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OPPORTUNITIES FOR CUBESAT-RELATED CAPACITY-BUILDING UNDER THE UNITED
NATIONS ACCESS TO SPACE FOR ALL INITIATIVE: ACHIEVEMENTS IN 2023-2024

Abstract

The United Nations Office for Outer Space Affairs (UNOOSA) promotes international cooperation in the peaceful uses and exploration of space and in the utilization of space science and technology for sustainable socioeconomic development. UNOOSA's Access to Space for All initiative, developed to accelerate and modernize capacity-building efforts, provides tracks that offer gradual learning steps. There are currently three tracks; Hypergravity/Microgravity Track: designed with the end goal of developing the capacity of running space experiments onboard orbital vehicles or space stations; Satellite Development Track: aiming at building the capacity to design, develop, test, operate and utilize a satellite; and Exploration Track: designed to cover aspects related to space exploration beyond the geostationary orbit.

The Satellite Development Track currently has three hands-on opportunities in partnership with governmental, intergovernmental and commercial stakeholders. KiboCUBE, a joint endeavour with the Japan Aerospace Exploration Agency (JAXA) enables the deployment of a 1U CubeSat from the International Space Station (ISS). Thanks to the programme, satellites of Kenya, Guatemala, Mauritius, Moldova, and Indonesia have been deployed and there are three more CubeSats being developed. The Payload Hosting Initiative (PHI) in cooperation with the Mohammed Bin Rashid Space Centre (MBRSC) provides a maximum 3U payload hosting opportunity on a MBRSC-developed satellite. In 2022, UNOOSA and MBRSC selected two entities from Bahrain and Nepal for the 1st round and the teams are currently developing their payloads. The Vega C opportunity in partnership with Avio S.p.A. provides a 3U launch slot utilizing the Vega C launcher. UNOOSA and Avio selected a team led by Kenya which is leading an international consortium.

To provide theoretical knowledge on satellite development, UNOOSA, the Government of Japan and Kyushu Institute for Technology (Kyutech) provide the Post-graduate study on Nano-satellite Technology (PNST) fellowship programme, where students receive fully-funded scholarships to study the whole life-cycle of satellite development at Kyutech. There is a joint effort between UNOOSA, JAXA, and the University Space Engineering Consortium (UNISEC) through the KiboCUBE Academy online lectures. There is also another partnership with NASA for a System Engineering webinar series.

This paper will provide an update on the activities and experiments carried out under the Satellite Development Track during 2023-2024 together with lessons learned, future prospects, and upcoming application opportunities.