

ISSN: 2156-8359

Volume 10, Number 12, December 2019



# International Journal of Geosciences



ISSN: 2156-8359



9 772156 835003 12

<https://www.scirp.org/journal/ijg>

# Journal Editorial Board

ISSN: 2156-8359 (Print) ISSN: 2156-8367 (Online)

<https://www.scirp.org/journal/ijg>

---

## Editors-in-Chief

**Prof. Jacques Bourgois**  
**Prof. Shuanggen Jin**

Université Pierre et Marie Curie, Paris 6, France  
Shanghai Astronomical Observatory, CAS, China

## Editorial Board

**Prof. Jong-Jin Baik**  
**Prof. Rajasekhar Balasubramanian**  
**Prof. Charles E. Button**  
**Dr. Dionisios Gasparatos**  
**Prof. Yury G. Gatinsky**  
**Prof. Ruixia Hao**  
**Prof. Oleg B. Khavroshkin**  
**Prof. Anthony Lupo**  
**Prof. Ashok K. Mishra**  
**Dr. Massimo Mucciardi**  
**Prof. Junboun Park**  
**Prof. Xianfang Song**  
**Dr. Agata Di Stefano**  
**Prof. Xuexi Tie**  
**Prof. George Tsiambaos**  
**Prof. Bernd Wünnemann**  
**Prof. Fawu Wang**  
**Prof. Xinghui Xia**  
**Dr. Jianwen Yang**  
**Prof. Xiaohuan Yang**  
**Prof. Lianyang Zhang**  
**Prof. A-Xing Zhu**

Seoul National University, South Korea  
National University of Singapore, Singapore  
Central Connecticut State University, USA  
Aristotle University of Thessaloniki, Greece  
Vernadsky State Geological Museum, Russia  
Peking University, China  
Russian Academy of Sciences, Russia  
University of Missouri-Columbia, USA  
Clemson University, USA  
University of Messina, Italy  
Seoul National University, South Korea  
Chinese Academy of Sciences, China  
University of Catania, Italy  
National Center for Atmospheric Research, USA  
National Technical University of Athens, Greece  
Freie Universität Berlin, Germany  
Shimane University, Japan  
Beijing Normal University, China  
University of Windsor, Canada  
Chinese Academy of Sciences, China  
University of Arizona, USA  
University of Wisconsin, USA

# Table of Contents

**Volume 10    Number 12**

**December 2019**

## **On Reducing the Magnitude of an Impending Catastrophic Earthquake**

M. G. Noppe.....1037

## **Evolutional Characteristics of Debris Flow in the Siwalik Hills of Nepal**

B. P. Bhandari, S. Dhakal.....1049

## **Geology and Geochemistry of the Chromiferous Mineralization in the External Zone of the Pan-African Dahomeyides Belt, Northwestern Benin (Gulf of Guinea, West Africa)**

L. Adissin Glodji, R. Saïzonou, F. B. Adjo, A. K. I. Fatiou, S. Yessoufou, B. Adjo Kanon.....1068

## **Petro-Geochemistry, Genesis and Economic Aspect of Syenitic and Mafic Rocks in Mindif Complex, Far North Cameroon, Central Africa**

N. S. Kanouo, L. X. Wang, A. P. Kouske, S. B. Yomeun, E. A. A. Basua.....1081

## **Potential of Sunflower to Extract Heavy Metals from Leachate**

S. Marathe, N. Ravichandran.....1115

## **Mid-West Growing Season Weather**

K. E. Kenyon.....1128

# International Journal of Geosciences (IJG)

## Journal Information

### SUBSCRIPTIONS

The *International Journal of Geosciences* (Online at Scientific Research Publishing, <https://www.scirp.org/>) is published monthly by Scientific Research Publishing, Inc., USA.

#### **Subscription rates:**

Print: \$79 per copy.

To subscribe, please contact Journals Subscriptions Department, E-mail: [sub@scirp.org](mailto:sub@scirp.org)

### SERVICES

#### **Advertisements**

Advertisement Sales Department, E-mail: [service@scirp.org](mailto:service@scirp.org)

#### **Reprints (minimum quantity 100 copies)**

Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.

E-mail: [sub@scirp.org](mailto:sub@scirp.org)

### COPYRIGHT

#### **Copyright and reuse rights for the front matter of the journal:**

Copyright © 2019 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 © 2019 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: [ijg@scirp.org](mailto:ijg@scirp.org)



# International Journal of Geosciences

ISSN: 2156-8359 (Print) ISSN: 2156-8367 (Online)

<https://www.scirp.org/journal/ijg>

**International Journal of Geosciences (IJG)** is an international refereed journal dedicated to the latest advancement of geosciences. The goal of this journal is to keep a record of the state-of-the-art research and to promote study, research and improvement within its various specialties.

## Editors-in-Chief

**Prof. Jacques Bourgois**  
**Prof. Shuanggen Jin**

Université Pierre et Marie Curie, Paris 6, France  
Shanghai Astronomical Observatory, CAS, China

## Subject Coverage

All manuscripts submitted to IJG must be previously unpublished and may not be considered for publication elsewhere at any time during IJG's review period. Additionally, accepted ones will immediately appear online followed by printed in hard copy. Topics to be covered by this journal include, but are not limited to:

- Atmosphere
- Biosphere
- Cartography
- Climate Change
- Earth System Modelling
- Earthquake and Seismology
- Environmental Science
- Estuarine and Coasts
- Geochemistry
- Geodesy and Surveying
- Geographic Information System
- Geography
- Geo-Instrument Developments
- Geology
- Geomechanics
- Geomorphology and Surficial Process
- Geophysics
- Geostatistics
- Glaciology
- Hydrosphere
- Lithosphere or Geosphere
- Marine Resources
- Mineralogy
- NASA Earth Science Enterprise
- Oceanography
- Pedosphere
- Petrology
- Seismology
- Soil Science

We are also interested in: 1) Short Reports—2 to 5 pages where the paper is intended to present either an original idea with theoretical treatment or preliminary data and results; 2) Book Reviews—Comments and critiques of recently published books in Geosciences.

## 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/ijg>

Email: [ijg@scirp.org](mailto:ijg@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](mailto:sub@scirp.org)**

**Advertisement: [service@scirp.org](mailto:service@scirp.org)**