**The Spanish contribution to the 1st ESA Concurrent Engineering Challenge: design of the Moon Explorer and Observer of Water-ice (MEOW) mission**

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**Abstract**

The IDR/UPM Institute (*Instituto Universitario de Microgravedad ‘Ignacio da Riva’*) joined the 1st ESA Concurrent Engineering Challenge in September 2017. The aim of this Challenge, organized by the ESA Academy, is to gather around students of different ESA members or associated States to design a mission in the ESA CDF. Besides, three more groups of students from different institutions, *Universidad Politécnica de Madrid* (Spain), *Politecnico di Torino* (Italy), and University of Strathclyde (United Kingdom) were invited to participate in the challenge. In this challenge, students had to design a mission proposed by ESA. The goal of this challenge was not a competition but to share information between the different teams, in order to achieve the best results in all cases. *Universidad Politécnica de Madrid*, represented by students and professors from the Master in Space Systems (MUSE), successfully developed a full mission fulfilling the ESA requirements called Moon Explorer and Observer of Water-ice (MEOW). In the present work, the design process of the mission from the educational point of view is presented. Including the students preparation, the challenges encountered, leasons learned and how this experience contributed to improve the IDR/UPM Concurrent Design Facility.