss Space Centre. This project brings together 20 student teams from 13 universities from 9 countries around Europe to develop a Human Habitat in Ice inside a glacier cave at the Glacier Palace of Klein Matterhorn in Zermatt, Switzerland, from 17 June to 3 July 2019. [1]

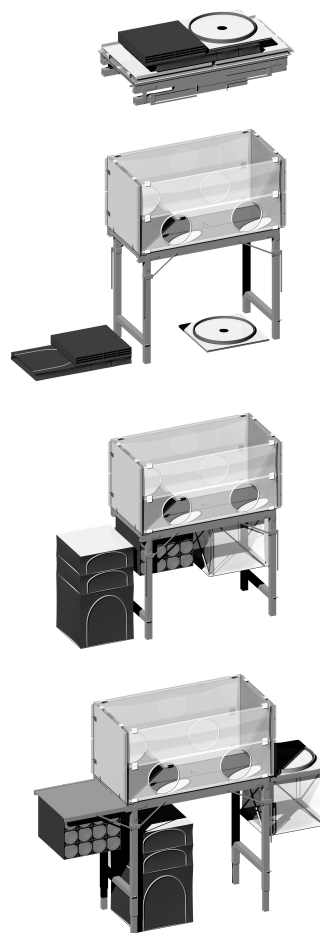
Mission of ILEWG [2] BTU team in this project is to provide scientists with the capability to conduct examinations and measurements on ice samples and cores, and to preserve the integrity of these for current and future investigations. We work together with art scientists to visualize scientific data and provide public outreach.

#### 1.1 Scientific Goals

ILEWG developed EuroMoonMars, an evolving pilot research programme starting with a Robotic Test Bench (ExoGeoLab) and a Mobile Laboratory Habitat (ExoHab) at ESTEC, & ExoLaboratory (ExoLab). They can be used to validate concepts and external instruments from partner institutes. [2] For IGLUNA we are developing a mobile Smart Ice Lab module to provide safe smart environment for VU science experiments and EPFL 3d printed saw experiment. We will deliver and preserve samples mined by RWTH Aachen team.

Laboratory unit shall provide stable anti-contamination environment for a number of experiments. It shall integrate glove box workspace at least 100x40x50cm, airlock at least 40x40x40 cm, storage facility at least 60x40x35cm, science instruments (scale, thermometer, computer, cameras,

lamps, pulveriser, saw, spectrometer VNIR/VISNIR, polarized microscope, microtome knife, heater pad, EC- and pH-meter, glass beakers etc.) Lab unit design is carried out in by BTU Master architecture students. Design challenges – portable deployable science working station and storage units with an envelope of 2,5 x 1 x 1,5m; Easy to assemble: 1 h. with 2 people; Compact to transport.



*Fig.1 Smart Ice Lab deployment sequence by A. Wanske & L. Dymova*

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## References

- [1] <https://www.spacecenter.ch/igluna/>, [2] Foing, B.H (2017) LPS49, Abstract #5073