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"As an emerging 2D material, black phosphorus (or phosphorene) has recently attracted extensive attention after graphene. The unique physical and chemical properties endow it with potential optoelectronic applications. This book showcases many aspects of the synthesis, fabrication, and integration of these materials."

Prof. Zhen Zhou
Nankai University, China

"This timely book illustrates the intrinsic properties of a new star, black phosphorus, a layered 2D material beyond graphene. It not only covers the detailed mechanisms of the electronic and phononic properties of black phosphorus, but also illustrates real issues related to its applications such as growth and device fabrication."

Prof. Junfeng Gao
Dalian University of Technology, China

This book is the first attempt to systematically present the progress in the research of phosphorene, an elemental 2D material that, like the intensively studied graphene, can be exfoliated by mechanical or liquid methods. It provides a comprehensive overview of the synthesis, growth, characterization, and applications of phosphorene. It also compiles cutting-edge research in the field with respect to thermal conduction, transistors, and electrochemical applications and encompasses the intrinsic properties (structural, electronic, defective, and phononic) of phosphorene. Edited by three prominent theoretical researchers, the book provides details various phenomena observed for phosphorene. It will benefit graduate students of physics, chemistry, electrical and electronics engineering, and materials science and engineering; researchers in nanoscience working on phosphorene and similar 2D materials; and anyone involved in nanotechnology, nanoelectronics, materials preparation, and device fabrication based on layered materials.

Yongqing Cai is a theoretical scientist specializing in computational physics and condensed matter. He obtained his bachelor's (2004) and master's (2007) in materials science and engineering from Northwestern Polytechnical University, China. Thereafter, he attended the National University of Singapore and completed his PhD in 2012 in quantum simulation of electronic transport processes for spintronics applications. His research is focused on quantum first-principles simulations on electronic and phononic properties of nanomaterials.

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Yong-Wei Zhang is principal scientist and deputy executive director at the Institute of High Performance Computing (IHPC), A*STAR, Singapore. He received his PhD from Northwestern Polytechnical University, China, after which he worked at several prestigious institutions, including Brown University, USA. His research is focused on using theory, modeling, and computation as tools to study the relationship between structures and properties of materials, mechanical-thermal coupling and mechanical-electronic coupling of 1D and 2D materials, mechanics in biology and bio-inspired materials, and design.

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