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HUMAN AND TECHNOLOGICAL CAPACITY BUILDING THROUGH THE SHARJAH-SAT-1 CUBESAT PROJECT

Abstract

Sharjah-Sat-1 is 3U+ CubeSat, carrying a primary payload consisting of an X-ray detector to study bright X-ray sources in our Galaxy and a dual-camera system as a secondary, remote-sensing application payload. It is the first small satellite mission of the Sharjah Academy for Astronomy, Space Sciences, and Technology (SAASST) and University of Sharjah (UoS), developed in close collaboration with Istanbul Technical University Space Systems Design and Test Laboratory (ITU-SSDTL), and Sabanci University (SU). Small satellites, especially of the CubeSat standard, have been of great interest to universities and educational establishments, largely due to the lower costs and shorter development time they involve. This makes them ideal for engaging students in satellite missions' design, testing, and operation and offers a unique firsthand experience in the space industry. The Sharjah-Sat-1 project has provided an essential basis of theoretical and hands-on knowledge of space technologies. This included various extensive workshops to the team of undergraduate students involved and public outreach programs on satellites and space systems. Additionally, the project has created a solid infrastructure at the academy to develop further CubeSat missions in the future. Throughout the mission duration, the CubeSat laboratory at SAASST has been expanding and building the necessary facilities vital for the mission's success. This includes the high-performance workstation prepped with the required software to design, simulate and analyze the task in the space environment, the cleanroom (ISO6 certified) to integrate and test the satellite subsystems, and the ground station (VHF/UHF) needed to communicate with CubeSat once it

is in orbit. Furthermore, the participating students have been trained on the use of the different software applications and the operation of the ground station in the scope of the Sharjah-Sat-1 mission. The human and technological capacities that the Sharjah-Sat-1 project has built will certainly be transferred to future projects.