



## Call for Papers for a Special Issue of *IEEE Transactions on Electron Devices*

on

### **“From Mega to nano: Beyond one Century of Vacuum Electronics”**

Vacuum electron devices were born more than one century ago and were, until the discovery of the transistor, the only existing electronic devices. From the first valve, “tubes” evolved over years and years of development into a variety of devices with specific purposes (magnetron, klystron, TWT, gyrotron) but a common unique feature, high output power to enable a wide range of fundamental applications, from space to healthcare, nuclear fusion, and many others.

After one century, vacuum electronic devices have evolved with the use of new materials, microfabrication processes, simulation tools. New frontiers are explored in the millimeter wave and sub THz range and in the nanometric domain. Vacuum electron devices are the only family of devices with size ranging from a few meters, Megawatt klystrons for particle accelerators, to nanometers, new nano vacuum transistors, spanning eight orders of magnitude in size.

This Special Issue of the IEEE Transactions on Electron Devices aims to value the great diversity in this family of devices by reporting the latest research results and the state of the art in the field of Vacuum Electronic Devices.

The Special Issue will include invited and open call papers from the Vacuum Electronics community and any other related disciplines or area of applications. Papers must be new and original material that has not been copyrighted, published or accepted for publication in any other archival publication, that is not currently being considered for publication elsewhere, and that will not be submitted elsewhere while under consideration by the Transactions on Electron Devices.

This Special Issue will be published in June 2023.

The topics of interest include, but are not limited to:

#### **Vacuum Electronics Devices (VEDs)**

- Slow-wave devices
- Klystrons and IoT's
- Fast-wave devices
- CW and pulsed-power devices
- Magnetrons and other cross-field devices
- Plasma-filled devices
- Field-emission devices

#### **Vacuum Electron Sources**

- Thermionic cathodes
- Field emission cathodes
- Photo cathodes
- Emission physics

#### **Emerging technologies in vacuum electronics**

- Simulation based design
- Advanced manufacturing
- Metamaterials
- Vacuum transistors
- RF-materials Interaction

#### **Technologies and phenomena**

- Fabrication techniques
- Novel materials (dielectrics, etc.)
- Components (guns, collectors, windows)
- Electronic power conditioners and supplies
- Linearizers and system integration
- High Power Microwave
- Multipactor
- Reliability
- RF breakdown

#### **System and Applications**

- Space
- Nuclear fusion
- Healthcare
- Defense
- Radar
- Accelerators
- High data rate communications

### **Submission instructions**

Manuscripts should be submitted in a double column format using an IEEE style file. Please visit [http://www.ieee.org/publications\\_standards/publications/authors/author\\_templates.html](http://www.ieee.org/publications_standards/publications/authors/author_templates.html) to download the templates.

When submitting your manuscript through the IEEE's web-based ScholarOne Author Submission and Peer Review System (<https://mc.manuscriptcentral.com/ted>), please indicate that your submission is for this special issue.

**Submission deadline: 31 October 2022**

**Publication Date: June 2023**

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