Special Issue

Silicon-Based Detection and Sensing Technology

Message from the Guest Editor

Focal plane arrays (FPAs) have been intensively investigated over the last few years, mostly driven by the flourishing of autonomous LiDAR applications. Silicon CMOS imaging sensors (CIS) dominates the visible wavelength windows, while the responsivity as well as the quantum efficiency (QE) drastically degrades over 1000 nm. Historically, detectors operating at these wavelength bands are relying on III-V compound semiconductors, the costs of these detectors remain extraordinarily high and the scalability is inherently limited due to the small size of III-V substrates. Therefore, a compelling approach would be integrating those III-V based detectors onto Si substrates for large-scale and high throughput manufacturing. Additionally, this approach favors the integration with silicon photonics (SiPh) platform and Si-based read-out integrated circuits (ROICs). The aim and scope of this special issue is to collect the pronounced advances in Si-based photodetectors in SWIR to LWIR, leveraging diverse integration strategies, namely wafer bonding, die-to-wafer bonding, micro-transfer printing (MTP), direct bond interconnect (DBI), and monolithic integration based on heteroepitaxy.

Guest Editor

Dr. Bei Shi

Electrical and Computer Engineering Department, University of California Santa Barbara, Santa Barbara, CA 93106, USA

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

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Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. Sensors organizes Special Issues devoted to specific sensing areas and applications each year.

Editor-in-Chief

Prof. Dr. Vittorio M. N. Passaro
Dipartimento di Ingegneria Elettrica e dell'Informazione (Department of Electrical and Information Engineering), Politecnico di Bari, Via Edoardo Orabona n. 4, 70125 Bari, Italy

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