National Academy of Science and Technology
2020 ANNUAL REPORT

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MANDATE, VISION, and MISSION

MANDATE

- To recognize outstanding achievements in Science and Technology as well as provide meaningful incentives to those engaged in Scientific and Technological Researches (Presidential Decree 1003-A).

- To advise the President and the Cabinet on matters related to Science and Technology (Executive Order No. 818).

- To engage in projects and programs designed to recognize outstanding achievements in science and to promote scientific productivity (Executive Order No. 818).

- To embark on programs traditionally and internationally expected of an academy of science (Executive Order No. 818).

- To manage, operate and maintain the Philippine Science Heritage Center (Republic Act 9107).

VISION

NAST, as an academy of recognized experts, serves as principal adviser to the nation on science, technology, and innovation contributing to national development

MISSION

- To recognize exemplary science and technology achievements among the young and among peers.
- To encourage individual Academy members to continue their own scholarly pursuits thereby making the Academy the principal reservoir of scientific and technological expertise in the nation.
- To provide independent and science-based advice on problems facing the nation and the world.
- To link with like-minded institutions and individuals in promoting scientific achievement in the Philippines and abroad.
- To promote a strong science culture in Philippine society.

NAST AT A GLANCE

77
ACADEMICIANS

19
CORRESPONDING MEMBERS

OF WHICH,
12
ARE NATIONAL SCIENTISTS.

15
NUMBER of policy recommendations and science advisories on various topics published

38
NUMBER of activities (webinar, policy forum, information forum, paper presentation, etc.) conducted

26%
SELECTION RATE. Percentage of scientists/scientific works selected as winners of awards

100%
TIMELY PROCESSING of nominations

AWARD RECEIVED

Food System Vision Prize

The Agricultural Sciences Division (ASD), through the leadership of Academician Eufemio T. Rasco, Jr., submitted *Feeding Metro Manila in 2050* to the Food System Vision Prize of the Rockefeller Foundation. The Prize aims to develop a vision of regenerative and nourishing food system by the year 2050. Out of 1,317 entries from 119 countries worldwide, the NAST entry was selected as one of the Special Mentions (11th to 14th places).

Feeding Metro Manila in 2050 is a food system that nurtures the health of the people and the planet, adapts to changing climate, and is sensitive to the diversity of food culture. It was envisioned as the typical 2050 dinner plate as diverse, mostly plant-based with less rice and highly processed grains, and assembled by a robust app that considers an individual's nutritional and health needs and capabilities, impact of the meal composition on the environment, local food culture, and farmers' welfare.

COVID-19-RELATED EFFORTS

STATEMENTS AND SCIENCE ADVISORIES

In response to the COVID-19 pandemic, the NAST submitted science advisories to the government and various institutions. The Executive Council issued a *Statement on the COVID-19 Crisis* that focuses on two things, namely: (1) highly calibrated scheme/gradual lifting of lockdown or quarantine after 30 April 2020; and (2) support for local/national R&D on COVID-19 and on novel food technologies for food security during disruptions like typhoons and pandemics.

The Health Sciences Division (HSD) issued an advisory on *Scientific Research and Development as Drivers to Win the Race against COVID-19* that focuses on supporting current research initiatives of the government

and DOST, particularly in areas of epidemiology, diagnostics, therapy, prevention and development of vaccines, and host factors. It emphasizes that sharing of information within and among scientists, researchers, and institutions both here and abroad will help us build on each other's strengths and accelerate the race for finding the solutions and answers we need to get through this pandemic. The HSD also issued a science advisory on *The Philippines' Participation to the COVID-19 Vaccines Global Access (COVAX) Facility*.

The ASD issued an advisory on *The Looming Food Crisis* that focuses on establishing an alternative and complementary food system that is decentralized, de-industrialized, and local to ensure food security and prepare for an extended quarantine. The ASD also issued an advisory entitled *Our Body: Our Last Line of Defense Against COVID-19*. The advisories were issued jointly with the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and Coalition for Agricultural Modernization in the Philippines, Inc. (CAMP).

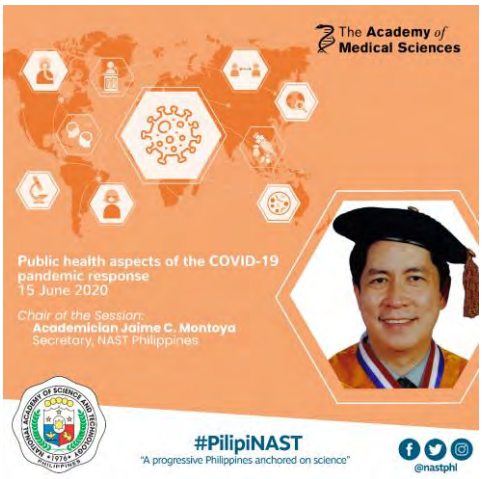
The NAST, as a member academy, also supported the *Call for Global Solidarity on COVID-19 Pandemic* of the InterAcademy Partnership (IAP). This global call emphasizes the importance of collective action on a global scale to mitigate the spread of the coronavirus across territories.

A growing concern on the pandemic urged various sectors and groups to call for the establishment of a research institute that deals with viruses. Relative to this, the NAST issued a position paper on the establishment of a Virology Institute of the Philippines.

MEMBERSHIP IN GLOBAL COVID-19 ADVISORY COMMITTEE

Academician Jaime C. Montoya was chosen as one of the member-experts of the IAP COVID-19 Advisory Committee.

GLOBAL WORKSHOPS AND WEBINARS

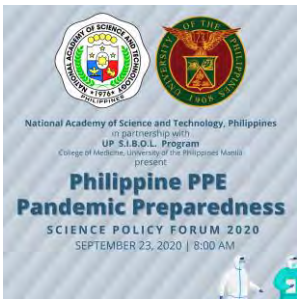


The NAST collaborated with the United Kingdom Academy of Medical Sciences (UK AMS) and other academies of sciences and organized a virtual workshop on the challenges of the COVID-19 pandemic response in Low-and-Middle Income Countries (LMICs) on 15-18 June 2020. Academician Montoya chaired the session on "public health aspects of the COVID-19 pandemic response". Academician Carmencita D. Padilla joined the session as a participant. On the other hand, Academician Michael L. Tan and Academician Agnes C. Rola participated in the session on the "social and behavioral aspects of the COVID-19 pandemic."

Academician Montoya also took part in the international webinar on the responses of national academies of sciences to COVID-19 organized by the Association of Academies and Societies of Sciences in Asia (AASSA) and Korean Academy of Science and Technology (KAST). The activity was conducted on 10 July 2020.

COVID-19 WEBINAR SERIES

The NAST initiated a webinar series entitled "*COVID-19: Where We Are and Where We Want To Be?*" on various topics, such as, scientific evidence for treatment, testing, and public health intervention, social aspects of the pandemic, food and food system through agri-innovation, vaccines, mitigation of economic losses, among others.



1) Health Aspects (in collaboration with DOST Region II and Cagayan Valley Health Research and Development consortium) (27 May 2020)
2) Socio-Economic Aspects (in collaboration with DOST Region II and Cagayan Valley Health Research and Development consortium) (03 June 2020)
3) Agricultural Aspects (in collaboration with DOST Region II and Cagayan Valley Health Research and Development consortium) (10 June 2020)
4) Science Policy and Information Forum on Fish Security Amidst COVID-19 Pandemic (15 July 2020)
5) Socio-Behavioral Dimension of COVID-19 (22 July 2020)
6) Understanding the Science of COVID-19 Testing (02 September 2020)
7) Webinar on Mitigating Economic Losses from COVID-19: Insights (16 September 2020)
8) Science Policy Forum on PPE (in collaboration with the University of the Philippines Manila SIBOL Program) (23 July 2020)
9) Consultative Forum re: Participation in the COVAX Facility (10 October 2020)
10) Science Policy Forum on PPE: Ways Forward (16 October 2020)
11) The Shadow Pandemic: Domestic Violence in the Context of COVID-19 Pandemic (11 December 2020)

EFFORTS OF THE NAST SECRETARIAT

In order to cope with the next/new normal work environment, the NAST Secretariat made some adjustments in accordance with the rules imposed by the Civil Service Commission (CSC), IATF-EID, and other agencies. Some adjustments include alternative work arrangements, continuous salary, hazard pay, shuttle service, online Daily Time Record (DTR), purchase of online meeting platforms.

RECOGNITION OF OUTSTANDING S&T ACHIEVEMENTS

The Academy recognizes and provides incentives to Filipino scientists for outstanding achievements in scientific research and development.

NATIONAL SCIENTIST RANK AND TITLE

The conferment of the Order of National Scientist by the President of the Republic of the Philippines is the highest honor given to a Filipino man or woman of science. Nominees should receive 70 percent of the total votes of the total membership of the Academy before being recommended to the President of the country for the honor. The award was created pursuant to Presidential Decree No. 1003-A on 16 December 1976.

Dr. Emil Q. Javier, member of the NAST Biological Sciences Division (BSD), was officially conferred the Order of National Scientist through a ceremony led by His Excellency Rodrigo R. Duterte at the Malacañang on 07 January 2020.

MEMBERSHIP IN THE ACADEMY

Membership to the Academy is by peer recognition and carries with it the title of "Academician". Elected as Academicians are resident Filipino scientists who have made exemplary contributions to science and technology and have advanced its cause in the Philippines.

ELECTED ACADEMICIANS

To date, there are 77 living Academicians (12 of which are National Scientists).

Elected Academicians CY 2020. *(L-R)* Arnel N. Del Barrio, Windell L. Rivera, Charlotte M. Chiong, Maribel G. Nonato, Christopher P. Monterola.

ARNEL N. DEL BARRIO, Ph.D.
Ruminant Nutrition
In recognition of his exemplary contributions to the advancement of various fields of animal science, namely, animal nutrition and feed management systems, rumen microbiology, reproductive biotechnology, meat science, and wildlife biology and conservation. His leadership

skills have been widely recognized by professional scientific societies. He served as president of the Philippine Society of Animal Science and the Philippine Society of Animal Production Societies. As Executive Director of the Philippine Carabao Center, he has steered it to become a more pragmatic research and development institution, utilizing science, technology, and innovation in engaging all stakeholders of the carabao industry value chain, particularly smallholder farmers, toward improved productivity and profitability.

WINDELL L. RIVERA, Ph.D.
Cellular and Molecular Microbiology
In recognition of his significant research contributions in Microbiology, particularly in the field of Protozoology; for having established the remarkable genetic heterogeneity of different protozoans within the taxonomic rank, species; for his pioneering work in the development of a diagnostic tool to accurately differentiate the morphologically identical yet genetically distinct *Entamoeba* species, the amebiasis-causing *Entamoeba histolytica* and the nonpathogenic *Entamoeba dispar*; for the redescription of the nomenclature of a number of protozoan species formerly classified according to their host-specificity; and for accurate diagnoses of medically-important protozoans through the design of a number of DNA markers that are now being utilized by many laboratories worldwide.

CHARLOTTE M. CHIONG, M.D.
Otolaryngology
In recognition of her pioneering work as a neurotologist in the Philippines that helped improve the quality of care for deaf adults and children, those with temporal bone cancer and skull base tumors, and those with intractable dizziness or vertigo. Dr. Chiong introduced cochlear implantation and auditory brainstem implantation and other implantable hearing devices in the country. Her body of work on hearing in children and neonates played a key role in the passage of Republic Act. No. 9709, "An Act Establishing a Universal Newborn Hearing Screening Program for the Prevention, Early Diagnosis and Intervention of Hearing Loss", in 2009. Her contributions to this field have made a significant impact on children afflicted with deafness, in particular to marginalized communities with little access to such technologies.

MARIBEL G. NONATO, Ph.D.
Chemistry
In recognition of her pioneering work on the discovery of the novel *Pandanus* alkaloids, which became significant contribution to the Chemistry of Alkaloids establishing the Genus Pandanus as a new source of alkaloids. These types of alkaloids show interesting biologically activities prompting organic chemists to carry out syntheses of these structurally unique alkaloids. She has promoted multidisciplinary research on Philippine medicinal plants by mentoring young researchers and generously imparts her expertise in natural products to the scientific community.

CHRISTOPHER P. MONTEROLA, Ph.D. (Physics)
Data Science
In recognition of his pioneering contribution to social science research using complexity and data science; in recognition further of the design and successful leadership of the first data science program in the Philippines; and of research results that have advanced evidence-based policy. He has successfully collaborated with experts from other fields to provide informed policy options in addressing critical issues such as the development of smart cities. He and his collaborators have deployed AI and machine learning models to successfully tackle such problems as the design of smart transport systems and optimization of water distribution systems. He has nurtured young minds to work as a team to take advantage of the digital revolution that opens new opportunities for the Philippines' further economic and social transformation.

ELECTED CORRESPONDING MEMBERS

Corresponding membership, on the other hand, is conferred on non-resident Filipino scientists who have made exemplary contributions to the advancement of science and technology, must have continuing connections and contributions to Philippine science, and regularly come to the Philippines to practice their field of expertise. Filipino citizenship and residency are waived as long as the three qualifications are met. To date, there are 19 living Corresponding Members.

Elected Corresponding Members CY 2020. *(L-R)* Francis L. De Los Reyes, Gonzalo C. Serafica, Ramon B. Gustilo, and Annabelle P. Villalobos.

FRANCIS L. DE LOS REYES III, Ph.D.
Environmental Bioengineering

In recognition of his significant research and scientific contributions at the interface of microbial ecology/biotechnology and environmental bioengineering, leading to deeper understanding of microbial communities in biological reactors and other environmental systems. His pioneering research relating microbial ecology to bioreactor function has elucidated fundamental mechanisms in, and led to improvements in design and operation of: aerobic processes for transforming water pollutants and nutrients, anaerobic and phototrophic processes for converting wastes and biomass to energy, sustainable sanitation systems, and wastewater treatment and collection systems. He has advocated for sustainable sanitation, particularly in underserved communities. He has served as adjunct professor, research collaborator, mentor to graduate students, and speaker and resource person for several universities in the Philippines. He has been Board Member, Board Chair, and President of the Philippine-American Academy of Science and Engineering.

GONZALO C. SERAFICA, Ph.D.
Chemical Engineering

In recognition of his pioneering work in the invention, development, and commercial application of a bacterial cellulose membrane technology for biomedical applications, primarily as a biocompatible tissue replacement for various conditions. The uniqueness of his work led to four early journal publications, 10 US patents, and 20 international patents that were used as basis for products that have been used by tens of thousands of patients in the US, Canada, and EU over the past two decades. With the desire to share his experience in the commercialization of research-based technologies in the Philippines, he has served as a high-level adviser to several organizations and major Philippine universities. He has also been involved in various initiatives to link government, industry, and academia, and has strengthened the Innovation Science and Technology Ecosystem in the Philippines.

RAMON B. GUSTILO, M.D.
Orthopedics
In recognition of his pioneering contribution to the classification and treatment of open fractures, a classification, which continues to bear his name and remains instrumental in the care of these fractures throughout the world. He established the Musculoskeletal Sepsis Research Unit, which remains pre-eminent in the world for basic research in orthopedic infection. His forward-thinking leadership helped forge an innovative, productive, and cutting-edge research group that actively advances Orthopedic study. He has designed and successfully commercialized a locally produced total knee replacement and has designed a hip replacement approved by the United State Food and Drug Administration for use without bone cement. Professor Gustilo has served as mentor to more than a hundred fellows from the Philippines and from other countries, and served as speaker and resource person for universities and hospitals both in the Philippines and around the globe.

ANNABELLE P. VILLALOBOS, Ph.D.
Chemistry
In recognition of her technical expertise and leadership at Johnson & Johnson where she led in the development of successful drug products for anemia, chronic renal failure, cancer chemotherapy, AIDS, and autologous donation for perisurgery. After taking early retirement from Johnson & Johnson, Dr. Villalobos has dedicated her resources and knowledge in helping various universities in the Philippines, in particular Central Mindanao University, which she assisted in developing research programs on its indigenous plants for use as alternative food sources, medicinal plants, and biopesticides. She led in the development of a natural fungicide for vegetables called TazSCure. She has generously shared her knowledge and resources with a wide range of people, from faculty and students to farmers' groups. Dr. Villalobos is a true example of a talented and generous Filipino scientist.

HONORARY MEMBERSHIP

To recognize exceptional outstanding contributions to science and technology, the Academy established the Honorary Membership which may be conferred on recipients of internationally recognized prestigious scientific awards such as Nobel Prize, the Food Prize and the like, whose researches have contributed to the development of the Philippines and who come to the country to deliver a lecture for the Academy.

NAST AWARDS

The NAST Trophy, unveiled in 2014, is a sculptural trophy which shows fluid lines and curves subtlety forming the word NAST. The upward movement of the lines shows modernity, great strides in science and excellence. The contours and holes all around symbolize how our outstanding scientists discover and explore the world of science from different perspectives. The trophy was conceptualized and designed by Sajid Imao, a nationally recognized sculptor.

Outstanding Young Scientist (OYS) Award

The Outstanding Young Scientist (OYS) award is given to young Filipino scientists (must not be 41 years old within January to December in the year of the award) who have made significant contributions to science and technology.

REMIL L. GALAY, Ph.D.
Veterinary Medicine (Pathological and Preventive Veterinary Science)
University of the Philippines Los Baños
In recognition of his significant contributions to the advancement of knowledge on arthropod vector biology and arthropod-borne diseases affecting animals and humans. His research on the detection of these pathogens that were previously unknown to occur in the country, improved disease surveillance and control programs. These have raised awareness among animal owners and handlers regarding diseases that can be acquired from ticks that infest animals. His research greatly helped in controlling tick-borne diseases (TBDs). This has improved animal productivity and decreased economic losses due to TBDs, particularly benefitting the low-income cattle farmers.

ADRIAN P. YBAÑEZ, Ph.D.
Veterinary Sciences (Animal Health)
Cebu Technological University
In recognition of his pioneering studies on selected economically important animal diseases, including the first molecular confirmations of ehrlichiosis, anaplasmosis, hemoplasmosis and babesiosis in small and large animals in the Philippines. His studies led to the development of several specific PCR methods and understanding of the genetic diversity of different tick-borne pathogens, which have global economic impact. His research has clarified the epidemiologic status of specific Philippine tick-borne pathogens and has changed the veterinary approach in the diagnosis and treatment of ticks in small and livestock animals.

MELBOURNE R. TALACTAC, Ph.D.
Veterinary Science (Preventive Veterinary Medical Science)
Cavite State University
In recognition of his contribution to the understanding and knowledge of the presence of secondary vectors that can potentially help in the surveillance and control of important tick-borne diseases in endemic and surrounding areas where different tick species coexist. His research focused on biotechnology to improve prevention, treatment, and control of viral pathogens using herbal medicines or natural substances that are traditionally used to prevent viral infections. He also ventured into vaccine production against Influenza A virus in mice and evaluated the innate immunity of chickens and mice focusing on Toll-like receptor 4.

RODNEY H. PEREZ, Ph.D.
Microbial Technology
University of the Philippines Los Baños
In recognition of his contributions to the advancement of knowledge on how antimicrobial peptides known as bacteriocins are synthesized by their producer strains. His studies have pointed to the possible application of bacteriocins as natural safe food preservatives that can reduce the use of harmful synthetic food additives in our local food industry. His research also identified the possible use of bacteriocins as an alternative arsenal against multidrug-resistant pathogens in the treatment of infections.

2020 Outstanding Young Scientists. *(L-R, top-bottom row)* Remil L. Galay, Adrian P. Ybañez, Melbourne R. Talactac, Rodney H. Perez, Argel A. Bandala, Erees Queen B. Macabebe, Jaime Alfonso M. Aherrera, Francis Norman C. Paraan, Marlon T. Conato, Betchaida D. Payot, Aries A. Arugay, and Erika Fille T. Legara.

ARGEL A. BANDALA, Ph.D.
Electronics and Communications Engineering
De La Salle University

In recognition of his significant contributions and pioneering work in the field of Artificial Intelligence and Robotics, specifically in the area of swarm robotics. The algorithms he developed enabled simple agents/nodes to cooperatively accomplish tasks by displaying collective emergent behaviors. His research can also be applied to larger systems where distributed computing is used,

such as communication networks, parallel computing, and the Internet of Things, which are key technologies in the Fourth Industrial Revolution.

EREES QUEEN B. MACABEBE, Ph.D. (Physics)
Energy Engineering
Ateneo de Manila University
In recognition of her significant contributions in energy engineering, particularly in the development of systems to monitor energy generation, consumption and the use of Artificial Intelligence (AI) in energy analytics. Using AI, her team developed algorithms to make photovoltaic technology "smart" by building the hardware prototype to show proof of concept and by designing the system for pre-commercialization testing to determine financial viability. She is increasing social impact through her technopreneurship skills through SolarSolutions, Inc., a start-up social enterprise that she co-founded, which aims to empower communities and individuals through renewable energy.

JAIME ALFONSO M. AHERRERA, M.D.
Cardiology
University of the Philippines Manila
In recognition of his significant contributions in the understanding and improvement of health care in the Philippines, by providing local data for the management of cardiovascular diseases and writing several books, including the IM Platinum series. His work on ST-elevation myocardial infarction (STEMI) focused on the timely management of heart attacks at the UP-Philippine General Hospital (UP-PGH). This served as the basis for the "Chest Pain Pathway" in the UP-PGH and the STEMI Consult App by the National Program of the Philippine Society of Cardiovascular Catheterization and Intervention.

FRANCIS NORMAN C. PARAAN, Ph.D.
Physics
University of the Philippines Diliman
In recognition of his scientific contributions to the fundamental understanding of how quantum effects can be used to measure and enhance an elusive quantity called entanglement, which is an important phenomenon for the next generation of quantum computing technologies. He has entered the fast-developing field of machine learning and is investigating image processing algorithms to improve computer vision.

MARLON T. CONATO, Ph.D.
Chemistry
University of the Philippines Diliman
In recognition of his contributions in the synthesis and development of inorganic microporous materials for applications in selective separation, asymmetric catalysis of chiral compounds, adsorption of toxic heavy metal ions, degradation of organic pollutants, and energy related fuel cells and batteries. His work impacts a wide range of practical applications in the development of important materials.

BETCHAIDA D. PAYOT, Ph.D.
Geology
University of the Philippines Diliman
In recognition of her scientific works that contributed to the understanding of the origin and formation of igneous rocks in different parts of the Philippines. Her research produced new petrographic and geochemical data that supported new models for a better understanding of the formation of igneous rocks. Her expertise in the operation of the only electron probe micro-

analyzer (EPMA) in the country advanced our knowledge of magmatic-metasomatic processes, which actively operate beneath island arcs. The application of this technique to ophiolites in Palawan and in the Pujada peninsula in Davao provided new insights on the evolution of the oceanic lithosphere.

ARIES A. ARUGAY, Ph.D.
Political Science
University of the Philippines Diliman
In recognition of his outstanding contributions to research in political science and in particular to the study of democratization processes and consolidation, security sector reform, and strategic studies in the Philippines and Asia. His results have particular value to the academe, the social science community, policy- and decision-makers, and the general public in the struggle for political stability and progress, concerns which are important not only to the Philippines but also to the developed and developing societies.

ERIKA FILLE T. LEGARA, Ph.D. (Physics)
Data Science
Asian Institute of Management
In recognition of her pioneering contribution to social science research using data science and to the design and implementation of the first data science program in the Philippines. Her expertise in data science has been tapped not only by the private sector and also by the Philippine government in crafting the country's AI roadmap, which will serve as guide for capacity building, investments, and R&D collaborations between industry and academia. Her passion for education and the nurture of the young, especially through collaborative research effort, have already made a deep impression in the field of social and big data research, which promises even greater harvest for the future of the Philippines.

NAST Environmental Science Award

The NAST Environmental Science Award recognizes outstanding scientific and technological research works that contribute to environmental protection and conservation. The winners were announced during the Earth Day celebration on 22 April 2020.

Winner: EMILYN ESPIRITU, Ph.D. (Applied Biological Science)
Title of research: "Assessment of Quantity and Quality of Microplastics in the sediments, waters, oysters, and selected fish species in key sites along the Bombong Estuary and the coastal waters of Ticalan in San Juan, Batangas"

Special Citations
ANTHONY S.F. CHIU, Dr. in Business Administration
Title of research: "Resource efficiency of the Philippine economy: A material flow accounting perspective (1955-2016)"

IAN A. NAVARRETE, Ph.D. (Soil Science)
Title of Research: "The role of reactive iron in long-term carbon sequestration in mangrove sediments: Implications on "Blue carbon" estimates in Philippine mangroves"

2020 NAST Environmental Science Award. *(L-R)* Winner: Emilyn Espiritu; Special Citations: Anthony S.F. Chiu, and Ian A. Navarrete.

NAST Talent Search for Young Scientist

The NAST Talent Search for Young Scientist is a project of the Academy that encourages young people (must not be more than 35 years old within January to December in the year of the award) to pursue a career in science. The finalists presented their research works on 26 June 2020. The winners were:

1st Place: LORICO D.S. LAPITAN, JR.
University of Santo Tomas
Title of research: "Magnetic nanoparticle-poly-enzyme nanobed sandwich assay for direct and ultrasensitive DNA detection and discrimination"

2nd Place: DARLON V. LANTICAN
UP Los Baños
Title of Research: "De novo Genome Sequence Assembly of Draft Coconut (*Cocos nucifera* L. Catigan Green Dwarf) Provides Insights into Genomic Variation between Coconut Types and Related Palm Species"

3rd Place: WILFRED JOHN E. SANTIAÑEZ
UP Diliman
Title of research: "Untangling nets: elucidating the diversity and phylogeny of the clathrate brown algal genus *Hydroclathrus*, with the description of a new genus *Tronoella* (Scytosiphonaceae, Phaeophyceae)"

Special Citations:

LYN MARIE DE JUAN CORPUZ
University of Santo Tomas
Title of research: "Rechargeable batteries utilizing 1D vanadium based electrode: Past, present, future"

ZOMESH ARTUS NATH MAINI
Ateneo de Manila University
Title of research: "Lead (II) tolerance and uptake capacities of fungi isolated from a polluted tributary in the Philippines"

Outstanding Books/Monographs

The award is given annually for outstanding books and/or monographs published in the Philippines by Filipino authors or co-authors within five years preceding the award.

1. Lapitan, P.G., N.M. Balahadia, J.B. Balatibat, N.C. Bantayan, C.A. Calimag, M.L. Castillo, P.C. Dolom, P.J.M. Eleazar, A.M. Mora, N.M. Pampolina, E.O. Peralta, J.M. Pulhin, T.T. Villanueva. 2018. *Science-Based Management and Upland Community Development in the Philippines: The Case of Mount Makiling Forest Reserve*. The University of the Philippines Press. ISBN: 978-971-542-860-6 (softbound); ISBN: 978-971-542-861-3 (hardbound);
2. Catelo, S.P., C.S. Mina, and T.J. Ramirez. 2019. *Financial Viability of Natural Food of Natural Food Colorants and Flavors in the Philippines*. University of the Philippines Los Baños, Department of Agriculture-Bureau of Agricultural Research, and Department of Agriculture-Philippine Agriculture and Fisheries Biotechnology Program. ISBN: 978-621-95271-9-4;
3. Corales, R.G., A.M. Corales, J.A. Manalo IV, W. Ha. 2019. *The Science and Art of Palayamanan Plus* (monograph). Philippine Rice Research Institute and Department of Agriculture-Bureau of Agricultural Research. ISBN: 978-621-8022-52-2; and
4. Ravago, M.L., J. Rousmasset, and R. Danao (eds.). *Powering the Philippine Economy: Electricity Economics and Policy*. The University of the Philippines Press. ISBN: 978-971-542-879-8.

Outstanding Scientific Paper Award

The award is given annually for scientific papers published in Philippine scientific or technical journals within five years preceding the award.

1. Manohar, A.N.C., D. V. Lantican, M.P. Dancel, D.E.M. Cardona, A.C.M. Ibarra, C.R. Gutlay, A.O. Canama, R.R. Gardoce, and H.F. Galvez. 2019. "Genome-guided molecular characterization of oil genes in coconut (*Cocos nucifera* L.)". *Philippine Journal of Science*. 148(1): 183-191. ISSN 00031-7683;
2. Doloiras-Laraño, A.D.; R.N. Garcia, C.M.C. Sandoval, A.G. Lalusin, L.S. Gueco, V.C. Huelgas and E.M. Tecson-Mendoza. 2018. "DNA Fingerprinting and Genetic Diversity Analysis of Philippine Saba and Other Cultivars of *Musa balbisiana* Colla Using Simple Sequence Repeat Markers". *Philippine Journal of Crop Science*. 43(2): 1-11. ISSN 0115-463X;
3. Salvador, J.M., J.J.R.B. Rodriguez, L.C.D.L. Carandang, A.B. Agmata, M.L.D. Honrado, F.C. Delfin and M.C.A. De Ungria. 2019. "Filipino DNA variation at 36 Y-chromosomal short tandem repeat (STR) marker units". *Philippine Journal of Science*. 148(1): 43-52. ISSN 0031-7683;
4. Salmo, S.G. and E.L.D. Gianan. 2019. "Post-disturbance stocks and rates of sequestration: Implications on "blue carbon" estimates in Philippine Mangroves". *Philippine Science Letters*. 12(2): 122-132. ISSN 2094-2818;
5. Rapadas, N.J. and M.D.L. Balela. 2017. "Hydrothermal synthesis of hierarchical hematite (a-Fe203) Nanostructures for Photocatalytic degradation of methyl orange". *Philippine Journal of Science*. 146(4): 395-402 2017. ISSN 0031-7683;
6. Bayaga, C.L.T., M.B. Pico, D.C. Bongga, E.B. Barrios, A.A. Gabriel. 2019. "Development and Evaluation of a Culturally Sensitive Food Frequency Questionnaire for the Assessment of

Prebiotic and Probiotic Intake of Urban-living, Low- To Medium-Income Women". *Philippine Journal of Science*. 148 (3): 551-561. ISSN 0031-7683;

7. Cornista, J.C., A.M.D. Cuña, H.J.A. Sanchez, and M.P. Balolong. 2019. "Detection of Extended-spectrum β-Lactamase-producing *Klebsiella pneumoniae* Isolated from Four Provincial Hospitals in Luzon and Genotyping of β-Lactamase (blaCTX-M, blaTEM, blaSHV, and blaOXA-1) Genes". *Philippine Journal of Science*. 148 (2): 277-287. ISSN: 0031-7683;
8. Pilar-Arceo, C.P.C., E.C. Jose, A.R. Lao, and E.R. Mendoza. 2019. "Chemical Reaction Networks: Filipino Contributions to Their Theory and Its Applications". *Philippine Journal of Science*. 148 (2): 249-261. ISSN 0031-7683; and
9. Roquel, K.I.D., A. Fillone, and K.D. Yu. 2019. "Comparative Flood-Risk Assessment of Different Freight Transport Development Programs". *DLSU Business and Economics Review*. 29(1): 146-164. ISSN 0116-7111.

42nd Annual Scientific Meeting (ASM) Best Scientific Posters

After the screening done by the Scientific Posters Committee, there were 175 abstracts accepted for presentation: 43 for agricultural sciences, 56 for biological sciences, 16 for chemical, mathematical and physical sciences, 34 for engineering sciences, 6 for health/medical sciences, and 20 for social sciences. The following were selected as Best Scientific Posters:

1. Agricultural Sciences
   a. "Enhancing Productivity and Harvest Quality of a Smallholding Coconut Farm through Integration of Irrigation and Fertilizer" of Consorcia Reaño, Christopher dela Cruz, Speedy Crisostomo, and Junnel Metrillo; and

   b. "Detection and PCR-identification of Streptococcus suis from a selected swine farm in Laguna, Philippines" of Susan Sedano.

2. Biological Sciences: "Tandem Mass Spectrometry-Based Glycomic Technologies Enable Glycome Profiling of Serum Samples from Filipino Non-Small Cell Lung Cancer (NSCLC) Cases" of Luster May N. Serrano, Maurice Y. Wong, Carlito B. Lebrilla, Joeriggo M. Reyes, Jomar F. Rabajante, Francisco M. Heralde III, Patrick G. Moreno, Michelle M. Cabanatan, Gladys Cherisse J. Completo, Isagani D. Padolina and Ruel C. Nacario;

3. Chemical, Mathematical, and Physical Sciences: "Novel Substrate-based Probes Aid in Unraveling *M. tuberculosis* Galactosyltransferase 1" of Jan Michael A. Salgado, Mikel Jason DG. Allas, Rowin Christian B. Angkico, Jaevee William T. Espejo, Ruixiang Blake Zheng, Todd L. Lowary, and Gladys Cherisse J. Completo;

4. Engineering Sciences: "A novel modeling framework for the proper implementation of biochar-based carbon management networks" of Beatriz A. Bemonte;

5. Health Sciences: "Isolation and Affinity Purification of Immunoglobulin Y against Synthetic Peptide Analog of In silico-Predicted Unique Epitope of Zika Virus NS1 Antigen" of Leonardo A. Guevarra Jr., Austin James Z. Sta. Maria, Nikki Cyrill C. Capistrano, Laarni Grace M. Corales and Leslie Michelle M. Dalmacio; and

6. Social Sciences: **"**Organic Agriculture Adoption amidst Sustainable Development Challenges: A Multidimensional Perspective" of Edna Luisa A. Matienzo, Myrna A. Tenorio and Marianne R. De Luna.

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DOST) INSTITUTIONAL AWARDS

National Science and Technology Week (NSTW) Awards

The National Science and Technology Week (NSTW) is the annual celebration of the Department of Science and Technology (DOST) that highlights the important contributions of science and technology to national development. During the NSTW, outstanding scientists and technologists are recognized. It also serves as a venue for scientists and researchers to interact with entrepreneurs and businessmen. The NSTW Awards are the Gregorio Y. Zara Medal for outstanding technology commercialization, Eduardo A. Quisumbing Medal for outstanding basic research and development (R&D), Julian A. Banzon Medal for outstanding applied R&D, and Dioscoro L. Umali Medal for outstanding science administrator.

Outstanding Technology Commercialization Award (Gregorio Y. Zara Medal)

For 2020, there was no declared winner.

Outstanding Research and Development Award

Eduardo A. Quisumbing Medal for Basic Research

1) Quantitative trait loci associated with root elongation ability of rice under nitrogen-deficient condition (Dr. Roel R. Suralta); and
2) Rarity of the "common" coral Pacillopora damicornis in the western Philippines archipelago (Dr. Rachel June R. Gotanco);

Julian A. Banzon Medal for Applied Research: Field-ready tools for fingerprinting of herbal materials for the medicinal plant industry (Dr. Erwin P. Enriquez)

Outstanding Science Administrator Award (Dioscoro L. Umali Medal)

Cynthia P. Saloma, Ph.D., Executive Director, Philippine Genome Center
In recognition of her profound and lasting contributions as Executive Director of the Philippine Genome Center (PGC) of the University of the Philippines (UP) System. Her proactive management approach and extensive experience, coupled with her unwavering mentorship of young scientists, has paved the way for the creation of PGC's Satellite Facilities in UP Visayas and UP Mindanao as well as the generation of many research grants and projects, which capitalized on building the capacity and capability of researchers to undertake genomics research in health, agriculture, fisheries, biodiversity, forensics and ethnicity. Dr. Saloma led the institution towards the utilization and appreciation of genomics for the benefit of Filipinos and of humanity.

DOST Intellectual Property Awards: International Publication Award and Utility Model Registration Award

The DOST IPA aims to: (1) give incentives to DOST researchers and technology developers to encourage them to publish in international refereed journals; (2) register their developed technologies;

and (3) boost the publication, patent and utility models output of DOST and its agencies. The award also supports the goal of DOST to institute measures to improve the performance of its Research and Development Institutes (RDIs) and monitor and evaluate their R&D results.

A total of 99 international publications and 21 registered utility models were recognized and given incentives this year from the following DOST agencies and regional offices:

- Advanced Science and Technology Institute (ASTI);
- DOST Region XI;
- Food and Nutrition Research Institute (FNRI);
- Forest Products Research and Development Institute (FPRDI);
- Industrial Technology Development Institute (ITDI);
- Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA);
- Philippine Nuclear Research Institute (PNRI); and
- Philippine Textile Research Institute (PTRI).

The PNRI was also recognized having the highest number of international publications, and the FNRI had the highest number of registered utility models. The awarding ceremony was held on 01 December 2020.

Magsaysay Future Engineers/Technologists (MFET) Award

The Magsaysay Future Engineers/Technologists (MFET) Award is an annual award that aims to recognize outstanding research outputs on engineering and technology at the collegiate level and encourage young Filipino students to pursue a career in science. Through a virtual paper presentation and awarding ceremony on 03 December 2020, former Senator Ramon B. Magsaysay, Jr., DOST Secretary Fortunato T. de la Peña with Academician Angel L. Lazaro III, Chair of the Board of Judges, presented the winners.

1st Prize: Michael T. Castro, UP Diliman
2nd Prize: Jadin Zam S. Doctolero, De La Salle University
3rd Prize: Aaron Jules R. Del Rosario, De La Salle University

Special Citations:

- Elizalde Miguel S. Flores, UP Visayas
- Neil John F. Catapang, UP Los Baños
- Edward Daniel R. Inciong, De La Salle University
- Kristin Y. Carampatana, De La Salle University
- Bien Dave B. Papasin, UP Los Baños
- Gabriel Jose G. Lim, De La Salle University

Scientific Career System (implemented with the Civil Service Commission and DOST)

The Scientific Career System (SCS) is a system of recruitment, career progression, recognition and reward of scientists in the governement service as means of developing a pool of highly qualified and proactive scientific personnel.

The SCS has eight (8) newly-conferred scientists:

- Dr. Charita S. Kwan (Scientist I) - UP Diliman-Natural Sciences Research Institute
- Dr. Pierangeli G. Vital (Scientist I) - UP Diliman-Natural Sciences Research Institute
- Dr. Elmer G. Bautista (Scientist I) - Department of Agriculture-Philippine Rice Research Institute (DA-PhilRice)
- Dr. Fe Esperanza Caridad J. Espino (Scientist I) - Department of Health-Research Institute for Tropical Medicine (DOH-RITM)
- Dr. Maria Luz J. Sison (Scientist I) - UP Los Baños-Institute of Plant Breeding (UPLB-IPB)
- Dr. Aurora M. Corales (Scientist I) - DA-PhilRice
- Dr. Angel B. Encarnacion (Scientist I) - DA-Bureau of Fisheries and Aquatic Resources Region II
- Dr. Leny C. Galvez (Scientist I) - DA-Philippine Fiber Development Authority

The SCS also upgraded the rank of three (3) career scientists, namely:

- Dr. Norvie L. Manigbas (Scientist II) - DA-PhilRice
- Dr. Merdelyn T. Caasi-Lit (Scientist II) - UPLB-IPB
- Dr. Mudjekeewis D. Santos (Scientist IV) - DA-National Fisheries Research and Development Institute (NFRDI)

PROVISION OF BENEFITS FOR THE NATIONAL SCIENTISTS AND ACADEMICIANS

Aside from the recognition awards, the Academy also provides incentives, benefits, and privileges to Academicians and National Scientists.

Research Fellowship Grant
₱4,260,000.00

Publication Assistance
₱100,000.00

Monthly Gratuity
₱26,890,451.55

Travel Assistance
0

Medical Reimbursement
₱4,098,239.43

For National Scientists only

Monthly Life Pension
₱7,200,000.00

Death/Burial Assistance
0

Table 1. NAST members with Research Fellowship Grants for 2020

RESEARCH FELLOW	DURATION	TITLE
Acd. Rhodora V. Azanza	01 January-31 December 2021	Science-Anchored Management of Philippine Marine Living Resources Towards A Sustainable Philippine Blue Economy
Acd. Edward H.M. Wang	01 January-31 December 2021	Addressing the Problem of Unplanned Excisions of Soft Tissue Sarcomas of the Extremities (Phase I)
Acd. Jose B. Cruz, Jr.	01 January-31 December 2021	Shifting Philippine Transportation Final Energy Demand from Fossil Fuels to Electricity: Improvement of Sustainability and Pollution Reduction
Acd. Rody G. Sy	01 March-28 February 2022	Predictors of hypertension among Filipinos from the LIFECARE Philippine cohort
Acd. Filemon A. Uriarte, Jr.	01 June 2021-31 May 2022	The Pasig River Conundrum
Acd. Antonio Miguel L. Dans	01 September 2021-31 August 2022	Acceptability, Feasibility and Impact of Up-To-Date (UTD) Use on Health Care Worker Knowledge from the Philippine Primary Care Studies
Acd. Eufemio T. Rasco, Jr.	01 November 2021-31 October 2022	Transformation of Various NAST Publications to More User-Friendly Online Version
Acd. Reynaldo B. Vea	01 December 2021-30 November 2022	A Lifelong Learning Framework for S&T in the Philippines
Acd. Virginia C. Cuevas	01 December 2021-30 November 2022	Impact of Providing Easy Access to Water Resource for Domestic and Farm Use of Ayta Community in Kanawan Negritos Reservation Area (KNRA) in Morong, Bataan

FORMULATION OF S&T POLICY RESOLUTIONS

The NAST was able to craft 15 policy resolutions/recommendations, and science advisories on various topics, such as single-use plastics, establishment of a virology institute in the country, COVAX facility, long-standing concerns–science education and talent retention, food system, shelter, transportation, other infrastructure, blue economy, climate change, energy, and water, among others.

STATEMENTS AND SCIENCE ADVISORIES ON COVID-19

For all science advisories on COVID-19, see section on COVID-19 Efforts (page 7).

RESOLUTIONS FROM THE 42nd ANNUAL SCIENTIFIC MEETING (ASM)

Republic of the Philippines Department of Science and Technology
NATIONAL ACADEMY OF SCIENCE AND TECHNOLOGY
Theme: "*Science and Technology for Society:Solutions to Long-Standing Concerns*"
Bicutan, Taguig City
10 July 2020

RESOLUTIONS

WHEREAS, our society has been confronting a host of long-standing concerns;

WHEREAS, the National Academy of Science and Technology, Philippines (NAST PHL), believes in Science & Technology as a source of innovations and solutions to society's long-standing concerns;

WHEREAS, the NAST 42nd Annual Scientific Meeting deliberated on the concerns in: (a) food system and health; (b) energy, water, and transportation;
(c) environment, climate change, and blue economy; (d) ICT, shelter, and other infrastructure; (e) science education; and (f) the way forward, among othermatters;

WHEREAS, the existing food system is dysfunctional and is linked to non-communicable diseases, poverty, and natural resource depletion and pollution; and transforming it requires understanding of its processes and impacts, including shift in eating habits;

WHEREAS, the science-based Planetary Health Diet (PHD) can be used as a guide in changing the eating habits of the Filipinos;

WHEREAS, the coronavirus pandemic has shown that water, sanitation, and hand hygiene are central to the prevention of the spread of the virus and are the first line of defense against this serious threat to people's lives and healthsystems;

WHEREAS, the coronavirus pandemic has resulted in an increase in the relative share of renewables in the overall global supply of electricity because they areless affected by supply chain disruptions than fossil-fuel based power sources. This situation has thus provided excellent opportunity for countries to transition to clean energy systems;

WHEREAS, the country has two key legislations to promote renewable energy, namely, the Renewable Energy Act of 2008 and the Biofuels Act of 2006;

WHEREAS, the country has prepared the Philippine Water Supply Roadmap (2010) and the National Sewerage and Septage Management Plan (2011);

WHEREAS, the Philippines has one of the most unique and diverse natural environments in the world, but this has been destroyed by human activities compounded by climate change;

WHEREAS, understanding the dynamics of human activities and natural systems is a key to stave off and reverse the degradation of environment;

WHEREAS, the Philippine blue economy can contribute to inclusive growth by harnessing the bountiful marine resources of the country while protecting its natural base;

WHEREAS, small and medium enterprises, including public and private organizations, lack the required resources to use information and communications technologies more and in better ways unless the costs are shared, such as in town-wide or city-wide digital ecosystems;

WHEREAS, the National Building Code of 1977 has been studied comprehensively, in consultation with stakeholders, culminating in the proposed adoption of a new Philippine Building Act of 2020, which contains major regulatory and building standards reforms;

WHEREAS, other infrastructure in local, regional and national scale need to be retrofitted, upgraded, or replaced for climate change adaptation and disaster risk reduction

WHEREAS, the Philippines has continued to perform poorly in Mathematics and Science, such as in the 2018 Programme for International Student Assessment (PISA), where the Philippines ranked second to last in Math and Science, and last in Reading out of 79 participating countries;

WHEREAS, alternative strategies in basic education, such as the Central Visayan Institute Foundation (CVIF) Dynamic Learning Program (DLP), have produced graduates, who performed well in various independent assessments, with minimal financial investments;

WHEREAS, numerous basic and higher STEM educational institutions need significant upgrading of faculty and facilities;

WHEREAS, there are regulatory laws that restrict innovation in STEM teaching and learning;

WHEREAS, public and private sector initiatives have failed to retain and attract highly-trained Filipino and foreign talents for research, development and innovation;

WHEREAS, the Philippines continues to lag behind other countries in terms of budget allocation for research and development;

NOW, THEREFORE, the National Academy of Science and Technology, Philippines (NAST PHL), in fulfillment of its mandate to give advice to the highestlevels of government, hereby resolves to recommend that the concerned public agencies take the following actions and in doing so work with private institutions, as necessary:

I. FOOD SYSTEM AND NUTRITION

1. Department of Education
   a. Revise the curriculum and integrate food system education at all levels;
   b. Train teachers to implement the new curricula;
   c. Utilize the Planetary Health Diet (PHD) as a guide in the school feeding program; and
   d. Monitor the learning and health outcomes of the feeding program.

2. Department of Health
   a. Adopt the PHD as a component of the Universal Health Care program;
   b. Actively promote the PHD as an important component of a healthylifestyle; and
   c. Integrate food system education and the PHD in training of medicalpersonnel.

3. Department of Agriculture
   a. Revive the Food Terminal in Taguig City and establish more farmers' markets to provide marketing services for small farmers;
   b. Improve local and regional food systems by training farmers to produce sustainable, nutritious, culturally-preferred, and widely accessible food; and
   c. Reduce food waste and progressively shift to lower-impact, less- resource-intensive food sources;
   d. Restructure support for food production programs to align the structure of Philippine agriculture with the needs of the PHD;
   e. Improve productivity of diversified farms needed in the PHD; and
   f. Establish model farms based on rice, corn, coconut and aquaculture to produce the requirements of the PHD.

4. Department of Agriculture, Department of Science and Technology, and Department of Trade and Industry
   a. Mainstream "nutrition-sensitive" policies, programs and investments across sectors by incentivizing the production of nutrient-rich foods like fruit and vegetables, investing in transport and cold-chain infrastructure, procuring from local smallholder farms, reformulating food, and regulating retail and food service chains, and food labels.

5. Department of Science and Technology and Department of Social Welfare and Development
   a. Provide for the immediate food needs of vulnerable populations by expanding social protection programs, scaling-up nutritional support, supporting management and prevention of undernourishment, and adjusting school meal programs.

II. ENERGY, WATER, AND TRANSPORTATION SYSTEMS

1. Department of Energy, Department of Science and Technology, and National Economic and Development Authority
   a. Implement key legislations on renewable energy, namely, Renewable Energy Act of 2008 and Biofuels Act of 2006, and focus on the following specific actions:
   b. Mandate power distribution utilities to purchase and inject a minimum portion of renewable energy (RE) to the grid to guarantee a market for RE producers; and
   c. Review the Biofuels Act, formulate realistic targets, and support research, development, and commercialization of local biofuels to reduce dependence on imported fuels.

2. Department of Interior and Local Government, National Water Resources Board, Local Water Utilities Administration, and Metropolitan Waterworks and Sewerage System
    a. Revise and update the Philippine Water Supply Roadmap (2010) and the National Sewerage and Septage Management Plan (2011) to adapt to the "new normal", focusing on the following actions:
    b. Provide a favorable environment for waterworks systems, water districts, LGUs and the private sector to attain complete coverage of an integrated water supply, sanitation, and sewerage service for the whole country;
    c. Provide water services with full recovery of costs (operation, maintenance, depreciation, investment in enhanced services) while ensuring that water services are priced equitably reflecting their scarcity value and fostering economy in water use; and
    d. Ensure full stakeholder consultation and participation at all levels in the decision-making process of development and management of water resources.

3. Department of Science and Technology
    a. Conduct R&D on alternative location-based technologies in acquiring water, such as solar desalination, water harvesting, and solar stills for remote areas; and
    b. Assess and study the safe yield of the country's groundwater resources.

4. Department of Interior and Local Government
    a. Construct medium- to large-scale water storage system and expand transmission lines to deliver water reliably to rural areas.

5. Metropolitan Waterworks and Sewerage System
    a. Develop new major source/s of bulk water supply to meet Metro Manila's increasing water demand for water security and redundancy.

6. Department of Transportation
    a. Plan, design and implement programs and projects on the use of active transport modes in Philippine cities; and
    b. Optimize the use of transport facilities by using ICT, including computerized performance monitoring systems, smart technology applications among users and enforcers for traffic management like electronic toll collection, automatic illegal parking detectors, security camera systems, transit smart cards, and real-time public transport information.

III. ENVIRONMENT, CLIMATE CHANGE, AND BLUE ECONOMY

Climate Change and Environment

1. Department of Environment and Natural Resources, and Climate Change Commission:
    a. Strengthen research and adoption of ecosystems-based adaptation in the country;
    b. Implement systems approach in environmental and natural resources management to address multiple threats (hazards) and attain sustainable development goals;
    c. Provide adequate support to building capability of concerned NGAs and LGUs in adopting ridge to reef approach to comprehensive land use and development planning; and
    d. Maximize the contribution of the forestry sector to climate change mitigation and adaptation, biodiversity conservation, DRR, and local and national development through Sustainable Forest Management (SFM).

2. Department of Science and Technology
   a. Invest in long-term research and monitoring of ecosystems and its responses to climate change, human activities, and natural hazards; and
   b. Harmonize R&D agenda of DENR, DA and CCC on environment, natural resources, and climate change.

3. Senate and House of Representatives
   a. Enact a law to improve the enabling policy environment for sustainable forestry and succeed the Revised Forestry Code of 1975; and
   b. Pursue the National Land Use Act and establish a framework for national and local land use and development planning.

Blue Economy

4. Congress and Executive Agencies
   a. Reiterate the recommendation of NAST in 2018 and 2019 to create the Department of Fisheries and Marine Resources that could focus on the planning, implementation, monitoring and regular updating of a consolidated "National Fisheries and Marine Resources Research, Development and Utilization".

5. Department of Foreign Affairs, and Department of Science and Technology
   a. Support cooperation/collaboration at the regional and global levels on the monitoring and management of natural and man-made risks and threats, including those from climate change effects in adjacent seas, while giving priority to national interests and security.

6. Department of Science and Technology, and Department of Energy
   a. Fund R&D on the economical and greener transport systems for people and goods with renewable energy from sun, wind and wave; and
   b. Promote the use of ICT, AI, and other appropriate technologies in the enhanced mapping, increased innovative investment, monitoring and science-guided governance and management of the Philippine Blue Economy.

IV. ICT, SHELTER, AND OTHER INFRASTRUCTURE

1. Department of Information and Communications Technology and Department of Science and Technology
   a. Undertake a comprehensive R&D program to establish digital ecosystems and accelerate the digital transformation of public and private organizations in the country; and
   b. Implement the National Broadband Plan for the Philippines to make internet connectivity ubiquitous and within reach for every Filipino.

2. Office of the President
   a. Certify as urgent the proposed Philippine Building Act of 2020, reform regulatory system and standards for various types of public and private buildings in the country, mainstream disaster risk reduction and management, promote inclusivity, sustainability and foresight, and repeal Presidential Decree No. 1096.

3. Senate and House of Representatives
   a. Approve and oversee the implementation of the Philippine Building Act of 2020 including major reforms such as, but not limited to: streamlining the building permit process; designing resilient buildings against multiple hazards; assessing old buildings; incentivizing the retrofit of old buildings; and creating the inter-agency and multi-sectoral Building Regulations and Standards Council (BRSC) with foresight to review and update the regulations and standards every five (5) years or sooner.

4. Department of Public Works and Highways, Department of Human Settlements and Urban Development, Professional Regulation Commission, Department of Interior and Local Government, Department of Trade and Industry, Department of Environment and Natural Resources, and Department of Science and Technology
    a. Engage partner government agencies and private sectors in crafting and updating periodically the regulations and standards for buildings, mainstreaming disaster risk reduction and management, and infusing with a culture of science, technology and innovation.

5. Department of Science and Technology, and National Economic and Development Authority
    a. Collaborate across agencies and sectors in the compliance with building regulations and standards and the enforcement of the same, infusing with research and development in particular and a culture of science, technology, and innovation in general.

V. SCIENCE EDUCATION AND TALENT RETENTION

1. Department of Education
    a. Undertake systematic and comprehensive effort to address the decline in Mathematics, Science and Reading at the basic education level, in collaboration with multi-sectoral stakeholders; and
    b. Pilot alternative modes of instruction in basic education, such as Central Visayan Institute Foundation (CVIF) Dynamic Learning Program (DLP).

2. Department of Education, and Commission on Higher Education
    a. Strictly monitor the quality of STEM institutions, in terms of faculty competency and adequacy of laboratory.

3. Professional Regulation Commission, and Commission on Higher Education,
    a. Review laws that restrict innovation in science and engineering, and identify amendments without compromising public safety, in collaboration with relevant scientific and professional societies, and concerned private sector organizations.

4. Department of Science and Technology
    a. Attract and retain highly trained Filipino and foreign talent in the country as stated in Chapter 14 of the Philippine Development Plan;
    b. Encourage and deploy more researchers, scientists, and engineers (RSEs) in the regions; and
    c. Increase R&D budget to address relevant basic research and innovation.

DONE on this 10th day of July 2020 in Bicutan, Taguig City.

PAGTANAW 2050

The NAST submitted the first version of *Pagtanaw 2050*, a Philippine foresight document on Science, Technology, and Innovation, to the DOST Secretary in December 2020.

MAXIMIZATION OF INTERNATIONAL SCIENTIFIC LINKAGES

The NAST continuously explores and maintains linkages with foreign academies of science, technology, and engineering, as well as with international and regional networks and local science organizations, to promote close scientific cooperation. These linkages aim to: (1) promote collaborative efforts among Filipino scientists, and between Filipino and foreign scientists; (2) promote and encourage scientific cooperation through its Scientist Exchange Visit Program under the memorandum of agreement between NAST and a foreign science academy; (3) endorse participation in international conferences, meetings, for a, seminars, workshops, and similar scientific activities; and (4) publish and exchange scientific literature.

Linkage with the United Nations

Academician Jaime C. Montoya was chosen by the United Nations as one of the 16 members of the Independent Group of Scientists that will prepare the Second Quadrennial Global Sustainable Development Report.

THE SECRETARY-GENERAL

14 October 2020

Dear Mr. Montoya,

I have the pleasure to invite you to serve in your personal capacity as a member of the Independent Group of Scientists tasked with the drafting of the second quadrennial Global Sustainable Development Report.

In July 2016, United Nations Member States decided that the Global Sustainable Development Report will be produced every four years, to inform the High-level Political Forum on Sustainable Development when it meets under the auspices of the United Nations General Assembly to review progress on the 2030 Agenda for Sustainable Development. The report serves to strengthen the science-policy interface and provide a strong evidence-based instrument to support policymakers in promoting poverty eradication and sustainable development.

Linkage with the InterAcademy Partnership (IAP)

Academician Montoya was also chosen to be a member of the group that prepared the IAP recommendation on Open Science and submitted to the UNESCO.

As a member academy of the IAP, the NAST submitted comments and suggestions to the draft unified IAP statutes on 26 October 2020. The NAST also successfully nominated Filipino experts to be members of IAP's international technical working groups on biosecurity and regenerative medicine.

SCIENCE ACADEMIES AND SOCIETIES WITH BILATERAL AGREEMENT

- Academie des Sciences (French Academy of Sciences) - Ongoing agreement (2006-present)
- German Research Society (Deutsche Forshungsgemeinschaft) - Ongoing agreement (since 12 December 1983)
- Indian National Science Academy (INSA) - Ongoing agreement (since 08 July 1983)
- Academy of Sciences Malaysia (ASM) - Ongoing agreement (since 26 August 1997)
- The Royal Society of London (RSL) - Ongoing agreement (since 20 December 1980)
- The Royal Swedish Academy of Sciences - Ongoing agreement (since 6 March 2001)
- Turkish Academy of Science (TÛBA) – Ongoing agreement (since 18 October 2002)
- US National Academy of Sciences (US NAS) - Ongoing agreement (since 02 April 2002)

AFFILIATIONS TO INTERNATIONAL SCIENTIFIC ASSOCIATION

- InterAcademy Partnership (IAP)
- Association of Academies and Societies of Sciences in Asia (AASSA)
- The World Academy of Sciences for the advancement of science in developing countries (TWAS)
- Third World Network of Scientific Organizations (TWNSO)

OTHER LINKAGES

- National Research Foundation of Korea
- Philippine-American Academy of Science and Engineering (PAASE)

MANAGEMENT OF THE PHILIPPINE SCIENCE HERITAGE CENTER (PSHC)

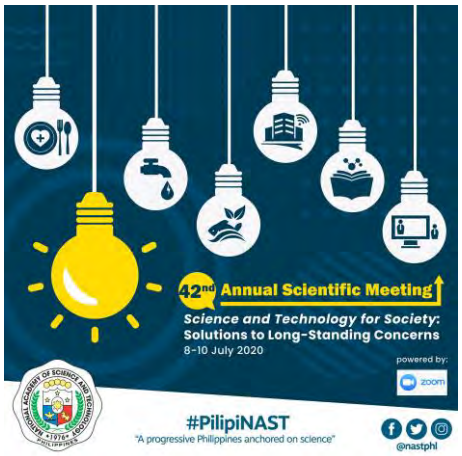
The Philippine Science Heritage Center (PSHC), under the management of the National Academy of Science and Technology, was established in 1998 to honor Filipino scientists and their contributions to the world of science. Republic Act 9107 of 2001, or the Philippine Science Heritage Center Act, mandated the NAST PHL to manage, operate and maintain the Center to serve as the main repository of the country's contributions, achievements, and accomplishments in the field of science and technology. It was envisioned to be the lasting tribute to numerous Filipino scientists and technologists who have unselfishly devoted their lives for the betterment of the country.

The hologram exhibit on the National Scientists was featured in "iBilib" TV show on 08 March 2020.

In response to the pandemic, the PSHC developed a virtual tour app that provides opportunity to the general public to visit its exhibits during this time. The app was launched on 26 November 2020 during the 2020 NSTW celebration.

ACTIVITIES

The NAST conducted 38 activities in the form of webinars, policy fora, information fora, paper presentations, etc. on various topics.



42nd Annual Scientific Meeting

Revolving around the theme "Science and Technology for Society: Solutions to Long-Standing Concerns," the 42nd Annual Scientific Meeting (ASM) was conducted on 8-10 July 2020 via Zoom Webinar – the first ASM to be conducted virtually due to the COVID-19 pandemic.

The ASM presented topics on the country's long-standing major issues and concerns in the fields of: (1) health and food system; (2) energy, water, and transportation; (3) ICT, shelter, and other infrastructure; (4) environment and climate change; and (5) science education and talent retention. Two special plenary sessions on the recent COVID-19 pandemic were added.

The activity was hosted by the Engineering Sciences and Technology Division (ESTD), chaired by Academician Reynaldo B. Vea.

Department of Science and Technology (DOST) Secretary Fortunato T. De La Peña, in his opening message, expressed his appreciation that the ASM focused on the preparation of the Science, Technology, and Innovation (STI) Foresight, a 30-year strategic plan for science and technology in the country. He was also pleased that the topics were aligned with the Sustainable Development Goals (SDGs). He emphasized the need to come up with solutions to long-standing concerns, especially that the threat of COVID-19 and other infectious diseases brought so many challenges in various disciplines.

The first plenary session focused on health and food system. Acd. Eufemio T. Rasco, Jr., chair of the ASD, discussed *Feeding Metro Manila in 2050*. Acd. Antonio Miguel L. Dans, HSD member, presented the latest data on diet and health.

The second session focused on energy, water, and transportation. Acd. Filemon A. Uriarte, Jr., ESTD member, discussed energy and water in the time of COVID-19. Dr. Jose Regin F. Regidor, professor at the UP Diliman, discussed transportation system in the New Normal.

The third session focused on blue economy and climate change. Acd. Rhodora V. Azanza talked about the sustainable use of the marine environment in the New Normal and Acd. Rodel D. Lasco, ASD member, gave his insights on climate change and environment.

For the fourth session, Acd. William T. Torres, ESTD member, talked about harnessing the digital ecosystems approach for small and medium enterprises (SMEs). Acd. Benito M. Pacheco, also a member of the ESTD, lectured on adapting the Philippine Building Act of 2020 with S&T innovation in regulations and standards for a New Normal.

The fifth session was on science education and talent retention. Acd. Christopher C. Bernido, member of the Mathematical and Physical Sciences Division (MPSD), presented the Central Visayan Institute Foundation (CVIF) Dynamic Learning Program (DLP) in achieving high learner performance levels

before, during and after a pandemic. Acd. William G. Padolina, also a member of the MPSD, discussed about removing the roadblocks in the Philippine higher education system towards excellence in STEM.

The first special plenary session on COVID-19 featured Mr. Jaime Augusto Zobel De Ayala, chairman and CEO of Ayala Corporation. He presented the challenges under the new normal and ways to move forward. The second special session focused on learnings from the COVID-19 pandemic and preparations for the New Normal. Dr. Maria Rosario S. Vergeire, undersecretary of the Department of Health, presented data on the country's response to the pandemic and the guidelines for lessening the spread of the virus. Dr. Ma. Regina Justina E. Estuar, project leader of the DOST-PCHRD-funded Feasibility Analysis of Syndromic Surveillance using Spatio-Temporal Epidemiological Modeler (FASSSTER) and professor at the Ateneo de Manila University, discussed the methods and protocols used by her team to model the pandemic for enhanced disease surveillance. Cabinet Secretary and co-chairperson of the Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF-EID) Karlo Alexei B. Nograles discussed the efforts of the IATF-EID to address various challenges on the economy, business, and education.

On 7 July 2020, the first-ever online Scientific Poster Session was launched through Facebook Live and reached 7,700 unique accounts. The digital posters were uploaded to a public Facebook group where the engagements of the individual posters were monitored and recorded.

Future Science Leaders Forum

The FSLF aims to empower young Filipino science leaders and create a pool of potential NAST awardees with the hopes of assisting young leaders maximize their leadership potential in their respective fields and to provide a venue for a leadership network of peers and potential mentors and advisers. Fifty (50) promising leaders from different institutions completed the 3-day forum on 17-19 November 2020.

The activity is tailored for individuals who show significant promise for leadership in their chosen field, less than 40 years of age, and with demonstrated outstanding accomplishments in their respective fields. For 2020, 50 promising leaders from different academes and institutions was able to complete the three-day forum.

The resource speakers were NS Lourdes J. Cruz, NS Dolores A. Ramirez, NS Ernesto O. Domingo, Acd. Carmencita D. Padilla, Acd. William G. Padolina, Acd. Libertado C. Cruz, Acd. Caesar A. Saloma, Acd. Raymond Girard R. Tan, Acd. Gisela P. Concepcion, Acd. Michael L. Tan, DOST Secretary Fortunato T. de la Peña, DOST Undersecretary Rowena Cristina L. Guevara, DOST Undersecretary Renato U. Soldium, Jr., and Department of Agriculture Secretary William D. Dar. The forum was supported by Dr. Merlyn S. Mendioro, Dr. Richard S. Lemence, and Dr. Leslie Michelle M. Dalmacio as moderators, and Dr. Aimee Lynn S. Dupo and Dr. Joey D. Ocon as rapporteurs.

Science Policy and Information Forum on Marine Spatial Planning and Coastal Reclamation: A Focus on Manila Bay Area

In collaboration with OCEANA Philippines
07 October 2020, Online

Acd. Rhodora V. Azanza highlighted the need to study and develop plans based on land and marine spatial planning (LSP and MSP).

Dr. Vera Horigue, research fellow of the Macquarie University, Australia, discussed the importance of marine protected areas (MPAs) as a tool for MSP and their positive impacts on fisheries, coastline protection and biodiversity conservation, among others. Dr. Horigue also presented the concept of Systematic Conservation Planning (SCP), which pertains to decision making in marine spatial management. She stated that the rehabilitation of Manila Bay requires collective and integrated efforts of municipal governments from Bataan to Cavite wherein rehabilitation, conservation and spatial planning would require looking at the bigger picture or considering the whole bay as one ecosystem. She recommended prioritization of pelagic resources; availability, accessibility, and verification of data for MSP; and coordination of local government units to evaluate impacts of certain management decisions.

Acd. Cesar L. Villanoy, member of the MPSD, discussed the impacts of pollution and reclamation on the physical oceanography of Manila Bay. According to him, the most important environmental problem in Manila Bay is pollution. He presented historical and comparative account of nutrient loading around the bay area, and their impacts on water movement and water residence time. Furthermore, Acd. Villanoy showed that the bay is an estuary with a narrow mouth, the water generally coming in from the Cavite side and going out on the Bataan side. The bay could be negatively impacted by reclamation, which include obstruction of littoral current, modification of wave propagation/energy dissipation patterns and modification of inland drainage system.

Dr. Rene Rollon, professor of UP Diliman, presented an overview of the ecological values of mangroves, which include: being the habitat for marine fisheries and wildlife; helping improve coastal water quality; protecting the coastline and coastal communities; and as blue carbon ecosystems. He shared his team's research works on the estimates of mangrove coverage in the country. In the case of Manila Bay area, an estimated 98% of the 93,000 hectares of original mangroves has already been depleted. The areas that still have mangroves are mostly in Bataan and Pampanga where Key Biodiversity Areas (KBAs) have been designated by the Department of Environment and Natural Resources (DENR). Several studies have targeted around 10% mangrove restoration but he suggested that the targets should be higher to have considerable effects.

Dr. John McManus of the University of Miami-National Center for Coral Reef Research presented his work on the effects of physical damages of dredging and reclamation of marine environment/coral reefs and how they can be rehabilitated and managed. He emphasized the importance of the use of community organizing approach in coastal management, specifically the unity of stakeholders whilst making socially undesirable behavior unacceptable.

National Economic Development Authority (NEDA) Assistant Secretary Roderick M. Planta, and Acd. Rex Victor O. Cruz (as Vice Project leader) presented the draft "Manila Bay Sustainable Development Plan" that includes an "Integrated Coastal Zone Management" (ICZM) Framework. The representatives from NEDA assured that they consulted various stakeholders, including DENR-Ecosystems Research and Development Bureau (ERDB) and Department of Agriculture (DA)-Bureau of Fisheries and Aquatic Resources (BFAR).

Director Ricardo L. Calderon of DENR-Biodiversity Management Bureau (BMB) stated that Manila Bay clean-ups would not be possible without cleaning its river systems. He also suggested forming a single management authority for Manila Bay in-charge of proper monitoring and ownership of the responsibility and accountability, and forming an advisory body for Manila Bay different from the one created by the Supreme Court Mandamus. Captain Xerxes Proceso B. Fernandez of the Philippine Coast Guard recommended mapping of critical habitats, fisheries, and mariculture areas while ensuring that these, including reclamation activities, would not affect water circulation within the bay, river drainage, and vessel movement and safety. Speaking for the private sector, Atty. Gloria Estenzo Ramos of OCEANA Philippines, identified the major challenges in Manila Bay, which are weak fisheries management and unabated reclamation. She emphasized the need for full compliance with laws and regulations, as well as science-based participatory and transparent management processes and integration of the impacts of climate change. Dr. Nilo S. Katada of DA-BFAR suggested updating fisherfolk and boat registrations,

consistent inventory of aquafarms, assisting and organizing coastal clean-ups, and implementing closed fishing season for different types of fishes.

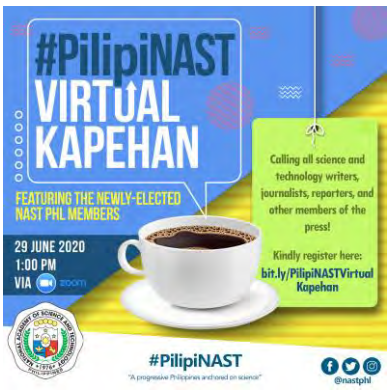
National Scientist Angel C. Alcala, pioneering marine scientist on Marine Protected Areas and a Ramon Magsaysay Awardee, showed impacts of reclamation on some coastlines in the United States and in Southern Philippines, particularly in Dumaguete. He encouraged transparency in the process of decision-making in the management of the environment. (Jainor Timothy U. Garcia/NAST PHL)

Presentation of Research Results and Papers

The *Presentation of Research Results* provide the NAST Awardees with the opportunity to discuss their most recent findings and receive feedback from colleagues with similar research interest and allow researchers in other disciplines, decision-makers, and relevant stakeholders to become aware of the innovative research being generated in particular subfields of science. Paper presentations were also conducted as part of the selection process of the NAST Environmental Science Award, NAST Talent Search for Young Scientists, Magsaysay Future Engineers/Technologists (MFET) Award, and NSTW Award: Outstanding Research and Development Award.

Science Information Forum or Virtual *Kapehan*

The Science Information Forum is conducted with members of the media and science communicators as audience. During the pandemic, its online version was launched as *virtual kapehan*.



The first virtual *kapehan* was held on 29 June 2020 and featured the newly-elected academicians and corresponding members of NAST PHL. The second activity featured the OYS 2020.

Speakers Bureau, *Salinlahi* Symposium, Dialogue with the NAST Scientists, Meet Your Scientist, and Symposium for the Youth/Scienteach

The NAST conducts five (5) activities that brings science closer to the public:

1) *Speakers Bureau* - aims to provide speakers on science-related issues to provincial centers and academic institutions;
2) *Salinlahi Symposium* - brings science to areas not usually reached by science symposia;
3) *Dialogue with the NAST Scientists* - aims to inspire and encourage researchers, government employees, and other professionals to conduct more research, and adapt science and technology for development;
4) *Meet Your Scientist* - aims to promote science among the youth, and inspire and encourage them to pursue careers in science; and
5) *Symposium for the Youth* - aims to inspire and encourage high school students to pursue a career in science. During the pandemic, its virtual version called *Scienteach* was launched.

The NAST conducted the following:

ACTIVITY	LOCATION	DATE	TOPICS (SPEAKERS)
Speakers Bureau	Boracay Island	07 January	Future Earth Program of the Philippines (NS L.J. Cruz); Philippine Blue Economy (Acd. M.D. Santos), Nature-Based Solutions for Water-Wise Cities (Dr. Marla M. Redillas); Solid Waste Management in the Philippines and Practices (Dr. Arnel B. Beltran)
Speakers Bureau	Dumaguete	27 January	Legislative Forum on Modern Crop Production with Acd. E.T. Rasco Jr. and Dr. Reynante L. Ordonio
Salinlahi Symposium	Dinagat Island	03-04 March	sustainable fisheries (Acd. M.D. Santos), bioremediation in mined-out areas (Acd. V.C. Cuevas), biodiversity and biogeography (Dr. Juan Carlos T. Gonzalez), and management of water resources (Dr. Arnel B. Beltran)
Speakers Bureau	Dinagat Island	05 March	sustainable fisheries (Acd. M.D. Santos), R&D output on mined-out areas (Acd. V.C. Cuevas), biodiversity (Dr. Juan Carlos T. Gonzalez), and sustainable water management (Dr. Arnel B. Beltran)
Meet Your Scientist: World Bamboo Day	Virtual	18 September	Edible shoots of endemic bamboo species (Dr. Merdelyn T. Caasi-Lit), bamboo technologies and practical uses (Dr. Ramon A. Razal)
Scienteach: Caraga	Virtual	02 October	
Speakers Bureau: Region I	Virtual	05-06 November	Venture financing program of DOST-TAPI (Romeo M. Javate), Surgical Innovation & BiOtechnology Laboratory (SIBOL) program of UP Manila (Acd. E.H.M. Wang), roles of science and technology for climate change and disaster risk adaptation and reduction (Acd. R.D. Lasco)
Speakers Bureau: Region III	Virtual	13 November	Hallmarks of a good high school investigatory project (Acd. W.L. Rivera), introduction to forensic sciences and the process of criminal investigation (Dr. Maria Corazon A. De Ungria)
Scienteach: Nueva Ecija	Virtual	16 November	Accretion and Erotion Along Negros Oriental Coastline: The Effects of Reclamation on Coastal Areas (NS A.C. Alcala), Bugs and Toilets, Science and Engineering (CM F.L. de los Reyes III), Philippine Carabao Center Carabao Development Program: Creating Livelihood Opportunities for the Farmers (Acd. A.N. del Barrio), Why I enjoy being a Scientist (Acd. R.D. Guerrero III)

Scienteach: NCR	Virtual	26 November	A Life Between Bacteria and Protozoa: My Journey as a Microbiologist (Acd. W.L. Rivera), Bugs and Toilets, Science and Engineering (CM F.L. de los Reyes III),, Effects of Reclamation on Coastal Areas (NS A.C. Alcala)
Scienteach: Dumaguete	Virtual	03 December	The DIY (Do It Yourself) Scientific Social Survey (Acd. Mahar K. Mangahas), 4 reasons why STEM (Acd. Christopher P. Monterola), Solar PV Technology Towards a More Resilient and Sustainable Economy (NS Raul V. Fabella)

Salinlahi Evolution: App Development Contest

The *Salinlahi Evolution* is an app development contest of the Philippine Science Heritage Center (PSHC). The contest is open to high school students. For 2020, the winners were:

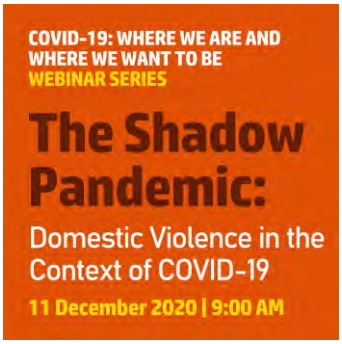
1st Place: Team Alumpihit of Philippine Science High School (PSHS) Southern Mindanao Campus (Prize: ₱50,000.00);

2nd Place: Team Scinapse of Davao City National Science High School (Prize: ₱30,000.00); and

3rd Place: Team SAYAns of PSHS Southern Mindanao Campus (Prize: ₱20,000.00).

Gender and Development (GAD)

The NAST conducted a webinar on domestic violence on 11 December 2020 as part of the celebration of the 18-Day Campaign to End Violence Against Women.



Social Media

The NAST Facebook page has 19,773 likes, 20,951 followers, 50,196,735 reach, and 3,875,909 engagements.

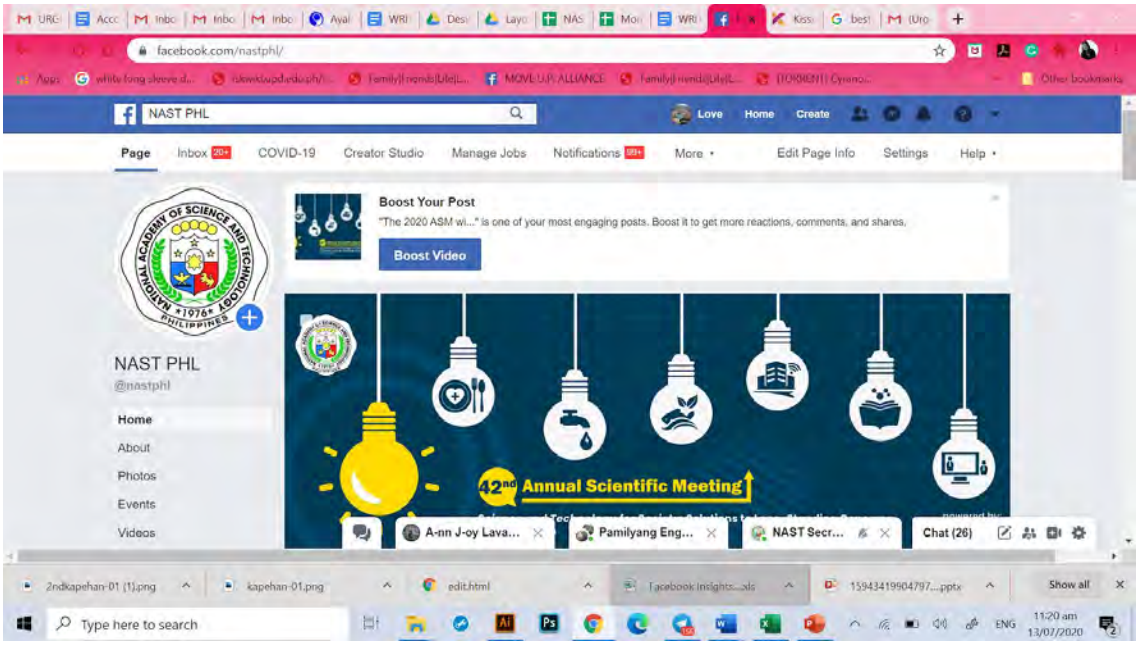
The NAST Twitter page has 1231 followers and produced 565,900 impressions.

To increase its reach online and make its scientists known by the larger public, NAST organized the *Ask a Scientist Facebook Live*, an informal online Q&A and *kwentuhan* session. The first episode featured National Scientist Emil Q. Javier.

The following is the series of posts in NAST social media accounts:

TITLE	SHORT DESCRIPTION
Agham Monday	Social Media feature of NAST Members and their outstanding contributions in science and technology
NAST FAQS	Posts about frequently asked questions about NAST PHL
#ChooseDay	Science related questions where people can engage through posting photos of their chosen answers in the comment section about a certain

	topic
WedNSday	Trivia about National Scientists/their significant contributions
NAST Awards/ Awardees	Social media feature of all NAST Awardees (OYS, OBM, OSP, NAORTM, NESA, NTSYS, and GTO)
#NowYouKnow	Anything under the sun; anything S&T related; science trivia
Ask A Scientist	Inspired by the famous trend on social media known as "Ask Me Anything" (AMA), an online question and answer (Q&A) portion; questions will be requested from the online audience to be answered by NAST members
Quote of the Week	Quotable quotes from NAST members and speakers
Tuesday With	To show what scientists' normal day is like as well as interesting facts about the NAST members
Birthday Greetings	Online birthday greeting card
Save the Date	Information about upcoming NAST events
Announcements	Announcements from NAST PHL
Congratulations Pub	Post that congratulates NAST members
Event Pub	Details/ Announcements on NAST events



IN MEMORIAM

ACADEMICIAN REMIGIO M. OLVEDA

Academician Remigio M. Olveda, a renowned Filipino expert in the field of infectious and tropical medicine joined his creator on Friday, April 24 at the age of 71 years.

The National Academy of Science and Technology, Philippines (NAST, Phl), the country's highest recognition and advisory body on issues concerning science and technology, joins the scientific community in mourning the demise of Dr. Olveda, who was chiefly recognized for his significant contributions as a researcher, clinician, mentor, and scientist particularly in his extensive research in pursuing cost-effective strategies for the control of the Schistosoma japonicum infection in the country affecting around 200 million people in 74 countries worldwide.

He played a central role in the diversification of sources of research funds leading to multidisciplinary, international research programs of the Research Institute for Tropical Medicine (RITM), where he served for more than 25 years. He then established the Good Manufacturing Practices Certified Vaccine Production Plant at RITM capable of producing affordable and high-quality vaccines.

Dr. Olveda obtained his Bachelor of Science PreMed at the University of Santo Tomas (1969) and Doctor of Medicine at the University of the East Ramon Magsaysay Memorial Medical Center (1973). He served as the director of the Research Institute for Tropical Medicine (RITM). He was a member of the American Society of Tropical Medicine and Hygiene, Manila Medical Society, and Philippine Medical Association.

He was a recipient of many awards, including the Outstanding Young Scientist given by NAST PHL in 1983, Outstanding Health Research Award by Department of Science and Technology and Department of Health in 2006, Achievement Awardee by the National Research Council of the Philippines in 2011, and NAST-LELEDFI Awardee for Outstanding Research in Tropical Medicine in 2012.

Dr. Remigio M. Olveda was elected to the NAST PHL as Academician in 2014.

Interment service was held on 28 April 2020 at the Manila Memorial Park, Sucat, Parañaque. (Dhan Michael L. dela Peña/NAST PHL)