

1. Record Nr.	UNINA9910831075903321
Titolo	Silicon nanomembranes : fundamental science and applications // edited by John A. Rogers and Jong-Hyun Ahn
Pubbl/distr/stampa	Weinheim, Germany : , : Wiley-VCH Verlag GmbH & Co. KGaA, , 2016 ©2016
ISBN	3-527-69100-6 3-527-69099-9
Descrizione fisica	1 online resource (369 p.)
Disciplina	660.2842
Soggetti	Membranes (Technology) Nanosilicon
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Cover; Title Page; Copyright; Contents; List of Contributors; Part 1 Materials and Processes; Chapter 1 Synthesis, Assembly, and Applications of Semiconductor Nanomembranes; 1.1 Introduction; 1.2 Strategies for Forming Silicon Nanomembranes; 1.2.1 Selective Etching to Release Nanomembranes from Layered Assemblies; 1.2.2 Anisotropic Etching to Release Silicon Nanomembranes from Bulk Silicon Wafers; 1.3 Transfer Printing for Deterministic Assembly; 1.3.1 Introduction; 1.3.2 Mechanics of Transfer Printing; 1.3.3 Transfer Printing for Single- and Multilayer Deterministic Assembly 1.4 Compressive Buckling for Deterministic Assembly1.4.1 Introduction; 1.4.2 Buckling on Compliant Substrates for Wavy Layouts; 1.4.3 Patterned Adhesion for Controlled, Large-Scale Buckling; 1.4.4 Deterministic Assembly of Complex, Three-Dimensional Architectures by Compressive Buckling; 1.5 Functional Devices Made from Silicon Nanomembranes; 1.5.1 Physically Transient Electronics; 1.5.2 Injectable, Cellular-Scale Optoelectronic Devices for the Brain; 1.5.3 Three-Dimensional Integumentary Membranes for Spatiotemporal Cardiac Measurements; 1.5.4 Arthropod Eyes Inspired Digital Camera 1.5.5 Cephalopod Skins Inspired Optoelectronic Camouflage Systems1. 6 Conclusions and Outlook; References; Chapter 2 Models of Reactive

Diffusion for Resorbable Electronics; 2.1 Introduction; 2.2 Hydrolysis of Silicon Nanomembranes; 2.3 Material-Level Dissolution; 2.4 Dissolution of Device with Layered Structures; 2.5 Discussion and Conclusion; Acknowledgments; References; Part 2 Applications in Bio-Integrated and Flexible Electronics; Chapter 3 Transparent and Foldable Electronics Enabled by Si Nanomembranes; 3.1 Introduction; 3.2 Fabrication; 3.3 Characterization
3.3.1 Mechanical Properties of Si NM in Bending and Stretching
3.3.2 Optical Properties; 3.3.3 Piezoresistive Effect in Si NM; 3.4 Configurations of Transparent and Foldable Electronic Devices; 3.4.1 Representative Materials for Transparent and Foldable Electronics; 3.4.2 Electrical and Optical Properties of Transparent TFTs; 3.4.3 Modification of the Bending Stiffness with Substrate Thickness; 3.4.4 Electromechanical Properties of Foldable TFTs; 3.4.5 Control of Stiffness by Thinning of Si for Stretchable Electronic Devices; 3.4.6 Control of Strain Distribution by Geometrical Design
3.4.7 Mechanical Properties of Stretchable Inverters
3.5 Concluding Remarks; References; Chapter 4 High-Performance Flexible Electronic and Optoelectronic Devices by Mechanical Exfoliation from a Brittle Substrate; 4.1 Introduction; 4.2 Steady-State Substrate Cracking Parallel to the Interface in a Bilayers; 4.3 Spalling-Mode Fracture for Layer Transfer; 4.4 High-Performance Flexible Electronics by Controlled Spalling; 4.4.1 Ultra-Low-Power Nanoscale Silicon Integrated Circuits on Plastic; 4.4.2 Electrical Characteristics of Flexible Devices and Circuits
4.4.3 Effect of Strain on Device Performance
