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*Subra Suresh*

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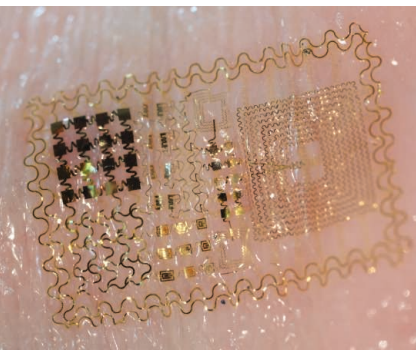
## COVER

Low-energy (<10 millielectron volts) electronic spectra of bilayer graphene undergoing nematic phase transition from an isotropic, unperturbed form (top left) to an asymmetric form (bottom right). Electron-electron interactions in suspended graphene layers drive this transition, causing a change in the material's band structure and, thus, its electronic properties. See page 860.

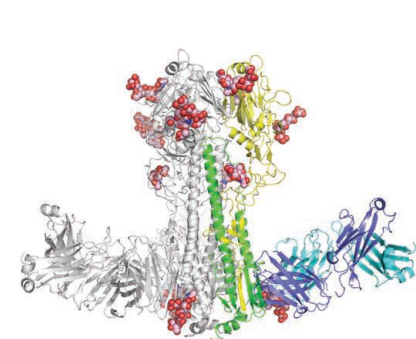
Image: *Kostya S. Novoselov/University of Manchester and Yael Fitzpatrick/Science*

## DEPARTMENTS

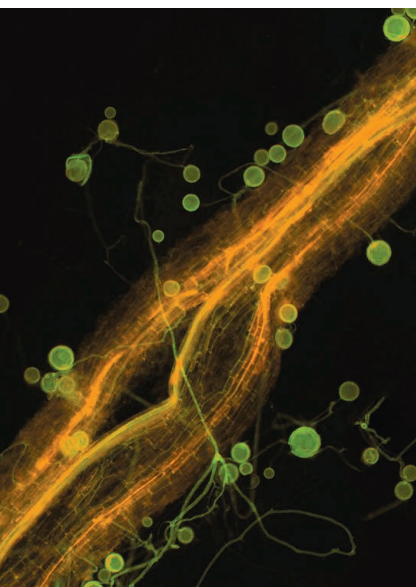
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**BREVIA**

- 837** A Simple Type of Wood in Two Early Devonian Plants  
*P. Gerrienne et al.*  
The earliest evolution of wood occurred in plants of surprisingly small stature.

**RESEARCH ARTICLES**

- 838** Epidermal Electronics  
*D.-H. Kim et al.*  
Electronic systems with physical properties matched to the human epidermis can be used in clinical monitoring.  
>> *Perspective p. 830; Science Podcast*
- 843** A Highly Conserved Neutralizing Epitope on Group 2 Influenza A Viruses  
*D. C. Ekiert et al.*  
An antibody against a conserved epitope broadly neutralizes group 2 influenza viruses.
- 850** A Neutralizing Antibody Selected from Plasma Cells That Binds to Group 1 and Group 2 Influenza A Hemagglutinins  
*D. Corti et al.*  
An antibody able to broadly neutralize both group 1 and group 2 influenza A viruses—and its target epitope—are identified.  
>> *Perspective p. 834*
- 870** Viviparity and K-Selected Life History in a Mesozoic Marine Plesiosaur (Reptilia, Sauropterygia)  
*F. R. O'Keefe and L. M. Chiappe*  
Plesiosaurs gave birth to a single, live large offspring and may have engaged in maternal care.
- 874** Nest Inheritance Is the Missing Source of Direct Fitness in a Primitively Eusocial Insect  
*E. Leadbeater et al.*  
Fitness benefits from the inheritance of breeding resources may explain why *Polistes* wasps cooperate with nonrelatives.  
>> *Perspective p. 833*
- 876** Archaeorhizomycetes: Unearthing an Ancient Class of Ubiquitous Soil Fungi  
*A. Rosling et al.*  
Cultivation and cloning allow phylogenetic placement of a prominent fungal lineage.
- 880** Reciprocal Rewards Stabilize Cooperation in the Mycorrhizal Symbiosis  
*E. T. Kiers et al.*  
Plants and their associated fungi reward partners that offer the best resources to sustain mutualism in complex systems.  
>> *Perspective p. 828*
- 883** The Structure of the Kinesin-1 Motor-Tail Complex Reveals the Mechanism of Autoinhibition  
*H. Y. K. Kaan et al.*  
A tail domain autoinhibits a dimeric kinesin by preventing relative movement of the two motor domains.
- 885** *Drosophila Sex lethal* Gene Initiates Female Development in Germline Progenitors  
*K. Hashiyama et al.*  
Primordial germ cells are directed toward oogenesis even before they migrate to the gonads of the fruit fly.  
>> *Perspective p. 829*
- 888** Nicotinic Acetylcholine Receptor  $\beta 2$  Subunits in the Medial Prefrontal Cortex Control Attention  
*K. Guillem et al.*  
An important molecular mechanism involved in cognition has been unraveled.
- 891** Schema-Dependent Gene Activation and Memory Encoding in Neocortex  
*D. Tse et al.*  
New hippocampal-dependent learning is in parallel consolidated with existing memories in the neocortex.

**REPORTS**

- 856** Circumstellar Material in Type Ia Supernovae via Sodium Absorption Features  
*A. Sternberg et al.*  
Most of the progenitors of type Ia supernovae in nearby spiral galaxies may be white dwarf-normal star binary systems.
- 860** Interaction-Driven Spectrum Reconstruction in Bilayer Graphene  
*A. S. Mayorov et al.*  
A correlated-electron phase was observed at low temperatures in suspended graphene bilayers with high carrier mobilities.
- 863** A Synthetic Nickel Electrocatalyst with a Turnover Frequency Above  $100,000 \text{ s}^{-1}$  for  $\text{H}_2$  Production  
*M. L. Helm et al.*  
Precisely shaped basic ligands protect highly reactive protons and electrons to help accelerate catalytic hydrogen formation.
- 866** The Persistently Variable "Background" Stratospheric Aerosol Layer and Global Climate Change  
*S. Solomon et al.*  
An increase in the amount of aerosols in the stratosphere during the past decade has decreased the rate of global warming.

## SCIENCEONLINE

## SCIENCEEXPRESS

[www.sciencexpress.org](http://www.sciencexpress.org)

## Coherent Two-Dimensional Nanoscopy

*M. Aeschlimann et al.*

Coherent electronic states excited by ultrafast laser pulses were imaged at subwavelength resolution with photoelectrons.

10.1126/science.1209206

## Focused Evolution of HIV-1 Neutralizing Antibodies Revealed by Structures and Deep Sequencing

*X. Wu et al.*

Broadly neutralizing antibodies to HIV with similar specificities can be found in multiple HIV-infected individuals.

10.1126/science.1207532

## Ribosome Assembly Factors Prevent Premature Translation Initiation by 40S Assembly Intermediates

*B. S. Strunk et al.*

Ribosome assembly factors block multiple steps in translation initiation.

10.1126/science.1208245

Pyrazinamide Inhibits Trans-Translation in *Mycobacterium tuberculosis*

*W. Shi et al.*

The target of a first-line tuberculosis drug that acts against persister bacteria is identified.

10.1126/science.1208813

## Role for the Membrane Receptor Guanylyl Cyclase-C in Attention Deficiency and Hyperactive Behavior

*R. Gong et al.*

A receptor for gut hormones also functions in the brain, where its loss affects attention.

10.1126/science.1207675

## SCIENCE NOW

[www.sciencenow.org](http://www.sciencenow.org)

Highlights From Our Daily News Coverage

## Lab Chimps Extend a Helping Hand

Females aid their comrades even when it doesn't seem to do them any good.

<http://scim.ag/labchimps>

## The Fate of the First Black Hole

Or what do the band Rush, Stephen Hawking, and a bright source of x-rays have in common?

<http://scim.ag/holefate>

## Yeast Get By on Almost No Oxygen

Finding may explain success of oxygen-dependent organisms on early Earth.

<http://scim.ag/yeast-02>

## SCIENCE SIGNALING

[www.sciencesignaling.org](http://www.sciencesignaling.org)

The Signal Transduction Knowledge Environment

9 August issue: <http://scim.ag/ss080911>

## EDITORIAL GUIDE: Focus Issue—Cracking the G Protein–Coupled Receptor Code

*N. R. Gough*

Research reveals how GPCRs produce ligand-specific, cell-specific, and genome-specific responses.

RESEARCH ARTICLE: Distinct Phosphorylation Sites on the  $\beta_2$ -Adrenergic Receptor Establish a Barcode That Encodes Differential Functions of  $\beta$ -Arrestin

*K. N. Nobles et al.*

## PERSPECTIVE: Phosphorylation Barcoding as a Mechanism of Directing GPCR Signaling

*S. B. Liggett*

GRK-mediated phosphorylation patterns orchestrate GPCR signaling output.

## RESEARCH ARTICLE: Quantitative Encoding of the Effect of a Partial Agonist on Individual Opioid Receptors by Multisite Phosphorylation and Threshold Detection

*E. K. Lau et al.*

## PODCAST

*M. von Zastrow and A. M. VanHook*

Partial and full agonists enrich distinct populations of phosphorylated receptors.

RESEARCH ARTICLE: A Polymorphism-Specific “Memory” Mechanism in the  $\beta_2$ -Adrenergic Receptor

*A. Ahles et al.*

PERSPECTIVE:  $\beta_2$ -Adrenergic Receptor Polymorphisms and Signaling—Do Variants Influence the “Memory” of Receptor Activation?

*P. A. Insel*

Genetic variation in the  $\beta_2$ -adrenergic receptor produces distinct responses to repeated drug exposure.

## PERSPECTIVE: Intracellular Signaling and the Origins of the Sensations of Itch and Pain

*S. K. Ham and M. I. Simon*

Signals underlying itch and pain emanating from the application of the same compound may be encoded by different receptors.

## SCIENCE CAREERS

[www.sciencereers.org/career\\_magazine](http://www.sciencereers.org/career_magazine)

Free Career Resources for Scientists

## A Juggling Act in Paradise

*G. Koch*

Graduate student Kawika Winter directs a Hawaiian botanical garden and preserve.

[http://scim.ag/Kawika\\_Winter](http://scim.ag/Kawika_Winter)

## A Mathematician Takes to the Streets

*E. Pain*

Portuguese mathematician Sara Santos has forged a career communicating her passion for mathematics.

[http://scim.ag/Sara\\_Santos](http://scim.ag/Sara_Santos)

## SCIENCE TRANSLATIONAL MEDICINE

[www.sciencetranslationalmedicine.org](http://www.sciencetranslationalmedicine.org)

Integrating Medicine and Science

10 August issue: <http://scim.ag/stm081011>

## COMMENTARY: Core Facilities—Maximizing the Return on Investment

*G. K. Farber and L. Weiss*

Cutting-edge translational research requires specialized core facilities with highly trained staff.

## FOCUS: Type 1 Diabetes Immunotherapy—Is the Glass Half Empty or Half Full?

*K. C. Herold and J. A. Bluestone*

The islet cell preservation seen in immunotherapy clinical trials should motivate the diabetes community.

## RESEARCH ARTICLE: T Cells with Chimeric Antigen Receptors Have Potent Antitumor Effects and Can Establish Memory in Patients with Advanced Leukemia

*M. Kalos et al.*

Adoptively transferred gene-modified T cells eliminate leukemic cells and form functional memory cells.

RESEARCH ARTICLE: Curaxins—Anticancer Compounds That Simultaneously Suppress NF- $\kappa$ B and Activate p53 by Targeting FACT

*A. V. Gasparian et al.*

## PERSPECTIVE: Cancer Drug Discovery Faces the FACT

*G. F. Draetta and R. A. DePinho*

The quinacrine-related curaxin compounds target multiple pro-cancer pathways with minimal toxicity.

## RESEARCH ARTICLE: Rare Copy Number Variation Discovery and Cross-Disorder Comparisons Identify Risk Genes for ADHD

*A. C. Lionel et al.*

Copy number variation in ADHD patients reveals overlap with genes implicated in autism.

## SCIENCE PODCAST

[www.sciencemag.org/multimedia/podcast](http://www.sciencemag.org/multimedia/podcast)  
Free Weekly Show

On the 12 August *Science* Podcast: epidermal electronics, hydropower development in the Mekong Basin, and more.

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