

# Preface

Graphene is an allotrope of carbon in the form of a single layer of atoms in a two-dimensional hexagonal lattice in which one atom forms each vertex. It is the basic structural element of other allotropes, including graphite, charcoal, carbon nanotubes and fullerenes. It can also be considered as an indefinitely large aromatic molecule, the ultimate case of the family of flat polycyclic aromatic hydrocarbons.

Graphene has a unique set of properties which set it apart from other materials. In proportion to its thickness, it is about 100 times stronger than the strongest steel. It conducts heat and electricity very efficiently and is nearly transparent. Graphene also shows a large and nonlinear diamagnetism, even greater than graphite, and can be levitated by Nd-Fe-B magnets. Researchers have identified the bipolar transistor effect, ballistic transport of charges and large quantum oscillations in the material.<sup>1</sup>

In the present book, thirty-three typical literatures about Graphene published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on Graphene. We hope this book can demonstrate advances in Graphene as well as give references to the researchers, students and other related people.

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<sup>1</sup><https://en.wikipedia.org/wiki/Graphene>.