

30th IAA SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS (E3)
International Cooperation - a cornerstone of 50 years UN Space Law and space diplomacy (1)

Author: Mr. Marco Gomez Jenkins
Costa Rica Institute of Technology (ITCR), Costa Rica

Mr. Byron Garcia
Universidad del Valle de Guatemala (UVG), Guatemala

Mr. Adolfo Chaves Jiménez
Instituto Tecnológico de Costa Rica (TEC), Costa Rica

Mr. Daniel Garcia
Universidad del Valle de Guatemala (UVG), Guatemala

Mr. Johan Carvajal-Godínez
Delft University of Technology (TU Delft), The Netherlands

Mr. Jonatan Lara
Universidad del Valle de Guatemala (UVG), Guatemala

Dr. Luis Zea
Universidad del Valle de Guatemala (UVG), Guatemala

MECHANISM OF COOPERATION FOR THE DEVELOPMENT OF A CENTRAL AMERICAN
SPACE PROJECT - A REGIONAL CUBESAT

Abstract

The Central American region has embarked on different endeavors related to space engineering in recent years. CubeSat missions are currently being independently developed in Costa Rica and Guatemala, with the main purpose of creating the human resources, know-how and infrastructure necessary to execute full-cycle space missions. On the longer term, both groups seek to develop further small satellite missions that will allow scientists and engineers to address the needs of the region, which include remote sensing, communications, monitoring of drug trafficking, illegal fishing, assessing the impact of and preparing for climate change, among others. Both teams understand that in order to potentiate their capacities beyond the realm of these initial projects, cooperation among peer teams is mandatory. Due to the similar socio economic situation of both countries and their similar level of development and geographical closeness, there exist a great potential in joint collaboration. In this scenario, it has been concluded that the best way to develop this collaboration is through the development of a joint space engineering project. This paper proposes a CubeSat mission that will initiate collaboration between research institutions of Central America, led by Universidad del Valle de Guatemala (UVG) and Costa Rica Institute of Technology (TEC). Previous examples of collaboration between countries of different regions in space-related projects are analyzed and discussed. A methodology developed by researchers at UVG is used to identify the mission that would benefit the Central American region the most, while considering programmatic risk and technical feasibility. This serves as the basis for determining aspects such as spacecraft capabilities, technical requirements and resources needed. Additionally, it helps define the different spacecraft subsystems and other mission features including project management, funding acquisition, testing, launch and operations. The design philosophy is presented as well, which consists of incremental innovation, starting with use of high Technology Readiness Level (TRL) spacecraft components from established suppliers, leading to subsystem development by universities and industry in the region. Furthermore, the distribution of responsibilities between participating organizations is defined based on the capabilities of the stakeholders.