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ESA/ELGRA Gravity-Related Research Summer School

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Introduction

The European Low Gravity Research Association (ELGRA) [1] and the European Space Agency (ESA) [2] co-organise since 2016 an annual Summer School on gravity-related research. The main objective of the Summer School is to promote gravity-related research amongst future scientists and engineers. These young minds are introduced to the benefits of performing research at different gravity levels and offered an overview of current research under microgravity and hypergravity conditions in both life and physical sciences. Over four and a half packed days they attend stimulating lectures and work within small groups to devise ideas for prospective experiments.

The Summer School takes place, every June, at the ESA Academy´s Training and Learning Facility in ESEC-Galaxia, Transinne (Belgium) and is opened to 30 Bachelor and Master students in science or engineering disciplines from ESA Member States, Canada and Slovenia not yet involved in the space sector. The trainers are ELGRA and ESA experts from across Europe, sharing their experience and know-how with the students, including their day-to-day work and research experience in biology, human physiology, and physics. The participating students and trainers (Fig. 1) are sponsored by ESA and ELGRA to cover their travel, accommodation and meals.

Figure 1: Group picture at ESA/ELGRA Gravity-Related Research Summer School, 2016

Each year, ELGRA contacts their members to offer them the opportunity to participate in the Summer School by submitting an abstract for a lecture in life or physical sciences (Fig. 2). SELGRA (the student association of ELGRA) is also supporting the Summer School by presenting their activities and offering students the opportunity to join the association.

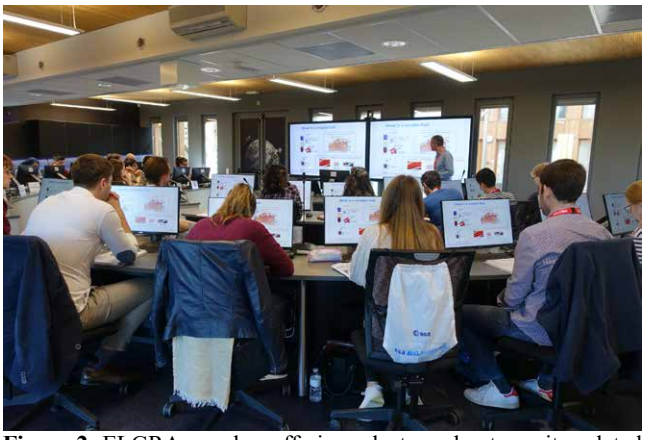

Figure 2: ELGRA member offering a lecture about gravity-related research during the ESA/ELGRA Gravity-Related Research Summer School, 2018

Summer school contents

The Summer School programme includes lectures in the following topics:

- Gravity-related research and gravity-related platforms
- Hands-on opportunities for university students
- Introduction to project management
- Gravity-related experiment development
- Experiment life cycle
- Physical sciences at different g levels
- Life sciences at different g levels
- Human physiology at different g levels

The lectures are complemented by three testimonials from university students who have designed, built, tested and performed a gravity-releated scientific experiment in the frame of ESA Academy's hands-on programmes [3].

Throughout the Summer School, the students are asked in groups of five to generate an idea for a future gravity-related experiment. They are asked to come up with a scientific or engineering objective, to choose a gravity-related platform and propose a preliminary experimental setup and procedure. Students take advantage of the continuous presence of experts to discuss their ideas. In the final day of the Summer School, as shown on Fig. 3 the student groups get the opportunity to present their projects and are evaluated by experts from ELGRA and ESA.

Figure 3: Student group presenting their project to ESA and ELGRA experts during the ESA/ELGRA Gravity-Related Research Summer School, 2017

Aside from the lectures and group project, students have the opportunity to visit ESEC-Redu [4] and the Euro Space Center [5].

At the end of the Summer School the students are presented with a certificate of participation and a course transcript including their evaluation to allow them to claim ECTS credit(s) for their participation to their respective universities.

Conclusions

The summer school aims at complementing what future scientists and engineers learn at university, inspire them and attract them into the space sector and its multiple research opportunities. Feedback from the participating students and trainers is very positive. Proposed improvements are taken into account by ELGRA and ESA for each rendition to improve the quality of the Summer School.

Acknowledgements

ESA and ELGRA would like to thank trainers who supported the four editions of the Summer School and shared their knowledge and enthusiasm with the university students.

References

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[2] www.esa.int
[3] N. Callens, L. Ha and P. Galeone, Benefits of ESA Gravity-Related Hands-on Programmes for University Students' Careers", Microgravity Science and Technology, Volume 28, Issue 5, 2016, pp 519–527
[4] www.esa.int/About_Us/Welcome_to_ESA/ESEC
[5] www.eurospacecenter.be