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Hideo Aoki • Mildred S. Dresselhaus
Editors

Physics of Graphene

 Springer

Editors

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Preface

Fascination with graphene has been growing very rapidly in recent years and the physics of graphene is now becoming one of the most interesting as well as the most fast-moving topics in condensed-matter physics. Needless to say, the Nobel prize in physics awarded to Andre Geim and Konstantin Novoselov in 2010 has given a tremendous impetus to this topic. Several years have passed since Andre Geim and his group put forward their method for the fabrication of graphene, as a result of which an anomalous quantum Hall effect was observed. This, however, is only one of the hallmarks of the unusual properties of the graphene system. The horizon of the physics of graphene is ever becoming wider, where physical concepts go hand in hand with advances in experimental techniques. Thus we are now expanding our interests to not only transport but also optical and other properties for layered systems that include multilayers as well as monolayer graphene.

Thus it should be very timely to publish a book that overviews the physics of graphene, which is exactly why we have edited the present volume, where general and fundamental aspects in the physics of graphene are overviewed by outstanding authorities. The book comprises five experimental and five theoretical chapters. A birds' eye view of the chapter contents is given in the figure overleaf.

We have endeavored to have reasonable levels of accessibility to students as well, with some heuristic introductions in each chapter. Given the unusually rapid progress in the field of graphene, we have found it impossible to cover all the frontiers, while parts of the chapters do extend to advanced levels. For instance, we have not covered much on graphene applications, which would require another volume. We hope the state-of-the-art articles presented here on graphene physics, which start from the “massless Dirac particle” and proceed with further unique aspects of graphene, will benefit a wide audience, and encourage them to go even further and to explore new avenues in this fascinating topic.

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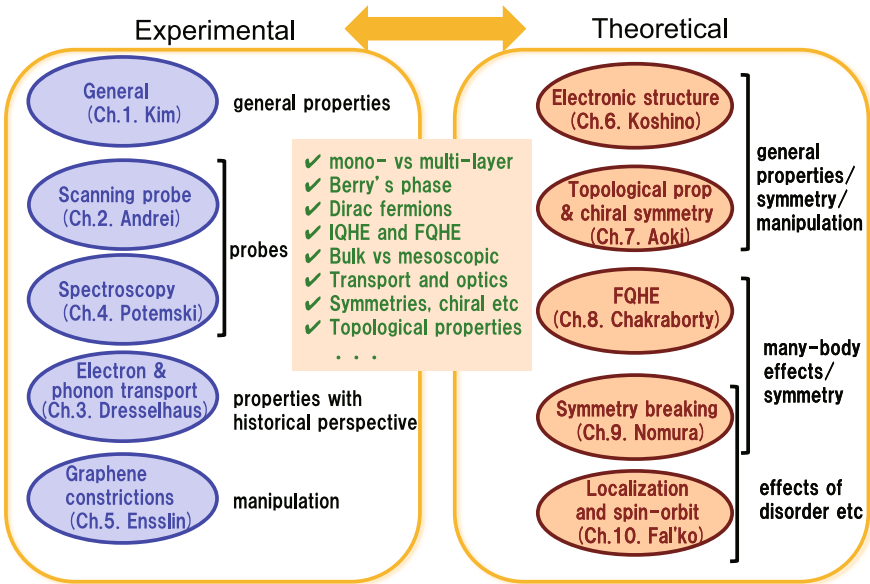


Fig. 1 Plan of the book

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