IGLUNA: Field Campaign and Preparations for a Habitat in Ice.

M. V. Heemskerk[1], B.H. Foing[2], and B. de Winter[1]
[1]VU Amsterdam, (mvheemskerk@gmail.com), (dewinterbram@hotmail.com), [2]ESA ESTEC (Bernard.Foing@esa.int)

Introduction: IGLUNA is the first ESA_Lab inter-university pilot project on a big scale, and it is coordinated by the Swiss Space Center [1]. As a modular demonstrator project, IGLUNA focuses on the topics and problems of habitation inside lunar ice caps. For 2 semesters, 20 student teams from 9 countries across Europe develop modular demonstrators that will be tested and presented in a field campaign. This campaign will take place in Zermatt, Switzerland from 17 June – 03 July 2019. During this time, the students will bring their projects together to build a 36m2 human habitat inside the Glacier Palace in Klein Matterhorn. The Glacier Palace will be open for the public and visitors will have the opportunity to observe or even participate in the experiments.

The idea to build a future inside lunar ice caps has been encouraged by recent scientific discoveries, a.o. by LRO/LCROSS [2], and Chandrayaan-1 [3], which proved high contents of hydrated soil and the presence of water ice inside the craters of the lunar South Pole.

Student teams: In total, 20 teams will each make individual designs and projects, which will be combined into one large modular analogue lunar outpost, including a habitat with a greenhouse inside the glacier, radio stations and a lander equipped with scientific instruments and telescopes on top of the glacier, and projects focused on outreach and educational programs inside a presentation hall of the facilities near to the Glacier Palace, see the image on the right (tilted).

All the participating student teams are listed below, divided in 'functional groups' of six different categories.

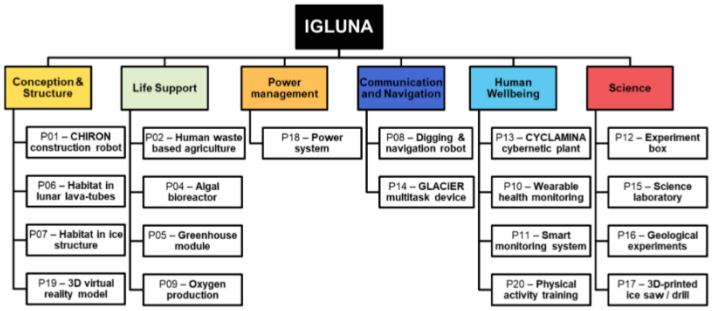

Fig. 2 The overall layout of IGLUNA and its functional groups. The project number of each group is originating from the date of submission of the letter of intent, and has no further meaning.

Mission progress: Being a student-based project, the individual project teams defined their own boundaries and requirements, which were then finetuned with the dimensions and requirements set forth by the Glacier Palace and Swiss Space Center. The project teams started their initial designs in September 2018, after the student coordinators of the teams got together in Zurich, Switzerland. After three months of close guidance and conference calls, the project teams met once again in January 2019 in Geneva, to discuss their ideas, present their progress, and 'freeze' their designs – defining one, final, design for each project.

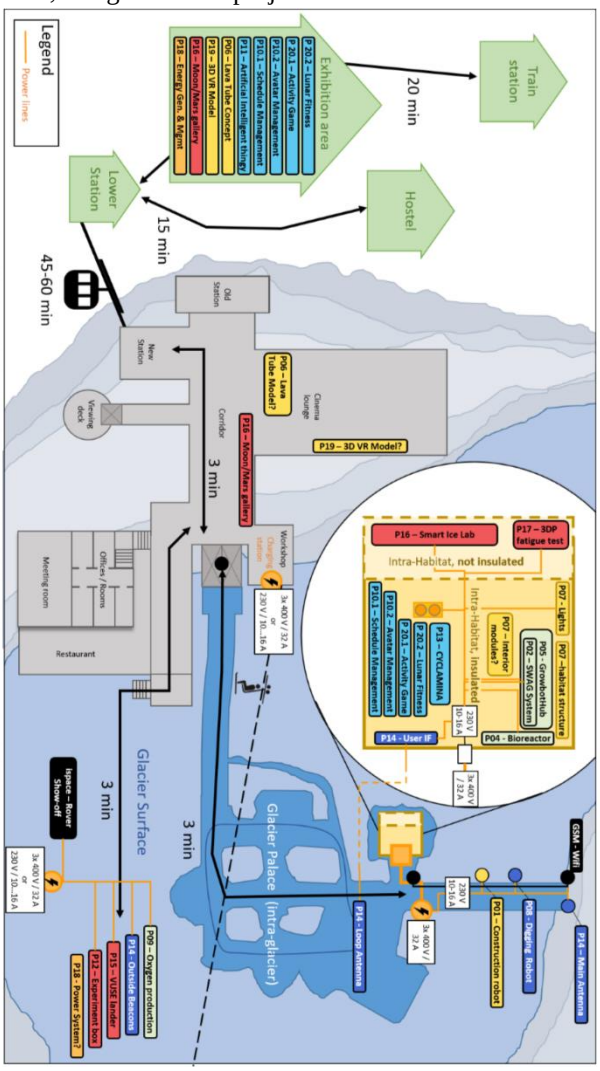

Fig. 1 Schematic lay-out of the analogue base of the IGLUNA field campaign in and around the Glacier Palace, Switzerland.

The student teams will meet once more, during the field campaign in June/July 2019. At the moment of writing, this has not yet taken place, but the field campaign will be concluded just two weeks before the presentation of this short abstract at the SSERVI ESF. Depending on the state and how the individual projects were received, the first results and short retrospect views will be shared during this Forum.

References: [1] https://www.spacecenter.ch/igluna/ [2] E. Lakdawalla, 2009[3] https://www.nasa.gov/