Special Issue on Room-temperature-operation Solid-state Radiation Detector

Preface

This Special Issue on *Room-temperature-operation Solid-state Radiation Detectors* has been organized in response to growing interest and research activity in the development of novel radiation detection materials and devices that function effectively at room temperature. The initiative for this issue was rooted in discussions held during the Compound Semiconductor Radiation Detector, BTOZ Korea-Japan Joint Symposium, which took place in Busan, Korea, in the summer of 2024. The symposium highlighted the pressing need for practical, high-performance detection systems across a wide range of applications including medical diagnostics, industrial radiography, security screening, and environmental monitoring.

Solid-state radiation detectors that operate without the need for cryogenic cooling offer substantial advantages in terms of compactness, cost, and usability. The recent advances in semiconductor materials, perovskite compounds, and hybrid detection systems have significantly broadened the scope and potential of these detectors. In addition, developments in device fabrication, signal processing electronics, and system integration have paved the way for innovations in spectrometry and imaging technologies.

This Special Issue has gathered 10 original research papers covering a wide range of topics—from crystal growth and material characterization to device applications and system-level demonstrations. These contributions represent the collaborative efforts of researchers in academia and industry, reflecting the current momentum and future directions of this dynamic field.

A part of this research is based on the Cooperative Research Project on the Research Center for Biomedical Engineering and the Research Institute of Electronics, Shizuoka University. We would like to express our sincere appreciation to all the authors for their high-quality submissions, and to the reviewers for their diligent and insightful evaluations that have contributed to the enhancement of this volume. We also thank the editorial staff of *Sensors and Materials* for their kind support and efficient coordination throughout the publication process.

We hope this Special Issue serves not only as a timely collection of the latest findings but also as a catalyst for future research and collaboration in the area of solid-state radiation detection.

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