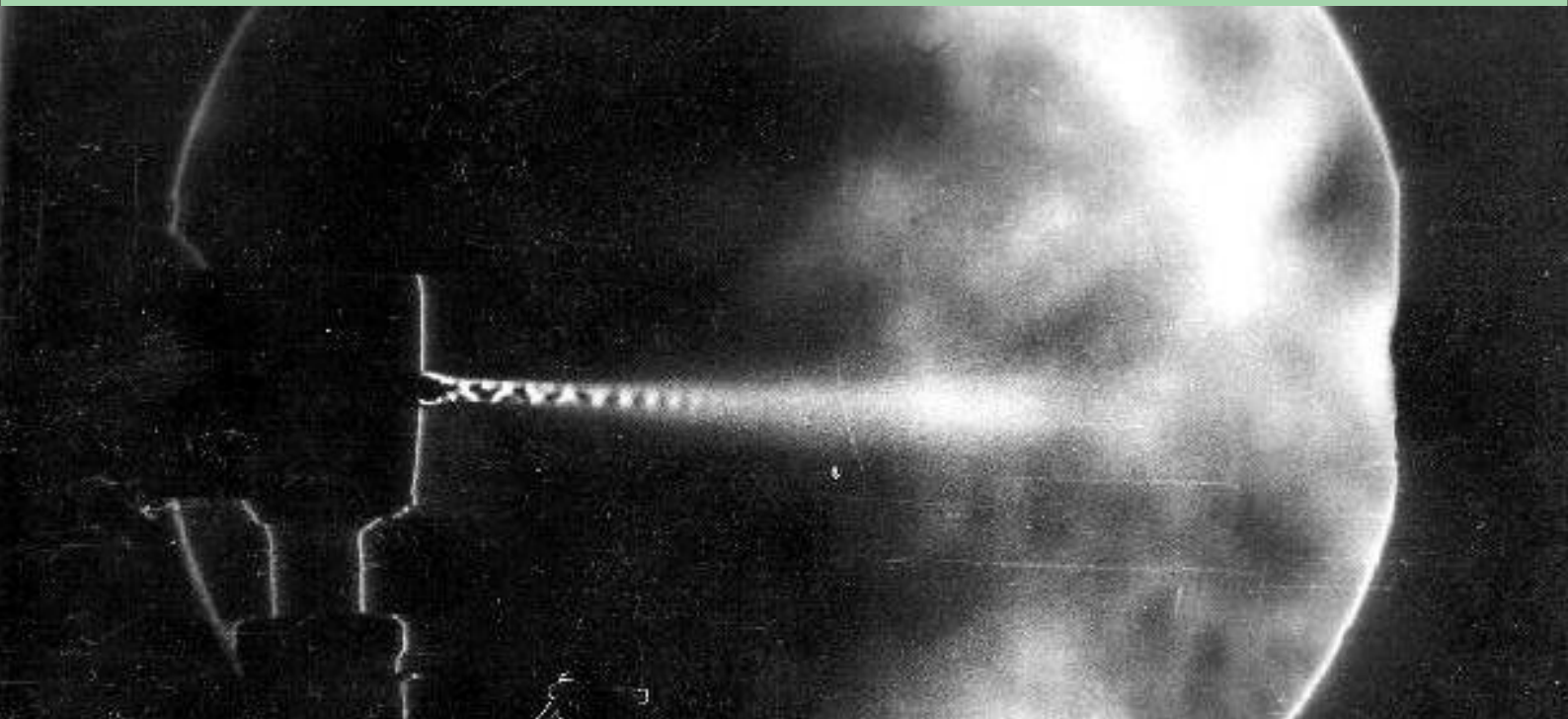


ISSN: 2153-1196 Vol. 4, No. 2, February 2013



Scientific
Research

Journal of Modern Physics



ISSN: 2153-1196



www.scirp.org/journal/jmp

Journal Editorial Board

ISSN: 2153-1196 (Print) ISSN: 2153-120X (Online)

<http://www.scirp.org/journal/jmp>

Editors-in-Chief

Prof. Moshe Gai
Prof. Yang-Hui He

University of Connecticut, USA
City University, UK

Executive Editor-in-Chief

Prof. Marko Markov

Research International, Buffalo Office, USA

Editorial Board

Dr. Yohannes Abate
Dr. Mohamed Abu-Shady
Prof. Sadhan Kumar Adhikari
Dr. Hamid Alemohammad
Dr. Ksenofontov Alexandre
Prof. Sami M. AL-Jaber
Prof. Kerim R. Allakhverdiev
Prof. Roberto Oscar Aquilano
Prof. Xinhua Bai
Dr. Simon Bott
Dr. Salvatore Capozziello
Dr. Riccardo Cerulli
Dr. Changle Chen
Prof. Stephen Robert Cotanch
Prof. Papadopoulos Demetrios
Dr. Hua-Shu Dou
Prof. Constantin Fetecau
Dr. Antonino Flachi
Prof. Ju Gao
Dr. Sachin Goyal
Dr. Wei Guo
Dr. Alioscia Hama
Dr. Johnny C. Ho
Dr. Guangjin Hou
Dr. Cosmin Ilie
Dr. Preston B. Landon
Dr. Chunlei Liu
Dr. Ray Luo
Prof. Karo Michaelian
Prof. Christophe J. Muller
Prof. Zdzislaw E. Musielak
Dr. Ambarish Nag
Prof. Luciano Nunziante
Prof. Valery Obukhov
Dr. Jorge Pereira
Dr. Tongfei Qi
Prof. Richard Saurel
Prof. Alejandro Crespo Sosa
Dr. Bo Sun
Dr. Mingzhai Sun
Dr. Sergei K. Suslov
Dr. Anca Tureanu
Dr. A. L. Roy Vellaisamy
Dr. Yuan Wang
Prof. Magnus Willander
Dr. Yiming Xu
Dr. Fan Yang
Dr. Peter H. Yoon
Dr. S. Zerbini
Dr. Meishan Zhao
Dr. Pavel Zhuravlev

California State University, USA
Department of Applied Mathematics, Menoufia University, Egypt
Universidade Estadual Paulista, Brazil
Advanced Test and Automation Inc., Canada
Moscow Engineering Physics Institute, Russia
An-Najah National University, Palestine
Institute of Physics, Azerbaijan Academy of Sciences, Azerbaijan
Universidad Nacional de Rosario, Argentina
South Dakota School of Mines & Tech, USA
University of California, USA
University of Naples Federico II, Italy
Gran Sasso National Laboratory, INFN, Italy
Celanese Corporation, USA
NC State University, USA
Aristotle University of Thessaloniki, Greece
Zhejiang Sci-Tech University, China
Gheorghe Asachi Technical University of Iasi, Romania
Instituto Superior Tecnico, Portugal
The University of Hong Kong, China
University of Michigan, USA
Florida State University, USA
Tsinghua University, China
City University of Hong Kong, China
University of Delaware, USA
Los Alamos National Laboratory, USA
The University of California, USA
Carnegie Mellon University, USA
University of California, USA
National Autonomous University of Mexico, Mexico
University of Provence, France
University of Texas at Arlington, USA
National Renewable Energy Laboratory, USA
University of Naples Federico II, Italy
Tomsk State Pedagogical University, Russia
The University of Notre Dame, USA
University of Kentucky, USA
University of Aix Marseille I, France
Universidad Nacional Autónoma de México, Mexico
Princeton University, USA
Ohio State University, USA
Arizona State University, USA
Academy of Finland, Finland
City University of Hong Kong, China
University of California, Berkeley, USA
Linköping University, Sweden
Lawrence Berkeley National Laboratory, USA
Fermi National Accelerator Laboratory, USA
University of Maryland, USA
University of Trento, Italy
James Frank Institute, University of Chicago, USA
University of Maryland at College Park, USA

Managing Executive Editor

Prof. Chang Liu

Wuhan University, China

Email: cliu@acc-lab.whu.edu.cn

TABLE OF CONTENTS

Volume 4 Number 2

February 2013

Natural Convection of Water-Based Nanofluids in a Square Enclosure with Non-Uniform Heating of the Bottom Wall

N. Ben-Cheikh, A. J. Chamkha, B. Ben-Beya, T. Lili.....147

Decaying of Nitrogen Second Positive System by Addition of H₂ Gas in Air DB Discharge

D. M. El-Zeer, A. Samir, F. Elakshar, A. A. Garamoon.....160

The Schrödinger Equation of the Hilbert Hyper Space

Y. Roth.....168

Spiky Development at the Interface in Rayleigh-Taylor Instability: Layzer Approximation with Second Harmonic

R. Banerjee, L. Mandal, M. Khan, M. R. Gupta.....174

Space Environment Simulator for Testing of Materials and Devices

H. N. Yeritsyan, V. V. Harutunyan, A. A. Sahakyan, S. K. Nikoghosyan, A. S. Hovhannisyan, N. E. Grigoryan,
K. Sh. Ohanyan, E. A. Hakhverdyan, N. A. Hakopyan, V. A. Sahakyan.....180

Simulation Mechanical Properties of Lead Sulfur Selenium under Pressure

M. S. Othman.....185

Some Important Features of Manganites

R. J. Singh.....191

Super-Compressibility Phenomenon

Kh. Khasanov.....200

Thermophysical Properties of NaCl, NaBr and NaF by γ -Ray Attenuation Technique

A. S. M. Rao, K. Narender, K. G. K. Rao, N. G. Krishna.....208

Dust Plasma Effect on the Etching Process of Si[100] by Ultra Low Frequency RF Plasma

A. R. Galaly, F. F. Elakshar.....215

Impacts of Opinion Propagation on Social Balance

S. L. Zhang, L. X. Chen, D. Hu, Y. F. Guo.....226

On the Usage of the Faraday Effect as an Authentication Technique for Vegetable Oils

M. I. Abu-Taha, M. A. Halasa, M. M. Abu-Samreh.....230

The Propagation of Circularly Polarized Waves in Quantum Plasma

B. F. Mohamed, R. Albrulosity.....236

**High Intensity Focused Ultrasound Optimal Device Design for Targeted Prostate Cancer Treatment:
A Numerical Study**

L. Curiel, D. Hobson, J.-Y. Chapelon, S. Pichardo.....240

Wronskian Representation of Solutions of NLS Equation, and Seventh Order Rogue Wave

P. Gaillard.....246

Simultaneous Measurability of Error and Disturbance

R. Mochizuki.....267

Defect Core Structures in Twisted Nematic and Twisted Chiral Liquid Crystals

X. Zhou, G. L. Zheng, Z. D. Zhang.....272

Critical Exponents of Quark Matter

H. Gholizade.....280

**Quantum Gravity in Heisenberg Representation and Self-Consistent Theory of Gravitons in
Macroscopic Spacetime**

G. Vereshkov, L. Marochnik.....285

The figure on the front cover is from the article published in *Journal of Modern Physics*, 2013, Vol. 4, No. 2, pp. 200-207 by Kholmurad Khasanov.

Journal of Modern Physics (JMP)

Journal Information

SUBSCRIPTIONS

The *Journal of Modern Physics* (Online at Scientific Research Publishing, 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©2013 Scientific Research Publishing, Inc.

All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as described below, without the permission in writing of the Publisher.

Copying of articles is not permitted except for personal and internal use, to the extent permitted by national copyright law, or under the terms of a license issued by the national Reproduction Rights Organization.

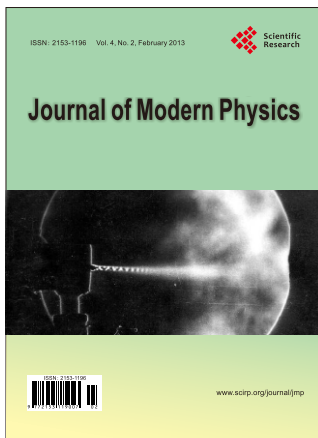
Requests for permission for other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works or for resale, and other enquiries should be addressed to the Publisher.

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: jmp@scirp.org



Journal of Modern Physics

ISSN Print: 2153-1196 ISSN Online: 2153-120X

<http://www.scirp.org/journal/jmp>

Journal of Modern Physics (JMP) is an international journal dedicated to the latest advancement of modern physics. 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 modern physics.

Editors-in-Chief

Prof. Moshe Gai
Prof. Yang-Hui He

University of Connecticut, USA
City University, UK

Executive Editor-in-Chief

Prof. Marko Markov

Research International, Buffalo Office, USA

Subject Coverage

Journal of Modern Physics publishes original papers including but not limited to the following fields:

Biophysics and Medical Physics	New Materials: Micro and Nano-Mechanics and Homogeneization
Complex Systems Physics	Non-Equilibrium Thermodynamics and Statistical Mechanics
Computational Physics	Nuclear Science and Engineering
Condensed Matter Physics	Optics
Cosmology and Early Universe	Physics of Nanostructures
Earth and Planetary Sciences	Plasma Physics
General Relativity	Quantum Mechanical Developments
High Energy/Accelerator Physics	Quantum Theory
High Energy Astrophysics	Relativistic Astrophysics
Instrumentation and Measurement	String theory
Interdisciplinary Physics	Superconducting Physics
Materials Sciences and Technology	Theoretical High Energy Physics
Mathematical Physics	Thermology
Mechanical Response of Solids and Structures	

We are also interested in: 1) Short Reports—2-5 page papers where an author can either present an idea with theoretical background but has not yet completed the research needed for a complete paper or preliminary data; 2) Book Reviews—Comments and critiques.

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

<http://www.scirp.org/journal/jmp>

E-mail: jmp@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, by delivering superior scientific publications and scientific information solution provider that enable advancement in scientific research.

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, world-wide, 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**

Website: <http://www.scirp.org>

Subscription: sub@scirp.org

Advertisement: service@scirp.org