

PNRI Newsletter

July-December 2016

| Volume 12

A newsletter of the Philippine Nuclear Research Institute (PNRI)

PNRI CELEBRATES 44TH ATOMIC ENERGY WEEK

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The PNRI Newsletter is an online publication of the Philippine Nuclear Research Institute (PNRI), a research and development institute of the Department of Science and Technology (DOST).

For comments, suggestions or inquiries, please contact:



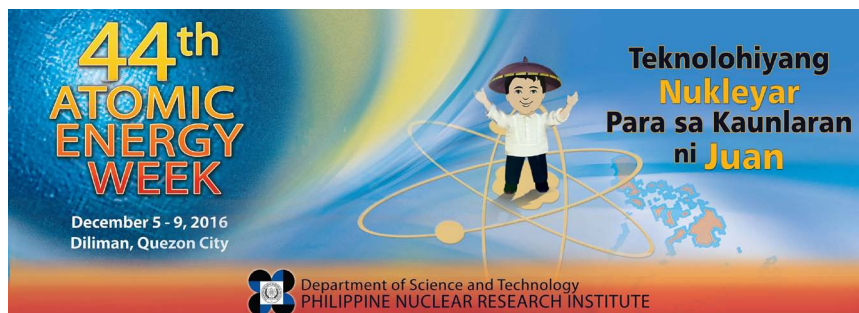
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PNRI Officer-in-Charge Dr. Carlos Primo David shows some of the applications of plant mutation breeding by technology adaptors to DOST officials and members of the media.

Spearheading the country's progress in nuclear science and technology, the Department of Science and Technology – Philippine Nuclear Research Institute (DOST-PNRI) celebrated the 44th Atomic Energy Week (AEW) from December 5-9, 2016 at the PNRI compound.

The annual AEW celebration, as mandated under Presidential proclamation No. 1211 in 1973, aims to generate awareness of the Filipino people on the beneficial uses of nuclear science and technology. With the theme, "Teknolohiyang Nukleyar para sa Kaunlaran ni Juan", PNRI once again featured the latest advances in nuclear science and technology in the country in the fields of agriculture, industry, medicine, and the environment.

PNRI Officer-in-Charge Dr. Carlos Primo David commended PNRI's efforts in both the development of nuclear and radiation applications and reaching out to various sectors to maximize its benefits.

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Best DOST Institute Award for 2016

Awarded by the
National Academy of Science and Technology (NAST)

2016 DOST Utility Model Registration Award under the 2016 DOST Intellectual Property Award:

“Polyvinyl pyrrolidone-chitosan implant for
endoscopic treatment of Vesicoureteral Reflux”

(by Lorna S. Relleve, Lucille V. Abad, David T. Bolong, Carlo C. Bisnar) 2-2014-000678

2016 DOST International Publication Award

- “Insecticidal Activity of Four Essential Oils against Diamondback Moth, *Plutella xylostella* Linnaeus (Lepidoptera: Pyralidae)” (by Abigaile Mia V. Javier, Virginia R. Ocampo, Flor A. Ceballo, Pio A. Javier) ISSN 0031-7454; Philippine Agricultural Scientist 99(2): 156-163 2016
- “Grafting of N,N-dimethylaminoethyl methacrylate from PE/PP nonwoven fabric via radiation-induced GRAFT polymerization and quaternization of the grafts” (by Jordan F. Madrid, Murat Barsbay, Lucille V. Abad, Olgun Güven) ISSN 0969-806X Radiation Physics and Chemistry 124:145-154 2016
- “Pupal eye color of *Bactrocera philippinensis* (Drew & Hancock) as tool for radiation sterilization” (by Sotero S. Resilva, Glenda B. Obra) ISSN 0031-7683 Philippine Journal of Science 145(2): 139-151 2016
- “Hemostatic efficacy evaluation of radiation crosslinked carboxymethyl kappa-carrageenan and chitosan with varying degrees of substitution” (by Charito T. Aranilla, Bin Jeremiah D. Barba, Jeanina Richelle M. Vista, Lucille V. Abad) ISSN 0969-806X Radiation Physics and Chemistry 124:124-129 2016
- “Size-dependent changes in toxicity of *Perna viridis* mussels exposed to natural populations of *Pyrodinium bahamense* var. *compressum*” (by Ma. Llorina O. Rañada, Rhett Simon dC. Tabbada, Aileen DL. Mendoza, Juan Relox Jr., Elvira Z. Sombrero) ISSN 2352-4855 Regional Studies in Marine Science 3: 176-180 2016
- “Fish diversity and trophic interactions in Lake Sampaloc (Luzon Is., Philippines)” (by Jonathan Carlo A. Briones, Rey Donne S. Papa, Gil A. Cauyan, Norman Mendoza, Noboru Okuda) ISSN 0564-3295 Tropical Ecology 57(3):567-581 2016
- “Microstructured boron foil scintillating G-GEM detector for neutron imaging” (by Takeshi Fujiwara, Unico Bautista, Yuki Mitsuya, Hiroyuki Takahashi, Norifumi L. Yamada, Yoshie Otake, Atsushi Taketani, Mitsuru Uesaka, Hiroyuki Toyokawa) ISSN 0168-9002 Nuclear Instruments & Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 838:124-128 2016
- “Microbiological quality of brown rice, ready-to-eat pre-cut fresh fruits, and mixed vegetables irradiated for immuno-compromised patients” (by Chitho P. Feliciano, Zenaida M. de Guzman, Levelyn Mito M. Tolentino, Celia O. Asaad, Maria Lucia C. Cobar, Gina B. Abrera, Davison T. Baldos, Gilberto T. Diano) ISSN 0969-806X Radiation Physics and Chemistry 130(2017): 397-399 2016
- “Historical record of nuclear activities from ¹²⁹I in corals from the northern hemisphere (Philippines)” (by Angel T. Bautista VII, Hiroyuki Matsuzaki, Fernando P. Siringan) ISSN 0265-931X Journal of Environmental Radioactivity 164:174-181 2016
- “Triterpene and sterols from *Hoya pubicalyx* Merr.” (by Nelson M. Panahon, Fernando B. Aurigue, Ian van Altena, Consolacion Y. Ragasa) ISSN 0975-5071; Der Pharmacia Lettre 8(13): 270-273 2016
- “Triterpenes and sterols from *Hoya diversifolia* Blume” (by Nelson M. Panajon, Fernando B. Aurigue, Chien-Chang Shen, Consolacion Y. Ragasa) ISSN 2231-3354 Journal of Applied Pharmaceutical Science 6(6):79-82 2016

PNRI Celebrates 44th AEW - Continued from Page 1

“We want the public to know that we exist and that the products of our research are quite relevant, maybe not in terms of producing power from nuclear technology just yet, but in terms of the applications of nuclear science in other sectors, such as industry competitiveness, agriculture productivity, health science, and the environment.”

Exhibits and Technical Sessions

To meet thousands of visitors from various sectors throughout the week, twelve exhibits by PNRI’s own scientists, researchers and regulators featured their various projects and services to compete for the Best Technical Exhibits.

The PNRI Chemistry Research Section won first place with their exhibit entitled Chemistry Research Section, We Explore, We Develop featuring diverse applications of carrageenan and receptor binding assay for red tide monitoring.

The second place was won by the Agriculture Research Section exhibit Smart Juan: Ang Makabagong Dalubsaka which featured a timeline of agriculture history and its development of precision farming and sterile insect techniques.

The Biomedical Research Section’s Teknolohiyang Nuklyar: Kalusugan Ang Handog Para Kay Juan won third place which featured food irradiation, honey alginate wound dressing and cytogenetic services, while the People’s Choice Award went to the Radiological Impact Assessment Section’s PNRI Emergency Response: Minimizing the Consequences of Ionizing Radiation.

Technical sessions were also held in December 5 and 6 in the afternoon. Experts from PNRI and other scientific institutions delivered lectures on the applications of nuclear analytical and isotopic techniques in air quality and algae studies, records of nuclear activities through Philippine corals, radiation processing, nuclear medicine, and the establishment of several advanced facilities such as a research reactor, accelerator, subcritical reactor assembly and neutron laboratory.

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A researcher from the Chemistry Research Section demonstrates the use of PNRI’s hydrogel wound dressings as part of their exhibits during the 44th Atomic Energy Week.

High school students are taught how to use radiation detection instruments by emergency responders from the PNRI Radiological Impact Assessment Section.



PNRI Scientist Dr. Lucille Abad lectures on radiation processing technologies during the 44th AEW Technical Sessions held on December 6.



Engineer Mauro Marcelo of the National Power Corporation discusses on the technology behind nuclear power plants during the technical sessions.



PNRI Celebrates 44th AEW - Continued from Page 3

2nd Philippine Nuclear Youth Summit

Meanwhile, students, teachers and young professionals attended the Second Philippine Nuclear Youth Summit held on December 7.

Speakers from PNRI along with youth leaders from Malaysia and Indonesia inspired the students to engage in science and mathematics-related courses, especially nuclear science, and to encourage the youth nuclear S&T professionals and students to initiate the establishment of the Philippine Young Generation in Nuclear.

The Summit also showcased Filipino creativity and skill as the participants competed in various games and group dynamics.

Among the highlights of the 44th AEW is the 2016 Philippine Nuclear Science Quiz. Twenty teams of high schools students from across the country competed in the national level. Manila Science High School won first place, followed by Pasig City Science High School and Philippine Science High School – Eastern Visayas.

The first placer received a cash prize of Php 50,000, the second placer Php 40,000 and the third placer Php 30,000, all including plaques and certificates of recognition.

Closing Ceremonies

At the closing ceremonies on December 9, PNRI recognized the achievements of its scientists and researchers who recently won twelve DOST International Publication Awards (IPA). The IPAs were given for articles by PNRI researchers which were published in internationally-recognized journals. For winning the most IPAs in DOST, PNRI was also awarded the Best DOST Institute Award for 2016 by the National Academy of Science and Technology (NAST).

Dr. Teofilo San Luis of the Philippine Society of Nuclear Medicine (PSNM) delivered the message during the closing ceremonies.



Students, teachers and other young professionals participate in the Second Philippine Nuclear Youth Summit held on December 7



Manila Science High School receives the award for first place in the 2016 Philippine Nuclear Science Quiz (PNSQ) during the closing ceremonies of the 44th AEW on December 9.



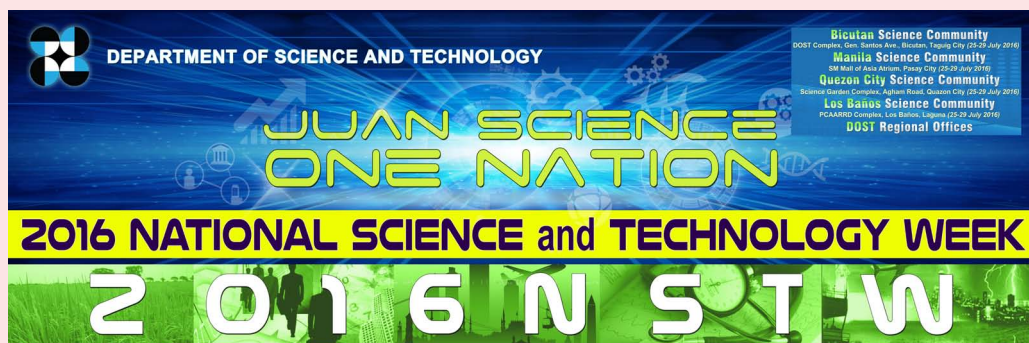
Dr. Teofilo San Luis of the Philippine Society of Nuclear Medicine (PSNM) delivered the message during the closing ceremonies of the 44th AEW.

PNRI JOINS QC SCIENCE COMMUNITY AT THE 2016 NSTW

With the theme, “Juan Science, One Nation”, the Department of Science and Technology – Philippine Nuclear Research Institute (DOST-PNRI) joined the Quezon City Science Community (QCSC) as well as its fellow DOST agencies in the celebration of the National Science and Technology Week 2016 from July 25 to 29, 2016.

This year’s celebration was spread across four science communities – the Bicutan Science Community at the DOST Complex in Taguig City, the Los Baños Science Community at the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) in Los Baños, Laguna, the Manila Science Community at the SM Mall of Asia Atrium in Pasay City, and the Quezon City Science Community at the Science Garden of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) in Quezon City.

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Above: The students observe a diorama of the Cobalt-60 Multipurpose Irradiation Facility

Left: Visitors also had the opportunity to try out one of PNRI’s survey meters to detect radioactive materials



PNRI WINS BEST POSTER AWARD IN CANADA FOR PLANT GROWTH PROMOTERS

Bringing home the bacon from the other side of the world, DOST-PNRI ends 2016 by once again gaining worldwide recognition for its research on radiation applications in agriculture.

With their project’s E-Poster titled “E-beam production of Radiation-Modified Carrageenan as Plant Growth Promoter”, PNRI Scientist and Chemistry Research Section Head Dr. Lucille Abad clinched the Best Poster Award for the Philippines along with other participants from the United States and Ireland during the International Meeting on Radiation Processing (IMRP) held from November 7-11 in Vancouver, Canada.

Organized by the International Irradiation Association, the IRMP serves as a venue where members of the industrial, research and academic sectors from different countries discuss on all aspects of irradiation science and technology.



PNRI Scientist Dr. Lucille Abad receives the Best Poster Award from the International Irradiation Association (IIA) for the PNRI project on the development of irradiated natural polymers as Plant Growth Promoters (PGPs) on November 10 at Vancouver, Canada.

This year’s IMRP poster competition drew submissions from more than 80 countries, where only three submissions, including the Philippines, were selected to receive the Best Poster Award.

The Institute’s PGP project was developed from carrageenan, a natural polymer from red seaweed commonly used in the food industry.

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PNRI at 2016 NSTW - Continued from Page 5

The DOST regional offices, agencies and institutes also celebrated the 2016 NSTW with their own open-house guided tours of facilities and exhibits.

Focusing on science & technology applications for disaster mitigation, preparedness and response, the QCSC adopted the sub-theme, "Juan Science, One Disaster Resilient Nation" which echoed throughout the community's various activities, contests, forums and exhibits.

The various DOST agencies in Quezon City also welcomed hundreds of visitors as they opened their facilities for guided tours.

In celebration of the 2016 NSTW, PNRI featured exhibits and guided tours on the applications of nuclear science and technology. These include the Electron Beam Irradiation Facility, the Cobalt-60 Multipurpose Irradiation Facility, PNRI's mutant breeds of ornamental plants, the Cytogenetics Laboratory, and the Real-time Online Environmental Radiation Monitoring Station, among others.

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Dr. Evangeline Bautista (4th from left), Dean of the Ateneo de Manila University School of Science & Engineering and President of the Quezon City Science Community Foundation Inc. (QCSCFI) with Dr. Soledad Castañeda (3rd from right), PNRI Officer-in-Charge, Office of the Deputy Director, and other officials of DOST and the QCSC formally open the 2016 NSTW exhibits at the PAGASA Science Garden.



Left: The PNRI exhibits on nuclear S&T disaster preparedness as featured in a DOSTv interview



Right: A PNRI specialist explains the various samples for radiation monitoring to a group of students

PNRI Wins Best Poster Award in Canada for PGP's - Continued from Page 5

The polymer is irradiated and applied by foliar spraying at certain stages of the plant's life. This later improved the yield and health of crops such as rice, mungbean and peanut.

During field testing, PGP's were capable of increasing the yield of rice by up to 65%.

The PGP-sprayed crops also proved to be more resilient against typhoons as well as the ravages of tungro infestation.

Experiments also showed an increase of up to around ten times the yield for normal practices in mungbean, and up to twice the average yield for peanut.

The PGP project is the product of close collaboration between DOST-PNRI, the Philippine Council for Agriculture, Aquatic and Natural Resources Research & Development and the National Crop Protection Center of the University of the Philippines Los Baños.



Agriculture Research Section Senior Science Research Specialist Fernando Aurigue explains the PGP exhibits to visiting farmers

Plant Growth Promoters (below left) were used in an experimental field in Pulilan, Bulacan (below right). The PGP-sprayed fields to the left area proved much more resilient to lodging after a typhoon compared to the ricefields without PGP's on the right area.

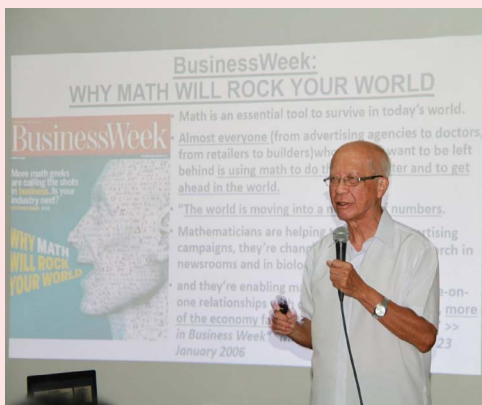


PNRI at 2016 NSTW - Continued from Page 6
Traiblazers of Science with NAST

On July 26, the second day of the NSTW celebration, PNRI hosted the *Traiblazers of Science* in cooperation with the National Academy of Science and Technology (NAST).

Hundreds of high school students from throughout Quezon City were awed by the inspirational talks given by no less than two of the Philippines' National Scientists - Fr. Bienvenido Nebres, former President of Ateneo de Manila University and an outstanding expert in the field of mathematics education, and social reform, and Dr. Edgardo Gomez, the visionary founding director of the University of the Philippines Marine Science Institute, which is now one of the leading marine research agencies in the world.

Also among the experts who gave a lecture was Dr. Maria Corazon De Ungria, head of the DNA Analysis Laboratory of the University of the Philippines Natural Sciences Research Institute, which helps in pioneering the field of forensic science in the Philippines.



National Scientist Fr. Bienvenido Nebres answers some of the questions asked by students during the NSTW Trailblazers of Science event held at PNRI on July 26 with the National Academy of Science and Technology (NAST)



(Left) National Scientist Dr. Edgardo Gomez, founding director of the UP Marine Science Institute (Right) Dr. Maria Corazon De Ungria of the DNA Analysis Laboratory of the UP Natural Sciences Research Institute

Disaster Summit at PHIVOLCS

On July 27, PNRI also participated in the Disaster Summit hosted by the Philippine Institute of Volcanology and Seismology (PHIVOLCS) with the theme "*Disasters: How Prepared Are We?*".

The summit's morning sessions featured lectures on disaster prevention and mitigation measures, particularly during earthquakes, typhoons and radiation-related incidents.

Meanwhile, the afternoon session gave more focus on response and rehabilitation efforts especially through the close cooperation of DOST with the other various agencies of the government.

Among the speakers during the summit was PNRI Health Physics Research Section Head Mr. Teofilo Garcia, who presented the Institute's efforts in radiation monitoring as part of the country's emergency preparedness and response during nuclear or radiological accidents.



(Above left) DOST Secretary Fortunato Dela Peña at the NSTW Disaster Summit on July 27 (Above right and below) PNRI Health Physics Research Section Head Mr. Teofilo Garcia lectures on PNRI's radiation monitoring activities for nuclear and emergency preparedness and response

Philippines Hosts the IFNEC Conference on Nuclear Energy

As neighboring countries continue to embark on their respective nuclear power programs, the Philippines was given the honor of hosting the International Framework for Nuclear Energy Cooperation (IFNEC) Conference on the Prospects of Nuclear Power in the Asia Pacific Region from August 30 to September 1 at the Diamond Hotel in Manila.

The conference was organized through the efforts of the Department of Energy, the Department of Foreign Affairs, DOST-PNRI, and the National Power Corporation.

Representatives from Bangladesh, Canada, Finland, Indonesia, Japan, Jordan, Kenya, Republic of Korea, Malaysia, Mongolia, Saudi Arabia, South Africa, Sri Lanka, Thailand, United Arab Emirates, United States, Vietnam and the Philippines participated in the three-day conference consisting of several sessions regarding the various aspects of a nuclear power program.

These include the development of a national nuclear legal and regulatory framework, determination of a suitable site for a nuclear power plant, spent fuel and radioactive waste management, financial considerations for a nuclear energy program, human resource development for operating the nuclear plants and other relevant facilities, stakeholder involvement, environmental considerations and international support.

The conference was also graced by the presence of IAEA Deputy Director General Dr. Mikhail Chudakov, who also heads the agency's Department of Nuclear Energy. Dr. Chudakov also had the opportunity to visit some of PNRI's nuclear and radiation facilities.

The IFNEC consists of 34 participant countries, 31 observer countries and four international organizations.



(Above) Dr. Mikhail Chudakov, IAEA Deputy Director General, speaks at the IFNEC Conference at the Diamond Hotel in Manila

(Below) PNRI Officials attending the conference



IAEA Deputy Director General Visits PNRI



IAEA Deputy Director General Dr. Mikhail Chudakov (white polo with tie) visits the Electron Beam Irradiation Facility (left) and the Technetium-99m Generator Facility (right) at PNRI.



Helping to strengthen the cooperation between the Philippines and the International Atomic Energy Agency (IAEA), one of its leading officials paid a visit to several facilities and laboratories of PNRI.

IAEA Deputy Director General Dr. Mikhail Chudakov, who heads the agency's Department of Nuclear Energy, visited the Institute on August 31 to meet with the senior officials of PNRI as well as members of the youth sector.

The IAEA official had previously graced the opening of the International Framework for Nuclear Energy Cooperation (IFNEC) Conference on August 30 in Manila. He first toured the Electron Beam irradiation Facility and the Technetium-99m Generator Facility, after which he presented on the future of nuclear energy in the global scene. This was followed by a brief question-and-answer with graduate students from University of the Philippines Diliman and high school students from San Francisco High School.

Philippines Joins in the 60th IAEA General Conference

Joining their counterparts from 168 countries, Philippine officials participated in the historic 60th General Conference of the international Atomic Energy Agency (IAEA) held from September 26 to 30 at the IAEA headquarters in Vienna, Austria.

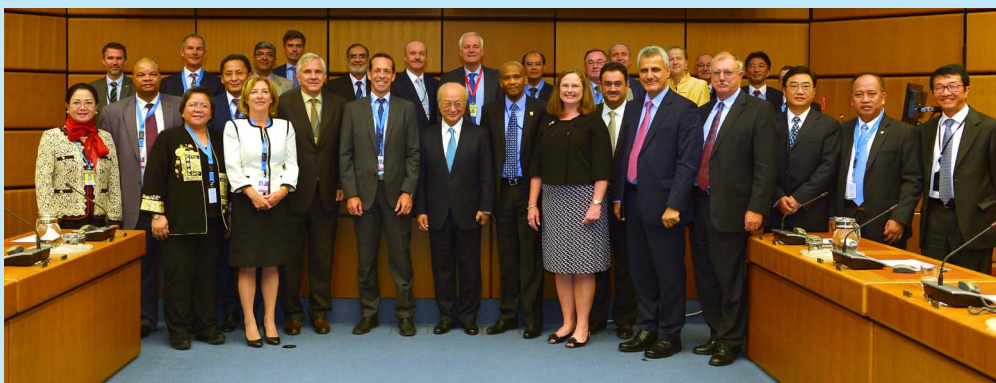
The Philippine Delegation was led by Dr. Rowena Cristina Guevara, DOST Undersecretary for Research and Development, and Ambassador Maria Zeneida Angara Collinson, Philippine Resident Representative to the IAEA.

Also among the delegation are officials from the Philippine Permanent Mission in Vienna, PNRI, and the Department of Education.

Addressing the IAEA during the 3rd Plenary Session on September 27, Undersecretary Guevara highlighted several results of the strong partnership between the Philippines and the IAEA, particularly under the Technical Cooperation Program.

Among the PNRI projects mentioned are its recently developed Plant Growth Promoters from irradiated carrageenan, the IAEA Water Availability Enhancement Project (IWAVE), the IAEA Collaborating Center for Harmful Algal Bloom studies, and the Compendium of Materials on Nuclear Science and Technology for High School Teachers.

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(Top) DOST Undersecretary Dr. Rowena Cristina Guevara delivering the Philippine statement at the 60th IAEA General Conference. Photo from the Department of Foreign Affairs

(Bottom) Undersecretary Guevara (1st row, 2nd from left) with IAEA Director General Yukiya Amano (1st row, 4th from right) and officials from other countries at the Renovation of the Nuclear Applications Laboratories (ReNuAL) Project event. Photo from IAEA

PNRI Research on Nanotherapeutics Wins Awards in Japan

Digging deep into technologies to protect the skin from the effects of radiation, PNRI's research once again gains the respect of the international community by winning several awards in Japan this 2016.

PNRI Biomedical Research Section senior science research specialist Chitho Feliciano, who is currently taking up his doctorate in Biomaterials Science at the University of Tsukuba since 2014, received the De Silva Prize for Best Oral Presentation at the Interdisciplinary Workshop on Science and Patents during the Tsukuba Global Science Week held in Tsukuba on September 19, 2016.

Feliciano's research, which was done in collaboration with his Japanese professor, also won two Best Poster Presentation awards. The first was during the Asian Conference on Nano-science and Nanotechnology (AsiaNANO) in Sapporo on October 10-16, followed by the 6th Chemistry Society of Japan (CSJ) Festa held in Tokyo on November 14-16.

His studies aim to use nanoparticles to improve the therapeutic effect of nitroxide radicals and to reduce the effects of skin aging, skin lesions, and other skin inflammatory disorders caused by ultraviolet rays and other forms of ionizing radiation, as well as radiation-induced reactive oxygen.



PNRI Senior Science Research Specialist Mr. Chitho Feliciano (above) wins the De Silva Prize for Best Oral Presentation (right) in Tsukuba, Japan



Philippines Joins in the 60th IAEA General Conference - Continued from Page 9



Ambassador Maria Zeneida Angara Collinson, Philippine Resident Representative to the International Atomic Energy Agency (IAEA), delivers an intervention on the implementation of IAEA safeguards in the Democratic People's Republic of Korea. Photo from the Department of Foreign Affairs.

Undersecretary Guevara also highlighted the Philippines's active role in the global effort to enhance nuclear safety and security.

These measures include the establishment of an online real-time environmental radioactivity monitoring system, the Philippines' participation in various international committees and activities, and the continued support for the establishment of a separate and independent nuclear regulatory body in the country.

On the final day of the conference, Ambassador Angara Collinson joined other delegates in pushing for the implementation of the safeguards agreement between the IAEA and the Democratic People's Republic of Korea.

In an intervention she delivered at the plenary, the ambassador, citing the ASEAN Foreign Ministers' statement, called on North Korea to abandon its nuclear weapons program and comply with the resolutions of the United Nations Security Council.

About Us

The Philippine Nuclear Research Institute (PNRI) is a research and development institute under the Department of Science and Technology (DOST) mandated by law to undertake research and development activities in the peaceful uses of nuclear energy, render nuclear and specialized services and exercise regulatory control in the field of nuclear science and technology. The Institute has been serving the public for the past 55 years, harnessing the beneficial applications of nuclear energy while ensuring the safe use and security of radioactive materials and nuclear facilities for the protection of workers, the general public and the environment.

PNRI Vision

The PNRI is an institution of excellence in nuclear science and technology propelled by a dynamic and committed workforce in the mainstream of national development.

PNRI Mission

We contribute to the improvement of the quality of Filipino life through the highest standards of nuclear research and development, specialized nuclear services, nuclear technology transfer and effective and efficient implementation of nuclear safety practices and regulations.

PNRI Newsletter

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Philippines Hosts Asian Educators to Bring Nuclear S&T to Secondary Schools

Teachers and educators throughout the Asia-Pacific region met in the Philippines as part of the international effort to bring nuclear science to classrooms as it hosts the Regional Training Course for Secondary School Educators from August 22-26, 2016.

The course was organized by the International Atomic Energy Agency (IAEA) in cooperation with the DOST-PNRI and the Department of Education Division of City Schools – Quezon City (DepEd – QC).

The training course supported the secondary school science educators in Member States in developing their competency in delivering nuclear science and technology topics as effective and engaging teaching learning processes.

The week-long event also fostered a discussion on the experiences and



Dr. Sunil Sabharwal of the IAEA, (2nd row, 6th from left), Dr. Valerie Segovia of, Texas A&M University, USA (2nd row, 6th from right), Mr. Eko Supardiyono from Indonesia (4th row, 3rd from left), PNRI Officer in-Charge, Office of the Deputy Director Dr. Soledad Castañeda (1st row, 6th from left) and DepEd-NCR Regional Director Dr. Ponciano Menguito (2nd row, 5th from left) with the course participants and officials from PNRI and DepEd.

strategies of various countries in the Asia-Pacific region in integrating nuclear S&T in their curriculum to meet their national perspectives.

Among the participants were government officials and science educators from Bangladesh, Jordan, Pakistan, Philippines,

Israel, Thailand, Vietnam, Myanmar, Sri Lanka, Malaysia and Indonesia, who trained on new approaches that will make teaching complex concepts such as nuclear energy and radiation more enjoyable and understandable.

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Medical Professionals from the Provinces Study Radioisotope Applications

Riding on the government's thrust to bring progress to the country's various regions, medical professionals from Mindanao, Visayas and several provinces beyond Metro Manila were among those who completed the 6th Course on Medical Use of Radioisotopes (CMR) and the 3rd Course on Radioisotope Technology (CRT) at the PNRI from September 5 to 20, 2016.

The course was conducted by the PNRI Nuclear Training Center (NTC). PNRI experts lectured on nuclear science and technology, the use of radioisotopes in the medical field as well as the equally important aspect of radiation protection, nuclear safety and security.

The participants came from major cities in Luzon, Visayas, Mindanao, and Metro Manila. Of the 27 CMR trainees, around half were from provincial hospitals and medical centers, many of which are either new or prospective licensees of PNRI.

Successful completion of the CMR is one of the requirements for designation as Radiation Safety Officer (RSO), and consequently, for fulfilling the regulatory requirements for radiation safety in nuclear medical centers and hospitals.



Participants of the 6th Course on Medical Use of Radioisotopes (CMR) and the 3rd Course on Radioisotope Techniques (CRT)

Meanwhile, five researchers and staff members from PNRI participated in the CRT. CMR focuses on medical applications of nuclear and radiation technologies, while CRT focuses on the nuclear applications in agriculture, industry, environment protection, healthcare, and research.

Common topics that were taught to participants in the CMR and CRT were nuclear physics, radiation chemistry, use of monitoring instruments, biological effects of ionizing radiation, basic principles of

radiation protection and nuclear regulation. Midway through the courses, separate classes were held for the CMR and the CRT.

The medical course included lectures and demonstrations on calibration of monitoring instruments, radiation therapy, cellular radiobiology, radioimmunoassay, cytogenetics, radiopharmaceuticals, nuclear medicine, and positron emission tomography.

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Philippines Hosts Asian Educators to Bring Nuclear S&T to Secondary Schools - Continued from Page 11



Teachers from the Asia-Pacific region observe Filipino demonstration classes involving radiation concepts and hands-on experiments.

Ms. Rhodora Leonin of the PNRI Nuclear Information & Documentation Section is the Course Director.

Lecturers from the IAEA shared their expertise in teaching as well as promoting nuclear S&T to the younger generation. Several teachers from two pilot schools in Quezon City – San Francisco High School and Quezon City Science High School – also performed classroom demonstrations during the training course.

These teachers were previously trained in conducting lectures and

radiation-related activities like the cloud chamber experiment, which allows students to “see” radiation through the trails left by emitted particles, and using the Hakaru-kun radiation detector in the environment, courtesy of the IAEA and the University of Tokyo. Not to be outdone, the high school students from both pilot schools showcased their creative talents combined with what they have learned from the previous seminars to promote nuclear S&T applications.

In 2015, the Philippines served as one of the pilot countries for the project

along with Malaysia, Indonesia and the United Arab Emirates. It aims to reach out and develop the interests of young students in the field of science and technology, with an emphasis on the peaceful and beneficial uses of nuclear and radiation applications.

The project also aims to encourage students to eventually take up science-related courses in college as well as their professional careers, which will augment the manpower and technological development of the IAEA Member States in the region.

Medical Professionals from the Provinces Study Radioisotope Applications - Continued from Page 11



The trainees participate in an exercise on using survey meters and general radiation protection at the PNRI Nuclear Training Center

On the other hand, the CRT participants learned about radiation applications in agriculture, industry, geology and environmental research, food irradiation and radiation processing of other products. The participants were also introduced to PNRI’s state-of-the-art equipment through experiments on gamma spectrometry, liquid scintillation counting, and x-ray fluorescence analysis.

Visits to the Philippine General Hospital, particularly its linear accelerator, radiation therapy and brachytherapy facilities and to several PNRI facilities, such as the semi-commercial Cobalt-60 Multipurpose Irradiation Facility, the Electron Beam Irradiation Facility, the Technetium-99m Generator Facility and the Philippine Research Reactor – 1, enhanced the learning experiences of the participants.

Formerly the Radioisotope Techniques Training Course (RTTC) with iterations for medical personnel and general training, the new CMR and CRT courses reflect PNRI’s continuing efforts to improve and update the knowledge and skills of professionals engaged in the use of radioisotopes in their respective fields.

The first RTTC was held on April 1959, and was one of the first human resources development program in nuclear science and technology in the country.

At the course culmination, participants presented case studies which aim to assess the comprehension of knowledge gained in the course as applied to their particular practice.