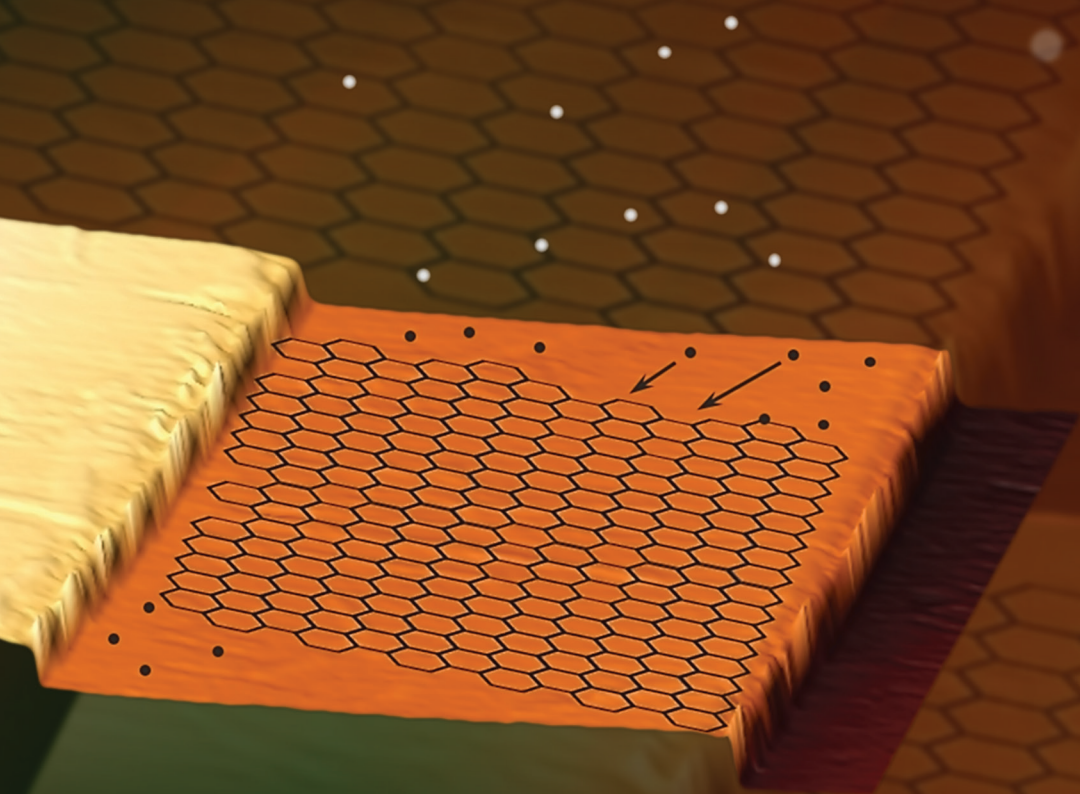


# Epitaxial Graphene on Silicon Carbide

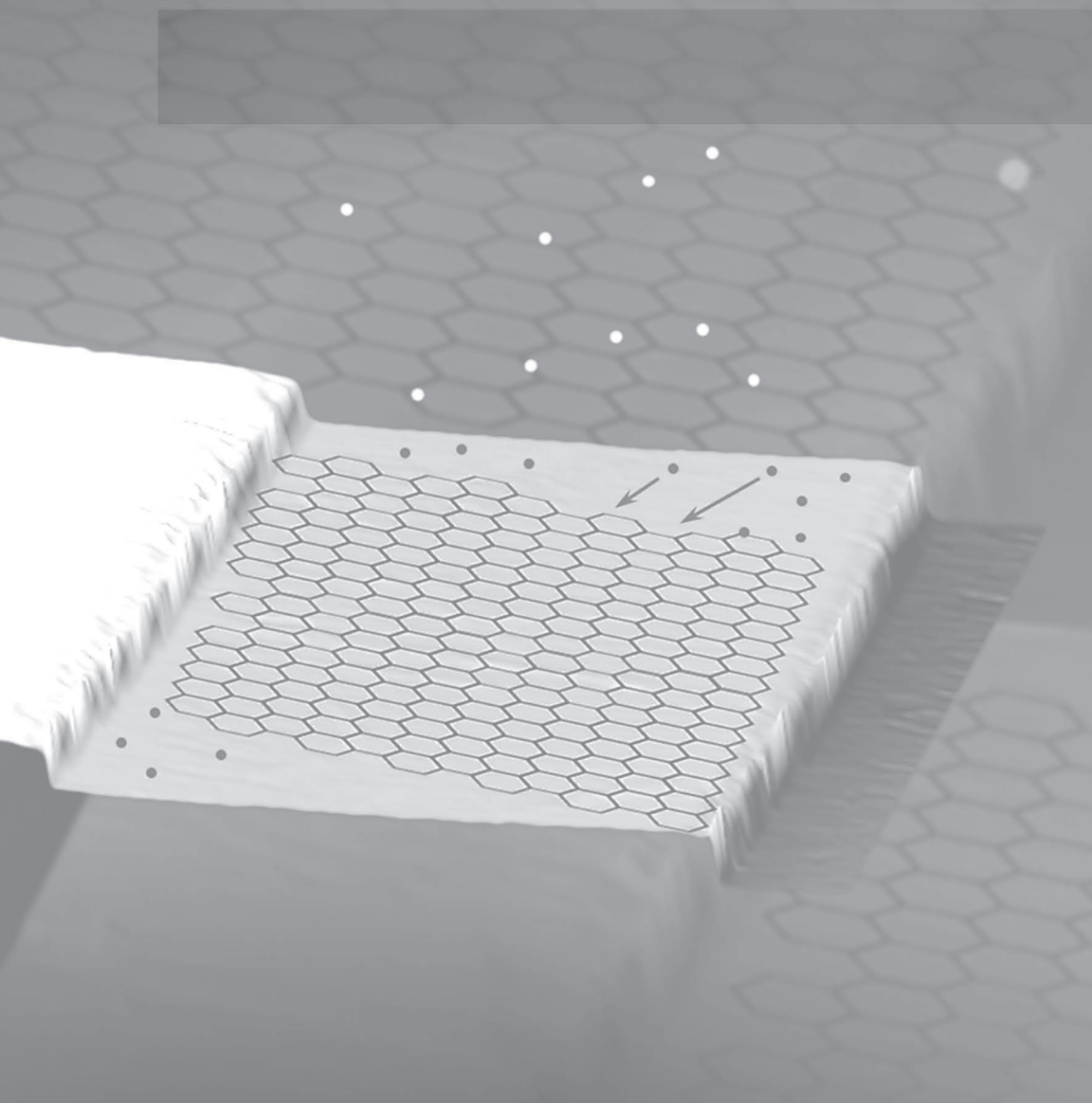
Modeling, Characterization, and Applications

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# Preface

We are pleased to present the first book dedicated exclusively to epitaxial graphene on silicon carbide (SiC). This book comprehensively addresses all relevant aspects of the study and technological development of epitaxial graphene materials and their applications. It comprises chapters contributed by a selected group of experts from Europe and Asia who have placed their research on the specific characteristics of epitaxial graphene on SiC herein in an organized manner. Importantly, each chapter provides a vision on the current state of the art of the discussed materials.

The book covers fundamental aspects of epitaxial graphene on SiC, as addressed by quantum Hall effect studies along with relevant examples on the synthesis, and probe-based characterization techniques, such as scanning tunneling microscopy and atomic resolution imaging based on transmission electron microscopy. Additionally, it addresses the processing of epitaxial graphene on SiC materials by describing pertinent methods for the fabrication of electronic devices and the fundamental aspects of their performance. It is noteworthy that it complements experimental works with theoretical modeling and simulation studies. Because of this compilation, it makes basic comprehension of epitaxial graphene on SiC substrates and its potential for electronic applications accessible.

Particularly, the book includes the state of the art on the synthesis of epitaxial graphene on SiC. It profusely explains the production process as a function of SiC substrate characteristics, such as polytype, polarity, and wafer cut, and complements the processing techniques, such as in situ and ex situ conditioning, including H<sub>2</sub> pre-deposition annealing, chemical-mechanical polishing, among others. It also generously describes growth studies including the most popular techniques for high-quality controlled deposition, such as ultrahigh vacuum processing and partial pressure or graphite cap-controlled sublimation techniques.

The book has been made possible by a supportive group of experts who have multidisciplinary backgrounds in physics, electronic engineering, materials science, and nanotechnology.

We sincerely acknowledge their effort and collaboration and hope that the readers will find their contributions useful and highly enlightening for learning or reviewing the main aspects of epitaxial graphene on SiC research.

**Gemma Rius**  
**Philippe Godignon**  
Autumn 2017