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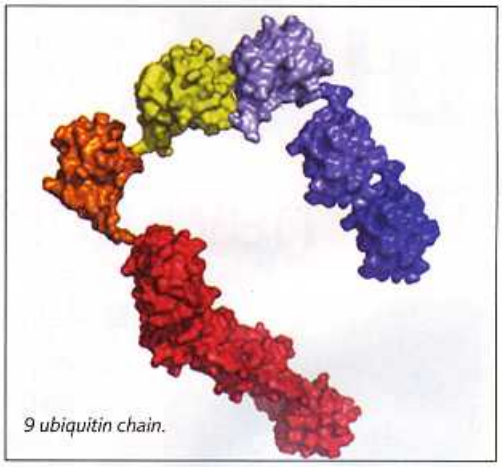
Regulars

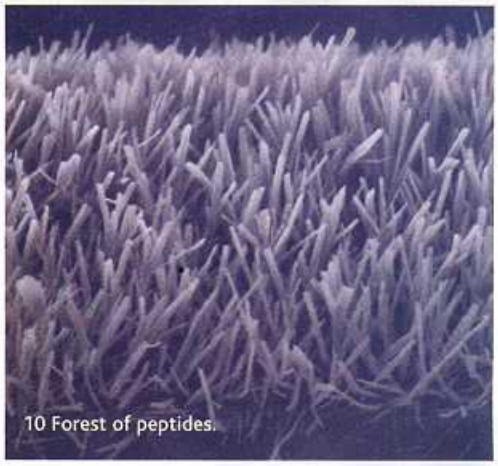
Updates

Cover Image

Courtesy of Jaemyung Kim, Franklin Kim and Jiaxing Huang, Department of Materials Science and Engineering, Northwestern University, Evanston, IL 60208 USA — Seeing graphene-based sheets, page 28.



9 ubiquitin chain.



10 Forest of peptides.

11 Art "inspired" by molecular worm research.

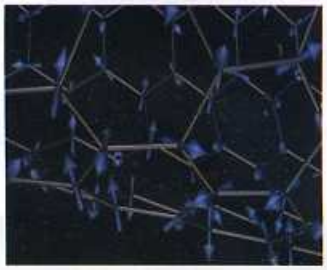
Lead story 12

The carbon new age

Graphene has been considered by many as a revolutionary material with electronic and structural properties that surpass conventional semiconductors and metals. Because of its exotic electronic properties, theorists are being forced to revisit the conceptual basis for the theory of metals. Hence, graphene seems to be unveiling a new era in science and technology with still unseen consequences.

Antonio H. Castro Neto

The new carbon age



Review 18

Carbon nanotubes for coherent spintronics

Kuemmeth *et al.* review the basic principles of fabricating spin-electronic devices based on individual, electrically-gated carbon nanotubes, and present experimental efforts to understand their electronic and nuclear spin degrees of freedom, which in the future may enable quantum applications.

F. Kuemmeth, H. O. H. Churchill, P. K. Herring, and C. M. Marcus

Review 28

Seeing graphene-based sheets

Kim *et al.* provides an overview of current imaging techniques for graphene-based sheets and highlights a recently developed fluorescence quenching microscopy technique that allows high-throughput, high-contrast imaging of graphene-based sheets on arbitrary substrate and even in solution.

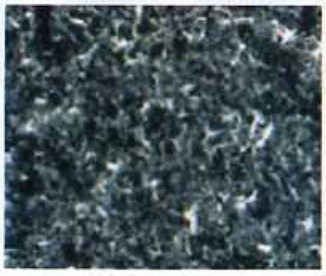
Jaemyung Kim, Franklin Kim and Jiaxing Huang

Review 44

Graphene single-electron transistors

Graphene, a single layer of carbon atoms forming a perfectly stable and clean two-dimensional crystal with very few defects, has been proclaimed to be a new revolutionary material for electronics.

T. Ihn, J. Güttinger, F. Molitor, S. Schnez, E. Schurtenberger, A. Jacobsen, S. Hellmüller, T. Frey, S. Dröscher, C. Stampfer, K. Ensslin



Review 52

Graphene, a promising transparent conductor

New electronic devices such as touch screens, flexible displays, printable electronics, solid-state lighting and thin film photovoltaics have led to a rapidly growing market for flexible transparent conductors.

Jonathan K. Wassei and Richard B. Kaner

Next issue

***Materials Today* looks at biomaterials: surfaces and interfaces**

Non-toxic antifouling strategies

This review focuses on antifouling biomaterials for marine and biomedical applications. The surface chemistry and physical properties of the substratum are both crucial to preventing the recruitment of biofouling organisms.

Chemistry and material science at the cell surface

To date, cell surface engineering has primarily been a subject of molecular biology. However, tools developed by chemists and material scientists provide simple alternatives to the genetic and biosynthetic approaches.

Chemical patterning in biointerface science

This review provides an overview of state-of-the-art fabrication tools for creating chemical patterns over length scales ranging from millimeters to micrometers to nanometers.

Molecularly controlled functional architectures at biointerfaces

The design and synthesis of molecularly or supra-molecularly defined interfacial architectures have seen in recent years a remarkable growth of interest and scientific research activities for various reasons.