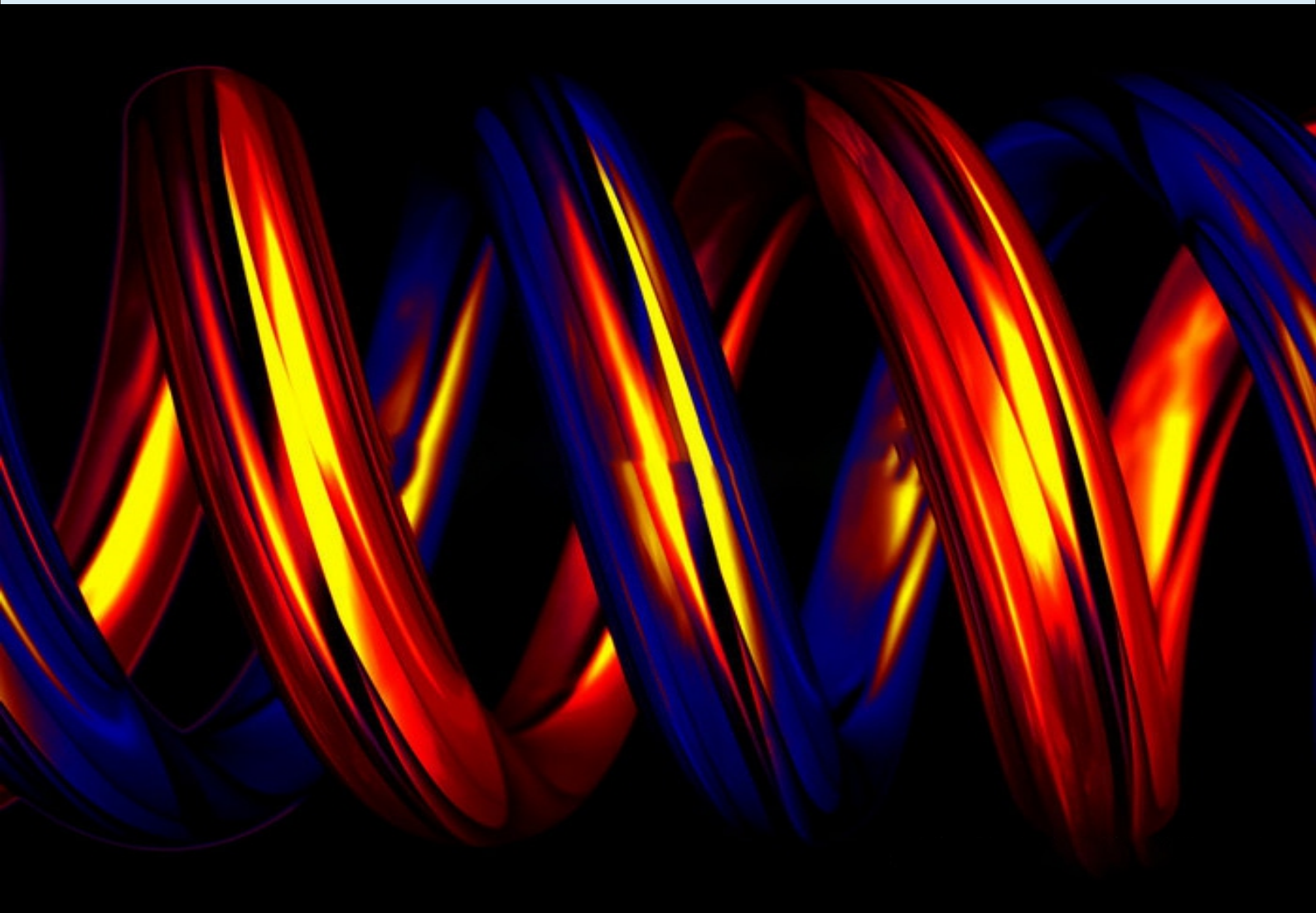


ISSN: 2162-6162 Volume 13, Number 4, December 2024



# Journal of Electronics Cooling and Thermal Control



ISSN: 2162-6162



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

# Journal Editorial Board

ISSN 2162-6162 (print) ISSN 2162-6170 (online)

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

---

## Editor-in-Chief

**Prof. Dayong Gao**

University of Washington, USA

## Editorial Board

**Prof. Suresh Aggarwal**

University of Illinois at Chicago, USA

**Dr. Bensely Albert**

ASML Netherlands B.V., Netherlands

**Dr. Sajad Alimohammadi**

Technological University Dublin, Ireland

**Prof. Ming-Chien Chyu**

Texas Tech University, USA

**Dr. Chaobin Dang**

The University of Tokyo, Japan

**Prof. Mohamed S. Hamed**

McMaster University, Canada

**Prof. Jesper Henri Hattel**

DTU Mechanical Engineering, Denmark

**Dr. Zhen Huang**

Research and Development Engineer, USA

**Prof. Carlo Saverio Iorio**

University of Brussels, Belgium

**Prof. Shung-Wen Kang**

Tamkang University, Chinese Taipei

**Prof. Abdul Rahim Assaad Khaled**

King Abdulaziz University, Saudi Arabia

**Prof. Chengwang Lei**

The University of Sydney, Australia

**Prof. Junhui Li**

School of Mechanical and Electrical Engineering,  
Central South University, China

**Dr. Oleg Lupan**

Technical University of Moldova (TUM), Moldova

**Dr. Shaibal Mukherjee**

Indian Institute of Technology, India

**Dr. Juan Carlos Ordonez**

Florida State University, USA

**Dr. Krishanu Roy**

University of Auckland, New Zealand

**Prof. Rathinam Panneer Selvam**

University of Arkansas, USA

**Prof. Sanjeeva Witharana**

Max Plank Institute, Germany

**Prof. Yuwen Zhang**

University of Missouri, USA

**Prof. Fu-Yun Zhao**

Wuhan University, China

**Prof. Xiaoming Zhou**

University of Electronic Science and Technology of  
China, China

# Table of Contents

**Volume 13    Number 4**

**December 2024**

## **Image Processing Based Colony Identification Research**

B. Huang, S. P. Zou .....61

# Journal of Electronics Cooling and Thermal Control (JECTC)

## Journal Information

### SUBSCRIPTIONS

The *Journal of Electronics Cooling and Thermal Control* (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 © 2024 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 © 2024 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.

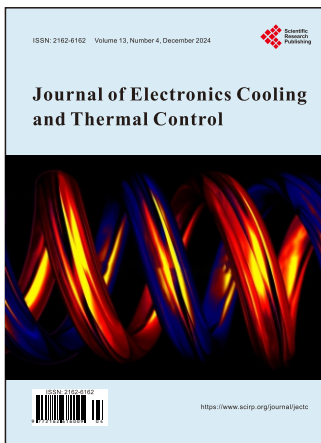
#### Disclaimer of liability

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



# Journal of Electronics Cooling and Thermal Control

ISSN 2162-6162 (print) ISSN 2162-6170 (online)  
<https://www.scirp.org/journal/jectc>

**Journal of Electronics Cooling and Thermal Control (JECTC)** is a quarterly, peer-reviewed, academic journal. It aims to provide a vehicle for the exchange and dissemination of original research results, technical notes, and state-of-the-art reviews pertaining to the electronic cooling and thermal system control technology in the computer and electronics industries.

## Subject Coverage

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

### Fundamentals and applications of heat/mass transfer processes for the electronics and micro-electronics, such as

- Base board design and material structure
- Control scenario
- Electronics packaging
- Fan design and performance
- Forced convection heat transfer
- Heat storage
- Heat sink design and optimization
- High heat conductive materials
- Heat transfer in micro channels
- Insulation
- Interface thermal contact performance
- Natural convection heat transfer
- Phase changing heat transfer
- Phonon
- Radiation
- Spray cooling
- Temperature stability
- Thermal modeling of electronics systems and components

### Technologies based on these transport processes such as

- Enhanced heat/mass transfer in precision-, micro-electronics, information technology
- Heat pipe
- MEMS (Micro-Electro-Mechanical-Systems) and NEMS (Nano-Electro-Mechanical-Systems)
- Various electronic devices, etc.

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

The submitted manuscript should not have been previously published in any form and must not 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 submission, please access the website.

## Website and E-Mail

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

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