

SENATE

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Introduced by

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RESOLUTION

COMMENDING THE THREE (3) FILIPINO SPACE ENGINEERS, NAMELY IZRAEL ZENAR C. BAUTISTA, MARK ANGELO C. PURIO AND MARLOUN P. SEJERA, FOR DEVELOPING THE PHILIPPINES' SECOND NANOSATELLITE CALLED THE MAYA-2 CUBESAT THAT WAS SUCCESSFULLY LAUNCHED TO THE INTERNATIONAL SPACE STATION ON 21 FEBRUARY 2021 at 1:36 AM UNDER PHILIPPINE STANDARD TIME

WHEREAS, the 1987 Philippine Constitution recognizes that science and technology are essential for national development and progress; and thus, the State shall give priority to research and development, invention, innovation, and their utilization, and to science and technology education, training, and services;¹

WHEREAS, the Philippine Senate has in numerous occasions paid tribute to exemplary Filipinos for their outstanding contribution to the country;

WHEREAS, in the area of science and technology (particularly in space science), three (3) Filipino Space Engineers, namely - Izrael Zenar C. Bautista, Mark Angelo C. Purio and Marloun P. Sejera - have brought pride to the country for developing a nanosatellite called the Maya-2 CubeSat that was successfully launched to the International Space Station (ISS) aboard the cargo spacecraft *Cygnus "NG-15"* propelled through the launcher *Northrop Grumman Antares rocket*, which lifted off

¹ 1987 Philippine Constitution, Article IV, Section 10

from the Mid-Atlantic Regional Spaceport (MARS) Pad 0A at the Wallops Flight Facility of the National Aeronautics and Space Administration (NASA) in Virginia, United States² on 20 February 2021 at 12:36 p.m. (under EST or Eastern Standard Time being followed in Virginia, USA)³, which translates to 21 February 2021 at 1:36 a.m. under Philippine Standard Time;

WHEREAS, the Maya-2 CubeSat was launched to the ISS along with Paraguay's GuaraniSat-1 CubeSat and Japan's Tsuru CubeSat under the BIRDS-4 Project or the fourth (4th) leg of the Joint Global Multi-Nation Birds Satellite Project, which is a program initiated by the Kyushu Institute of Technology in Japan, with assistance from partner institutions, to train graduate students from developing countries to use innovative systems engineering in designing, developing, and operating CubeSats and with the goal of capacitating these students to help in improving the space programs of their respective countries⁴;

WHEREAS, the spacecraft *Cygnus "NG-15"*, carrying the Maya-2 CubeSat, is Northrop Grumman's 15th contracted cargo resupply mission for NASA to the ISS and is tasked to deliver 8,000 pounds of science and research, crew supplies, and vehicle hardware to the orbital laboratory and its crew⁵;

WHEREAS, the Maya-2 CubeSat developed by Filipino Space Engineers *Bautista, Purio and Sejera* has been reported to weigh 1.3 kilograms and has the following remarkable features, among others: (a) equipped with a camera for image and video capture, attitude determination and control units for active attitude stabilization and control demonstrations, Perovskite solar cells and Latchup-detection chip, and an Automatic Packet Reporting System Message Digipeater (APRS-DP); (b) it uses commercial off-the-shelf (COTS) components to verify proper function in space and the information gathered form the basis for usage of these COTS

² (2021 February 21). 3 Pinoy space engineers make history with Maya-2 CubeSat launch. *Philippine Technology Information Organization*. <https://phil-it.org.ph/3-pinoy-space-engineers-make-history-maya-2-cubesat-launch>

³ (2021 February 21). NG-15 Mission Updates. *Northrop Grumman*. <https://www.northropgrumman.com/space/nasa-commercial-resupply-mission-ng-15>

⁴ *The BIRDS Satellite Project*. SSPI (Space & Satellite Professionals International). <https://www.sspi.org/cpages/about-sspi>

⁵ *Ibid.*

components for future space missions; and (c) carry a store-and-forward payload that can be used to gather data from ground sensors for more practical applications like for weather and infectious disease analysis⁶;

WHEREAS, the Maya-2 CubeSat, while being the second Philippine nanosatellite launched, is actually considered as the Philippines' fourth satellite orbiting into space, following the Diwata 1 microsatellite launched on 23 March 2016, the Diwata 2 microsatellite launched on 29 October 2018 and the Maya-1 nanosatellite launched on 29 June 2018⁷;

WHEREAS, Space Engineers Bautista, Purio and Sejera are all currently pursuing their respective doctorate degrees in Space Engineering at the Kyushu Institute of Technology in Japan, and their qualifications and specific works in the development of the Maya-2 CubeSat are as follows, among others: (1) Izrael Zenar C. Bautista, being armed with BS in Electronics and Communications Engineering and MS in Energy Engineering degrees from the University of the Philippines (UP), Diliman, is the BIRDS-4 Project manager who monitored the team's activities from planning, design, execution, implementation, and operation of the satellite; (2) Mark Angelo C. Purio, who is a holder of degrees in BS in Electronic and Communications Engineering from Batangas State University, MA in Education from Adamson University, and MS in Electronics Engineering from De La Salle University, was responsible for the Camera Mission (CAM) of the BIRDS-4 Satellite Project that captures images using a commercial-of-the-shelf (COTS) camera, as well as assisted in the design and development of a standardized backplane board (BPB) holding the boards together and serving as a bus for inter-board connections and power supply; and (3) Marloun P. Sejera, who has obtained degrees in BS Electronics and Communications Engineering and MSc Electronics and Communications Engineering from Mapua Institute of Technology, was in charge of ensuring that the satellite has reliable communication with ground stations for the continuous execution of satellite missions and also handled the Automatic Packet Reporting System – Digipeater (APRS-DP) mission which aims to demonstrate the functionality of low-cost

⁶ Ibid.

⁷ Ibid.


Commercial off-the-shelf (COTS) APRS digipeater and to provide amateur radio service to the amateur radio community⁸;

WHEREAS, the remarkable achievement of Space Engineers Bautista, Purio and Sejera are not just in line with the policies and goals of Republic Act No. 11363 or the Philippine Space Act, but also viewed as a welcome good news bringing genuine inspiration to the Filipinos, amidst the backdrop of the prolonged COVID-19 pandemic in the country;

WHEREAS, their work on the development of Maya-2 CubeSat launched into space constitute a valuable contribution to the country's science and technology, particularly in the area of space science; and for this, they should be given a commendation;

Resolved, as it is hereby resolved by the Senate, To commend the three (3) Filipino Space Engineers, namely Izrael Zenar C. Bautista, Mark Angelo C. Purio and Marloun P. Sejera, for developing the Philippines' second nanosatellite called Maya-2 CubeSat that was successfully launched to the International Space Station on 21 February 2021 at 1:36 am under Philippine Standard Time.

Adopted,


CYNTHIA A. VILLAR


MARIA LOURDES NANCY S. BINAY

⁸ Atienza, Charisse. (2021 February 20). Meet the brains behind PH second nanosatellite Maya-2. *Manila Bulletin online*. https://mb.com.ph/2021/02/20/meet-the-brains-behind-ph-second-nanosatellite-maya-2/?utm_source=rss&utm_medium=rss&utm_campaign=meet-the-brains-behind-ph-second-nanosatellite-maya-2