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Nonlinear Photonics and Optoelectronics of 2D Materials

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时间: 3月1日 (星期四) 15:00—16:30

地点: 北京大学物理大楼西楼202报告厅

•**摘要:** Our research interests are mainly focused on the light-matter interactions in 2D materials. In order to fabricate improved graphene photodetectors working in different spectral ranges, we integrated graphene with other 2D materials with variant electronic structures, *for example*, graphene/perovskite for visible light detection, graphene/MoTe₂ and graphene/Cu_{3-x}P for near infrared light detection, and graphene-Bi₂Te₃ for broadband infrared light detection. It is found that the photo-gating effect plays an important role to amplify the photocurrent. Furthermore, we developed new methods to grow and transfer large area single crystal WS₂, large area MoS₂/WS₂ heterojunction array, and monolayer-bilayer WSe₂ heterojunction, and demonstrated their applications for highly responsive photoelectric devices with large photo-active area. We investigated plasmonic excitation and THz modulation in graphene/Bi₂Te₃, graphene nanoribbon and 3D graphene using either spectroscopic or real space imaging techniques. The important discoveries include the plasmonic coupling of two Dirac materials, excitation of high-order mode [9] and edge chirality-related plasmonic broadening. Lastly, we report our recent progress on the synthesis of 2D non-layered perovskite nanosheets as well as their optoelectronic applications in waveguide, photodetectors, fiber lasers, LED and solar cells. In summary, the advances of 2D materials may pave the way for the next generation photonic and optoelectronic applications.

•**报告人简介:** Dr. Qiaoliang Bao received his Bachelor (2000) and Master (2003) degree from School of Materials Science and Engineering, Wuhan University of Technology, and Ph. D degree from Physics Department, Wuhan University (2007). From 2008 to 2012, he has been working on graphene photonics in Graphene Research Centre, National University of Singapore (NUS). He is now appointed as tenured Associated Professor at Department of Materials Science and Engineering, Monash University, Australia. He has authored or co-authored more than 150 refereed journal articles with more than 13,000 total citations and an H-index of 48. His research interests include synthesis and optical characterization of two-dimensional materials as well as their incorporation into photonic and optoelectronic devices.

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