EDITORIAL

*Journal of Semiconductors*
(2020) 41, 080101
doi: 10.1088/1674-4926/41/8/080101

# Preface to the Special Issue on Monoelemental 2D Semiconducting Materials and Their Applications

**Guest Editors**

**Han Zhang**
*Institute of Microscale Optoelectronics (IMO), Shenzhen University, Shenzhen, 518060, China*
*Email: hzhang@szu.edu.cn*

**Xiantao Jiang**
*College of Chemistry and Environmental Engineering, Shenzhen University, Shenzhen, 518060, China*
*Email: jiangxtemail@sina.com*

**Yeliang Wang**
*School of Information and Electronics, Beijing Institute of Technology, Beijing, 100081, China*
*Email: yeliang.wang@bit.edu.cn*

**Krassimir Panajotov**
*Department of Applied Physics and Photonics (IR-TONA), Vrije Universiteit Brussels, Pleinlaan 2, B-1050 Brussels, Belgium*
*Email: kpanajot@b-phot.org*

**Shengli Zhang**
*School of Materials Science and Engineering, Nanjing University of Science and Technology, Nanjing, 210094, China*
*Email: zhangslvip@njust.edu.cn*

Atomically monolayer 2D material was predicted thermal dynamically unstable, until the ground-breakthrough reports of the isolation of graphene in 2004, which was shortly recognized by the Nobel Prize in 2010. Monoelemental graphene inherits the merits of simple stoichiometry and crystal structure, which offers the possibilities for basic physics scenarios demonstrations and a great deal of functional devices explorations. The recent decades have witnessed the unprecedented enthusiasm of investigations and fruitful achievements on the nano-platform of graphene. Recently, the family of monoelemental 2D materials has embraced the birth of multiple members, including silicene, germanene, phosphorene, and so forth. Moreover, heterostructures and superlattices of monoelemental 2D materials have opened a new realm in materials science, offering unlimited possibilities.

In this special issue, we collected 6 original articles, 3 comprehensive reviews, and 2 research news from the leading research groups, and we are grateful to have received such warm feedback and support. This special issue presented the cutting-edge material fabrication techniques **[Yixuan Fan *et al.*]**, remarkable performance of devices **[Chang Li *et al.*]**, basic mechanism explorations **[Carolien Castenmiller *et al.*, Qian Yang *et al.*]**, theory predictions **[Qiang Gao et al., Hengze Qu *et al.*]**, and state-of-art research progress reviews **[Hanliu Zhao *et al.*, Xiaolin Cai *et al.*, and Peiwen Yuan *et al.*]** of monoelemental 2D materials. Particularly, Zhou *et al.* **[Jingshu Zhou *et al.*]** reported their exciting results of photodetectors based on 2D material/Si heterostructure, which shows the possibility of integrating of 2D materials and traditional semiconductor fabrication processes. Zhong *et al.* **[Mianzeng Zhong *et al.*]** introduced a novel single-element 2D semiconductor: black arsenic, which is analogous of black phosphorus and has been shown to demonstrate extraordinary electronic properties.

We sincerely hope that the researchers working in this hot area could benefit a lot from the published papers in this special issue. And we also welcome the authors working in this area could publish their high impact works in the *Journal of Semiconductors*.