

p-ISSN : 2550-6951

VOLUME 8 / NUMBER 1 / APRIL 2024

International Journal of Physical Sciences and Engineering



Ecuador, South America

International Journal of Physical Sciences and Engineering

EDITOR-IN-CHIEF

Ziyad Salameh

Department of Electrical and
Computer Engineering, Lowell,
Massachusetts, United States

CHIEF EXECUTIVE EDITOR

María Rodríguez Gámez

Universidad Técnica de
Manabí, Portoviejo, Ecuador

EDITORS

M.C. Fernández

Technical Sciences, Faculty of
Electrical of Cujae, Spain

Y. Hotta

National Institute of Advanced
Industrial Science and
Technology Chubu Center,
Japan

A. Kwade

Braunschweig University of
Technology, Germany

R. Eckman

NASA, Washington, District of
Columbia, United States

P. Willis

Institut National de l'Information
Géographique et Forestière
(IGN), Direction Technique,
France

G. Bassioni

Ain Shams University Faculty of
Engineering, Cairo, Egypt

K. Ahmed

University of Strathclyde
Department of Electronic and
Electrical Engineering,
Glasgow, United Kingdom

M. Azzouz

University of Windsor
Department of Electrical and
Computer Engineering, Windsor,
Ontario, Canada

G.A.L. Castillo

Electrical Engineering,
Universidad Técnica de Manabí,
Portoviejo, Ecuador

ASSOCIATE EDITORS

A. Chateauneuf

Clermont Auvergne University,
Cezeaux Campus, Aubière,
France

A. Atangana

University of the Free State
Faculty of Natural and
Agricultural Sciences,
Bloemfontein, South Africa

R. Boules

The Catholic University of
America, Washington, District of
Columbia, United States

S. Ergin

Istanbul Technical University
Faculty of Naval Architecture
and Ocean Engineering,
Istanbul, Turkey

C. Sophocleous

University of Cyprus Department
of Mathematics and Statistics,
Lefkosia, Cyprus

L. Li

University of Queensland, Div. of
Environmental Engineering,
Australia

W.M.S. Arauz
*Renewables energy source,
Escuela Superior Politécnica
del Chimborazo, Electrical
engineer, Universidad Técnica
de Manabí, Portoviejo,
Ecuador*

M. Hartnett
*National University of Ireland
Galway, Ireland*

C. Lu
*State Key Laboratory of
Hydrology-Water Resources and
Hydraulic Engineering, China*

J.W. Chew
*Nanyang Technological
University, Singapore*

S.Y. Lu
*National Tsing Hua University,
Taiwan*

M.D.R.C. Felipe
*Physical Sciences, Universidad
Técnica de Manabí, Portoviejo,
Ecuador*

A. Yip
*University of Canterbury, New
Zealand*

J. Dash
*University of Southampton,
Southampton, United Kingdom*

E D I T O R I A L B O A R D

J. Lastovicka
*Institute of Atmospheric
Physics Czech Academy of
Sciences, Praha, Czech
Republic*

M. Jah
*University of Texas at Austin,
Austin, Texas, United States*

N. AboulAtta
*Ain Shams University Faculty of
Engineering, Cairo, Egypt*

H. Palkowski
*Clausthal University of
Technology Institute of
Metallurgy, Clausthal-
Zellerfeld, Germany*

M.M. Rashidi
*Tongji University, Shanghai,
China*

R. Bromley
*University at Albany State
University of New York, Albany,
New York, United States*

Jeom-Kee Paik
*Pusan National University
Department of Naval
Architecture and Ocean
Engineering, Busan, Korea,
Republic of*

E. Bauer
*Graz University of Technology,
Austria*

L.A.C. Alava
*Industrial
Engineering, Universidad
Técnica de Manabí (UTM),
Portoviejo, Ecuador*

Y.E.L. Albuérne
*Electrical Engineer, Specialist
and Automatic Control,
Faculty of Mathematical,
Physical and Chemical
Sciences, Universidad Técnica
de Manabí, Portoviejo,
Ecuador*

M. Ghorab
*Natural Resources Canada
Canmet ENERGY Technology
Centre Department of
Mechanical Engineering,
Ottawa, Canada*

I N T E R N A T I O N A L A D V I S O R Y B O A R D

K.W. Chau

*The Hong Kong Polytechnic
University Department of Civil
and Environmental
Engineering, Hong Kong*

J.A.R. Salgado

*General fruit growing, major and
minor fruit trees, Adventist
University of Chile, Chile*

X. Niu

*Changjiang Institute of Survey,
Planning, Design and
Research, China*

X. Qin

*Nanyang Technological
University, Singapore*

M. Ye

*Florida State University
Department of Scientific
Computing, United States*

P. García-Triñanes

*University of Greenwich
Faculty of Engineering and
Science, United Kingdom*

T. Ohno

*Kitami Institute of Technology,
Japan*

Y. Shen

*University of New South Wales
School of Chemical Engineering,
Australia*

C.C. Stephen

*Engineering, Delta State
Polytechnic Ogwashi-uku,
Nigeria*

E. Palomba

*Institute of Space Astrophysics
and Cosmic Physics Milan,
Milano, Italy*

G. Occhipinti

*Institute of Earth Physics of
Paris, Paris, France*

T. Schildknecht

*University of Bern, Bern,
Switzerland*

M. Abdelaziz

*Ain Shams University Faculty
of Engineering, Cairo, Egypt*

S. Lissel

*University of Calgary Schulich
School of Engineering, Calgary,
Canada*

C.G.R. Borges

*Industrial Engineer, Head of
the Energy Supervision Area
Corporación Eléctrica Nacional,
Venezuela*

H.C. Ong

*University of Technology
Sydney Faculty of Engineering
and Information Technology,
Sydney, New South Wales,
Australia*

E.F.D. Goufo

*University of South Africa,
Department of Mathematical
Sciences, Florida, South Africa*

G.A.P. Espinoza

*Industrial Engineering,
Universidad Técnica de
Manabí, Portoviejo, Ecuador*

L.A. El-Guebaly

*University of Wisconsin-
Madison Department of
Engineering Physics, Madison,
Wisconsin, United States*

R. Shoucri

*Royal Military College of Canada
Department of Mathematics and
Computer Science, Kingston,
Ontario, Canada*

P. Lin

*Sichuan University State Key
Laboratory of Hydraulics and
Mountain River Engineering,
China*

G.V. Franks

*The University of Melbourne
Department of Chemical
Engineering, Australia*

K. Tanno

*Central Research Institute of
Electric Power Industry, Japan*

B. Neyestani

*Civil Engineering, De La Salle
University, Manila, Philippines*

P R O D U C T I O N E D I T O R

X. Liang

*Missouri University of Science
and Technology, United States*

K.H. Henthorn

*Rose Hulman Institute of
Technology, United States*

H. Li

*Southern University of Science
and Technology, China*

W E B M A S T E R

Vedran Vucic

*PKP Developer,
Belgrade*

C O P Y R I G H T A N D C O P Y I N G (I N A N Y F O R M A T)

Articles published in the International Journal of Physical Sciences and Engineering (**IJPSE**) are available under *Creative Commons Attribution Non-Commercial No Derivatives Licence (CC BY-NC-ND 4.0)*. Authors retain copyright in their work and grant **IJPSE** right of first publication under CC BY-NC-ND 4.0. Users have the right to read, download, copy, distribute, print, search, or link to the full texts of articles in this journal, and to use them for any other lawful purpose. Articles published in **IJPSE** can be copied, communicated and shared in their published form for non-commercial purposes provided full attribution is given to the author and the journal. Authors are able to enter into separate, additional contractual arrangements for the non-exclusive distribution of the journal's published version of the work (*e.g., post it to an institutional repository or publish it in a book*), with an acknowledgment of its initial publication in this journal.

D I S C L A I M E R

The Publisher and Editors cannot be held responsible for errors or any consequences arising from the use of information contained in this journal; the views and opinions expressed do not necessarily reflect those of the Publisher and Editors, neither does the publication of advertisements constitute any endorsement by the Publisher and Editors of the products advertised.

For submission instructions, subscription and all other information visit: <https://sciencescholar.us/journal/index.php/ijpse/>

International
Journal of
Physical
Sciences and
Engineering

Research Articles

Pages

Autonomous photovoltaic solar system for a home in the San Clemente Community, Las Chacras de Río Chico **1**

*Andy Ariel Guerrero-Vélez, Katherine Lisbeth Carreño-Suárez,
Maria Rodriguez-Gamez, Antonio Vaquez-Pérez, Efrain Perez-Vega*



Universidad Técnica de Manabí

Av. Urbina y Che Guevara, APARTADO: 82 (Ecuador/South America)

email : ijpse@utm.edu.ec

Phone : (05) 2635-611

Fax : (05) 2651-569