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Foreword

It is with great pride that I present the Second Special Issue on Nuclear Science and Technology (NST) of the Philippine Journal of Science. This second issue not only continues the legacy established by the inaugural special issue in 2020 but also demonstrates the significant strides made by the Philippine scientific community in harnessing NST for national development over the past four years. Key milestones in NST since the first issue include the operationalization of the Philippine Research Reactor-1 Subcritical Assembly for Training, Education, and Research or PRR-1 SATER, the only operating nuclear training reactor in the Philippines, and the ongoing construction of the Nuclear Medicine Research and Innovation Centre or NMRIC. Groundbreaking technologies developed by Filipino scientists, the hemostat based on carboxymethyl cellulose, carboxymethyl hyaluronic acid hydrogels, and super water absorbent gels were recognized internationally. These accomplishments provide the foundation for advancing NST in the Philippines, as reflected in the articles featured in this issue.

The articles featured in this special issue reflect the wide-ranging applications of NST in addressing pressing challenges in health, agriculture, engineering, environmental protection, industry, and energy. From ensuring the safety of neutron source encapsulations and improving radiation dosimetry systems to exploring isotopic techniques for environmental studies and developing advanced materials for radiation shielding, these studies embody the innovative mindset and resourcefulness of Filipino researchers.

Several noteworthy studies highlight the impact of nuclear technology on sustainable agriculture and food security. For instance, the development of stress-tolerant rice varieties using gamma irradiation and the use of isotopic methods to optimize water use in rice paddies demonstrate the potential of nuclear techniques in enhancing agricultural productivity. Similarly, the application of radiation to improve food functionality and detect adulteration reflects its relevance in ensuring food safety and quality. The current issue also includes the seismic evaluation of the PRR-1 SATER core tank and the innovative use of radiation grafting for environmental applications. These studies contribute to building resilient infrastructure and addressing environmental challenges, aligning with the nation's development goals.

The inclusion of research in the social sciences such as studies on nuclear power perceptions among college students highlights the importance of understanding societal attitudes toward nuclear technologies. Such insights are vital as the country moves toward developing its nuclear infrastructure and exploring the role of nuclear power in its energy mix, especially in consideration of the nuclear energy roadmap, as outlined in the Philippine Energy Plan 2023–2050.

As we look to the future, this special issue serves as a reminder of the transformative potential of NST in addressing complex societal challenges. I commend the authors, contributors, and editors for their invaluable contributions to this volume. Together, let us continue to pursue the promise of NST to improve lives, strengthen the nation, and foster international collaboration for a more sustainable future.

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