

# Call for Papers

## *Special Section on Rare-Earth-Free Electrical Machines: Driving Decarbonization and Energy Efficiency*

As the world moves towards electrification and aims to achieve zero-net greenhouse gas emissions, electrical machines emerge as a crucial enabling technology across a wide array of applications. The urgent need for decarbonization and energy efficiency has brought the spotlight to rare-earth-free electrical machines. Because, the production of permanent magnets predominantly relies on alloys of rare earth metals such as neodymium and dysprosium, which are becoming increasingly more expensive, resulting in the generation of hazardous by-products during the mining and processing stages. These by-products pose significant ecological challenges in the vicinity of rare-earth mines and refineries.

Rare-earth-free machines offer a promising alternative to traditional permanent magnet-based counterparts, significantly reducing environmental impact while maintaining high performance. This Special Section aims to explore the latest advancements, challenges, and applications of rare-earth-free electrical machines, highlighting their potential in driving decarbonization efforts, combating climate change, mitigating environmental pollution and enhancing energy efficiency. By focusing on energy efficiency and environmental issues, this Special Section will contribute to the development and deployment of clean and efficient technologies, fostering a greener and more sustainable future.

In order to further strengthen academic exchanges and promote the sharing of experiences and achievements of researchers and experts from academia and industry around the world in the fields of design, analysis, and optimization of rare-earth-free and ferrite magnet machines for improved performance characteristics, application of new materials, new design topologies, loss and torque ripple reduction methods, etc, the editorial department of “CES Transactions on Electrical Machines and Systems” invited Asst. Prof. Tayfun Gundogdu from Energy Institute, Istanbul Technical University as the Guest Editor in Chief, and Asst. Prof. Udochukwu Bola Akuru from Department of Electrical Engineering, Tshwane University of Technology, as Guest Co-Editor in Chief, as well as another 6 well-known experts at home and abroad as the Guest Editors to organize the Special Section on “Rare-Earth-Free Electrical Machines”. We warmly welcome prospective experts and scholars in this field to contribute actively. Detailed topics include but are not limited to:

- Squirrel-cage and wound rotor induction machines;
- Double-fed induction machines;
- Salient pole synchronous machines;
- Electrically excited or wound field machines;
- Variable reluctance machines;
- Switched reluctance machines;
- Synchronous reluctance machines;
- Rare-earth-free magnet machines;
- New magnetic, ferromagnetic, and conductor materials for electrical machines;
- Novel rare-earth-free or ferrite magnet machines;
- Design, analysis and optimization of rare-earth-free electrical machines for various applications (e.g., transportation, renewable energy, industrial systems);
- Comparative studies and benchmarking of rare-earth-free machines against magnet-based alternatives in terms of performance, cost, and environmental sustainability;
- Analysis and mitigation of electromagnetic noise and vibration in rare-earth-free machines for improved user experience and reduced environmental impact;
- Advanced thermal analysis and management for rare-earth-free machines;
- Loss analyses and advanced loss reduction methods for rare-earth-free machines;
- Flux-weakening analyses for rare-earth-free machines;
- Comparative studies and benchmarking of rare-earth-free machines against magnet-based alternatives in terms of performance, cost, and environmental sustainability;



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### ***Important Dates***

Full paper submission:

**30 December, 2023**

Final decision notification:

**20 February, 2024**

Contact the guest editor-in-chief if your manuscript is not within the listed topics, as papers within the general topic of electrical machines and systems are all welcome by the CES TEMS.

Publication:

**25 March, 2024**

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### ***Brief guideline for authors:***

#### **Papers styles:**

1. Review articles.
2. Original research.
3. Rapid communications.

All manuscripts must be submitted through Manuscript Central at <https://mc03.manuscriptcentral.com/tems>. Submissions must be clearly marked "***Rare-Earth-Free Electrical Machines: Driving Decarbonization and Energy Efficiency***" on the cover page. When uploading your paper, please select your manuscript type "Special Section" Refer to <http://www.cestems.org> for general information about electronic submission through Manuscript Central. Manuscripts submitted for the special section will be reviewed separately and will be handled by the guest editorial board noted below.

### ***About the journal***

CES TEMS is a brand-new quarterly journal published by the China Electrotechnical Society (CES) and the Institute of Electrical Engineering of the Chinese Academy of Sciences, with co-sponsorship of IEEE PELS, starting from March 2017.

CES TEMS is an open-access journal, currently with no publication charge applied to the authors. Published papers will be included in the IEEE Xplore. Also, CES TEMS has been Indexed by Scopus, Inspec and CSCD.

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