

ISSN: 2162-5751 Volume 13, Number 3, September 2023



# Journal of Quantum Information Science

ISSN: 2162-5751



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

# Journal Editorial Board

ISSN 2162-5751 (Print) ISSN 2162-576X (Online)

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

---

## Executive Editor-in-Chief

**Prof. Arun Kumar Pati** Harish-Chandra Research Institute (HRI), Allahabad, India

## Editorial Board

**Prof. Yas Al-Hadeethi** King Abdulaziz University, Saudi Arabia

**Prof. Indranil Chakrabarty** International Institutes of Information Technology, India

**Prof. Jing-Ling Chen** Nankai University, China

**Prof. Shi-Hai Dong** CIDETEC, Instituto Politécnico Nacional, Mexico

**Prof. Hans-Thomas Elze** University of Pisa, Italy

**Dr. Durdu Guney** Michigan Technological University, Houghton, USA

**Dr. Jianing Han** University of South Alabama, USA

**Prof. L. B. Levitin** Boston University, USA

**Prof. Archan S. Majumdar** S. N. Bose National Centre for Basic Sciences, India

**Prof. Nasser Metwally Aly** University of Bahrain, Bahrain

**Mohamed**

**Prof. Do Diep Ngoc** TIMAS, Thang Long University, Vietnam

**Prof. Masanao Ozawa** Nagoya University, Nagoya, Japan

**Prof. Prasanta K. Panigrahi** Indian Institute of Science Education and Research Kolkata, India

**Prof. T. Toffoli** Boston University, USA

**Prof. V. Vedral** University of Oxford, UK

# Table of Contents

**Volume 13    Number 3**

**September 2023**

## **On Topics in Quantum Games**

Y. Avishai.....79

## **Bell's Theorem and Einstein's Worry about Quantum Mechanics**

H. Geurdes.....131

## **Leveraging Quantum Computing for the Ising Model to Simulate Two Real Systems: Magnetic Materials and Biological Neural Networks (BNNs)**

D. L. Cao, K. Dinh.....138

## **One Hot Encoding Synthesis of Quantum Automata from Flowcharts**

Y. C. Huang, M. Perkowski.....156

# Journal of Quantum Information Science (JQIS)

## Journal Information

### SUBSCRIPTIONS

The *Journal of Quantum Information Science* (Online at Scientific Research Publishing, <https://www.scirp.org/>) is published quarterly by Scientific Research Publishing, Inc., USA.

#### **Subscription rates:**

Print: \$79 per issue.

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 © 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.

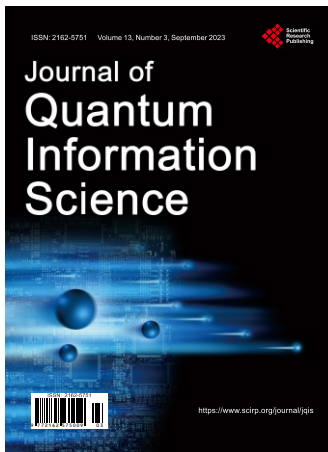
#### **Disclaimer of liability**

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: [jqis@scirp.org](mailto:jqis@scirp.org)



# Journal of Quantum Information Science

ISSN 2162-5751 (Print) ISSN 2162-576X (Online)  
<https://www.scirp.org/journal/jqis>

## Executive Editor-in-Chief

**Prof. Arun Kumar Pati**

Harish-Chandra Research Institute (HRI), Allahabad, India

## Editorial Board

**Prof. Yas Al-Hadeethi**

King Abdulaziz University, Saudi Arabia

**Prof. Indranil Chakrabarty**

International Institutes of Information Technology, India

**Prof. Jing-Ling Chen**

Nankai University, China

**Prof. Shi-Hai Dong**

CIDETEC, Instituto Politécnico Nacional, Mexico

**Prof. Hans-Thomas Elze**

University of Pisa, Italy

**Dr. Durdu Guney**

Michigan Technological University, Houghton, USA

**Dr. Jianing Han**

University of South Alabama, USA

**Prof. L. B. Levitin**

Boston University, USA

**Prof. Archan S. Majumdar**

S. N. Bose National Centre for Basic Sciences, India

**Prof. Nasser Metwally Aly Mohamed**

University of Bahrain, Bahrain

**Prof. Do Diep Ngoc**

TIMAS, Thang Long University, Vietnam

**Prof. Masanao Ozawa**

Nagoya University, Nagoya, Japan

**Prof. Prasanta K. Panigrahi**

Indian Institute of Science Education and Research Kolkata, India

**Prof. T. Toffoli**

Boston University, USA

**Prof. V. Vedral**

University of Oxford, UK

## Subject Coverage

The field of Quantum Information Science is the most challenging and hot topic among all branches of science. This field is also quite interdisciplinary in character, and people from quantum theory, computer science, mathematics, information theory, condensed matter physics, many-body physics and many more have been actively involved to understand implications of quantum mechanics in information processing. JQIS aims to publish research papers in the following areas:

- Dynamical Maps
- Experimental Implementation
- Geometric Quantum Computation
- Quantum Computation
- Quantum Cryptography
- Quantum Entanglement
- Quantum Information Processing Protocols
- Quantum Information Theory
- Relativistic Quantum Information Theory

JQIS will consider original Letters, Research articles, and short Reviews in the above and related areas. Before publication in JQIS all the submitted papers will be peer-reviewed by the experts in the field. We can plan to bring out JQIS as a monthly journal, hence all the authors can take advantage of rapid publications of their results in this fast growing field. Being an open access journal we can hope to reach a much wider readership compared to other journals in the related areas.

## Website and E-Mail

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

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