# Philippine Journal of Science

## Volume 148 No. 4

Philippine Journal of Science (Philipp J Sci) is a scientific journal published by the Department of Science and Technology (DOST) and managed by the Science and Technology Information Institute (STII).

### **Editorial Board**

# Editor-in-Chief Caesar A. Saloma, Ph.D.

National Institute of Physics, College of Science University of the Philippines Diliman, Quezon City, Philippines

#### Dolores A. Ramirez, Ph.D.

Institute of Plant Breeding, College of Agriculture University of the Philippines Los Baños College, Laguna, Philippines

#### Fabian M. Dayrit, Ph.D.

School of Science and Engineering Ateneo de Manila University Loyola Heights, Quezon City, Philippines

#### Queena N. Lee-Chua, Ph.D.

Department of Mathematics Ateneo de Manila University Loyola Heights, Quezon City, Philippines

#### Florencia G. Claveria, Ph.D.

Department of Biology
De La Salle University-Manila
2401 Taft Avenue, Manila, Philippines

#### Consolacion Y. Ragasa, Ph.D.

Department of Chemistry
De La Salle University-Manila
2401 Taft Avenue, Manila, Philippines

#### Rafe M. Brown, Ph. D.

Department of Ecology and Evolutionary Biology 1345 Jayhawk Blvd., Dyche Hall University of Kansas Lawrence, KS 66045 USA

#### William G. Padolina, Ph.D.

National Academy of Science and Technology DOST Complex, Bicutan, Taguig City

#### Rosalia CM. Simmen, Ph.D.

Department of Physiology and Biophysics and The Winthrop P. Rockefeller Cancer Institute University of Arkansas for Medical Sciences Biomed Bldg. 1, Rm. 212D, 4301 W. Markham St. Little Rock, AR 72205 USA

#### Ronaldo P. Ferraris, Ph.D.

Department of Pharmacology and Physiology New Jersey Medical School 185 S. Orange Avenue Newark, NJ 07103-2714 USA

#### Josefino C. Comiso, Ph.D.

Laboratory for Hydrospheric Processes, Code 971 National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, MD 20771 USA

#### Sohichi Hirose, Ph.D.

Department of Civil and Environmental Eng'g. School of Environment and Society Tokyo Institute of Technology Ookayama, Meguro-ku, Tokyo, Japan