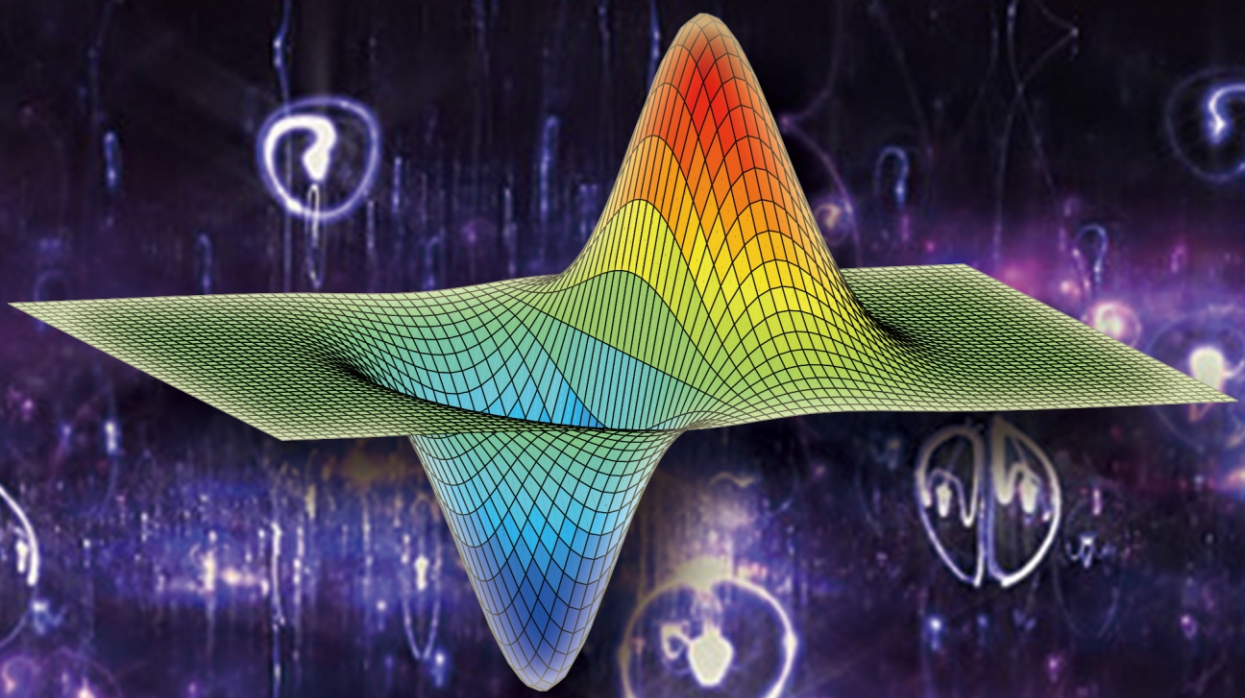
ISSN: 2160-0368 Volume 13, Number 5, May 2023

Scientific Research Publishing

Advances in Pure Mathematics



ISSN: 2160-0368

https://www.scirp.org/journal/apm

Journal Editorial Board

ISSN 2160-0368 (Print) ISSN 2160-0384 (Online)
https://www.scirp.org/journal/apm

Editor-in-Chief

Prof. Leo Depuydt Brown University, USA

Editorial Board

Dr. Taher S. H. Abdelmonem Mansoura University, Egypt
Prof. Ravi P. Agarwal Texas A&M University-Kingsville, USA
Prof. Rafik Aramyan Russian-Armenian University, Armenia
Prof. Józef Banas Bronislaw Markiewicz State School of Higher Vocational Education in Jaroslaw, Poland
Prof. Serdar Beji Istanbul Technical University, Türkiye
Prof. Constantin Buse West University of Timisoara, Romania
Prof. M. P. Chaudhary International Scientific Research and Welfare Organization, India
Prof. Chuanmiao Chen Central South University, China
Prof. Xiaoxing Chen Fuzhou University, China
Dr. Claudio Cuevas Federal University of Pernambuco, Brazil
Prof. Dragan S. Djordjevic University of Nis, Serbia
Dr. Ozgur EGE Celal Bayar University, Türkiye
Prof. Hala J. El-Khozondar Islamic University of Gaza, Palestine
Prof. Rifa Jarallah El-Khozondar Al-Aqsa University, Palestine
Prof. Ahmed M. A. El-Sayed Alexandria University, Egypt
Prof. Cristescu Gabriela Aurel Vlaicu University of Arad, Romania
Prof. Hongya Gao Hebei University, China
Prof. Aleksander Grytczuk University of Zielona Góra and Jan Pawel II Western, Poland
Prof. Yuxia Guo Tsinghua University, China
Dr. Sevdzhan Hakkaev University of Kansas, USA
Dr. Chengchun Hao Chinese Academy of Sciences, China
Prof. Tianxiao He Illinois Wesleyan University, USA
Prof. Wei He Nanjing Normal University, China
Prof. Tingzhu Huang University of Electronic Science & Technology of China, China
Prof. Huzoor H. Khan Aligarh Muslim University, India
Prof. Mostafa M. A. Khater Xuzhou Medical University, China
Prof. Abdessatar Khelifi Carthage University, Tunisia
Prof. Shaban Khidr Beni-Suef University, Egypt
Prof. Toshitake Kohno The University of Tokyo, Japan
Prof. Vichian Laohakosol Kasetsart University, Thailand
Prof. V. Lokesha Vijayanagara Sri Krishnadevaraya University, India
Dr. Jingjing Ma University of Houston-Clear Lake, USA
Prof. Elimhan N. Mahmudov Istanbul Technical University, Türkiye
Dr. Lucia Marino Catania University, Italy
Prof. Ming Mei McGill University, Canada
Dr. Vishnu Narayan Mishra Indira Gandhi National Tribal University, India
Dr. Farkhod Mukhamadiev National University of Uzbekistan, Uzbekistan
Dr. M. T. Mustafa Qatar University, Qatar
Dr. Mahammad A. Nurmammadov Shamakhy Astrophysical Observatory, Azerbaijan National Academy of Sciences, Azerbaijan
Prof. Jyotindra C. Prajapati Charotar University of Science and Technology, India
Dr. Marius Rădulescu Institute of Mathematical Statistics and Applied Mathematics "Gheorghe Mihoc-Caius Iacob" of the Romanian Academy, Romania
Dr. Madhu Ram University of Jammu, India
Prof. Jingli Ren Zhengzhou University, China
Dr. Gábor Sági Alfréd Rényi Institute of Mathematics and BUTE, Hungary
Prof. Bayram Sahin Inonu University, Türkiye
Prof. Samir H. Saker Mansoura University, Egypt
Dr. Bessem Samet Tunis College of Sciences and Techniques, Tunisia
Dr. Navneet Lal Sharma National Rail and Transportation Institute (NRTI) Vadodara, India
Dr. Yongli Song Tongji Universtiy, China
Prof. Hari M. Srivastava University of Victoria, Canada
Prof. Yeong-Jeu Sun I-Shou University, Chinese Taipei
Dr. Néstor Thome Universitat Politècnica de València, Spain
Prof. Aydin Tiryaki Izmir University, Türkiye
Prof. Gabor Toth Rutgers University, USA
Prof. Amitabha Tripathi Indian Institute of Technology, India
Prof. Nodari Vakhania Georgian Academy of Sciences, Mexico
Prof. Qingwen Wang Shanghai University, China
Dr. Yanjin Wang Institute of Applied Physics and Computational Mathematics, China
Prof. Changjin Xu Guizhou Key Laboratory of Economics System Simulation, China
Dr. Jasang Yoon University of Texas Rio Grande Valley, USA
Prof. Mohamed F. Yousif The Ohio State University, USA
Dr. Shijun Zheng Georgia Southern University, USA
Prof. Changjiang Zhu South China University of Technology, China

Scientific Research Publishing

Advances in Pure Mathematics, 2023, 13, 207-302
https://www.scirp.org/journal/apm
ISSN Online: 2160-0384
ISSN Print: 2160-0368

Table of Contents

Volume 13 Number 5 May 2023

A Discussion on the Establishment That a Fibre Metric on the Positive Definite Real Inner-Product of a Properly Embedded Smooth Submanifold Be Always Extended to a Riemannian Metric on the Positive Definite Real Inner-Product

Z. W. Yan.....207

On the Asymptotic Stability of Discrete Crocodilians Model

K. Saito, Y. Hamaya.....211

Goodness-of-Fit Test for Non-Stationary and Strongly Dependent Samples

C. Crisci, G. Perera, L. Sampognaro.....226

Shift, the Law of the Invention of Zero

E. C. Anaxhaoza.....237

The Integral of the Inverse of the Primes

P. Doroszlai, H. Keller.....250

Some Characterizations of Upper and Lower M-Asymmetric Preirresolute Multifunctions

L. K. Matindih, E. B. Mpelele, J. Hambulo, D. K. Manyika.....267

A New Extended BIC and Sequential Lasso Regression Analysis and Their Application in Classification

J. Chen, W. Z. Ye.....284

Advances in Pure Mathematics (APM)
Journal Information

SUBSCRIPTIONS

The *Advances in Pure Mathematics* (Online at Scientific Research Publishing, https://www.scirp.org/) is published monthly by Scientific Research Publishing, Inc., USA.

Subscription rates:
Print: $79 per issue.
To subscribe, please contact Journals Subscriptions Department, E-mail: sub@scirp.org

SERVICES

Advertisements
Advertisement Sales Department, E-mail: service@scirp.org

Reprints (minimum quantity 100 copies)
Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.
E-mail: sub@scirp.org

COPYRIGHT

Copyright and reuse rights for the front matter of the journal:
Copyright © 2023 by Scientific Research Publishing Inc.
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/

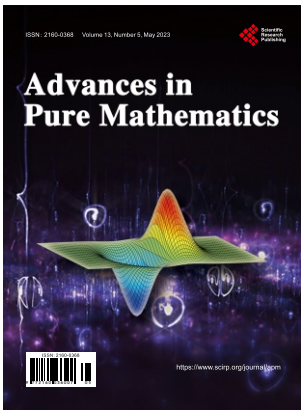
Copyright for individual papers of the journal:
Copyright © 2023 by author(s) and Scientific Research Publishing Inc.

Reuse rights for individual papers:
Note: At SCIRP authors can choose between CC BY and CC BY-NC. Please consult each paper for its reuse rights.

Disclaimer of liability
Statements and opinions expressed in the articles and communications are those of the individual contributors and not the statements and opinion of Scientific Research Publishing, Inc. We assume no responsibility or liability for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained herein. We expressly disclaim any implied warranties of merchantability or fitness for a particular purpose. If expert assistance is required, the services of a competent professional person should be sought.

PRODUCTION INFORMATION

For manuscripts that have been accepted for publication, please contact:
E-mail: apm@scirp.org



Call_for_Papers

Advances in Pure Mathematics (APM)

ISSN 2160-0368 (Print) ISSN 2160-0384 (Online)
https://www.scirp.org/journal/apm

***Advances in Pure Mathematics* (*APM*)** is an international journal dedicated to the latest advancements in ordered algebraic structures. The goal of this journal is to provide a platform for scientists and academicians all over the world to promote, share, and discuss various new issues and developments in different areas of ordered algebraic structures.

Subject Coverage

This journal invites original research and review papers that address the following issues. Topics of interest include, but are not limited to:

- Applied Harmonic Analysis
- Approximation Theory
- Asymptotic Methods
- Bifurcation Theory
- Coding Theory
- Combinatorics
- Complex Analysis
- Convex Analysis
- Difference Equations
- Differential Equations
- Dynamical Systems
- Fixed-Point Theory
- Fourier Analysis
- Fractals
- Fractional Analysis
- Functional Differential Equations
- Fuzzy Mathematics
- Geometry
- Geometry of Banach Spaces
- Integral Equations
- Mathematical Biology, including Population Dynamics
- Mathematical Physics
- Matrix Theory
- Moment Theory
- Number Theory
- Numerical Analysis
- Operator Theory
- Optimal Control
- Optimization Wavelets
- Partial Differential Equations
- Probability
- Reaction-Diffusion Problems, Discrete Mathematics
- Scattering Theory
- Semigroups of Operators
- Signal Theory
- Special Functions
- Statistics
- Stochastic Process
- Topology and Applications
- Transport Theory
- Ultrametric Analysis
- Variational Methods

We are also interested in short papers (letters) that clearly address a specific problem, and short survey or position papers that sketch the results or problems on a specific topic. Authors of selected short papers would be invited to write a regular paper on the same topic for future issues of the APM.

Notes for Intending Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Paper submission will be handled electronically through the website. All papers are refereed through a peer review process. For more details about the submissions, please access the website.

Website and E-Mail

https://www.scirp.org/journal/apm **E-mail: apm@scirp.org**

What is SCIRP?

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science with its publication.

What is Open Access?

All original research papers published by SCIRP are made freely and permanently accessible online immediately upon publication. To be able to provide open access journals, SCIRP defrays operation costs from authors and subscription charges only for its printed version. Open access publishing allows an immediate, worldwide, barrier-free, open access to the full text of research papers, which is in the best interests of the scientific community.

- High visibility for maximum global exposure with open access publishing model
- Rigorous peer review of research papers
- Prompt faster publication with less cost
- Guaranteed targeted, multidisciplinary audience

Scientific Research Publishing

Website: https://www.scirp.org

Subscription: sub@scirp.org

Advertisement: service@scirp.org