

# Contents

---

Preface.....	ix
Acknowledgments .....	xi
Editor .....	xiii
Contributors .....	xv

## **PART I Nanocomposites**

---

1 Carbon Nanotube/Polymer Composites.....	1-1
<i>Hua Deng, Asa H. Barber, and Ton Peijs</i>	
2 Printable Metal Nanoparticle Inks.....	2-1
<i>Bibin T. Anto, Loke-Yuen Wong, Rui-Qi Png, Sankaran Sivaramakrishnan, Lay-Lay Chua, and Peter K. H. Ho</i>	
3 Polymer-Clay Nanocomposites .....	3-1
<i>Sabrina Pricl, Paola Posocco, Giulio Scocchi, and Maurizio Fermeglia</i>	
4 Biofunctionalized TiO <sub>2</sub> -Based Nanocomposites.....	4-1
<i>Tijana Rajh, Nada M. Dimitrijevic, Adam Elhofy, and Elena Rozhkova</i>	
5 Nanocolorants .....	5-1
<i>Qing Zhang</i>	
6 Magnetoelectric Interactions in Multiferroic Nanocomposites .....	6-1
<i>Vladimir M. Petrov and Gopalan Srinivasan</i>	
7 Strain-Induced Disorder in Ferroic Nanocomposites.....	7-1
<i>Anna N. Morozovska and Eugene A. Eliseev</i>	
8 Smart Composite Systems with Nanopositioning.....	8-1
<i>Kougen Ma and Mehrdad N. Ghasemi-Nejhad</i>	

## **PART II Nanoporous and Nanocage Materials**

---

9 Nanoporous Materials.....	9-1
<i>Zheng-Ming Wang</i>	
10 Ordered Nanoporous Structure.....	10-1
<i>Jun Shen, Bin Chu, and Yuan Liu</i>	
11 Giant Nanomembrane.....	11-1
<i>Hirohmi Watanabe and Toyoki Kunitake</i>	

12	Graphitic Foams.....	12-1
	<i>Juan Matos, Eduardo B. Barros, Josue Mendes Filho, and Antonio G. Souza Filho</i>	
13	Arrayed Nanoporous Silicon Pillars.....	13-1
	<i>Xin Jian Li</i>	
14	Nanoporous Anodic Oxides.....	14-1
	<i>Martin S. Bojinov</i>	
15	Metal Oxide Nanohole Array.....	15-1
	<i>Tsuyoshi Hamaguchi, Masayoshi Uno, and Shinsuke Yamanaka</i>	
16	From Silicon to Carbon Clathrates: Nanocage Materials.....	16-1
	<i>Patrice Mélinon and Alfonso San Miguel</i>	

### PART III Nanolayers

---

17	Self-Assembled Monolayers.....	17-1
	<i>Frank Hagelberg</i>	
18	Graphene and Boron Nitride Single Layers.....	18-1
	<i>Thomas Greber</i>	
19	Epitaxial Graphene.....	19-1
	<i>Walt A. de Heer, Xiaosong Wu, and Claire Berger</i>	
20	Electronic Structure of Graphene Nanoribbons.....	20-1
	<i>Juan Jose Palacios, Joaquin Fernández-Rossier, Luis Brey, and Herb A. Fertig</i>	
21	Transport in Graphene Nanostructures.....	21-1
	<i>Christoph Stampfer, Johannes Güttinger, Françoise Molitor, Stephan Schnez, Eric Schurtenberger, Arnhild Jacobsen, Sarah Hellmüller, Thomas Ihn, and Klaus Ensslin</i>	
22	Magnetic Graphene Nanostructures.....	22-1
	<i>Oleg V. Yazyev</i>	
23	Graphene Quantum Dots.....	23-1
	<i>Prabath Hewageegana and Vadym Apalkov</i>	
24	Gas Molecules on Graphene.....	24-1
	<i>Tim O. Wehling, Mikhail I. Katsnelson, and Alexander I. Lichtenstein</i>	
25	Graphene Cones.....	25-1
	<i>Henning Heiberg-Andersen, Gavin Stuart Walker, Ane Torbjørn Skjeltorp, and Stine Nalum Naess</i>	

### PART IV Indentation and Patterning

---

26	Theory of Nanoindentation.....	26-1
	<i>Zhi-Qiang Feng, Qi-Chang He, Qingfeng Zeng, and Pierre Joli</i>	
27	Nanoindentation on Silicon.....	27-1
	<i>Tong Hong Wang, Te-Hua Fang, and Yu-Cheng Lin</i>	
28	Nanohole Arrays on Silicon.....	28-1
	<i>Hidetaka Asoh and Sachiko Ono</i>	
29	Nanoindentation of Biomaterials.....	29-1
	<i>Jin Tong, Jiyu Sun, and Jiang Zhou</i>	

30	Writing with Nanoparticles .....	30-1
	<i>Debdulal Roy</i>	
31	Substrate Self-Patterning .....	31-1
	<i>Jens Falta and Thomas Schmidt</i>	

## **PART V Nanosensors**

---

32	Nanoscale Characterization with Fluorescent Nanoparticles .....	32-1
	<i>Lionel Aigouy and Michel Mortier</i>	
33	Optochemical Nanosensors .....	33-1
	<i>Yong-Eun Koo Lee and Raoul Kopelman</i>	
34	Quantum Dot Infrared Photodetectors and Focal Plane Arrays.....	34-1
	<i>Xuejun Lu</i>	

## **PART VI Nano-Oscillators**

---

35	Nanomechanical Resonators.....	35-1
	<i>Josef-Stefan Wenzler, Matthias Imboden, Tyler Dunn, Diego Guerra, and Pritiraj Mohanty</i>	
36	Mechanics of Nanoscaled Oscillators.....	36-1
	<i>Duangkamon Baowan, Ngamta Thamwattana, Barry J. Cox, and James M. Hill</i>	
37	Nanoelectromechanical Resonators .....	37-1
	<i>Andrew N. Cleland</i>	
38	Spin-Transfer Nano-Oscillators.....	38-1
	<i>Stephen E. Russek, William H. Rippard, Thomas Cecil, and Ranko Heindl</i>	

## **PART VII Hydrogen Storage**

---

39	Endohedrally Hydrogen-Doped Fullerenes.....	39-1
	<i>Lemi Türker and Çağlar Çelik Bayar</i>	
40	Molecular Hydrogen in Carbon Nanostructures .....	40-1
	<i>Felix Fernandez-Alonso, Francisco Javier Bermejo, and Marie-Louise Saboungi</i>	
41	Hydrogen Storage in Nanoporous Carbon .....	41-1
	<i>Iván Cabria, María J. López, and Julio A. Alonso</i>	
42	Hydrogen Adsorption in Nanoporous Materials .....	42-1
	<i>Pierre Bénard, Richard Chahine, and Marc-André Richard</i>	
<b>Index</b> .....		<b>Index-1</b>