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## PH's first CubeSat, Maya-1 successfully deployed in space

By Kristelle Nicole G. Chavez, DOST-PCIEERD



Key officials and guests from DOST, UP, JAXA, and the Embassy of Japan in the Philippines pose with a 1:1 replica of Maya-1 after the successful launch of the BIRDS-2 CubeSats from the ISS. (L-R) Dr. Joel Joseph Marciano Jr., director of DOST-ASTI; Shigeki Kamigaichi, senior expert of JAXA; Minister Atsushi Kuwabara, consul general of the Embassy of Japan in the Philippines; DOST Sec. Fortunato T. de la Peña; Dr. Michael Tan, chancellor of UP Diliman; Dr. Evangeline Amor, vice chancellor for academic affairs of UP Diliman; and Dr. John Richard Hizon, director of UP Diliman-Electrical and Electronics Engineering Institute. (Photo courtesy of DOST-PCIEERD)

**C**heers full of Filipino pride rang on the hallways of the University of the Philippines (UP) Diliman Electrical and Electronics Engineering Institute building as Maya-1, the Philippines' first ever cube satellite (CubeSat), was launched into space from the International Space Station (ISS) on 10 August 2018.

The hearty cheers came from a group of officials from UP, the Department of Science and Technology (DOST), the Embassy of Japan in the Philippines, and the Japan Aerospace Exploration Agency (JAXA) who were all part of the development of Maya-1.

After its turnover to JAXA on 15 May 2018, the Maya-1 CubeSat was brought to the ISS on 29 June 2018 through the SpaceX Falcon 9 CRS-1, a Commercial Resupply Service mission that delivers cargo and supplies to the ISS. The ISS, a large spacecraft that is in orbit around Earth, serves as a unique science laboratory and home for astronauts and cosmonauts who are on space mission.

"The Maya-1 launch is a very important step in the establishment of the Space Technology

Development Program in the Philippines," said DOST Secretary Fortunato T. de la Peña. He further said that the program contains many components from education and human resource development to industry development.

"All of these can be facilitated by having international collaborations. We do not want to be left out," Sec. de la Peña added.

With its deployment in space, Maya-1 will be able to communicate with ham radios with its automatic packet reporting system that allows for real-time digital communications. It also has a remote data collection system called Store-and-Forward that can collect data from ground sensor terminals and be able to save and forward the data to any member ground station.

During or after typhoons, Maya-1 may be used to send text messages and advisories even when communication signals are down. Maya-1 is also equipped with a global positioning system or GPS chip as well as cameras that can capture low resolution images and videos.

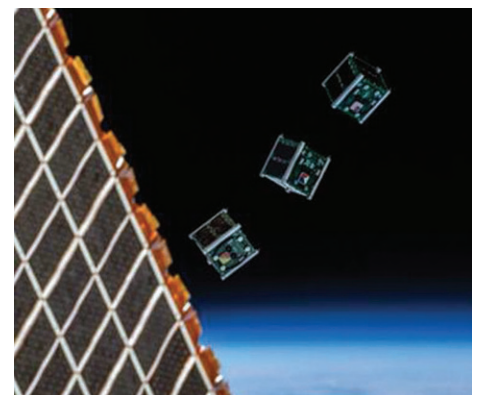
The development of Maya-1 falls under the BIRDS-2 (Birds Satellite Project), a cross-border interdisciplinary satellite project that

accommodates non-space faring countries. The project consists of 11 participating team members from Bhutan, Japan, Malaysia, and the Philippines.

The Philippines was represented throughout the project by Joven Javier from DOST-Advanced Science and Technology Institute (DOST-ASTI) and Adrian Salces of UP Diliman. In the course of the project, Javier was designated as project manager and led the multinational BIRDS-2 team in the development of the CubeSats. Both Javier and Salces are DOST scholars enrolled in graduate studies at the Kyushu Institute of Technology.

"This is actually our second major achievement in space science and technology," said UP Diliman Chancellor Michael Tan as he looked back on the Diwata-1 microsatellite launch on 23 March 2016 from Cape Canaveral in Florida, United States and its deployment from the ISS on 27 April 2016.

The participation of the Philippines in the BIRDS-2 Project and the development of Maya-1 is part of the research program "Development of the Philippine Scientific Earth Observation Microsatellite" or PHL-Microsat Program implemented by UP Diliman and DOST-ASTI with funding from the DOST Grants-in-Aid. Monitoring the project is the DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD).



The Maya-1 was launched together with the BHUTAN-1 CubeSat of Bhutan and the UITSAT-1 CubeSat of Malaysia. (Photo by Alexander Gerst, European Space Agency)

# Lipa City HS unveils modern classroom

By Allyster A. Endozo, DOST-STII

**I**nosloban–Marawoy Integrated National High School in Lipa City, Batangas now joins the city's other pioneering high schools equipped with a modern classroom under the 21st Century Learning Environment Model (21st CLEM) program.

Initially a concept of the Department of Science and Technology (DOST), 21st CLEM was implemented through a multisector collaboration with the Department of Education (DepEd) and the Department of Information and Communications Technology (DICT).

Representative Maria Rosa Vilma T. Santos-Recto of the lone district of Lipa led the ribbon cutting and marker unveiling on 13 Aug 2018. Rep. Santos-Recto said that they are taking on the challenge of the 21st century by providing “quality education for our children and [for our] students to be competitive.”

“[Now that] we have the [modern] classroom, the technology, we can expect our children to learn more, to be productive,” said Rep. Santos-Recto.

The 21st CLEM classroom features various concepts, designs, and wi-fi enabled devices fit for young Filipino learners of the 21st century.

Wooden tables paired with colored plastic chairs were crafted in trapezoidal fashion to flexibly enable individual, pair, and group arrangements and student to student interaction. The teacher's lectern has a storage unit for laptops and teaching accessories.

The ultra-short throw-type projector which serves as an interactive smart board can display up to four screens projected from laptops, mobile phones, and tablets. A visualizer camera can magnify very small objects in real time and save captured images in photo or video form.

A wireless printer is placed atop a mobile caddy, which can simultaneously store and charge up to 26 laptops. A 3D printer, which can be used for student project prototyping, utilizes polylactic acid-based filaments and XYZprinting da Vinci Mini software.

The so-called “Sumo-bots” and “M-bots,” powered by Arduino and Scratch softwares, comprise the robotics kit that includes various sensors. Conveniently, a special type of sensor automatically opens and closes a trash bin within seconds.

Also displayed is a Science and Technology Academic and Research-Based Openly Operated Kiosks or STARBOOKS, the DOST-developed digital library that enables offline access to thousands of S&T information materials.

Around the room are vertical gardens and the open learning space equipped with spotlights for “mini-stage” function and a storage cabinet for school projects and textbooks.



(L-R) Engr. Eliseo M. Rio Jr.; Dr. Leonor M. Briones; Hon. Maria Rosa Vilma T. Santos-Recto; Dr. Brenda L. Nazareth-Manzano; Dr. Alexander R. Madrigal; and Engr. Albert G. Mariño led the ribbon cutting ceremony for unveiling of the 21st CLEM classroom at Inosloban–Marawoy Integrated National High School in Lipa City, Batangas. (Photo by Henry A. de Leon, DOST-STII).

Other schools in Lipa City that are equipped with a 21st CLEM classroom are the Bolbok National High School, Lipa City National Science High School, Pinagtongulan National High School, and San Celestino National High School.

Other key government officials present in the unveiling ceremonies were DepEd Secretary Leonor M. Briones, DICT Acting Secretary Engr. Eliseo M. Rio, Jr., DOST Undersecretary

for Regional Operations Brenda L. Nazareth-Manzano, DOST–IV A Regional Director Alexander R. Madrigal, DOST–Science Education Institute Deputy Director Albert G. Mariño, Engr. Ermie M. Bacarra from DOST–Philippine Council for Industry, Energy and Emerging Technology Research and Development, and Fernando Air Base Commander Maj. Gen. Arnold A. Mancita.



Various modern devices equip the 21st CLEM classroom at Inosloban–Marawoy Integrated National High School such as (clockwise from top left) trapezoidal wooden tables and colored plastic chairs, interactive projector and smart TV, visualizer camera, 3D printer, robotics kits, and tablet with augmented reality function. (Photos by Henry A. de Leon, DOST-STII).



DOST Secretary Fortunato T. de la Peña and DOST-TAPI Director Edgar I. Garcia with the winners of the 2018 NICE during the closing and awarding ceremonies on 16 August 2018 at the Le Pavillon Metropolitan Park, Pasay City. (Photo from DOST-TAPI)

## Virus detector bags top award in DOST's invention tilt

By **Jund Rian A. Doringo**, DOST-TAPI

**T**he lamp primer, a technology that detects the presence of the deadly white spot virus in cultured shrimp, took home the first prize for the Outstanding Invention (Tuklas Award) Category during the 2018 National Invention Contest and Exhibit (NICE) held on 14-16 August 2018 at the Le Pavillon Metropolitan Park in Pasay City.

Prof. Mary Beth B. Maningas and Dr. Benedict A. Maralit of the University of Santo Tomas took home P300,000.00 for their entry "LAMP Primers for White Spot Syndrome Virus". They also took home a plaque and certificate of recognition from DOST-TAPI, and gold medals from the World Intellectual Property Office (WIPO) and International Federation of Inventors Associations (IFIA).

For the Outstanding Utility Model, first prize went to the "Portable Unihoused Water Purification and Sterilization Apparatus" that provides instant source of safe drinking water through filtration by Engr. Rodrigo P. Duque, a mechanical and electrical engineer from the Cordillera Administrative Region. The "Interlocking Block (Ecoblock)" that maximizes flexibility in creating a total matrix within a system when completed, won for Justino R. Arboleda of Quezon City the first prize for the Outstanding Industrial Design Category.

The Outstanding Utility Model and Outstanding Industrial Design first prize winners took home P200,000.00, plaque and certificate of recognition from DOST-TAPI, and WIPO and IFIA gold medals each.

The Likha Award for Creative Research Category which is given to a research and development that has potential to develop into a reliable and relevant commercially viable technology was given to the "Impeller Compact Rice Mill" by Dr. Michael A. Gragasín, Dr.

Romualdo C. Martinez, and Jayvee P. Illustrisimo, all from the Philippine Center for Postharvest Development and Mechanization in Nueva Ecija. They took home P100,000.00, plaque and certificate of recognition from DOST-TAPI.

For the Student Creative Research for College (Sibol Award), the "Flame Emission Photometric Determination of Iron via Digital Imaging-Based Detection" bagged first prize for Sandra Mei M. Branzuela of the Pamantasan ng Lungsod ng Maynila. Meanwhile, first prize for the Student Creative Research for High School (Sibol Award) went to the "Pectin-carboxymethyl Cellulose Biocapsule for Potential Colon Targeted Oral Drug Delivery" by Felix Arthur C. Dioso, Jeremae Aira M. Moderno, and Coleen A. Quirim, all from the Philippine Science High School Southern Mindanao Campus.

The Sibol awardees received P100,000.00, plaque and certificate of recognition from DOST-TAPI.

The qualifiers for the 2018 NICE are winners of the Regional Invention Contest and Exhibit conducted all over the regions in 2017. Previous finalists of the NICE were able to take advantage of the comprehensive programs of the Department of Science and Technology-Technology Application and Promotion Institute (DOST-TAPI) specifically tailored for the needs of the inventors and researchers in whichever commercialization phase they are in.

"Since all of the finalists of the 2018 NICE are considered winners, all of them are entitled to avail of the numerous programs and assistance provided by DOST-TAPI from intellectual property rights protection to technology commercialization," said DOST-TAPI Director Edgar I. Garcia.

"When introducing a new invention, one must have a strong will and determination to defend

your inventions to the stakeholders, including your possible competitors," said DOST Secretary Fortunato T. de la Peña, who also reiterated the contribution of inventions and innovations to economic progress and social development.

Spearheaded by the DOST-TAPI, NICE is held annually pursuant to Republic Act 7459 or the "Inventors and Invention Incentives Act of the Philippines" to showcase the Filipino's innovative nature and to recognize these innovations.

### ABOUT US

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# 2018 STARBOOKS Convention kicks off in Leyte

By Rosemarie C. Señora, DOST-STII

**I**nvited speakers unite with a common belief – that collaboration and partnership through STARBOOKS or the Science and Technology Academic and Research-Based Openly Operated Kiosks is indeed key to a smarter future for our Filipino children.

This year's STARBOOKS Stakeholders Convention successfully kicked off on 2 August 2018 at the Oriental Hotel in Palo, Leyte, the first in a four-leg series aimed to convene stakeholders and their beneficiaries and keep them posted with up-to-date library and learning trends.

The event also aims to acquaint them with the services offered by the partners, and recognize outstanding practices of institutions with regard to STARBOOKS implementation.

The convention is organized by the Department of Science and Technology-Science and Technology Information Institute (DOST-STII), developer of STARBOOKS.

Present during the first ever STARBOOKS convention conducted in Visayas were DOST Undersecretary for Regional Operations Brenda Nazareth-Manzano; Palo, Leyte Mayor Remedios L. Petilla; DOST VIII Regional Director Engr. Edgardo M. Esperancilla; and DOST-STII Director Richard P. Burgos.

Dubbed as the first Philippine Science, Technology and Innovation (STI) Digital Library, STARBOOKS contains local and foreign science and technology resources in text, video, and audio formats including journals, investigatory project materials, and livelihood videos. The materials cover a diverse range of topics, from food and nutrition, health and medicine, energy, to environment, livelihood technologies, and many others. It aims to bring STI information to all corners of the country, especially in areas that lack proper library and research facilities.

Usec. Nazareth-Manzano shared in her speech during the opening ceremonies of the convention that having served for 25 year as



DOST-STII Director Richard P. Burgos (3rd from the left) with the representatives of four STARBOOKS recipient schools from Regions VII and VIII that were recognized during the 2018 STARBOOKS Convention for submitting the most number of monitoring reports. (Photo from Director John Glenn De Guia Ocaña, PSTC-Leyte).

the Regional Director of DOST Region IX, she came “face to face with the harsh reality in the ground – realities such as you are working in a geographically isolated and disadvantaged areas and you see those students without access to library or internet, and worse, there are some areas with no electricity yet. STARBOOKS, it seems, has been a saving grace.”

“The project is very good though challenging because STII only provided for the content and not computer units. But once deployed, it is so fulfilling because you can see their faces light up and their smiles. That makes it worth it,” added Usec. Nazareth-Manzano.

The use of computers has become a basic necessity but in far-flung areas, it remains a dream.

Responding to this in her speech and having highlighted the importance of instilling to the youth the passion for reading, Mayor Petilla issued a challenge to the region to have STARBOOKS in every province, town, city, and barangay. She added that she envisions coming

up with a public digital library in Palo, Leyte before her term ends next year.

Furthermore, Engr. Esperancilla promises that Region VIII will continue to be an active partner of DOST-STII with regard to STARBOOKS. In 2017, the region, in partnership with various stakeholders, was able to deploy 243 complete sets of STARBOOKS to the provinces of Leyte, Southern Leyte, Biliran, Samar, and Eastern Samar, with more STARBOOKS units set to be deployed this year to public schools and Negosyo centers.

As of writing, there are now 2,733 deployed STARBOOKS nationwide.

Among those who shared their experiences, good practices, and opportunities that come with being a STARBOOKS partner were Eloisa E. Olivera, president of the Association of Science and Mathematics Educators of Philippine Private Schools; Erika Aurora A. Aquino, executive director of Infinite-0 Group Foundation; and Geenette M. Garcia, executive director of Children's Hour Philippines Foundation, Inc.

## inFocus



**Inspirational women.** (From left:) Former DOST scholars Hillary Diane A. Andales, a Philippine Science High School alumna and 2017 Breakthrough Junior Challenge Winner; Karen Ibasco, Miss Earth 2017; and Engr. Myra Ruth S. Poblete, University of the Philippines Assistant Professor, shared their experiences and insights as fearless females in their respective fields during the Women Inspiring Women Forum held on 16 August 2018 at the Philippine International Convention Center in Pasay City. Spearheaded by the Department of Science and Technology-Science Education Institute, the forum aims to encourage students to move out from the usual stereotyping in career choices. (Text by Laurence M. San Pedro and photo by Rosemarie C. Señora, DOST-STII).