

2019 NSTW

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Department of Science and Technology Secretary Fortunato T. de la Peña (3rd from left), together with Senator Francis N. Tolentino (4th from left) and Department of Education Secretary Leonor M. Briones (2nd from right) and Chris Tiu (leftmost), DOST Brand Ambassador, led the ribbon cutting of the 2019 National Science and Technology Week, held from 17-21 July at the World Trade Center in Pasay City.

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2019 NSTW showcases innovation for sustainable development

by Sheila Marie Anne J. de Luna, *DOST-STII*
Photo by Henry A. de Leon, *DOST-STII*

The National Science and Technology Week (NSTW), an annual celebration of the Department of Science and Technology (DOST), focuses on how developments in science, technology, and innovations will help achieve the Philippines' commitment to the United Nations' Sustainable Development Goals (SDGs).

At the opening of the 2019 NSTW, DOST Secretary Fortunato T. de la Peña said, "This year's NSTW focuses on how science and technology are helping us achieve the Sustainable Development Goals. With our NSTW experience, I can say that there is hope in the Philippines because of science and technology."

The Secretary described the eight clusters in the exhibit area at the NSTW which displays the latest technologies and innovations, programs, and advocacies of the different agencies of the DOST.

President Rodrigo Duterte, the keynote speaker for the NSTW, was represented by Department of Education Secretary Leonor Briones, who commended the President for his support to the establishment of the Senior High School program. Sec. Briones believes that the integration of STEM education in the senior high school program will provide a strong science and technology foundation among the youth who will be scientists, researchers, engineers, and mathematicians in the future.

Sec. Briones also acknowledged how science and technology has helped improved the way science is being taught these days. "Science and technology developments are helping our teachers improve the way we teach," said Sec Briones.

Incoming chair of the Science and Technology Committee at the Senate, Senator Francis Tolentino, also graced the opening of the NSTW and shared how excited he is to chair the S&T Committee and learn new things about science and technology and how it will help improve the lives of Filipinos.

The event also saw the launching of Chris Tiu as DOST brand ambassador to help spread awareness on science and technology especially among the youth.



2019 NSTW's Innovation Park shows bright future for PH

by Framelia V. Anonas, *DOST-STII*

Photos by Kimverlyn C. Sayson, *DOST-STII*

With its modern, minimalist look, the Innovation Park at the 2019 National Science and Technology Week celebration gave the audience a glimpse of a bright future ahead for the Philippines through science and technology.

Its technologies on display focus on three of the United Nations' Sustainable Development Goals (SDGs), namely affordable and clean energy; industry, innovation and infrastructure; and responsible consumption and production.

To address the demand for access to clean energy, the Department of Science and Technology funded researches on renewable energy, infrastructure, and technologies that can provide clean and more efficient energy. Some of the technologies showcased in this booth are Jolt, a stackable multi-functional energy storage for household solar and emergency applications; modified road train energy storage system; solar biomass for multi-heat application; and others.

Meanwhile, the technologies exhibited at the booth for the SDG on industry, innovation and infrastructure were designed to contribute to the improvement, resiliency, and sustainability of transport, irrigation, energy, and ICT in the country. Included here were the USHER or the Universal Structural Health Evaluation and Recording System, Project DIME which monitors big infrastructure projects such as irrigation networks, and others.

The booth on SDG on responsible consumption and production, on the

other hand, basically educated and lead consumers to choose a lifestyle that highlights sustainable consumption, management, and efficient use of natural resources. Some of the technologies on display reduce food losses in production and food waste, and manage chemicals in an environment-friendly way. Technologies in this booth included Nanocomposite for Water Purification, Bio-Oil Production from Agricultural Waste, Abaca fiber-reinforced Composite (for boat application), and others.



DOST-supported projects make physical therapy easier in PH

by Angelica Marie Paz, DOST-STII

In the Philippines, there are only 33,000 licensed physical therapists out of almost 105 million population.

To address this shortage, experts from the De La Salle University Institute of Biomedical Engineering and Health Technologies (DLSU-IBEHT) developed two technologies that can assist physical therapists in doing rehabilitation treatments. These are the Agapay Project, catered to the upper extremities, and the Tayô Project for the lower extremities.

The two projects are supported by the DOST Philippine Council for Health Research and Development (DOST-PCHRD).

Agapay Project

Agapay is an artificial intelligence-assisted therapy innovation that aids the upper limbs (shoulder, elbow, wrist) of patients so they can regain their motor control. The SEMG or surface electromyography enables it to detect muscle contraction.

It is designed as a wearable robot that acts as an external skeleton which can assist the motor movements of the patients. This new technology is user-friendly, and adjustable to the patients' specifications.

This therapy device also uses biofeedback mechanism system that trains patients to recover on their own by controlling bodily processes that usually happens involuntarily such as heart rate, blood pressure, and muscle tension.

The primary target patients of this technology are stroke patients.

Currently, there are already three working prototypes of Agapay. This new development in physical therapy technology also includes games that stimulate real life. This is to reduce the patients' fear and anxiety during the rehabilitation process.

Tayô Project

On the other hand, the Tayô project is intended for the lower extremities of the body. It is a multifunctional device that acts as a 3D-printed external skeleton for lower limb and early trunk rehabilitation. It is a wearable machine that assists physical therapists to minimize lifting, mobilizing, and transferring patients.



*A demonstration of the prototype of Agapay, which aids in the rehabilitation of the upper extremities of the body.
(Photo from Mr. Julius Banayo, Research Associate from DLSU-IBEHT).*

Similar to Agapay, the equipment aims to restore the motion, strength, and ability of patients to stand through performing exercises and various gamification software. The device requires electricity but consumes minimal power only.

The Tayô project is now at the clinical testing stage, and is set to be completed by May 2020.

Julius Banayo, one of the research associates under the Tayô project, said that these innovations are meant to help physical therapists, not replace them. "It's made to assist them and enable them to handle more patients at a time," he explained.

Further, the lack of manpower and lack of equipment in Philippine hospitals served as the main inspiration in developing these technologies.

By showcasing the Tayô and Agapay projects in events like the

National Science and Technology Week, Banayo hopes that their innovation could gain more awareness. "This is why we want to bring the innovation here in the NSTW, so we can attract entrepreneurs and businessmen to adopt our technology", Banayo shared.

Once the technologies are adopted by companies, it would be easier for these equipment to be commercialized and distributed to hospitals across the country. Such will make it the first pure Filipino made physical therapy equipment.

The Tayô and Agapay projects exhibit by the DLSU-IBEHT was located in Cluster 2: Aging Society, Health and Medical Care at the 2019 National Science and Technology Week.



Photo from DOST-SEI

Science learning on-the-go

DOST launches 'nuLab' to discover future scientists, innovators

by Allan Mauro V. Marfal, DOST-STII

By the bus, this is the Department of Science and Technology-Science Education Institute's (DOST-SEI) latest strategy in discovering the next breed of Filipino scientists and innovators.

Called 'nuLab', this customized bus was launched Wednesday, 17 July, at the World Trade Center in Pasay City during the opening of the 2019 National Science and Technology Week (NSTW) celebration.

Installed inside the nuLab are modern audio-visual and educational tools and equipment, laboratory facilities, and various learning materials useful in introducing concepts and developing skills. It can accommodate 24 students in one session and can hold two sessions per day.

The bus, according to DOST-SEI, would allow the Filipino youth to discover their potential in the various fields of Science, Technology, Education, and Mathematics (STEM) and eventually pursue courses and careers along these lines.

At the end of every session, students are encouraged to apply for the undergraduate scholarship program through a strategic campaign called "#Push4science : Maging DOST Scholar Ka!"

Dr. Josette T. Biyo said that 98 percent of the municipalities all over the country have already at least one DOST scholar. This is a testament that many young Filipinos are interested in pursuing S&T careers, she said.

"As the nuLab hits the road, it is our way of reaching out to every young Filipino in different sides of the country. It is also our way of providing them access to various advanced learning tools in the field of science and technology," said DOST Secretary Fortunato T. de la Peña.

nuLab is the second mobile learning facility of DOST-SEI after the success of the Science Explorer project which

has served 32,000 students in more than 100 municipalities.

Scientists and former DOST scholars, namely astrophysicist Dr. Rogel Mari Sese, marine biologist Dr. Aletta Yñiguez, entomologist Dr. Aimee Lynn Dupo, Engr. Myra Ruth Poblete, Engr. Angelo Javier, Charmaine Villanueva-Villamil, Pamela Tolentino, Ana Jamille Restubog, Jomar Rabajante, Gilbert Zamora, Nico Mendoza, Garry Jay Montemayor, Seymour Sanchez, Timothy James Dimacali, Shaira Panela, among others, designed the modules for the NuLab sessions.



Photo by Kimverlyn C. Sayson, DOST-STII



DOST regional offices showcase #ASTIGCountryside in NSTW 2019

by Aliana Gene Sarmiento, DOST-Caraga

Featured among others at this year's NSTW is the exhibit area "Cluster 4: Equity and Growth in the Countryside" or the Regional Offices' Exhibits Area. It displays a collection of science, technology and innovation (STI) efforts and stories from the 16 Department of Science and Technology (DOST) regional offices in bringing "accelerated STI for growth in the countryside" or #ASTIGCountryside.

"Astig" is a Filipino colloquial which means "cool" or something that is awesome.

Through the office of the Undersecretary for Regional Operations, the DOST regional offices highlight three Sustainable Development Goals (SDGs): No Poverty (SDG 1), Peace, Justice and Strong Institutions (SDG 16), Decent Work and Economic Growth (SDG 8).

The tagline is #ASTIGCountryside because the DOST regional offices want the world to see communities, local businesses, and institutions outside the major centers in the country as equally empowered, competitive, and science champions.

The STI for No Poverty area showcased a diorama of three best CEST communities in Luzon, Visayas, and Mindanao that walked viewers through 2-D models representing the projects and accomplishments of the program in the communities. Testimonials of program beneficiaries were



viewed in hologram effect and CEST products produced by the different communities were also displayed.

In the STI for Decent Work and Economic Growth exhibit area, there were audio-visual presentations featuring SETUP-assisted MSMEs with best transformational stories. There were demonstrations of actual machines like computer numerical control, laser, vertical form fill seal and 3D printer machines.

Visitors were able to see, smell, and touch the displayed delicacies of the provinces and local products from SETUP partner firms.

The STI for Peace, Justice and Strong Institutions exhibit area showcased efforts in building back better communities in Marawi thru S&T. Featured were DOST-X's livelihood projects as assistance



to those affected by the conflict in Marawi City. These projects include:

- 1) Skills Development on the Production of Do-It-Yourself Bamboo Shelter;
- 2) Establishment of Corn Mill Processing Facility;
- 3) Introduction of Innovation Support System and Management Strategies to Vegetable Production to Farmers; and
- 4) Reviving the Handloom Weaving Industry for the Recovery, Reconstruction, and Rehabilitation of Marawi and Adjacent War Affected Communities in Lanao del Norte..

Aside from the exhibits highlighting the SDGs 1, 8 and 16, the Cluster 4 or the Regional Offices' Exhibits also featured a game zone, wellness garden, souvenir shoppe, and a concierge where IEC materials can be accessed.



DOST-FPRDI showcases new studies, technologies at 2019 NSTW

For decades, the Philippines has depended on imported materials to make its own paper money. Now the promising result of a research conducted by the Department of Science and Technology-Forest Products Research and Development Institute (DOST-FPRDI) shows that the Philippines can already produce its own paper money.

“We are planning to team up with the Bangko Sentral ng Pilipinas (BSP) to make our own currency base paper (CBP) using 100% locally available fibers,” said DOST-FPRDI Director Romulo T. Aggangan.

Dr. Aggangan is referring to local fibers, namely abaca (*Musa textilis*

Nee), salago (*Wikstroemia spp.*) and mangium (*Acacia mangium*) which can be combined together to come up with a durable material for CBP.

Aside from this project, the DOST-FPRDI is also bent on helping local craftsmen find new sources of raw materials.

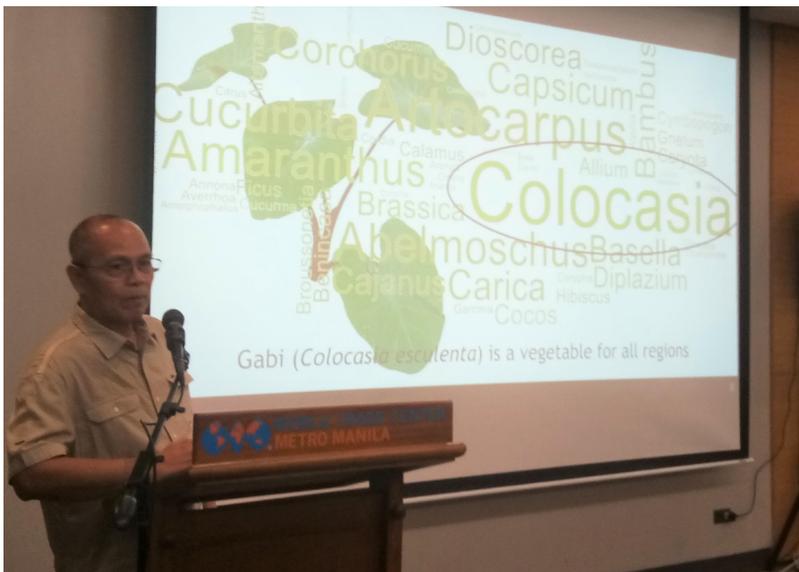
“The DOST-FPRDI is leading a project aimed at determining the volume and location of significant forest vines in the Bicol region, as well as studying the factors affecting their natural growth and regeneration,” he informed.

One of the most biodiverse countries in the world, the Philippines is home to a wide array of the world’s plants and animal species, and “the DOST-FPRDI

is doing its best to sustainably tap these natural resources for a multitude of purposes,” Dr. Aggangan said.

Studies on the said currency base paper and new sources of materials for craftsmen were showcased by the DOST-FPRDI at the 2019 National Science and Technology Week (NSTW).

Other studies put on spotlight include the propagation of forest vines in Bicol for handicraft and furniture production and bullet-resistant vest developed using the widely available and renewable bamboo. The Institute also featured its newest program on Bamboo Musical Instruments Innovation Research and Development.



EATING GABI. Gabi or taro is the most eaten vegetable in the Philippines, says Prof. Nestor C. Altoveros from the University of the Philippines Los Banos-Institute of Crop Science. Prof. Altoveros found this fact while visiting 14 provinces all over the country to document indigenous vegetables that Filipinos include in their everyday dishes. Their team saw that all parts of gabi or scientifically named as *Colocasia esculenta*--from the roots up to its leaves--are cooked in recipes like laing or taro leaves with coconut milk, pastilas (candy), sinangang (stewed), ginataang gabi or taro root in coconut milk. According to him, a vegetable can be considered as indigenous if the plant is underutilized, low-cost, nutritious, endemic in the country or was brought in the country during the colonial period. Dr. Altoveros was speaker in the forum “Rediscover the Philippines One Vegetable at a Time” during the 2019 NSTW.



Photo from ABS-CBN



Dressing up to perfection the scientific way

by Rodolfo de Guzman, DOST-STII

Do you find it difficult to get the perfect fit for your wardrobe? With science and technology, your worries may now be the thing of the past because of the Perfect Fit 3D Body Scanner made available by the Philippine Textile Research Institute (PTRI) of the Department of Science and Technology (DOST) to textile designers, artists and clothes manufacturers.

“The Perfect Fit” Project under the Textile Product Development Center of DOST-PTRI is part of the Institute’s move to introduce modern

technologies and innovations with the aim of becoming the first textile R&D laboratory in the Philippines.

A component of the Perfect Fit Project, the 3D Body Scanner was recently acquired by DOST-PTRI to give textile designers, artists, retailers, and manufacturers easy access in the prototyping of their designs and products for evaluation before public offering.

With this technology, the textile and clothing industry will be able to provide accurate measurements using the avatar specifically “tailor-fit” for the Filipino body type. Later, this is expected to provide a national sizing system for clothes in the country.

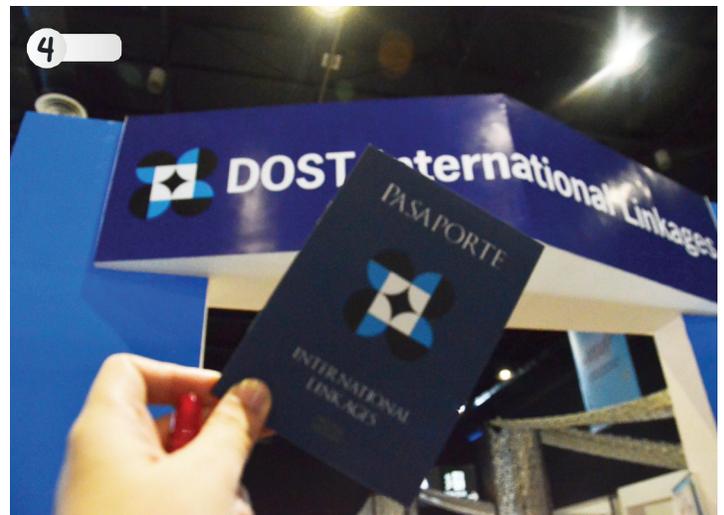
At the 2019 NSTW, the 3D Body Scanner was the centerpiece of the DOST-PTRI exhibit where visitors had the chance to get their body measurements and find their perfect fit.

Aside from the 3D Body Scanner, the center also featured at the 2019 NSTW some state-of-the-art equipment for textile product development such as the 3D visualization system and computerized fabric prototyping loom.



Dress made of natural dyed BANDALA fabric





1

DUCK. COVER. HOLD. Selected grade school students volunteer to demonstrate on-stage how to duck, cover, and hold during an earthquake. This practice is one of the highly advised disaster-readiness measures discussed by Jeffrey S. Perez of the Department of Science and Technology-Philippine Institute of Volcanology during the Disaster Summit for Kids held 19 July 2019. He also explained the other earthquake hazards as well as preparing for “The Big One.”

2

CLOUD IN A BOTTLE. The student-participants excitedly try the mini experiment on how clouds are formed using a specialized plastic bottle. The rubber squeeze on the bottle cap pumps air into the bottle and forces water vapor in the atmosphere to compress together inside. As soon as the bottle cap is opened, pressure is released and this simulates what a cloud looks like inside the bottle. This experiment shows how typhoons are formed and how people can prepare before, during, and after a typhoon. Bernard R. Punzalan, a meteorologist from the Department of Science and Technology-Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), demonstrated the mini-experiment.

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ALL ABOARD! Participants form a long queue at the airport-themed booth for the Cluster 8: International Linkages during the 2019 NSTW. Spearheaded by the Department of Science and Technology (DOST)-International Technology Cooperation Unit, the creative and interactive cluster was designed in such way to promote the international engagements of DOST. Complete with check-in counters and approachable ground service staff who disseminates free mini-passports to the participants, this cluster was a sure hit to the kids and the kids-at-heart. The passports were presented inside the cluster as the participants went around each booth representing the countries that have collaborations with DOST. The International Linkages Cluster was one of the eight clusters during the 2019 NSTW.

*Text by Jasmin Joyce P. Sevilla, DOST-STII
Photos by Gerardo G. Palad & Kimverlyn C. Sayson, DOST-STII*