

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
On Track - Undergraduate Space Education (3)

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RESULTS AND LESSONS LEARNED FROM THE BARCELONA ZERO-G CHALLENGE

Abstract

The "Barcelona Zero-G Challenge" is a unique international contest aimed at motivating students to conduct research in zero gravity using an aerobatic aircraft to conduct experiments in parabolic flight. More than 50 students have already flown their experiments in previous educational campaigns. Up to 16 microgravity experiments designed by student teams from all over the world have been presented to this 2021-22 ongoing edition, which is an unprecedented number in the history of this contest. Data will be shown with the variety of experiments proposed and flown along with quotes from participants. A panel of experts from ESA Academy chose the winner team: an all-female group of Colombian student engineers from the University of Antioquia (Medellin), who have been invited to fly their experiment in parabolic flight in Barcelona (Catalonia, Spain) this fall. The team is named "Vera Gravitass", which in Latin means 'true gravity', and also refers to Dr. Vera Rubin, a famous female astronomer who made important contributions to science. They are part of the Colombian Association of Women in Aerospace, which aims to arouse women's interest in this science. Their proposed experiment is called "Deposition of tin droplets on electronic components in the absence of gravity." The experiment seeks to study how the solder pond of microgravity electronic component plates is arranged, a little-studied research topic that may have many applications in the immediate future. Over the last six months, this team of students has been working closely with the advice of researchers from UPC BarcelonaTech and pilots from the Barcelona-Sabadell Aviation Club in order to develop their experiment, adapt it to the cockpit of the plane and finally fly it this year 2022 from Sabadell Airport, in the outskirts of Barcelona . The team also receives a grant of 2,500 euros to carry out the experiment, aside from the opportunity to fly it in zero gravity. Importantly, they are conducting an important outreach program to explain their advances and motivate other students to pursue a career in STEM studies. We discuss herein how Challenge-Based Learning is able to provide a framework for outreach and educational projects that motivate students far beyond the classical syllabus taught at higher education institutions and universities. Lessons learned include the importance of international cooperation, the involvement of student associations and providing

effective and constant mentorship advice in order to achieve a successful educational campaign and reach the general public.