

Preface to the Special Issue on the Celebration of the 60th Anniversary of Dedicating to Scientific Research of Prof. Zhanguo Wang

Guest Editors

Zhijie Wang

*Institute of Semiconductors,
Chinese Academy of Sciences,
Beijing, 100083, China
Email: wangzj@semi.ac.cn*

Chao Zhao

*1. JARA-Fundamentals of
Future Information Technology
(JARA-FIT) and RWTH Aachen
University, 52074, Aachen,
Germany
2. Peter Grünberg Institute
(PGI-9), Forschungszentrum
Jülich, 52425, Jülich, Germany
Email: zhaochao83@gmail.com*

Fei Ding

*Institute for Solid State Physics,
Leibniz University of Hannover,
Appelstraße 2, 30167,
Hannover, Germany
Email: f.ding@fkp.uni-
hannover.de*

Prof. Zhanguo Wang, a world-famous semiconductor materials physicist, was born on December 29, 1938, in Zhenping County, Henan Province, China. After graduating from the Department of Physics, Nankai University in 1962, he joined the Institute of Semiconductors, Chinese Academy of Sciences, until now.

Prof. Wang has made outstanding achievements in the field of semiconductor materials and material physics. He has engaged in the study of the irradiation effect of silicon solar cells used in artificial satellites and the devices/modules in nuclear transient irradiation in his early career, which significantly contributed to the realization of atomic/hydrogen bombs and artificial satellites in China. Prof. Wang joined the Department of Solid State Physics, the University of Lund, from 1980 to 1983, where he worked on deep energy level physics and photoluminescence studies of semiconductors. He and collaborators developed a new method to identify whether the two-deep levels within a bandgap are coupled, thus solving the long-existing argument for the nature of gold-related donors and acceptors in silicon and A and B deep levels in liquid phase epitaxy grown GaAs. He proposed a physical model of deep level broadening and photoluminescence spectrum splitting in semiconductor alloys. In 1986, he joined Prof. Lanying Lin's group and grew the GaAs single crystal successfully in outer space for the first time. In 1993, he proposed a multi-level compensation model and new criteria of electrical compensation for undoped GaAs, which can not only explain the electrical conductivity of GaAs but also provide a clue for improving its quality. From 1993, he and his group work on the growth of semiconductor nanostructures and the fabrication of devices such as quantum cascade lasers, quantum dot lasers, and superluminescent diodes. He later proposed a conception of flexible substrates, which might open a new direction for developing heterostructure materials with a significant lattice mismatch.

Prof. Zhanguo Wang was awarded a number of National and Chinese Academy of Sciences Prizes and was elected the academician of the Chinese Academy of Sciences in 1995. He served as the deputy director in Division of Information Technology and Science and seventh presidium member in CAS, the deputy director of the Institute of Semiconductors, and the standing director of the Chinese Materials Research Society. In his career, he trained more than one hundred masters, Ph.D. students, and postdocs.

On December 29, 2018, Institute of Semiconductors CAS hosts a **celebration of the 60th Anniversary of Dedicating to Scientific Research of Prof. Zhanguo Wang and seminar on advanced semiconductor materials and devices** in Xijiao Hotel in Beijing. *Journal of Semiconductors* invites several experts from the seminar to submit their review and original research papers in the fields of semiconductors. This special issue contains four review papers, four research papers, and one News and Views which are from Leibniz University Hannover, RWTH Aachen University, Institute of Semiconductors CAS, Suzhou Institute of Nano-Tech and Nano-Bionics CAS, Beijing Jiaotong University, etc. The latest progress and development of this field in domestic and abroad are introduced. Prof. Zhijie Wang's review paper entitled "The application of perovskite materials in solar water splitting" from Institute of Semiconductors CAS, Prof. Fei Ding's review paper entitled "Strain tunable quantum dot-based non-classical photon sources" from Leibniz University Hannover, and Prof. Chao Zhao's review paper entitled "Boron-doped III-V semiconductors for Si-based optoelectronic devices" follow Prof. Zhanguo Wang's main research direction, and introduce the latest development in semiconductor materials and devices research.

We hope this special issue will promote the academic exchange, help the development of semiconductor science, and celebrate the 60th anniversary of dedicating to scientific research of Prof. Zhanguo Wang.