2024
ACCOMPLISHMENTS

VISION, MISSION, AND MANDATES

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, series of 1976).
- To advise the President and the Cabinet on matters related to Science and Technology (Executive Order No. 818, s. 1982).
- To engage in projects and programs designed to recognize outstanding achievements in science and to promote scientific productivity (Executive Order No. 818, s. 1982).
- To embark on programs traditionally and internationally expected of an academy of science (Executive Order No. 818, s. 1982).
- To manage, operate and maintain the Philippine Science Heritage Center (Republic Act 9107, s. 2001).

VISION

The National Academy of Science and Technology, Philippines is the country's lead adviser towards the advancement of a strong science, technology, and innovation ecosystem for a prosperous, equitable, and sustainable society

MISSION

1. To recognize outstanding achievements of Filipinos in science, technology and innovation;
2. To provide authoritative and evidence-based advice to government and society, in general;
3. To promote a strong science culture in Philippine society; and
4. To facilitate collaboration with communities and institutions for scientific, technological, and innovative pursuits.

CORE VALUES

NAST is committed to promote and exemplify the values of INTEGRITY and EXCELLENCE in pursuit of science in the interest of Philippine society and the global community.

Department of Science and Technology (DOST) – National Academy of Science and Technology (NAST)

HIGHLIGHTS OF ACCOMPLISHMENTS
As of 31 December 2024

1.1. EXECUTIVE SUMMARY

The National Academy of Science and Technology (NAST) envisions itself as the country's lead adviser towards the advancement of a strong science, technology, and innovation (ST&I) ecosystem for a prosperous, equitable, and sustainable society.

Its mission statements are the following:

1. To recognize outstanding achievements of Filipinos in science, technology, and innovation;
2. To provide authoritative and evidence-based advice to government and society, in general;
3. To promote a strong science culture in Philippine society; and
4. To facilitate collaboration with communities and institutions for scientific, technological, and innovative pursuits.

Through its Science and Technology Recognition and Policy Advisory Program, the Academy aims to recognize outstanding achievements and accomplishments in ST&I and provide authoritative and evidence-based advice to government and society, in general. The majority of the total budget allotted for this program is spent on benefits and privileges of the Academy Members (National Scientists and Academicians) and cash awards/incentives for scientists/researchers in recognition of their exemplary contributions to the advancement of science and technology in the country.

In 2001, Republic Act 9107 mandated NAST to manage and operate the Philippine Science Heritage Center (PSHC) to "be the main repository of the country's contributions, achievements, and accomplishments in the field of science and technology."

The Academy continues to collaborate with communities and institutions for ST&I pursuits, as exemplified by its membership to the InterAcademy Partnership (IAP) and Association of Academies and Societies of Sciences in Asia (AASSA), the global and Asian scientific groups of academies of sciences and similar organizations.

In 2023, Executive Order No. 17 charged NAST to provide the necessary technical and administrative support to the Philippine Scientific Career System (SCS), a system of recruitment, career progression, recognition, and reward of scientists in public service as a means of developing a pool of highly qualified and productive scientific personnel. The system aims to attract scientific experts in the government service to stay in the science career path while at the same time allowing them to develop within their respective areas of expertise. Under the system, qualified personnel who are conferred 'Scientist' rank are awarded a corresponding salary grade and are entitled to receive grants and benefits in order to harness their scientific capability and support the conduct of their research, namely: foreign travel grant when presenting papers in international symposia; and publication assistance, support for membership to international scientific organizations and subscription to scientific journals.

The SCS is co-implemented by the Civil Service Commission (CSC) and Department of Science and Technology (DOST). As the SCS Secretariat, the NAST facilitates the processing of applications for admission and upgrading; organizes the oath-taking ceremony of the new and upgraded Career Scientists; conducts orientation seminars to research personnel, finance, and administrative personnel from different government research agencies; facilitates the performance evaluation of active Career Scientists; provides benefits/support grants to qualified Career Scientists; and conducts research colloquium, annual meeting, scientific forum, and other related activities.

With the issuance of the Executive Order No. 17 s. 2023, a new P/A/P was created and an additional budget of P9.105 million was downloaded to the regular funds of NAST beginning in FY 2024.

1.2 OBJECTIVES

ORGANIZATIONAL OUTCOME:
Increase benefits to Filipinos from scientific knowledge by recognizing outstanding achievements and enhancing and fostering policy environment for the development of Science and Technology.

PROGRAM OBJECTIVE STATEMENT:
Promote and recognize outstanding scientific and technological efforts and achievements.

1.3 BACKGROUND

The program has two major sub-programs: a) S&T Recognition; and b) Science Policy Advisory.

S&T Recognition:

The Academy aims to be the premier organization that recognizes achievements in science, technology, engineering, and mathematics (STEM) and nurtures emerging scientific talents.

NAST plans to increase its membership and sustain its current recognition programs by endorsing outstanding Academy members to the Order of National Scientist; nominating outstanding ST&I experts for election to the Academy; electing Corresponding and Honorary Members; recognizing exemplary ST&I works; and recognizing and nurturing young scientists.

The Academy also plans to continue administering awards or recognition systems of other institutions by serving as Board of Judges, advisory and/or selection boards, facilitating paper presentations, among others.

Activities under this include a) screening, selection, and awarding of outstanding achievements of individual or group of scientists/researchers; b) provision of benefits for National Scientists and members of the Academy (Academicians and Corresponding Members); and c) promotion of scientist/researchers and their achievements through the operation of PSHC.

a. Screening, selection, and awarding of outstanding achievements of individuals or groups of scientists/researchers

   The Academy recognizes and provides incentives to individuals or groups of Filipino scientists for outstanding achievement in scientific research and

development. NAST is actively promoting and fostering excellence in ST&I in the country through this activity. At present, the Academy gives eight (8) prestigious awards annually. These are a) Outstanding Young Scientists; b) NAST Talent Search for Young Scientists; c) NAST Environmental Science Award; d) NAST Outstanding Research in Tropical Medicine; e) Outstanding Scientific Paper; f) Outstanding Book/Monograph; and g) Geminiano T. de Ocampo Visionary Award for Medical Research.

Aside from the NAST Awards, the Academy also administers the DOST-National Science and Technology Week (NSTW) Awards that include: Outstanding Technology Commercialization Award (Gregorio Zara Medal); Outstanding Research and Development Award (Eduardo Quisumbing Medal for basic research and Julian Banzon Medal for applied research); and Outstanding Science Administrator Award (Dioscoro L. Umali Medal).

To recognize outstanding works of young engineering and technology students/graduates, the Academy administers the Magsaysay Future Engineers/Technologists Award.

To encourage the scientific productivity of DOST scientists and researchers, NAST administers the DOST Intellectual Property Awards (IPA) that include the International Publication Award (IPub), Granted Patent and Utility Model Registration Award (GPUMRA), and Industrial Design Award (IDA). The IPub recognizes DOST employees, who publish their studies in refereed journals, ISI journals or scientific journals covered by international indexing services and citation databases. Aside from the research publication, incentives are also given to DOST employees who have registered their technologists through patents, utility model applications, and industrial designs.

b. Provision of benefits and privileges of National Scientists and members of the Academy, including research fellowship grants, pursuant to the Academy's Charter

The conferment of the Order of National Scientist by the President of the Republic of the Philippines is the highest honor being given to a Filipino man or woman of science. Nominees should receive 70 percent of the total votes of the full membership of the Academy before being recommended to the President of the Philippines for the honor. The award was created pursuant to Presidential Decree No. 1003-A on 16 December 1976. Since 1978, 43 Filipinos, 11 of whom are living, have been conferred as the Order of National Scientist. Once conferred, a National Scientist is entitled to privileges and benefits similarly enjoyed by a National Artist (though with different amounts).

The following are the living National Scientists with their fields of specialization:

NATIONAL SCIENTISTS	FIELD OF SPECIALIZATION
Mercedes B. Concepcion	Demography
Lourdes J. Cruz	Biochemistry
Romulo G. Davide	Nematology / Plant Pathology
Ernesto O. Domingo	Internal Medicine / Gastroenterology
Raul V. Fabella	Economics
Emil Q. Javier	Plant Breeding and Genetics
Ricardo M. Lantican	Plant Breeding and Genetics
Bienvenido F. Nebres, SJ	Mathematics

Carmencita D. Padilla	Human Genetics
Dolores A. Ramirez	Biochemical Genetics
Gavino C. Trono, Jr.	Marine Botany

On the other hand, the membership to the Academy is by peer recognition and carries with it the title of "Academician," as well as benefits and privileges. Elected as Academicians are resident Filipino scientists, who have made exemplary contributions to science and technology and have advanced its cause in the Philippines.

c. Promotion of S&T achievements through the operations and maintenance of the Philippine Science Heritage Center

The PSHC or *Salinlahi* (meaning heirloom of a generation) serves as the main repository of the significant contributions and achievements of Filipinos in the world of science. It is the only science center enacted by law (RA 9107) in the country and has the following components: a) development and maintenance of exhibits/displays; b) conduct of alternative STEM learning activities to immerse the students in the works of Filipino Scientists and encourage them to pursue a career in science; and c) establishment of linkages with local and international science center.

S&T Policy Advisory:

The Academy aims to be the primary advisory body on national ST&I policy and related matters. It specifically aims to systematize NAST as the preferred point of reference for all ST&I matters through the following activities:

a. Institutionalize the role of NAST in the formulation and review of periodic national plans/documents;
b. Conduct a series of activities, such as Science Policy/Legislative Fora, to address a specific concern, resulting in consensus reports or policy recommendations;
c. Conduct the Annual and Regional Scientific Meetings on thematic issues, resulting in policy resolutions or recommendations for national and/or regional legislations;
d. Issue Position Papers, Statements, and Science Advisories on timely issues;
e. Prepare a White Paper(s) for the National Government; and
f. Engage other scientists and researchers on various topics through commissioned papers, science advisories, etc.

Deriving strength from some of the most eminent and accomplished scientists in the country, NAST is in the best position to comment on national issues and concerns as well as initiate and implement significant and relevant research.

In order to maximize the ability of the Academy in providing advice and guidance towards the formulation of policies that will allow science, technology and innovation to contribute to the national development agenda, the Academy is also conducting projects under its Special Concerns Program (SCP) that are expected to provide valuable inputs and recommendations to the legislative and executive branches of government. The SCP, through its Technical Working Groups (TWGs), conducts more in-depth studies on various matters and develops relevant policy recommendations and legislative proposals therefrom. In 2024, the following were the areas in focus:

a. An Assessment of the Effectiveness of the National R&D Investment;

b. Studies on the Alignment of the Philippine R&D System from a Domestic to a Global Network;
c. Assessment of Basic Industrial Base of the Philippine Economy;
d. The Competitiveness and Sustainability of Philippine Agriculture: Developing New Products;
e. Natural Resource Management Issues and the Economy;
f. Assessment of the Regulatory Laboratories in the Philippines and their Role in Trade Facilitation;
g. Enhancing the Science, Technology, and Mathematics Components of the K-12 Curriculum;
h. Targeting the Appropriate Technological Maturity of Rural Industries;
i. Applications of Advanced Technologies in the Delivery of Health Care Services;
j. Formulation of Schemes to Improve the Production and Retention of STEM PhD Graduates in the Country;
k. Bioplastics: Technical Challenges and Opportunities for the Philippines;
l. Technology Trends and Policy Directions towards Philippine Niche in Energy Storage Development;
m. Use of Space Technology for Agriculture and Natural Resources Management; and
n. Accelerating the Utilization of Knowledge and the Development of Ocean Science in the Country.

Because of the activities of the different SCP TWGs, the NAST was able to conduct consultative activities in various parts of the country. Some of the conducted discussions include an assessment of the National Greening Program, advancement of the innovation coordination efforts in the food manufacturing and artificial intelligence services industries, among others. Insights from these consultative activities are expected to embody the concerns and suggestions of various stakeholders and provide bases in the preparation of science-based and futures-oriented policy recommendations.

However, regardless of the number of policy recommendations the Academy generates to respond to the needs of the society, the adoption largely depends on the priority areas of DOST, legislative (Senate of the Philippines and House of Representatives), and other concerned agencies.

Furthermore, the Academy also aims to be a strategic partner in ST&I locally and globally by building and/or strengthening inter- and transdisciplinary communities in strategic areas on national and international platforms.

Moreover, pending the inclusion of performance indicators for the new P/A/P, the "Implementation of the Scientific Career System Under E.O. No. 17 s. 2023" was temporarily lodged under this program.

II. HIGHLIGHTS OF ACCOMPLISHMENTS

A. Scientists given awards

The Academy, having been mandated to promote and foster excellence in science and technology in the country, recognizes and provides incentives to Filipino scientists for their outstanding achievements in scientific research and development. In 2024, the following scientists were recognized for their exemplary contributions to the advancement of ST&I:

ORDER OF NATIONAL SCIENTIST

National Scientist Romulo G. Davide

Academician Davide's more than 30 years of focused research and teaching on plant parasitic nematodes makes him a towering figure in his field. In 1968 upon his return to the Philippines from PhD studies at North Carolina State University, he creased plant nematology as a major field of study at the College of Agriculture, University of the Philippines Los Baños. With hundreds of his graduate and undergraduate students, he covered a wide range of research: taxonomy, distribution, life cycle, host range, and biological control, among others. Together, they published a total of 83 TR-indexed journal articles plus more than other articles for a total of 137 scientific publications.

He pursued his research one significant notch further through his research on potential biological control agents against nematodes that led to the development of a commercial product with the tradename "Bioact" patented in the Philippines and the USA. It provided Filipino farmers with an alternative to the highly toxic, expensive, and inaccessible chemical nematicides. The work on biological control of nematodes inspired local researchers to do similar work not only on nematodes but other plant pests and diseases as well.

In the course of Academician Davide's work with farmers, he saw the need to engage them as extension agents due to the lack of it, particularly in far-flung agricultural areas. He then conceptualized the "farmer-scientist", a farmer leader who is trained to think like a scientist and guided by him and other scientists to create and share knowledge. After a successful demonstration in Cebu Province, it was institutionalized as the Farmer-Scientis Training Program (FSTP) by UP Los Baños. Later, it was launched as a national program through an Executive Order by former President Gloria Macapagal-Arroyo. As of today, the program has already covered approximately 100,000 farmers from all of the 13 regions of the country. A great majority of them have been lifted out of poverty as documented by the program implementers.

To sum it up, Academician Davide's impact derives from his being a pioneer researcher, teacher, innovator, and extension agent in the field of plant nematology.

MEMBERSHIP TO THE ACADEMY

Academician Joseph S. Masangkay (Field of Specialization: Agriculture)

For his exemplary achievements in Veterinary Diagnostics and Pathology. His significant contributions include identifying selenium toxicity as the cause of tamaraw deaths in Mindoro and addressing fungal infections at the Philippine Raptor Center, University of the Philippines (UP) Los Baños. He was instrumental in the necropsy of (Crocodylus porosus) Lolong, confirming heavy metal poisoning as the cause of death. His dedication to teaching and research has mentored numerous veterinarians now in key positions and contributed significantly to the MS and PhD curricula in Veterinary Pathology at UP Los Baños, earning him the title of Father of Veterinary Pathology in the Philippines.

Academician Cleofas R. Cervancia (Field of Specialization: Entomology)

For her significant role in advancing and innovating sustainable bee technologies through rigorous research that resulted in increased crop productivity and biodiversity maintenance. She spearheaded an interdisciplinary approach to bee research, contributing to advancements in bee biology, chemistry, mathematics, economics, and apitherapy. The practical impact of her work is evident in the translation of research findings into beneficial technologies and policies that have positively impacted farmers, entrepreneurs, and scientists. Her contributions extend to the establishment of standards for bee products, best beekeeping practices, and guidelines for bee quarantine regulations. Under her

leadership, the Philippines has carved out a distinctive presence in the global bee scientific community, fostering research collaborations and opening markets for Philippine bee products.

Academician Fortunato T. De la Peña

For his outstanding lifelong dedication and contributions to promoting the development and advancement of S&T as an engineering educator, institution builder, innovator, and administrator. As an expert in industrial engineering, he focused on productivity and quality in programs for MSMEs at the University of the Philippines (UP) Institute for Small-Scale Industries. He was pivotal in DOST programs such as the Manufacturing Productivity Extension Program and played leadership roles in various institutions, including the establishment of the UP National Engineering Center, the DOST Technology Business Incubation Program, and the Philippine e-library Program. His contributions are reflected in co-authored books on "Science for the People" and laws he helped push to be enacted.

Corresponding Member Homer D. Pantua (Field of Specialization: Biomedical Sciences)

For his significant contributions to research that encompass microbial pathogenesis, antiviral discovery, and vaccine platform development; for serving as an adjunct professor, collaborator, and mentor to students in academic and industry setting; for his significant role in the establishment of a pioneering life science company in the Philippines; and for being a driver and catalyst in establishing a robust and stronger life science research atmosphere by starting multi-agency collaborations in the Philippines.

OUTSTANDING YOUNG SCIENTIST AWARD

Mark Joseph M. Desamero, Ph.D. Veterinary Medical Sciences

In recognition of his discovery of new compounds as functional food and their specific mechanism of actions that led to the development of the first propolis-based wound healing patch tested preclinically for safety and efficacy using different animal models of wounds prior to its application for a human clinical trial; and for his involvement in addressing the economically debilitating African Swine Fever (ASF) through the ASF virus epidemiology and immune response studies that can be used for the development of rapid detection ASF test kits and vaccine.

Emmanuel P. Hernandez, Dr. of Veterinary Medicine

In recognition of his significant work on the elucidation of the role of glutathione S-transferase of ticks in acaricide metabolism and vector competency that has laid some of the foundation in the development of new methods to control vectors and vector-borne diseases.

Reuel M. Bennet, Dr.rer.nat. Biology

In recognition of his significant work on the establishment of the first phylogenetic and evolutionary study for the Philippine labyrinthulids and saprotrophic oomycetes, which became a basis for the proposal of natural groupings of the large phyla of Oomycota and Labyrinthulomycota. His significant contribution to the current knowledge of fungus-like protists greatly impacted the evolution of eukaryotic microorganisms and the Tree of Life.

Jae Joseph Russell B. Rodriguez, M.S. Genetics

In recognition of his outstanding contributions to forensic and population genetics; for establishing reference DNA databases for Filipinos, crucial in the statistical analysis of DNA evidence; for

developing an integrated system for DNA testing in sexual assault cases, providing an objective tool for human identification; for his work in the Sulu Archipelago exploring its population history, resulting in the creation of the largest genomic database of autochthonous Filipinos to date; and for his dedication to respecting indigenous sovereignty and ownership in scientific research.

Angelo Earvin S. Choi, Ph.D. Chemical Engineering

In recognition of his outstanding and significant contributions to cleaner production, he has developed systematic methodologies to enhance fuel oil desulfurization efficiency. His framework optimizes process variables with ultrasonicator and high-shear mixer techniques for sulfur oxidation and adsorption, achieving high sulfur removal in fuel oils. He promotes sustainable fuel usage through oxidative desulfurization and explores wastewater remediation, biodiesel production, and eco-friendly cement synthesis, supporting his advocacy for a greener environment.

Ramon Christian P. Eusebio, Ph.D. Environmental Engineering and Biotechnology

In recognition of his outstanding contribution to the field of Environmental Engineering, specifically in water and wastewater treatment, seawater desalination, and membrane technology; for his work on forward osmosis as an alternative process for seawater desalination that addressed the pressing issue of high energy requirement in generating potable water in coastal communities; and for his pioneering work in the simultaneous removal of nitrogen and phosphorus in wastewater treatment utilizing membrane bioreactor. These technological advancements offered various options to stakeholders to meet national water quality standards.

Jose Isagani B. Janairo, Ph.D. Chemistry

In recognition of his pioneering contributions to biological chemistry, particularly for leading interdisciplinary research on deciphering the chemical cues used by the cacao mirid bug, paving the foundation for developing environment-friendly pest control strategies; for his research on semiochemistry that led to the understanding of the chemical effects of "cocolisap" infestation on their hosts, enabling tailored interventions for the infested plant; and for his active participation in environmental policy formulation and provision of science-based inputs relevant to the Philippines and to society at large.

Renier G. Mendoza, Dr.rer.nat. Mathematics

In recognition of his outstanding contributions in the field of numerical analysis and scientific computing with applications in diverse areas: medical image reconstruction in electrical impedance tomography, tsunami mitigation strategies using shallow water equations, metaheuristic algorithms in solving real-world applications from science and engineering, pioneering optical character recognition of Baybayin texts in word and block levels, novel approaches in solving forward and inverse problems, modeling and control of infectious disease models, new formulations of optimization algorithms, and path following technique in solving boundary value problems.

John Paolo R. Rivera, Ph.D. Economics

In recognition of his innovative contributions to measuring sustainability and welfare through the development of techniques, approaches, and methods for the analysis, representation, and validation of such constructs; for his contribution to the advancement of research and publication in various higher educational institutions, public and private institutions, and professional organizations. His work and efforts in strengthening the culture of research and development in the Philippines have

served as inputs to welfare-enhancing policies and as inspiration for younger scientists to contribute to the body of knowledge.

NAST ENVIRONMENTAL SCIENCE AWARD

Hernando P. Bacosa, Ph.D. Environmental Studies

In recognition of his pioneering research entitled "Breathing plastics in Metro Manila, Philippines: Presence of suspended atmospheric microplastics in ambient air" on the presence and characterization of microplastics from local atmospheric samples based on color, shape, size, and polymer type. The innovative technology-aided study showed that microplastic particles can be inhaled by unprotected persons when exposed to these pollutants for hours to several days. Owing to the potential health effects of atmospheric microplastics and their associated chemicals and microorganisms, this study earned wide attention from government, academia and the private sector.

Dr. Bacosa's research and publications on plastic pollution extend to coastal environments, seagrass beds, riverine systems, and the human dimension of plastic pollution. His study in Laguna de Bay and Northern Mindanao revealed the presence of microplastics in the food system including milkfish and shellfish, prompting action from different sectors to protect these resources and thus prevent public health problems.

Rubigilda P. Alili, Ph.D. Medical Science

In recognition of her outstanding research entitled "Revolutionizing Waterborne Pathogen Surveillance: Unleashing the Potential of Isothermal Amplification-Based Biosensors for Rapid Detection of Schistosoma japonicum and Leptospira spp. in Environmental and Flood Waters", tailored for immediate field application, aligning seamlessly with the objectives of the Department of Health's control program for waterborne pathogens. This transformative research holds significant promise for enhancing the efficiency of public health initiatives, particularly in resource-limited settings grappling with waterborne diseases.

Ivan Henderson V. Gue, PhD Mechanical Engineering

For his significant research contribution entitled "Environmentally-extended input-output analysis of circular economy scenarios in the Philippines", which analyzed the GDP growth, material intensity, and regulatory constraints scenarios. Circular Economy implementation in developing countries is a critical research gap with significant implications on global material flows.

NAST TALENT SEARCH FOR YOUNG SCIENTISTS AWARD

First Prize: Bryan John A. Mangoling, Ph.D. Biochemical Sciences

In recognition of his outstanding scientific and technological research entitled "Membrane Protein Modification Modulates Big and Small Extracellular Vesicle Biodistribution and Tumorigenic Potential in Breast Cancers In Vivo"

Second Prize: Paul Reine Kennett L. Dela Rosa, Ph.D. Mathematics

In recognition of his outstanding scientific and technological research entitled "Completing an Operator Matrix and the Free Joint Numerical Radius"

Third Prize: John Andrew C. Albay, Ph.D. Physics

In recognition of his outstanding scientific and technological research entitled "Colloidal Heat Engine Driven by Engineered Active Noise"

Special Citations:

Neil Patrick A. Del Gallego, Ph.D. Computer Science

In recognition of his outstanding scientific and technological research entitled "A New Approach for Training a Physics-Based Dehazing Network Using Synthetic Images"

Katherine Yasmin M. Garcia, M.S. Chemistry

In recognition of her outstanding scientific and technological research entitled "Antiproliferative and Cytotoxic Cytochalasins from Sparticola triseptata Inhibit Actin Polymerization and Aggregation"

Jame Monren T. Mercado, M.A. Cultural Heritage Studies

In recognition of his outstanding scientific and technological research entitled "Ysla De Panciteria: A Preliminary Study on the Culinary Heritage Significance of Pancit using the Heritage Documentation Approach – the Case of Luzon Island, Philippines"

OUTSTANDING BOOK/MONOGRAPH AWARD

Manigbas, N.L., Padolina, T.F., Desamero, N.V., Rigor, A.T., and Masajo, T.M. (2022). **Rice Breeding Operations Manual of the Philippine Rice Research Institute.** Science City of Munoz, Nueva Ecija: Philippine Rice Research Institute.

Luzon, K.S., Verdadero F.X.D., Mendoza, Y.F., and Licuanan, W.Y. (Eds.). (2019). **A Handbook of Protocols for the Conduct of Reef Assessments in the Philippines.** Manila, Philippines: De La Salle University Publishing House.

Mejia, A.D., Faustino, E.F., Fernandez, L.C., Penserga, E.G., Reyes, B.H.M., and Tangco, R.V. (2023). **The PCP Textbook of Internal Medicine (Vols. 1 and 2)**. Quezon City, Philippines: Philippine College of Physicians.

Mabaquiao Jr., N. M. (2022). **Ang Mabuting Kita: Mga Isyu ng Etika sa Negosyo**. Manila, Philippines: De La Salle University Publishing House.

Teehankee, J. C. and Calimbahin, C.A.A. (Eds.). (2022). **Patronage Democracy in the Philippines: Clans, Clients, and Competition in Local Elections**. Quezon City, Philippines: Ateneo de Manila University Press, Bughaw.

OUTSTANDING SCIENTIFIC PAPER AWARD

Pino, R.B., Mendoza, R.G., and Sambayan, R.R. (2022). **Block-level optical character recognition system for automatic transliterations of Baybayin texts using support vector machine**. Philippine Journal of Science, 151(1): 303–315.

Bautista Jr., R., Dui, R., Jeong, L.S., and Paredes, M.P. (2020). **Does altruism affect purchase intent of green products? A moderated mediation analysis**. Asia-Pacific Social Science Review, 20(1): 159-170.

Manzano, J.A.H., Magdalaga, M.T., Nicolas, E.M.N.M., Medalla, M.A.R., Urrutia, M.G.Z., Llames, L.C.J., Macabeo, A.P.G. and Papa, R.D.S. (2023). **First record of culturable microbial communities associated with the freshwater sponge Spongilla alba in Lake Taal, Philippines**. Philippine Journal of Science, 152(1): 501-514.

Damasco, O.P., Dela Cueva, F.M., Descalsota, J.C., and Tayobong, R.R.P. (2019). **Gamma radiation and in vitro induced banana bunchy top virus (BBTV) resistant mutant lines of banana cv 'Lakatan' (Musa sp., AA)**. Philippine Journal of Science 149(S1): 159-173.

Sultan, A., de Asa, A.A., Guimbangunan, T.M., Serapio, E.D., Fellizar, A., Albano, P.M., and Tomas, R.C. (2023). **Machine learning-based prediction of the likelihood of colorectal cancer using miRNA expression**. Philippine Journal of Science, 152(4): 1413-1432.

Caguiat, L.S. and Samoy-Pascual, K. (2023). **Microclimate of tropical paddy rice as influenced by water management**. Philippine Journal of Science, 152(S1): 137–150.

Borja, A.L.A. (2023). **Political illiberalism in the Philippines: Analyzing illiberal political values**. Asia-Pacific Social Science Review, 23(1): 63-78.

Mallari, R.A.N., Garciano, L.E.O., Peñarubia, H.C. (2023). **Development of risk-targeted seismic hazard maps for low-rise and mid-rise reinforced concrete buildings in the Philippines**. Philippine Journal of Science, 152(4): 1371-1386.

Special Citation

Galiga, H.F. and Sevilla III, F.B. (2021). **Assessment of iodate in food-grade salt based on a smartphone colorimetric platform**. Philippine Journal of Science, 150(6A): 1417–1423.

NSTW AWARDS

Outstanding Research and Development Award (for basic research)
Eduardo A. Quisumbing Medal

Pia D. Bagamasbad

In recognition of her outstanding scientific research titled, "Krüppel-like factor 9 (KLF9) links hormone dysregulation and circadian disruption to breast cancer pathogenesis" which helps in understanding the role of KLF9 in influencing the hormone response of core cellular clock and clock output genes, ultimately leading to tumorigenesis. Her study bridged a critical gap in the knowledge of key players involved in hormone-associated circadian disruption and its role in the development of breast cancer.

Aurelio A. De los Reyes V

In recognition of his outstanding scientific research titled, "Toward an optimal contraception dosing strategy" which provides insights and guidance for developing optimal treatments to induce anovulation. The mathematical model in the study accurately predicted the mean daily hormone levels, enabling the optimization of both dosage and administration schedule of exogenous estrogen and/or progesterone for effective contraception.

Outstanding Research and Development Award (for applied research)
Julian A. Banzon Medal

Mary Donnabelle L. Balela

In recognition of her outstanding scientific research titled "Modular Kapok Booms for Marine Oil Spills with Low Secondary Waste Generation" which developed biodegradable and reusable oil sorbent materials from locally sourced fibers. The innovative technology demonstrates a sorption capacity up to 4000% of its weight (depending on the type of oil), offering an effective and sustainable solution for managing oil spill disasters, while minimizing environmental impact through reduced secondary waste generation.

Outstanding Science Administrator Award
Dioscoro L. Umali Medal

Jonel P. Saludes

In recognition of his exemplary leadership as Vice President for Research and Global Relations of the University of San Agustin, which was transformed into a research-intensive university. His leadership was instrumental in the rapid establishment of five (5) world-class research centers within a span of six (6) years: the Center for Chemical Biology and Biotechnology (C2B2), the Center for Natural Drug Discovery and Development (CND3), the Center for Heritage and Indigenous Cultures (CHIC), the Center for Informatics (CFI), and the Center for Advanced New Materials, Engineering, and Emerging Technologies (CANMEET). He has also forged strategic partnerships with both local and international institutions, consistently collaborating with private companies to enhance the research capabilities and output of the university, leading to commercialization and national distribution of science-backed health and wellness products. His deep commitment to the Filipino value of Bayanihan is reflected in his altruistic support for several higher education institutions around the country, assisting them in the design of research facilities and the preparation of successful grant proposals.

Outstanding Technology Commercialization Award
Gregorio Y. Zara Medal

Dana G. Vera Cruz

In recognition of the successful commercialization of Daerry's Tilapia Ice Cream, a healthy alternative to traditional ice cream enriched and crafted with protein sourced from tilapia (Oreochromis niloticus). This innovative product offers Filipinos a delicious and nutritious way to enjoy fish. The initiative benefits the community by using environmentally friendly materials, creating job opportunities especially to PWD individuals, contributing to economic growth and stability, and fosters a sense of connection and shared prosperity with local fish farmers, carabao milk suppliers, and micro and small businesses.

DOST INTELLECTUAL PROPERTY AWARDS

In 2024, one hundred thirty-nine (139) publications were awarded the International Publication Award (IPA), which came from fifteen (15) DOST agencies and regional offices, namely: Advanced Science and Technology Institute (ASTI), Food and Nutrition Research Institute (FNRI), Forest Products Research and Development Institute (FPRDI), Industrial Technology Development Institute (ITDI), Metals Industry Research and Development Center (MIRDC), National Academy of Science and Technology (NAST), Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD), Philippine Institute of Volcanology and Seismology (PHIVOLCS), Philippine Nuclear Research Institute (PNRI), Philippine Textile Research Institute (PTRI), Philippine Science High School (PSHS), Science Education Institute (SEI), DOST V and DOST XI.

The PHIVOLCS was awarded the Granted Patent Award for their technology entitled "Systems and Methods in Conducting Multi-Hazard Assessment." There were seventeen (17) Utility Model Registration Award recipients from DOST XI and ITDI. Five (5) industrial designs from MIRDC and ITDI were awarded the Industrial Design Award.

The PNRI was recognized as the DOST institution with the highest number of international publication awardees. The ITDI and the MIRDC were awarded for having the highest number of utility model registration awardees and industrial design awardees, respectively. The PHIVOLCS was awarded as the sole DOST agency with a granted patent registration.

MAGSAYSAY FUTURE ENGINEERS/TECHNOLOGISTS AWARD

1st Prize Winner: Kaira Maxine V. Gonzales

In recognition of her outstanding scientific and technological research entitled: "Effect of Check Meter Quantity on Theft Detection in Distribution Networks with Rooftop PV and Net Metering"

2nd Prize Winner: Marck Herzon C. Barrion

In recognition of his outstanding scientific and technological research entitled: "Advancing Swarm Robotics Security: A Two-factor Blockchain Consensus Framework for Environmental Surveillance"

3rd Prize Winner: Charles Jared S. Cañolas

In recognition of his outstanding scientific and technological research entitled: "Operational Modal Analysis of a Bridge with Varying Measurement Densities"

Special Citations:

Joseph Aristotle R. De Leon

In recognition of his outstanding scientific and technological research entitled: "Development of Novel Urban Subsurface Imaging System for Monitoring Soil Liquefaction Events"

Kynn O. Lebrillo

In recognition of his outstanding scientific and technological research entitled: "Bamboo Cellulose Nanofibrils as Potential Phenol-Formaldehyde Adhesive Reinforcement in Engineered Bamboo Plank Application"

Grace C. Maligaya

In recognition of her outstanding scientific and technological research entitled: "Assessment of Irrigation Management Practices under Changing Climate Conditions using Deficit Irrigation Toolbox in Sta. Cruz, Laguna, Philippines"

Marissa F. Munar

In recognition of her outstanding scientific and technological research entitled: "Electrification of Boats for Small-Scale Rural Fishing"

Christian Dave T. Navesis

In recognition of his outstanding scientific and technological research entitled: "Real-Time HGR for Mouse Control via Static Pose MLP and Late Fusion Temporal Transformers on Handcrafted Descriptors"

Patrick John G. Santisidad

In recognition of his outstanding scientific and technological research entitled: "Philippine Indigenous Musical Instruments Recognition and Classification with Timbre and Pitch Characterization"

B. Policies, recommendations, formulated, submitted to concerned offices and accepted by said offices

Through its advisory activities, NAST heightens public awareness, understanding and appreciation of the role that science and technology plays in national development. The conduct of advisory activities has encouraged public participation in open discussion of a wide range of topics on important S&T issues related to agriculture, biology, health, engineering, social, mathematics, and physical sciences, among others. Results of these activities are formulated into policy recommendations submitted to the President of the Philippines, House of Representatives, Senate of the Philippines, academic institutions, government agencies, and other concerned decision-makers and stakeholders. In 2024, the following were the commentaries/policy recommendations produced by NAST:

1. Comments on House Bill No. 8791 "An Act to Promote a Circular Economy" and House Bill No. 9791 "An Act Providing for A Framework for Circular Economy to Promote Sustainable Production and Consumption and National Economic Security", introduced by Representative Francisco "Kiko" B. Benitez submitted to and acknowledged by the House Committee on Economic Affairs on 30 January 2024

2. Certificate of Concurrence to the Agreement under the United Nations Convention on the Law of the Sea (UNCLOS) on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Agreement) that was adopted on 19 June 2023 submitted to and acknowledged by DFA MOAO on 30 January 2024; submitted to DOST-ITCU and acknowledged on 2 February 2024

3. Accomplished survey to provide the States with an initial opportunity to inform the development of future assistance in support of becoming party to the Agreement (Agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Agreement) and early implementation submitted to and acknowledged by DFA MOAO on 7 February 2024

4. Recommendations on Oil Spill Rehabilitation Technologies for LGU Pola, Oriental Mindoro were transmitted to DOST OSec, DOST IV-B, and LGU Pola and acknowledged by Mr. Ferdinand Melaya of LGU Pola on 22 February 2024

5. Comments on the Proposed Mining Code prepared by the International Seabed Authority were transmitted to the OUSECRD on 14 March 2024 and acknowledged on 15 March 2024

6. Position of the NAST Agricultural Sciences Division on the recent decision of the Court of Appeals of the City of Manila effectively putting yet another moratorium on products of modern plant breeding transmitted to DA, DENR, DOH, BPI, PhilRice, UPLB, OP, Senate and House of Representatives Committees on Agriculture on 25 April 2024; acknowledged by DOH, BPI, UPLB on 25 April 2024

7. 2024 Luzon RSM Resolutions, received by NEDA Regional Office II and Presidential Assistant for Northern Luzon during the conference

8. 2024 Mindanao RSM Resolutions, received by Regional Development Council - Region X and Department of Trade and Industry - Region X during the conference

9. 2024 Visayas RSM Resolutions, received by NEDA Region Office VII - Central Visayas and NEDA Regional Office VI during the conference

10. Inputs on Open Science for APEC Open Science Alliance submitted to DOST OUSECRD on 19 June 2024, acknowledged receipt of physical copy on 20 June 2024

11. Four (4) Position Papers for the Philippine Drug Policy and Law Reform Summit 2024 - NAST PHL Health Sciences Division and ACDP submitted to the UN Joint Programme for Human Rights in the Philippines, acknowledged on 14 June 2024

12. NAST PHL Statement of Support for the New R&D Indicators of DOST transmitted to DOST Assistant Secretary for Technology Transfer, Communications, and Commercialization; Presented by Asec. Juanillo on his keynote address on Science, Technology, and Innovation for Social and Economic Transformation during the Research and Innovation Competitiveness Summit on 25 June 2024 at Sequioa Manila Bay, Pasay City

13. Updated Position Paper on the Establishment of the Virology and Vaccine Institute of the Philippines (VIP) and Possible Points for Discussion (as presented in the Senate Main Bill), submitted to DOST-DLLO and Usec. Gatchalian on July 15, included in the DOST position submitted to the Office of Sen. Pia Cayetano on July 26

14. NAST PHL to provide definitions of terms discussed on the HOR Committee on Economic Affairs on its Technical Working Group (TWG) meeting on 6 August 2024 (Tuesday) regarding Proposed Circular Economy Act submitted to the TWG Proposed Philippine Circular Economy Act on August 13 and acknowledged on August 29

15. Position paper regarding concerns related to Republic Act 9147, the Wildlife Resources Conservation and Protection Act, specifically Collection and Conservation of Stingless Bees by Wildlife Collection Guidelines submitted to DENR Secretary on 26 September 2024; acknowledged by DENR Office of the Secretary on 2 October 2024

16. Proposed Language of Section 37 of the Implementing Rules and Regulations of the New Government Procurement Act submitted to GPPB on 27 September 2024; acknowledged by GPPB-TSO on 30 September 2024

17. ASM Resolutions accepted by DOST, NEDA, and DA during the ASM. Transmitted to NEDA, DA, DOH, DOST, DENR, and DTI, via email on 17 October 2024; acknowledged by DA and DTI on 18 October 2024, by DENR and NEDA on 21 October 2024

18. Statement of the NAST Executive Council and the Engineering Sciences And Technology Division on the Philippine Building Act (PBA) Bills submitted to the Senate of the Philippines on 4 November 2024 and acknowledged by Senators Villanueva, Hontiveros, Cayetano, Tolentino, Go, and Revilla (Senate Committee on Public Works)

19. Position paper of NAST on SB 2893 or the Virology Science and Technology Institute of the Philippines (VIP) Act to DepEd Secretary as response to the request from HREP House Committee on Health in preparation for the upcoming bicameral committee conference between the HRep and Senate submitted to DOST-OSEC Records Section received on 11 Dec 2024

20. Comments, suggestions, and recommendations prepared by the NAST Ad Hoc Committee on Procurement on the Implementing Rules and Regulations of the New Government Procurement Act, specifically Section 37, transmitted to DOST OASEC ALA, GPPB-TSO, and NIC on 20 December 2023, acknowledged by DOST OASEC ALA on 21 December 2024 and GPPB TSO on 23 December 2024

C. Benefits and privileges provided to national scientists and academy members within the prescribed period

The Academy is composed of outstanding scientists who were recognized by their peers for excellent achievements and contributions to the advancement of science and technology in the country. It serves as a reservoir of competent scientific and technological manpower for the country. In recognition for their invaluable contributions, the Academicians and National Scientists are entitled to receive benefits and privileges as authorized under P.D. No. 1003-A and E.O. No. 818 namely: gratuity/life pension, medical assistance, travel support for attendance and participation in local and international conferences, publication assistance, and research fellowship grant; and a state funeral for a deceased National Scientist.

In 2024, twelve (12) National Scientists were granted with gratuity at P50,000.00 per month and medical benefits at P500,000.00 average per year. One (1) National Scientist, NS Romulo G. Davide, was conferred the rank and title of 'National Scientist' by virtue of Malacañang Proclamation No. 643 dated 2 August 2024 and was granted a one-time cash award amounting to P500,000.00. One (1) National Scientists, NS Clare R. Baltazar, passed away and was accorded a state funeral on 18 July 2024.

Likewise, eighty-three (83) Academicians were granted with gratuity at P30,000.00 per month and medical benefits at P50,000.00 average per year. Eighty (80) living Academicians as of November 2024 were provided with year-end incentives at P30,000.00 each. Two (2) requests for travel assistance and seventeen (17) research fellowship grants were acted upon in 2024, with details as follows:

2024 TRAVEL ASSISTANCE

Acd. Rhodora V. Azanza	Travel to Bangkok, Thailand to participate in the 2nd UN Ocean Decade Regional Conference and present a paper at the 11th Western Pacific International Marine Science Conference on 22-25 April 2024
Acd. Jaime C. Montoya	Travel to Montpellier, France to participate in the Montpellier Global Days 2024 International Event on "The Montpellier Process: Pooling Collective Intelligence for Action" on 18-20 March 2024

2024 RESEARCH FELLOWSHIP GRANTS

RESEARCH FELLOW	PROJECT TITLE AND DESCRIPTION
NS Carmencita D. Padilla	**Critical assessment of policies and regulations adversely affecting Philippine R&D output and recommendation of**

	enabling policies that can be adopted from other countries The project aims to obtain relevant information from the literature on policies and regulations influencing Philippine R&D output; collect available data on the best practices of Philippine R&D in comparison with the other countries; prepare a comprehensive assessment report for the policies and regulations of the Philippine R&D output; prepare technical recommendations for policies and regulations on specific Philippine R&D output; and prepare policy recommendations on specific Philippine R&D output that can be practiced locally and internationally.
Acd. Antonio Miguel L. Dans	**Voices from the Field: Understanding the Lived Experiences and Capacity-Building Needs of Community Health Workers in Rural and Remote Philippines** The project aims to outline the roles that rural and remote community health workers (CHWs) occupy in delivering primary care services in the Philippines; identify the capacity-building needs of CHWs for their roles; and explore CHWs' perceptions of using UpToDate as a capacity-building tool.
Acd. Christopher C. Bernido	**Stochastic Processes with Memory in a Complex Solar Dynamics that Impact Climate and Space-based Technologies** This research is in line with two of the 12 key operational areas in PAGTANAW2050: The Philippine Foresight on Science, Technology, and Innovation: (a) Environment and Climate Change, and (b) Space Exploration. The objective of this research is to analyze the stochastic behavior and memory properties of sunspot numbers from 1823 to 2019 to better gauge solar activities that impact the earth's climate, our telecommunication system, power generation, and earth-orbiting satellites. The insights and expertise gained in the conduct of the research may help guide in determining possible directions that Philippine science may take in the internationally competitive area of solar physics.
Acd. Rhodora V. Azanza	**Critical Assessment of the Human Resource Needs for Philippine Blue Economy Development in the Area of Marine Ecosystem Health** The project aims to map and assess existing trained/qualified human resources that undertake research, monitoring and management of marine ecosystems in selected/biodiversity hotspot sites in the western, northern, eastern and southern Philippine marine waters; provide estimates on the gaps and needs on trained/qualified human resource for research, monitoring and management of marine ecosystems in selected sites, i.e. representing biodiversity hotspots in the western, northern, eastern and southern marine waters; and provide policy and other recommendations in support of the urgent needs to improve human resource requirements for the development of Philippine Blue Economy in the area of marine ecosystem health.
Acd. Fortunato B. Sevilla III	**Review and Assessment of the National Metrology Laboratory and its Role in Trade Facilitation** The project aims to review the status of the NML particularly on its role in trade facilitation, considering its relation with designated

institutes, calibration laboratories, regulators, industry and other members of NQI; analyze the strengths and weaknesses of the NML particularly in its role in trade facilitation; determine why some products/technologies from various sectors (agriculture, forestry, fisheries, health, mining, electronics, etc.) are not exported due to inability to meet international standards and choose a selected few as case studies; and develop appropriate policy recommendations to address problems/weaknesses that limit export trade.

Acd. Evelyn Mae Tecson-Mendoza

Transactions NAST PHL: Publication of Volumes 45-46 (2023-2024) and Digitation and Website Uploading of Volumes 23-25 (2001-2013)

The project aims to strengthen the Transactions NAST PHL journal to ensure timely, impactful, and sustained releases of issues and articles. Specifically, it aims to: process, edit, and finalize papers for Transactions NAST PHL Vol.45 (2023) and start processing of papers for Vol.46 (2024); edit, digitize, and upload Volume 23-35 (2001-2013) on the TNP website; take initial steps in the accreditation process from selected local, regional, and international journal accreditation bodies.

Acd. Ernesto J. Del Rosario

Bioplastics from Seaweeds in the Philippines: SWOT Analysis

The project aims to obtain scientific information from the literature on seaweeds as source of biopolymers for bioplastic production; collect available data on Philippine seaweed production and export, as well as processing technologies, in comparison with other countries; prepare a comprehensive analysis of Strengths, Weaknesses, Opportunities, and Threats (SWOT) for bioplastic production from seaweeds in the Philippines; prepare technical recommendations for specific local R&D projects involving laboratory-scale, pilot-plant or village-level studies on the production of bioplastic packaging materials using raw or semi-processed seaweeds, or their extracted biopolymers; and prepare policy recommendations on suitable species of seaweeds to be farmed locally as bioplastic feedstocks, as well as appropriate processing technologies for producing bioplastic packaging materials.

Acd. Alvin B. Culaba

Life Cycle Assessment of Carrageenan-Based Bioplastic

The project aims to assess the environmental burdens associated with the production of carrageenan-based bioplastic using a life cycle assessment (LCA) approach. Specifically, the study intends to: establish the system's boundary of the carrageenan-based bioplastic material from cradle-to-grave; provide a detailed life cycle inventory covering energy, wastes, and emissions associated with the carrageenan-based bioplastic production; determine and quantify the potential environmental impacts of carrageenan-based bioplastic using ReCiPe Impact categories; compare the LCA results to petroleum-based based on available literature; and provide policy recommendations on the future of bioplastics development and utilization in the country.

Acd. Agnes C. Rola

Exploring Policy Support for Plastic Manufacturing and Food Packaging Industry to promote bioplastics use in the

	Philippines The project aims to describe the performance of the current policies on plastic use and plastic waste management both at the national and the local levels; determine the drivers that can potentially influence the plastic manufacturer's shift from synthetic plastics to bioplastic production in the Philippines; analyze the factors that may lead to the adoption of bioplastics in the food packaging industry at various levels (institutional users, supermarkets, wet markets); and identify necessary policy support for plastic manufacturers and food packaging industry players for a potentially robust bioplastics industry in the country.
Acd. Marco Nemesio E. Montaño	**Bioplastics from Marine Natural Resources** The project aims to gather scientific and technical data on bioplastics/polymers, their properties, biodegradability, and bioavailability of raw materials in the Philippines; collect available data on the Philippine seaweed production and processing technologies in comparison with other countries; prepare a technical status production of bioplastics from raw and semi-refined biopolymers to include the processes and equipment relevant to local fabrication or importation; prepare technical material as the background for use in the preparation of the national and local LGU policies on seaweed bioplastic in relation to waste disposal, resource conservation, protection, and utilization; and prepare policy recommendations on the suitable species or variety of seaweeds to be farmed as well as processing technologies for bioplastic packaging materials.
Acd. Jose Maria P. Balmaceda	**Futures of Philippine STEM Education** The project aims to publish a book on futures of Philippine STEM Education and prepare a technical paper for submission to a refereed journal.
Acd. Maribel G. Nonato	**National Metrology Laboratory and the National Quality Infrastructure** The project aims to review the status of the updated legal framework of the National Metrology Laboratory (NML) and the National Quality Infrastructure (NQI); assess the effectivity of the implemented NML policies; analyze the strengths and weaknesses of the technical and management capacity of NML and their relationship to trade; formulate indicators in the establishment of efficient and responsive NML's functions; determine the challenges/reasons for the trade rejection of certain commodities/technologies from various sectors; examine the status of integrating courses on metrology into the technical curricula; develop indicators in the establishment of metrology culture in the Philippines; and formulate appropriate policy recommendations to address challenges and/or weaknesses that limit export trade.
Acd. Cristina J. Montiel	**The Psychological Foundations of Territorial Rights** The project aims to establish a theoretical framework for a psychology of territorial rights, contestations, and peacebuilding.
Acd. Reynaldo B.	**Microcredentials for accelerated social and economic mobility**

Vea	The project aims to find ways to harness microcredentials to facilitate and accelerate the social and economic mobility of Filipino learners throughout their lifetime. It will situate these microcredentials within the formal Philippine education system and the Philippine Qualifications Framework (PQF).
Acd. Edward H.M. Wang	**Addressing Gaps in Sarcoma Care in a LMIC referencing Global Guidelines and Standards** The project aims to: (1) Review the flow of sarcoma care at PGH, from patient presentation to screening to diagnosis to management and surveillance; to identify gaps in this flow of care, utilizing international guidelines as mentioned above; to provide recommendations or solutions and initial steps to improve the referral and management of sarcoma within the hospital; to form, in the process, and maintain a cooperative sarcoma group composed of all disciplines taking care of sarcoma patients in order to facilitate this investigation.
Acd. Filemon A. Uriarte Jr.	**Sustainable Management of QSR Wastes** The project aims to prepare an authoritative reference and learning material - using actual field data and information in the Philippine setting - on the sustainable management of wastes from quick service restaurants (QSRs), which are becoming increasingly ubiquitous and significant sources of environmental pollution and other externalities.
Acd. Cleofas R. Cervancia	**The bio-ecology of red dwarf bee, Apis florea fabricius in the Philippines** The project aims to determine the bio-ecology of A. florea, focusing on its recent appearance in the country. The specific objectives are as follows: a) to elucidate the taxonomic status of the red dwarf bee through morphometric analysis, b) to identify the pollen sources utilized by the species through palynology, and c) to characterize their nesting behavior.

D. Recognition, advisory, scientific linkages, and PSHC-related activities

a. Recognition-related Activities

As the government's highest recognition body on science and technology, the NAST serves as the venue through which the government supports Filipino scientists. It recognizes significant contributions to science and technology and provides them with meaningful incentives for the furtherance of their works. It also embarks on activities to promote the awardees and at the same time encourage the younger generation to pursue careers and advances in scientific studies and research.

The following were the awarding ceremonies conducted in 2024:

19 April 2024 - NAST Talent Search for Young Scientist Paper Presentation of Finalists

11 June 2024 - NAST Environmental Science Award Paper Presentation and Awarding Ceremony

23 September 2024 - NSTW ORDA Paper Presentation of Finalists

25 November 2024 - DOST Intellectual Property Awards Awarding Ceremony

27 November 2024 - NSTW Awards Awarding Ceremony

02 December 2024 - MFET Paper Presentation and Awarding Ceremony

The NAST also conducted promotional activities to introduce the Academy, its members and awardees to different sectors of the society:

The 'ScienTeach: Symposium for the Youth' and 'Dialogue with NAST Scientists' highlight varying topics featuring National Scientists, NAST Members, and its awardees who are accomplished in their respective fields. Its objectives are to promote science and technology, bring our scientists closer to the youth, and inspire and encourage students to pursue a career in science and technology. The ScienTeach is open to all junior and senior high school students while the Dialogue with NAST Scientists is participated by faculty members from the state colleges and universities in the area, representatives from LGUs, and other interested researchers. The following were conducted in 2024:

07 May 2024 - ScienTeach: Symposium for the Youth in Cagayan de Oro

24 May 2024 - ScienTeach: Symposium for the Youth in Cebu City

25 May 2024 - Dialogue with NAST Scientists in Camotes Island, Cebu

22 August 2024 - ScienTeach: Symposium for the Youth in Antique

23 August 2024 - Dialogue with NAST Scientists in Antique

28 November 2024 - ScienTeach:Symposium for the Youth in Cagayan de Oro (In celebration of the 2024 National Science and Technology Week)

The #PilipiNAST Kapehan is a series of dialogues between NAST PHL and the press, media, and science communicators to introduce the programs, activities, awardees, and members of the Academy as well as timely issues faced by the country. In 2024, the following press conferences were conducted:

04 July 2024 - #PilipiNAST Kapehan with 2024 NAST Awardees

06 December 2024 - #PilipiNAST Kapehan featuring NSTW and MFET Awardees

The Future Science Leaders Forum (FSLF) was conducted on **13-14 November 2024**. The FSLF aims to empower young Filipino science leaders and create a pool of potential NAST awardees. Through this activity, the Academy hopes to assist young leaders to maximize their leadership potential in their respective fields and to provide a venue for a leadership network of peers and potential mentors and advisers.

In connection with the ongoing assessment on the utilization of technologies with DOST Granted Patent and Utility Model Award, the NAST also conducted the Life Cycle Analysis Training on **29-30 January 2024**.

The NAST also convened a hybrid forum on "Net Zero for Philippine Shipping by 2050: A Possibility?" on **28 February 2024**. The event showcased the research fellowship paper entitled "A Marine Transportation System for a Prosperous, Archipelagic, Maritime Nation" written by Academician Reynaldo B. Vea.

b. Advisory-related Activities

As the country's premier advisory body on S&T, the Academy remains proactive on legislative matters and consistently advises the Executive and Legislative Branches on matters related to science and technology. The Academy deliberates regularly on issues and concerns arising within the Philippine scientific community. Policy recommendations emanating from its advisory activities are gathered and forwarded to concerned agencies and stakeholders. In 2024, the following activities were conducted:

09 January 2024 - Roundtable Discussion on Data-Mining Strategy for Obtaining the Number of Filipino STEM PhD and MS Graduates Produced by Selected HEIs from 2001 to 2023

30 January 2024 - Regional Focus Group Discussion on the National Greening Program in North and Central Luzon

01-02 February 2024 - Workshop on Regional Assessment of Climate Risks and Vulnerabilities-Mindanao Cluster (In collaboration with The Outstanding Women in Nation's Service)

05 February 2024 - Regional Focus Group Discussion on the National Greening Program in Visayas

13 February 2024 - Regional Focus Group Discussion on the National Greening Program in NCR and Southern Luzon

14 February 2024 - Focus Group Discussion on State and Competitiveness of Philippine R&D Output

15 February 2024 - Focus Group Discussion on Policies and Regulations Adversely Affecting Philippine R&D Output

16 February 2024 - Focus Group Discussion on Developing Internationally Competitive Graduate Programs in STEM

05 March 2024 - Roundtable Discussion on Advancing Innovation Coordination in the Artificial Intelligence Services Industry

25 March 2024 - Stakeholders Consultation Meeting on the Use of Space in Agriculture and Natural Resources Management

01 April 2024 - Science Policy Forum on Leveraging Higher Education to Resolve Healthcare Constraints (Health Human Resource Retention)

02 April 2024 - Roundtable Discussion on Advancing Innovation Coordination in the Additive Manufacturing Industry

18 April 2024 - Science Policy Forum on Leveraging Higher Education to Resolve Healthcare Constraints (Health Human Resource Migration)

23 April 2024 - Science Policy Forum on Leveraging Higher Education to Resolve Healthcare Constraints (Health Human Resource Supply, Demand and Health Labor Market)

25 April 2024 - Virtual Consultation Meeting with National Government Agencies on Targeting the Appropriate Technological Maturity of Rural Agricultural Industries

14 May 2024 - Roundtable Discussion on Electric Vehicle Research & Manufacturing: Advancing Innovation Coordination in the Electric Vehicle Industry

21 May 2024 - Roundtable Discussion on the Role of Omics Technologies in Healthcare

04 June 2024 - Roundtable Discussion on Stakeholders' Challenges in Increasing the Number of Filipino STEM PhD and MS Graduates

25 June 2024 - Focus Group Discussion on Good Practices, Constraints, and Opportunities in Adoption of Appropriate Technologies by Rural Industries (Abalone Industry)

16 July 2024 - Focus Group Discussion on the Good Practices, Constraints, and Opportunities in the Adoption of Appropriate Technologies by Rural Industries of Abalone Davao

29 July 2024 - Roundtable Discussion on Rapid Horizon Scanning of Major Agricultural Products, Inputs, and Services of the Philippines

30-31 July 2024 - Workshop on The Use of Space Technology for Agriculture and Natural Resource Management

13 August 2024 - Focus Group Discussion on Good Practices, Constraints, and Opportunities in the Adoption of Appropriate Technologies by Rural Industries (Cassava industry)

23 August 2024 - Science Policy Forum on the Development of Bioplastics from Marine Sources in the Philippines: R&D and Policy Needs

27 August 2024 - Focus Group Discussion on Advancing Energy Storage in the Philippine Electric Vehicle Sector: Strategies for Innovation and Policy Development

22 October 2024 - Roundtable Discussion on the Development of Bioplastics from Terrestrial Sources in the Philippines: R&D and Policy Needs

25 October 2024 - Discussion on the Formulation of Evidence-based Strategies for Increasing the number of Filipino STEM PhD and MS graduates

30 October 2024 - Science Policy Forum on Leveraging Higher Education to Resolve Healthcare Constraints

The Annual Scientific Meeting (ASM) and Regional Scientific Meetings (RSM) aim to ventilate, discuss, clarify and expound S&T issues and use the results to formulate policies or implementing guidelines; to serve as venue for the presentation of S&T breakthroughs; and to provide analyses and science-based solutions/policy recommendations to the government, the private sector and the society at large.

The 2024 ASM focused on equity, consumer health, and environmental issues, particularly those that result from defects in the food system beyond primary production. The aim was to

assemble all of the stakeholders concerned with the transformation of the country's food system and for experts to present alternative scenarios of business as usual and transformed food systems using evidence-based studies to convince the policymakers and society in general about the wisdom of food system transformation. The presentations were then used as a basis for policies and recommendations to transform the food system, especially in the aspect of consumption, to be lobbied for.

The following were conducted in 2024:

29-30 April 2024 - 2024 Luzon Regional Scientific Meeting

08-09 May 2024 - 2024 Mindanao Regional Scientific Meeting

27-28 May 2024 - 2024 Visayas Regional Scientific Meeting

10-11 July 2024 - 46th Annual Scientific Meeting

The NAST Innovation Series aims to showcase how the physical and life sciences provide innovative solutions to address food security and climate change in the country. It also aims to promote open innovation, a concept that encourages de-siloing and active collaboration within, outside, and among organizations. On **13, 20, & 27 March 2024**, the NAST conducted the "NAST Innovations Series: Innovations for Human and Planet Health and Security". The series featured scientists actively engaged in innovation through their research and current projects.

The Research Upgrading and Performance Evaluation (RUPE) program aims to improve the productivity and the international visibility of the country's science and technology community. It also aims to make an impact in the field of research and development by creating an exchange of ideas from different expertise and collaborations in the scientific community to upgrade the quality of research, scientific outputs, and publications. On **14 March 2024**, the NAST conducted the Seminar-Workshop on Strengthening the Scientific Foundation in Cavite.

The Stakeholder Consultation, Workshop and Policy Forum on R.A. No. 12009 aims to gather stakeholders from academe, industry, and government to discuss New Government Procurement Act (NGPA) and its implications on scientific and technological activities. The activity provides a platform for knowledge sharing, collaborative discussions, and generating inputs for the drafting of the Implementing Rules and Regulations (IRR) for the NGPA. The following were conducted in 2024:

25 September 2024 - Stakeholder Consultation and Workshop on the Proposed Language for the IRR of the NGPA Part 1

09 October 2024 - Stakeholder Consultation and Workshop on the Proposed Language for the IRR of the NGPA Part 2

15 November 2024 - Science, Technology and Innovation under the New Government Procurement Act – A Policy Forum on R.A. No. 12009 and Stakeholder Consultation for the Formulation of its IRR

c. Scientific linkages-related activities

The Academy also 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.

On **29-30 October 2024**, the NAST conducted the International Symposium on Digital Transformation in Healthcare, in collaboration with The Association of Academies and Societies of Sciences in Asia (AASSA). With the participation of the different member academies and societies of AASSA as representatives of their countries, the international symposium facilitates the sharing of experiences on digital transformation among developing and developed nations. Recommendations generated from the discussions during the conference can help in advancing digital transformation in healthcare. The members of the regional network can also forward the recommendations and the proceedings of the symposium to the concerned ministries in their countries.

d. PSHC-related activities

Aside from the exhibits, the PSHC is also actively promoting science culture through the conduct of alternative STEM learning activities focused on supplementing science teaching and learning. The programs and activities under the PSHC hope to heighten the awareness and appreciation of today's youth on contributions and achievements of Filipino scientists, thus instilling pride in our science culture and encouraging them to pursue careers in science.

The Meet Your Scientist program aims to promote S&T to the youth and the general public. In this program, renowned Filipino scientists are invited to share their knowledge and experiences on the chosen topic. It serves as a platform to encourage the youth to pursue a career path in Science, Technology, Engineering, Mathematics (STEM), and increase awareness of the young minds on the given topic, and celebrate the contribution and knowledge of Filipino scientists.

The Salinlahi Symposium Series aims to bring science closer to the public and to areas not reached by scientific conferences and seminars. Discussions can focus on the role of science and technology in our everyday lives thus, making ordinary people appreciate and understand science.

In 2024, the following PSHC-related activities were conducted:

25 January 2024 - Meet Your Scientists: A Look on Climate Change (In celebration of the 2024 Observe the Weather Day)

22 February 2024 - Meet Your Scientists: Heart to Heart Talk with our Scientists (In celebration of the 2024 Philippine Heart Month)

22 March 2024 - Meet Your Scientists: Women Breaking Barriers through Science (In celebration of the 2024 National Women's Month)

24 April 2024 - Salinlahi Symposium Series in Dinagat Island