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12 years of bringing S&T good news

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DOST launches 3D printing research facilities

By Raissa Jean C. Ancheta, *DOST-PCIEERD*
Photos from DOST-PCIEERD

The proposed Additive Manufacturing Center building design

In its bid to leapfrog ASEAN countries in the additive manufacturing industry, the Department of Science and Technology (DOST) has launched two 3D printing research facilities in the country.

One is the Additive Manufacturing Research Laboratory (AMREL) which DOST Secretary Fortunato T. de la Peña and other DOST officials recently inaugurated at the Bataan Peninsula State University (BPSU). AMREL is a state-of-the-art 3D printing research facility equipped with the latest machines on additive manufacturing.

Another is the Additive Manufacturing Center (AMCen), which had its groundbreaking recently at the DOST-Metals Industry Research and Development Center (MIRDC). The AMCen is conceived to be the country's leading research center in innovative 3D printing technologies, processes, and materials.

At the groundbreaking ceremony of AMCen, Sec. de la Peña emphasized the importance of partnerships with different agencies—national government organizations, non-government agencies, private companies, and the academe—in optimizing the program objectives.

DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara also encouraged the academe and the industry to collaborate with AMCen to produce new products, substitutes for parts/components, and/or realize other applications of 3D printing.

"With the recent trends in Industry 4.0, advance additive manufacturing will support our independence from many imported items and sustain our development. It will also serve as buffer with regard to the economic effect of importation, inflation, and dollar fluctuation while enhancing the technical support of the government to the industry," said Usec. Guevara.

Meanwhile, Dr. Enrico C. Paringit, executive director of the DOST-Philippine Council for Industry, Energy, and Emerging Technology Research and Development (DOST-PCIEERD),

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Science chief lauds physics enthusiasts

By Joel O. Legaspi, *PSTC-Negros Oriental*
Photos from PSTC-Negros Oriental

"The immense importance of physics in our lives cannot be discounted in our daily activities," emphasized Department of Science and Technology (DOST) Secretary Fortunato T. de la Peña in his speech during the 41st Annual National Physics Seminar-Convention of the Philippine Physics Society (PPS) on 10 April 2019 at the Maxino College, Dumaguete City, Negros Oriental.

Before an audience of more than a hundred physics teachers, students, and researchers from different regions of the country, Sec. de la Peña highlighted the important role of physics in many aspects of our lives.

"The internet would not have been possible without the physics-based ideas that played a huge role in the development of computers and the World Wide Web," Sec. de la Peña cited as an example.

The science chief added, "Whenever we have our blood pressure checked or—in the case of

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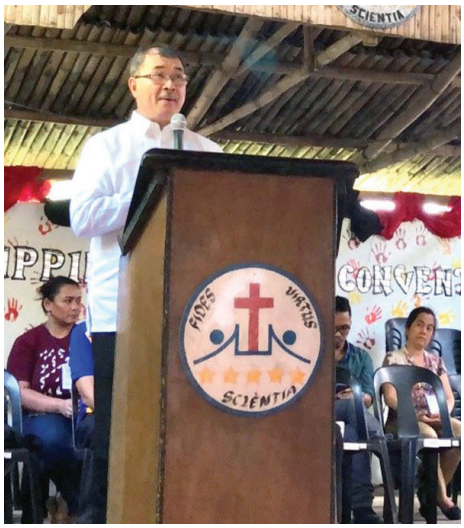

DOST Secretary Fortunato T. de la Peña delivers his speech during the 41st Annual National Physics Seminar-Convention of the PPS. *(Photo by PSTC-Negros Oriental)*

Science chief...
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Dr. Gerardo C. Maxino (middle), founder of PPS, awards a certificate to DOST Secretary Fortunato T. de la Peña (rightmost).

expecting mothers—avail of ultrasound as part of prenatal care, it is physics knowledge that have made them standard medical procedures."

The Secretary also highlighted the achievements of the DOST in terms of research and development, technology transfer/productivity through science and technology (S&T), S&T services, human resource development, and disaster risk reduction and climate change adaptation.

He expressed his "fond hope that members and prime movers of the Philippine Physics Society shall be forever committed to develop lifelong learners who are logical, analytical, creative, and critical thinkers who can share their talents and skills toward national development and inclusive growth."

Sec. de la Peña also lauded Dr. Gerardo C. Maxino, the founder and prime mover of the PPS for his leadership and guidance since the establishment of the organization some 45 years ago.

For the part of the PPS, Dr. Maxino reaffirmed their mission of being committed to serving the people using the principles of physics and by increasing the capability of the members to link, teach, and do researches relevant to the actual needs of the communities.

Also present in the event were Dr. Loreto B. Feril Jr., researcher from the Fukuoka University and one of the event's keynote speakers; Engr. Edilberto L. Paradela, regional director of DOST-VII, Engr. Jesus F. Zamora Jr., assistant regional director for Technical Operations, DOST-VII; Bernarda G. Perez, assistant regional director for Finance, DOST-VII; and Atty. Gilbert R. Arbon, provincial director of PSTC-Negros Oriental.

DOST launches...
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DOST-PCIEERD project managers, DOST-PCIEERD Executive Director Dr. Enrico C. Paringit (third from left), and AMREL Project Leader Prof. John Ryan C. Dizon (middle)

expressed optimism over the prospects of additive manufacturing in the country with the opening of the two new facilities.

"We are launching two centers for 3D printing research and development and we at DOST-PCIEERD are privileged to be part of this game-changing initiative. The additive manufacturing research industry will open the doors to previously unimaginable possibilities, and every single 3D-printed product will unfold more innovations. Soon, how we create things will be different from what we're used to," said Director Paringit.

3D printing, from small parts to big structures, can be used in aerospace, defense, biomedical, healthcare, printed electronics, agricultural machinery, and automotive industries.

AMREL is the first additive manufacturing research laboratory in the Philippines and, since 2 July 2018, it has been used to conduct research for undergraduate and graduate theses.

Prof. John Ryan C. Dizon, project leader of AMREL, proudly shared some studies on the applications of 3D printing for defense applications and health care. He also had a technology demonstration with junior high school students of the Bataan National High School, successfully creating a 3D-printed drone.

"These are all blessings for all of us and for the future generations," said Dr. Gregorio J. Rodis, president of BPSU, who expressed his gratitude on behalf of the BPSU for being the first recipient of a research laboratory that focuses on 3D research and development.

AMREL will be used for the following thrusts: development of new materials; testing and characterization of materials; faculty and student sharing and creating of ideas; rapid prototyping, tooling, and manufacturing; training, education, and empowerment; and designing and analysis of parts and systems.

Meanwhile, AMCen is expected to rise after nine months, and will be operational in its second year of implementation.

Two DOST agencies will lead the management of AMCen: the DOST-Industrial Technology Development Institute will develop new materials for additive manufacturing while the DOST-Metals Industry Research and Development Center will handle the advanced prototyping.

ABOUT US

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For comments, suggestions or queries, contact: (02) 837-2071 to 82 loc. 2148/839-2193 local 107 or email: dost.digest@gmail.com

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
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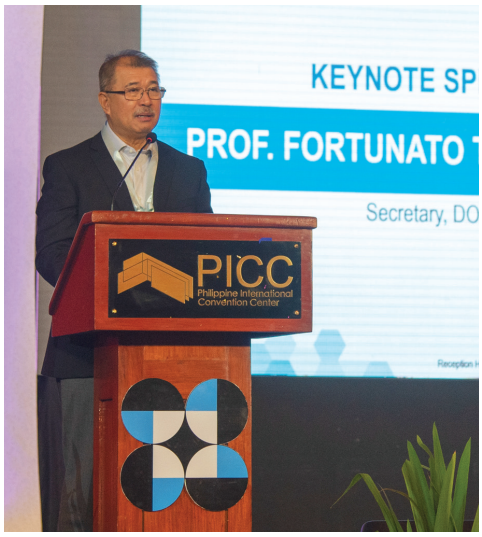
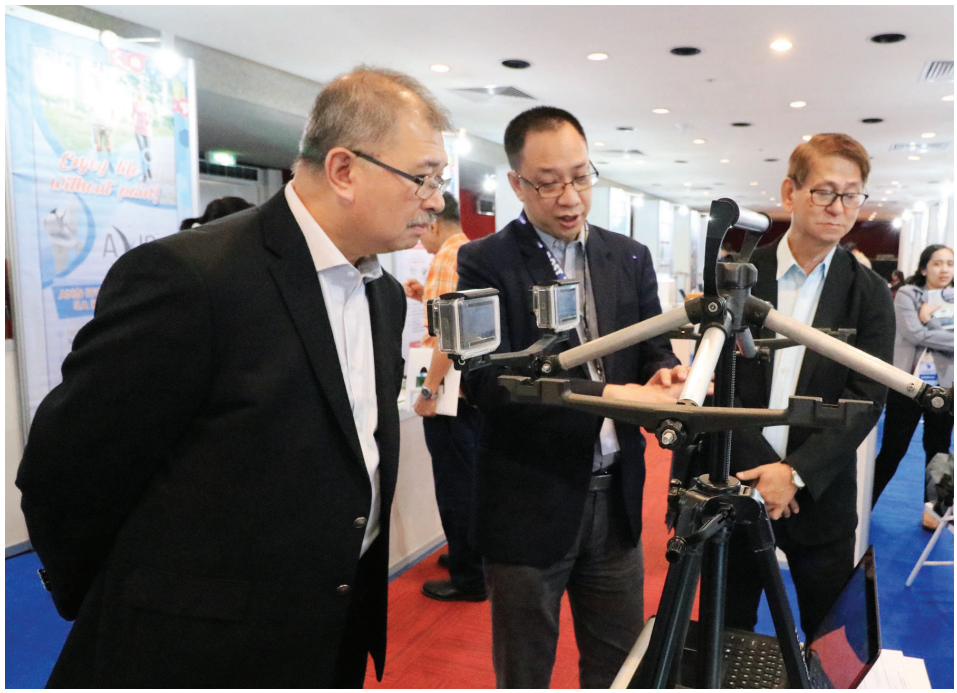
21 techs pitched at the Nat'l Tech Transfer Day

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



DOST Secretary Fortunato T. de la Peña delivers his keynote speech during the 2019 National Technology Transfer Day on 4 April 2019 at the Philippine International Convention Center, Pasay City.



DOST Secretary Fortunato T. de la Peña (left) and DOST-TAPI Director Edgar I. Garcia (right) visit the booths during the 2019 National Technology Transfer Day.

A total of 21 technologies developed by some of the country's technology generators and innovators were pitched to possible investors and adoptors during the recently concluded National Technology Transfer Day 2019.

Held on 4 April 2019 at the Philippine International Convention Center in Pasay City, the National Technology Transfer Day 2019 was led by the Department of Science and Technology (DOST), through the Technology Application and Promotion Institute (TAPI).

The National Technology Transfer Day provides the necessary mechanism in speeding up the transfer and commercialization of DOST-funded and generated technologies by virtue of Republic Act (RA) 10055 or the Philippine Technology Transfer Act of 2009.

Since the conception of the Technology Transfer Day in 2016, six technologies were already commercialized by seven technology adoptors all over the regions.

"The technologies we present today focus on the five-pillar innovation ecosystem which provides great contribution in raising the country's performance in the Global Competitiveness Index by the World Economic Forum," said DOST Secretary Fortunato T. de la Peña during his keynote speech.

"We realized that the objective of RA 10055 in the speeding up and cascading of technologies generated from publicly funded research and development into the market fell into our hands to challenge the current system by creating innovative infrastructures for the benefit of the Filipinos," added Sec. de la Peña.

This year's celebration presented an opportunity for micro, small, and medium enterprises (MSMEs), investors, fabricators, and adaptors to invest in local technologies developed by Filipino technology generators and innovators. The technologies presented were concentrated in the areas of agricultural productivity, disaster resilience, information technology development, MSME competitiveness, and quality healthcare.

The new format of the National Technology Transfer Day supports the provision of a platform for recognition and dissemination of top and recent DOST breakthroughs that have potential significant impacts for global competitiveness.

This year's event included two preparatory activities before the actual National Technology Transfer Day—the Regional Offices (ROs) meet Technology Generators (Tech Gens) and the Tech Gens meet Chief Executive Officers.

"Businessmen may not have the patience to wait that long in order to obtain a clearance before they can finally get a license from government-funded technologies," said DOST-TAPI Director Edgar I. Garcia.

"It is for this reason that we have our industry-based ideal licensing or spinoff terms that you may be interested to use, where we can substantially reduce the waiting time from 60 to 90 days, to just one day up to 15 days," added Garcia.

In the 2019 ROs meet Tech Gens, 21 selected technologies of the DOST-Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development and the DOST-Forest Products Research and Development Institute were presented to the ROs.

Subsequently, the ceremonial signing of the amended implementing rules and regulations of RA 10055 between the DOST, represented by Sec. de la Peña, and the Intellectual Property Office of the Philippines, represented by Director General Josephine R. Santiago, was held during the National Technology Transfer Day 2019.

Balik Scientist recommends work hazard compensation for metro traffic enforcers

By Geraldine B. Ducusin, *DOST-STII*

Dr. Emmanuel S. Baja presents his study findings during the DOSTkusyon conducted by the DOST for the Balik-Scientist program. *(Photo by Henri A. de Leon, DOST-STII)*

In a study that assessed the cardio-pulmonary health of 158 traffic enforcers from Metropolitan Manila Development Authority (MMDA), a team of researchers led by Balik-Scientist Dr. Emmanuel S. Baja of NIH-UP Manila found that exposure to black carbon and heavy metals affected the blood pressure (BP), inflammation, and lung function of traffic enforcers on duty.

According to Dr. Baja, the findings can provide some evidence for traffic enforcers to have some form of occupational hazard compensation.

Investigating the effect of black carbon on diastolic and systolic BPs, the research team also studied whether these effects vary according to the participating enforcers' individual characteristics. The researchers also wanted to find out the link between exposure to traffic-related air pollution and other cardiovascular and pulmonary outcomes at times within days of exposure.

Systolic BP refers to the top number of the BP reading, while diastolic refers to the bottom number. The former refers to the force emitted by the heart as it pushes blood and creates pressure on the blood vessels. The latter refers to the pressure in the arteries when the heart rests between beats, when the heart gets filled with blood and oxygen.

Effects on cardio-pulmonary health

The study found out that exposure to increasing ambient black carbon, a marker of vehicular gas and diesel traffic-pollution, may increase the systolic blood pressure among traffic enforcers who are women and those who are "ever smokers."

Additionally, the study showed that black carbon may decrease lung function among enforcers who are obese, or who are non-smokers, or who are men.

Regarding exposure to heavy metals, lead was found in the enforcers' blood which may be associated with increased C-reactive protein (CRP), a marker of systemic inflammation. More susceptible to the increase in CRP are enforcers who are female, or who are never smokers.

Dr. Baja also said that the study provides additional evidence that heavy metal or black carbon via the inflammation pathway may be a factor in heart damage of traffic enforcers.

Hazard pay for enforcers

"Currently, the traffic enforcers don't have any kind of hazard pay as part of their salary," Baja said.

"This evidenced-based research could help them ask for certain compensation from the Department of Budget and Management and local government units."

Hazard pay for traffic enforcers has been constantly proposed in the past. Dr. Baja hopes that the results of their study would serve as strong evidence of the need for such occupational hazard compensation for traffic enforcers and traffic aids.

According to Dr. Baja, his team did the health assessment of the enforcers along Epifanio Delos Santos Avenue (EDSA) in Metro Manila from 5:00 am to 2:00 pm. The enforcers' toenails and blood were collected for metal exposure assessment and their blood for inflammatory marker. They also assessed the enforcers' lung function and blood pressure.

This health research was funded by the Department of Science and Technology-Philippine Council for Health Research and Development, the government agency that funded health-related technologies, such as the RxBox, Biotek-M, OL Trap, Lagundi tablet and syrup, Sambong tablet, Yerba buena tablet, Tsaang Gubat, and Axis Knee System, among others.

inFOCUS

FREE train rides! Starting 6 May 2019, passengers will have the chance to ride the Hybrid Electric Train (HET), FREE for 19 days. As part of its turnover process to the Philippine National Railways (PNR), the HET will have to complete 150 hours or approximately 19 days of run time for the train which will run the Alabang-Calamba route. Comfortable rides are rest assured, as the train coaches are fully air-conditioned. The coaches also have CCTV system, LED TV sets, and automatic sliding doors. The HET, a 100 percent locally-made train, is developed by the Department of Science and Technology-Metals Industry Research and Development Center in partnership with the PNR. *(Text by Enrico C. Belga, Jr., DOST-STII and photo from DOST-MIRDC)*