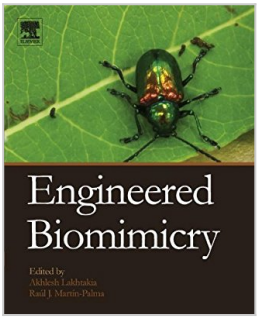

Engineered Biomimicry

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Engineered Biomimicry covers a broad range of research topics in the emerging discipline of biomimicry. Biologically inspired science and technology, using the principles of math and physics, has led to the development of products as ubiquitous as Velcro™ (modeled after the spiny hooks on plant seeds and fruits). Readers will learn to take ideas and concepts like this from nature, implement them in research, and understand and explain diverse phenomena and their related functions. From bioinspired computing and medical products to biomimetic applications like artificial muscles, MEMS, textiles and vision sensors, *Engineered Biomimicry* explores a wide range of technologies informed by living natural systems.

Engineered Biomimicry helps physicists, engineers and material scientists seek solutions in nature to the most pressing technical problems of our times, while providing a solid understanding of the important role of biophysics. Some physical applications include adhesion superhydrophobicity and self-cleaning, structural coloration, photonic devices, biomaterials and composite materials, sensor systems, robotics and locomotion, and ultra-lightweight structures.

- Explores biomimicry, a fast-growing, cross-disciplinary field in which researchers study biological activities in nature to make critical advancements in science and engineering
- Introduces bioinspiration, biomimetics, and bioreplication, and provides biological background and practical applications for each
- Cutting-edge topics include bio-inspired robotics, microflyers, surface modification and more

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Editorial Review

Review

*"Chemical, electrical, and mechanical engineers explain the basic process of mimicking biological systems to achieve certain goals, and illustrate them with some recent examples. Among their topics are noise exploitation and adaptation in neuromorphic sensors, biomimetic robotics, surface modification for bio-compatibility, biomimetic anti-reflection surfaces…"--**Reference & Research Book News,** **October 2013***

From the Back Cover

Engineered Biomimicry

Living organisms provide inspiration for innovations in many different arenas of science and engineering. ***Engineered Biomimicry*** provides exposure to a broad range of research topics within an evolving field comprising bioinspiration, biomimetics, and bioreplication. The reader will learn to grasp concepts from nature, implement them into his/her research, and gain the ability to understand and reproduce a diversity of natural outcomes, functionalities, and devices. Like any mimicked organism, the field of engineered biomimicry is highly cross-disciplinary and embraces physics, materials science, nanotechnology, biology, chemistry, computing and control, design integration, optimization, multifunctionality, and economics. ***Engineered Biomimicry*** will help the reader seek solutions in nature to address the most pressing technological problems of our times. Among the research topics covered are adhesion, superhydrophobicity and self-cleaning, structural color, biomaterials and composite materials, sensor systems, robotics and locomotion, and ultra-light-weight structures.

As the only technical reference that covers the broad scope of the field of engineered biomimicry through chapters authored by visionary and award-winning research leaders, this book is a major resource that presents physical and chemical mechanisms underlying biological activities and devices and introduces appropriate mathematical tools.

KEY FEATURES

Provides physical, chemical, and biological backgrounds for practical applications of engineered biomimicry **About the editors:Akhlesh Lakhtakia** is the Charles Godfrey Binder (Endowed) Professor of Engineering Science and Mechanics at Pennsylvania State University. He has published 725 papers and 5 books, and edited 11 research books and 14 conference proceedings. He is the founding Editor in Chief of the Journal of Nanophotonics (SPIE) and a Fellow of the American Association for the Advancement of Sciences, American Physical Society, Optical Society of America, Institute of Physics (UK), and SPIE. Among his many awards is the 2010 SPIE Technical Achievement Award. **Raúl J. Martín-Palma** is a Professor of Applied Physics at Universidad Autónoma de Madrid, Spain. He has published over 100 papers and is co-author of two books in nanoscience and nanotechnology. A Fellow of SPIE, he is also an Associate Editor of the Journal of Nanophotonics (SPIE). He has received several awards on his research on nanoscience. Shelving code: Applied PhysicsAbout the Author
Raúl José Martín-Palma is Adjunct Professor of Materials Science and Engineering at Universidad Autonoma de Madrid, Spain. His research interests include work in nanostructures and nanotechnology,

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