This special issue of *physica status solidi (a)* contains 23 papers, which are based on presentations at the Compound Semiconductor Week (CSW) 2019 held in Nara, Japan, May 19–23, 2019. Further 21 papers have been published in *physica status solidi (b)* [Phys. Status Solidi B 2020, 257, issue 2]. The CSW2019 is a joint venue for the 46th International Symposium on Compound Semiconductors (ISCS) and the 31st International Conference on Indium Phosphide and Related Materials (IPRM). ISCS is the preeminent international conference in the field of III–V, II–VI, and IV–IV semiconductors. The ISCS series was initiated in 1966 under the name of “International Symposium on GaAs”. IPRM is a major worldwide conference on indium phosphide and related materials, from physics to applications, since 1989. CSW is a premier forum for science, technology and applications in all areas of compound semiconductors.

CSW2019 hosted 524 participants and accommodated 381 presentations, including excellent 4 plenary talks, a special lecture, and 43 invited talks. We would like to thank all the participants for contributing to the success of the symposium.

We are grateful also to all the committee members for their excellent support. CSW2019 covered a wide range of recent progress in material sciences, fabrication technologies, and physics of compound semiconductors. Furthermore, novel electronic/photonic device applications were also extensively discussed. In particular, we had a number of exciting discussions on materials/devices related to gallium oxide and hexagonal boron nitride. We hope that readers will feel the liveliness of the conference from the papers in this special issue.

Kazuhiko Hirakawa, Shinji Matsuo
Steering Co-chairs

Masaaki Tanaka, Masakazu Sugiyama
Program Co-chairs

Masaaki Tanaka, Masakazu Sugiyama, Takuro Fujii, Shinobu Ohya
Guest Editors