

# International Journal of Astronomy and Astrophysics





# **Journal Editorial Board**

ISSN 2161-4717 (Print) ISSN 2161-4725 (Online) http://www.scirp.org/journal/ijaa

#### **Editor in Chief**

Prof. Michael D. Smith University of Kent, UK

### **Editorial Board (According to Alphabet)**

Prof. John Beckman Spanish Astronomical Society, Spain

Prof. Vahram Chavushyan Instituto Nacional de Astrofisica, Opticay Electronica, Mexico

**Prof. Osman Demircan** Çanakkale University Observatory, Turkey

Prof. Antonio Elipe University of Zaragoza, Spain

Prof. Itzhak Goldman Afeka College, Israel

Prof. Guillermo A. Gonzalez Universidad Industrial de Santander, Colombia

Prof. Constantine L. Goudas University of Patras, Greece

Prof. Anatol Guglielmi Russian Academy of Sciences, Russia

Prof. Richard Brice Hoover National Space Science and Technology Center, USA

Prof. Nadejda T. Kaltcheva University of Wisconsin Oshkosh, USA

Prof. Rafik A. Kandalyan Byurakan Astrophysical Observatory, Armenia

**Dr. Vladimir Kondratyev**Taras Shevchenko National University of Kiev, Ukraine

Prof. Alexander M. Krymskii Southern Federal University, Russia

Prof. Jonathan Peter Merrison Mars Simulation Wind Tunnel Facilities, UK

Prof. Ratan MohapatraUniversity of Ottawa, CanadaProf. David Fonseca MotaUniversity of Oslo, Norway

Prof. Gopalakrishnarao Parthasarathy National Geophysical Research Institute (CSIR), India

**Prof. Sudip Sen**Lancaster University, UK

Prof. Andrew ShearerNational University of Ireland, IrelandProf. Yuriy G. ShkuratovKharkov National University, UkraineProf. J. W. F. ValleSpanish National Research Council, Spain



## TABLE OF CONTENTS

Volume 3 Number 1	March 2013
Wave Optics and Image Formation in Gravitational Lensing	
Y. Nambu	1
Riemannian Space-Time, de Donder Conditions and Gravitational Field in Flat Space-Time	
G. Liu	8
A Synthesis of Fundamental Parameters of Spiral Arms, Based on Recent Observations in the Milky Way	
J. P. Vallée	20
Approximate Kepler's Elliptic Orbits with the Relativistic Effects	
L. L. Jia	29
High Energy Studies on the Non-Thermal Emissions from Cassiopeia A & Tycho	
M. Bozkurt, T. Ergin, M. Hudaverdi, E. N. Ercan	34
Change in Energy of Non-Spinning Black Holes w.r.t. the Change in Mass	
D. Mahto, R. N. Mehta, N. Pant, R. K. Sah.	49
Possible Signs of Life on the Planet Venus	
L. V. Ksanfomality	57

The figure on the front cover is from the article published in International Journal of Astronomy and Astrophysics, 2013, Vol. 3, No. 1, pp. 57-79 by Leonid V. Ksanfomality.

Copyright © 2013 SciRes.

#### International Journal of Astronomy and Astrophysics (IJAA)

#### **Journal Information**

#### **SUBSCRIPTIONS**

International Journal of Astronomy and Astrophysics (Online at Scientific Research Publishing, www.SciRP.org) is published quarterly by Scientific Research Publishing, Inc., USA.

#### **Subscription rates:**

Print: \$59 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@2011 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 assumes 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: ijaa@scirp.org

# Call for Papers



# International Journal of Astronomy and Astrophysics (IJAA)

ISSN 2161-4717 (Print) ISSN 2161-4725 (Online) http://www.scirp.org/journal/ijaa

International Journal of Astronomy and Astrophysics (IJAA) is an international scientific journal dedicated to the publication and public discussion of high quality original research in all the fields of astrophysics and space sciences and related technology. All the manuscripts must be prepared in English, and are subject to a rigorous and fair peer-review process. Accepted papers will immediately appear online followed by printed hard copies.

#### **Editor in Chief**

Prof. Michael D. Smith

University of Kent, UK

#### **Editorial Board**

Prof. John Beckman

Prof. Vahram Chavushyan

Prof. Osman Demircan

Prof. Antonio Elipe

Prof. Itzhak Goldman

Prof. Guillermo A. Gonzalez

Prof. Constantine L. Goudas

Prof. Anatol Guglielmi

Prof. Richard Brice Hoover

Prof. Nadejda T. Kaltcheva

Prof. Rafik A. Kandalyan

Dr. Vladimir Kondratyev

Prof. Alexander M. Krymskii

Prof. Jonathan Peter Merrison

Prof. Ratan Mohapatra

Prof. David Fonseca Mota

Prof. Gopalakrishnarao Parthasarathy

Prof. Sudip Sen

Prof. Andrew Shearer

Prof. Yuriy G. Shkuratov

Prof. J. W. F. Valle

# **Subject Coverage**

The journal publishes original papers including but not limited to the following fields:

- Astrogeodynamics
- Astrophysics
- Cosmic Rays and Gamma Astronomy
- Dynamics of Celestial Bodies in the Solar System and Artificial Bodies
- Extrasolar Planets
- Formation and Evolution of Galaxies and Their Clusters
- Formation and Evolution of Stars
- Heliospheric Physics
- High-Energy and Cataclysmic Processes in Astrophysics
- Interstellar Matter
- Interstellar Medium: Star Formation Regions
- Kinematics and Structure of the Galaxy
- Large-Scale Structure of Universe Formation and Evolution of Galaxies

- Last Stages of Stellar Evolution and Chemical Evolution of the Galaxy
- Magnetospheric Physics
- Microquasars and High-Energy Astrophysics
- Neutron Astronomy
- New Astronomical Techniques and Methods
- Planets, Comets, Asteroids and Dust
- Pulsar Magnetospheres
- Solar and Stellar Physics
- Solar Magnetic Activity and Heliogeospace Environments
- Solar/Interstellar Terrestrial Relations
- Solar-Terrestrial Physics and Space Weather
- Space Observation and Exploration
- Supernovae and Evolution of the Universe

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 IJAA.

# **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.

http://www.scirp.org/journal/ijaa E-mail: ijaa@scirp.org