

Special Issue

On-Chip Electron Emission and Related Devices

Message from the Guest Editors

It is well known that most vacuum electronic devices based on free electron beam (EB) have given way to solid state devices because of the disadvantages of bulky size, high cost, difficulty in integration, etc. However, there are still lots of irreplaceable electron beam-based devices and instruments nowadays, including microwave tubes, X-ray tubes, electron guns, etc., even though they still encounter the above-mentioned disadvantages. Benefit from the development in advanced nanomaterials and microfabrication technologies in recent years, it becomes possible to scale down and integrate these electron beam-based devices and instruments on a chip, which makes them free of above-mentioned disadvantages and exhibit boosted performances, and breathes new life into this traditional area. For example, vacuum transistors, a kind of vacuum triodes scaled down on a chip, have rekindled many researchers' interest in old-fashioned devices because they can combine the respective advantages of traditional vacuum triodes and solid-state transistors.

Guest Editors

Dr. Xianlong Wei

School of Electronics, Peking University, Beijing 100871, China

Dr. Yuwei Wang

College of Electrical and Information Engineering, Hunan University, Changsha 410082, China

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Micromachines
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
micromachines@mdpi.com

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Editor-in-Chief

Prof. Dr. Nam-Trung Nguyen

Queensland Quantum and Advanced Technologies Research Institute,
Griffith University, West Creek Road, Nathan, QLD 4111, Australia

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