

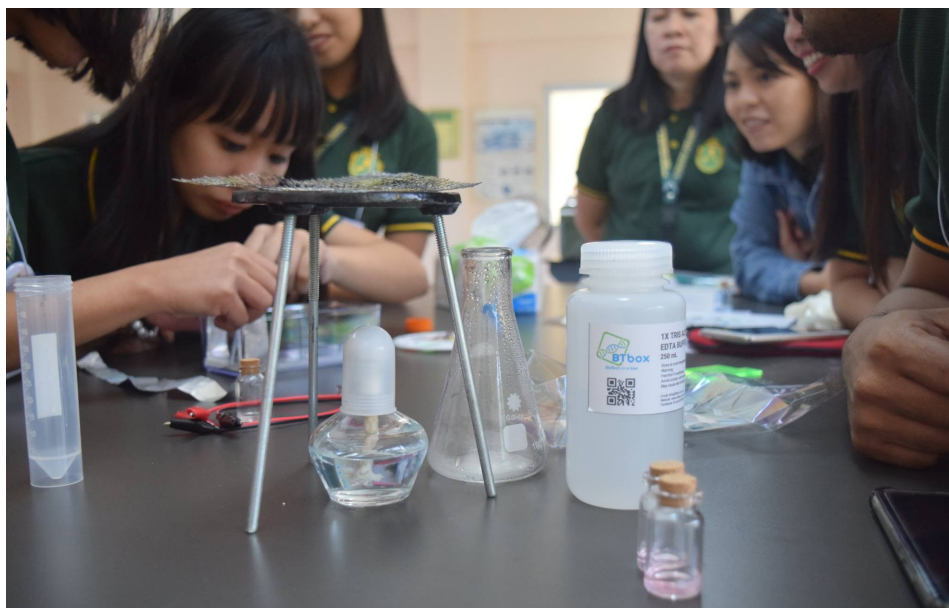
11 years of bringing  
S&T good news

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# Biotech lab kits eyed to aid HS students in science experiments

By Allan Mauro V. Marfal, *DOST-STII*



Students of Laguna BelAir Science School explore the uses of Gel Electrophoresis, one of the three available kits in "BioTech in a Box" or BTBox. (Photo by Kenneth M. Kim of BTBox)

**H**igh school students around the country will soon be able to do biotechnology experiments in a classroom setting with an affordable and portable lab-in-a-box tool kit.

The Department of Science and Technology-Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD) and a start-up company based at the University of the Philippines-Diliman are set to produce and sell biotech laboratory kits in different secondary schools in the country.

Called "BioTech in a Box" or BTBox, it is a hands-on, lab-in-a box tool kit which enables teachers and students to conduct biotechnology experiments in the classroom. The design is very portable, so schools with small spaces will still be able to put them to good use.

The innovation is part of the efforts to encourage students to pursue a career in science

by letting them experience science first-hand in the form of basic experiments.

BTBox is composed of three kits, DNA extraction, genetic engineering, and gel electrophoresis. It also offers modules on forensics, antibacterial resistance, climate change, and viruses and vaccines. Its targeted price would be PHP 5,000.

According to Kenneth M. Kim, developer of BTBox and a marine biology student of the University of the Philippines-Diliman, they want to increase the capacity of science, technology, engineering, and mathematics (STEM) educators in the country and enhance the scientific literacy of students in biotechnology through inquiry-based kits.

"Adapting to the shift of the Philippine education to the K-12 system is not an easy task for most schools and educators," said Kim.

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## Science docus featured in filmmaking contest

By Lovely B. Aquino, *DOST-SEI*

**F**rom 300 concept proposals to 45 entries, seven films earned the nod of judges and selected viewers in the third Indie-Siyensya filmmaking competition.

The winning films captured the role of science and technology (S&T) in addressing some of the most pressing national and community issues.

Winners in the Open Category were Hector Badis of the Cordillera Consortium for Agriculture, Aquatic and Resources Research and Development for the film "Dagem" (third place), Brian Sulicipan of Ambag-Ambagan Collective for "The Land Will Grow, The Food We'll Eat" (second place), and Edward Laurence Opena of Cebu Normal University for Sugbuanong Alibangbang (first place).

"Dagem" and "The Land Will Grow, The Food We'll Eat" both tackled agriculture, environment, and food security issues. The former featured S&T interventions that help Benguet farmers mitigate climate change hazards in vegetable farm terraces, while the latter focused on permaculture practice in the Philippines. Sugbuanong Alibangbang is a film about the Jumalon Butterfly Sanctuary where the Jumalon family fights butterfly extinction in the province of Cebu.

In the Youth Category, the group of Angelo Cruz from Rizal National Science High School won third place for their film "Akuwakultura" while junior high school students Cyah Angela Sombingo, Johan Villanueva, and Norie Bautista from Cavite National High School won second place for their film "Lambat". "Akuwakultura" showed the importance of aquaculture in Laguna Lake, while "Lambat" documented water pollution in Cavite.

Patrick Pimentel, a senior high school student also from Cavite National High School, bagged the top prize for his film "Manglares (Buhay at Peligro)", a film on disaster mitigation.

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Biotech lab...

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He further explained that teaching STEM is a huge challenge for educators without tools that can complement textbook-based teaching particularly for subjects that are either too abstract or not visible to the naked eye such as chemistry, cell biology, genetics, and molecular sciences

Kim shared that only three out of ten public schools in the country have science laboratories, a deficit that currently exists because most schools are still adjusting to the extended K to 12 system and STEM programs.

According to Kim, BTBox tries to link STEM learning to real-life applications that have a huge impact in changing the current challenges that the country face that are either due to a lack of information or misinformation.

“We see biotechnology as an area that could impact many sectors and services, from agriculture, healthcare, safe environment, and livelihood,” Kim said.

He added that he would like to see BTBox in the future as an instrument that can help more Filipinos better understand and realize the role of science in addressing real-life problems.

Kim also hopes that BTBox could contribute in making the Philippines become a science nation just like Singapore and South Korea, both of which heavily invested in research and treated it as a way to forward their economy.

BTBox was presented during the “Biotechnology in Education and Food Safety” organized by DOST-PCIEERD on 17 November 2018 at the Hall D of the World Trade Center in Pasay City. It was part of the recently concluded 14th National Biotechnology Week held from 13 to 17 November 2018.



Science docus...

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Judges, organizers, and winners of the third Indie-Siyensya Youth Category with DOST-SEI Director Josette T. Biyo (rightmost). (Photo from DOST-SEI)

The winners earned trophies and cash prizes amounting to PhP 100,000 for the Best Film; PhP 50,000 for the second place; and PhP 25,000 for the third place.

“Bakas”, a film by Kiano Bacolod from the Philippine Science High School-Central Luzon Campus, also won for getting the highest number of votes during the film screenings of Indie-Siyensya. The film earned the Viewer’s Choice Award, a trophy, and PhP 10,000 cash prize for its depiction of the use of forensic science in solving crimes.

Indie-Siyensya, a science filmmaking competition organized by the Department of Science and Technology-Science Education

Institute (DOST-SEI), in partnership with the Film Development Council of the Philippines (FDCP), aims to promote a culture of science in the country by using film as a medium.

The contest is also the agency’s response to the growing field of science communication in the country. “Malaking kontribusyon ito sa larangan ng science communication na isa sa mga isinusulong ng DOST-SEI,” said Director Dr. Josette T. Biyo of DOST-SEI. “Ang inyong mga film entry, magwagi man o hindi, ay tunay na nag-ambag na sa pagpapaunlad ng komunikasyong agham sa ating bansa kaya binabati ko kayo sa inyong mga obra,” she added.

The Awarding Ceremony, held on 28 November 2018 at the Philippine International Convention Center in Pasay City, was attended by more than a hundred students, teachers, science professionals, and filmmakers.

Also present in the event were previous Indie-Siyensya winner Justin Parel from the Philippine Science High School-Central Luzon Campus who shared his experiences in joining Indie-Siyensya, FDCP representative Karol Ramirez, and Indie-Siyensya judges Prof. Garry Jay Montemayor and Seymour Sanchez.

Montemayor is chair of the Department of Science Communication from the College of Development Communication at the University of the Philippines Los Baños, while Sanchez is an advocacy filmmaker and educator from the De La Salle-College of Saint Benilde Digital Filmmaking program and Far Eastern University Department of Communication.

Montemayor and Sanchez screened the film concept proposals with fellow judges Prof. Patrick Campos, director of the University of the Philippines Film Institute; Dr. Mudjekeewis “Mudjie” Santos, father and founder of the Genetic Fingerprinting Laboratory under the Department of Agriculture-National Fisheries Research and Development Institute; and astrophysicist and data scientist Dr. Reinabelle “Reina” Reyes, who became known as “the Filipina who proved Einstein right” with her work on Einstein’s Theory of Relativity.

Dir. Biyo encouraged all qualified individuals and groups to join next year’s Indie-Siyensya and to continue using film to develop understanding on the role of science in solving many of the country’s problems.

# Women shine at Pisay's biotech career forum

By **Allyster A. Endozo**, *DOST-STII*

Photos by **Maribeth R. Ollet**, *DOST-PSHSS*



Dr. Regina P. Berba (center) with students from the Manila Science High School.

**I**n a forum organized by the Philippine Science High School (PSHS) system, two of the school's women alumni inspired a roomful of "Iskos" and "Iskas" by sharing their rich experiences and perspectives in their careers

Karen Ann L. Hipol takes pride in being a teacher, a consultant, an entrepreneur, a graduate student, and a diplomat.

Realizing the opportunity to help build a science and technology (S&T) ecosystem in the country, she co-founded Hybridigm Consulting, Inc.—a one-of-a-kind local start-up that enables Filipino scientists to commercialize their technologies. As a consultant, she learned a lot on how to deal with different personalities, how to be business resilient, and on how to build credibility.

She likewise learned to become assertive with her own ideas as she pursued a master's degree in bioscience enterprise as a Cheavingfull scholar at Cambridge University in the United Kingdom. "[For] being open to new ideas, you're actually able to come up with better ideas because if you challenge [them] and see the holes, then everyone else would be able to provide solutions or alternatives," she said.

As the current Strategic Manager of the British Embassy's Newton Agham Programme, Hipol uses her "matchmaking" skills to encourage Philippine and British agencies to collaborate on S&T projects and programs—particularly on sectors like infrastructure development, disaster mitigation, and healthcare.

"We are growing at a fast pace because of many reasons," she said. "Unless we can produce our own technologies or come up with new knowledge we will always be lagging behind other countries, we will always be importing and copying new technologies." She also underscored

biotech innovation's vital role in strengthening the Philippine economic base.

As for Dr. Regina P. Berba, chairperson of the Infectious Disease Unit of the Philippine General Hospital, she chose to "tweak" her career at the right time as she considers being a scientist a really special profession. "It's not too difficult to find one's place in the future—there is too much abundance of need," she emphasized.

In her presentation entitled "Relevance in Science", she revealed her "satisfying" 30-year journey from being a biology student to an infectious disease specialist. Not minding the two-hour travel from her office at The Medical City in Ortigas, she continues to serve "the poorest of the poor" at the Philippine General Hospital in Manila.

Her involvement in outreach activities is unusually diverse for a doctor-scientist—from being a volunteer medic for indigent patients in Antipolo to a dance contest judge for 12,000 Grade 10 students in Pasig City.

"I live now to serve as many people as I can in various opportunities, not just in being a doctor but also being a scientist and a volunteer," Dr. Berba said.

Consistent with her humanitarian outlook, Dr. Berba applauded the recent research and development advancements in the medical biotech sector. These include Gene Xpert, a tool that has raised the diagnostic rate for tuberculosis from 30 percent to an astounding 90 percent. Another is the Biotek-M, a "lab-in-a-mug" diagnostic kit for dengue and tuberculosis funded by the Department of Science and Technology.

"If we're able to diagnose patients with fever in clinics and barangay health centers, there would be no need for huge hospitals," she said.

"Within one to two days, we can accurately



Karen Ann L. Hipol (center) talks to students during her lecture on biotech careers.

diagnose the presence or absence of dengue. This will really save a lot of lives."

The event, dubbed "Career Talks and Forum on Biotechnology", was held on 14 Nov 2018 at Hall D of the World Trade Center in Pasay City, in celebration of the 14th National Biotechnology Week on 13 to 17 Nov 2018. The theme for this year is "Bioteknolohiya: Pambansang Hamon, Pambansang Solusyon."

Participants included high school students from PSHS's Main and Central Luzon campuses, Manila Science High School, and Pasay City North High School's Tramo campus.

## ABOUT US

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**Framelia V. Anonas**

Editor-In-Chief

**Sheila Marie Anne J. de Luna**

Managing Editor

**James B. Intia**

Layout Artist

**Jasmin Joyce P. Sevilla**

Proofreader

**Allan Mauro V. Marfal**

Circulation

Department of Science and Technology-  
Science and Technology Information Institute  
Bicutan, Taguig City 1631  
Metro Manila  
Philippines

[www.stii.dost.gov.ph](http://www.stii.dost.gov.ph)

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# S&T forum highlights science-related legislative bills

By Enrico P. Belga Jr. and David Matthew C. Gopilan, DOST-STII  
Photos by Neil Anjo B. Bio, DOST-STII

**S**cience and technology (S&T) related legislative bills that are currently pending approval in the House of Representatives were the center of discussions at the recent Science and Technology Legislative Forum held in Legazpi City, Albay on 28 to 29 November 2018.

Attended by representatives from various Provincial Science and Technology Centers (PSTC) around the country, the forum sought to strengthen legislative policy advocacy on S&T programs and to generate support from all stakeholders for the approval of the S&T related bills pending in the Congress.

"This forum would not only be about updates or S&T concerns, but it would hopefully strengthen the partnership among personnel from PSTCs," Department of Science and Technology (DOST)-Region V Director Tomas B. Briñas said in his opening remarks during the event.

## Modernizing how Filipinos measure

Currently, Albay Representative Joey S. Salceda is pushing for a bill that would revise the National Metrology Act of 2003 and make the current National Metrology Laboratory (NML) more responsive to the times.

The House Bill (HB) 4368 or the "Enhanced National Measurement Infrastructure System" aims to protect Filipinos from wrong measurements that may affect health, safety, fair trade, environment protection, and law enforcement. It builds on the National Metrology Act which was first enacted in 2003.

Once HB 4368 becomes law, it would transform the NML to the National Metrology Institute (NMI) of the Philippines, which will be headed by a director general under the DOST.

As of now, the NML is responsible for overseeing the national measurement system. With a limited manpower, facilities, and financial resources the task is too much for the NML. NML is currently a division under the DOST-Industrial Technology Development Institute (ITDI).

"Even before we learned how to read, we learned to count first," said Ahdrian Camilo C. Gernale, deputy section head of the Force Standards Section at the DOST-ITDI, while explaining the importance of metrology or the scientific study of measurement. "Simple deviations from the standard or normal may mean life and death," he added.

For example, an incorrect measurement from a broken sphygmomanometer would most likely affect a doctor's report on a patient's blood pressure. Correct measurement too would ensure car owners that they get the correct amount of fuel they are paying for as reflected in calibrated gas pumps.

Metrology indeed affects all human activities, and the bill would like to ensure that Filipinos get correct measurements.

## Pushing for space agency development

The forum also tackled the benefits of space S&T. For one, satellite images can capture the before-and-after scenario of, for example, vegetation and buildup of structures in Boracay. Using the data captured by the satellite, it would be easier to monitor human activities and recommend environment-friendly plans.

Satellite images can also show the extent of a recent landslide in Itogon, Benguet or damages caused by a typhoon. The data generated by the satellite would make it easier for the National Disaster Risk Reduction and Management Council to know where to exactly deploy a response team.

All of these activities will be consolidated by the Philippine Space Agency (PhilSA) once HB 8541 or the Philippine Space Development Act has been enacted. Once established, PhilSA will lead the policy formation, planning and coordination, as well as implementation of all issues and activities related to space science and technology. The agency will be under DOST.

PhilSA, according to the bill, will be guided by a framework disclosing five key development areas: international cooperation; space education and awareness; space research and development; hazard management and climate studies; and national security and development.

Proposed amendments to the Republic Act No. 8439 of the "Magna Carta for Scientists, Engineers, Researchers, and other S&T Personnel in the Government" were also discussed during the forum. There were several notable amendments presented, including the one that removes set limit to the amount of additional salary or honoraria that scientists can receive as compensation from internally or externally-funded grants-in-aid, provided this is part of a budget from the funding agency and does not entail additional usual expense to the government. In addition, the Hazard Allowance for S&T personnel would see an increase from 10 to 30 percent to 15 to 30 percent. Also included in the proposed Magna Carta amendments is to upgrade S&T provincial officers to director level.

Another proposed bill is the "Comprehensive Nuclear Regulation Act" which was approved by the House Committee on Appropriation on August 28, 2018. It aims to create a single, independent regulatory body which will be called Philippine Nuclear Regulatory Commission to respond to the need for regulation of peaceful applications of nuclear energy

## inFocus



**NegOcc schools receive STARBOOKS.** Five schools in San Carlos City, Negros Occidental received one unit each of the Science and Technology Academic and Research-Based Openly Operated Kiosks (STARBOOKS) during their annual celebration of the Pintaflares Festival on 6 November 2018. San Carlos City Mayor Gerardo P. Valmayor Jr., who received the STARBOOKS units in behalf of the city, emphasized the importance of STARBOOKS in helping increase the appreciation and knowledge of their students towards science and technology. The five schools that received the STARBOOKS units were Bagonbon National High School, Don Carlos Ledesma National High School, Julio Ledesma National High School, Sipaway National High School, and Quezon National High School. Developed by the Department of Science and Technology-Science and Technology Information Institute, STARBOOKS is the first digital library-in-a-box in the country that can also be used offline. To date, there are around 3,000 units of STARBOOKS deployed across all provinces in the country. (Text by Jasmin Joyce P. Sevilla, information and photo from David Matthew C. Gopilan, DOST-STII).