



COVER

Ordovician sedimentary rocks at Presqu'île de Crozon, Brittany, France. These rocks show high-frequency cycles of less than 500,000 years between bay and open marine conditions. This and similar records allow reconstruction of global sea level from 550 to 250 million years ago. The pink boulder at the bottom is about 15 centimeters across. See page 64.

Photo: *Bilal U. Haq*

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SCIENCE EXPRESS

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ECOLOGY

Natal Homing and Connectivity in Atlantic Bluefin Tuna Populations

J. R. Rooker et al.

Isotopes in the ear bones of tuna reveal that two populations—from the Gulf of Mexico and the Mediterranean—mingle in the Atlantic as adolescents but return home to breed. >> *Science Podcast*

10.1126/science.1161473

CHEMISTRY

Molecular Confinement Accelerates Deformation of Entangled Polymers During Squeeze Flow

H. D. Rowland, W. P. King, J. B. Pethica, G. L. W. Cross

When polymers are squeezed at nanometer scales, the longest chains unexpectedly flow more easily, even though in theory they should be the most entangled.

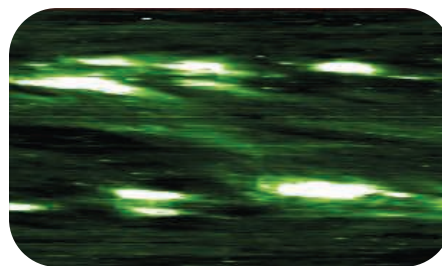
10.1126/science.1157945

CELL BIOLOGY

Ubiquitin-Like Protein Involved in the Proteasome Pathway of *Mycobacterium tuberculosis**M. J. Pearce, J. Mintseris, J. Ferreyra, S. P. Gygi, K. H. Darwin*

A prokaryotic version of ubiquitin, a eukaryotic tag for protein degradation, is linked to lysines in prokaryotic proteins destined for destruction, a process called pupylation.

10.1126/science.1163885



ASTROPHYSICS

A Large Excess in Apparent Solar Oblateness Due to Surface Magnetism

M. D. Fivian, H. S. Hudson, R. P. Lin, H. J. Zahid

Satellite measurements indicate that the sun is more oblate than previous measurements suggested, a shape resulting from the combined effects of rotation and magnetism.

10.1126/science.1160863

BIOCHEMISTRY

The 2.6 Angstrom Crystal Structure of a Human A_{2A} Adenosine Receptor Bound to an Antagonist*V.-P. Jaakola et al.*

The ligand binding pocket of the caffeine-binding human adenosine receptor has a different position and orientation than that of other G protein-linked receptors.

10.1126/science.1164772

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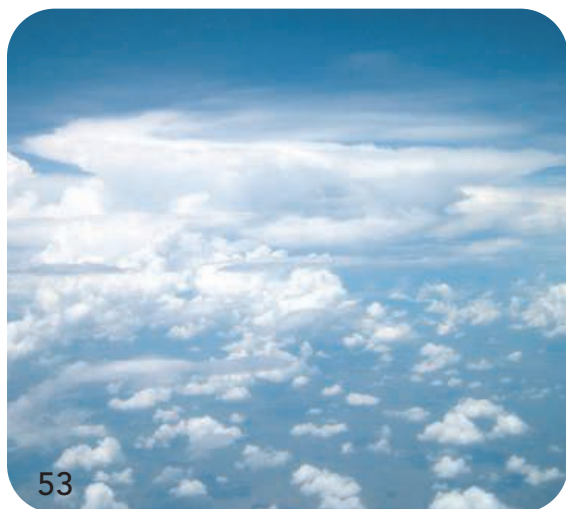
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J. J. Scott et al.

The southern pine beetle uses a polyene peroxide antifungal agent secreted by a bacterium to protect its fungal food source from attack by another fungal species. >> *Perspective p. 52*



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A Chronology of Paleozoic Sea-Level Changes

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The marine sedimentary rock record shows that sea level rose from the Early Cambrian to the Ordovician and then fluctuated through the Permian, partly in response to glaciations.

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A. L. Kritcher et al.

A transient x-ray source reveals rapid structural changes in LiH as a high-powered laser produces extreme compression and heating, inducing an insulator-to-metal transition.

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Surface-Modified Carbon Nanotubes Catalyze Oxidative Dehydrogenation of *n*-Butane

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J. Zhang, X. Liu, R. Blume, A. Zhang, R. Schlögl, D. S. Su

Carbon nanotubes decorated with phosphate groups can catalyze the partial oxidation of alkanes, a process that has normally required complex metal oxides.

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A Physical Map of the 1-Gigabase Bread Wheat Chromosome 3B 101

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A physical map of the largest chromosome of wheat provides the first step toward sequencing the huge, 17-billion base pair genome of this critical food crop.

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High-Quality Binary Protein Interaction Map of the Yeast Interactome Network 104

H. Yu et al.

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Ceramide Biogenesis Is Required for Radiation-Induced Apoptosis in the Germ Line of *C. elegans* 110

X. Deng et al.

In worms, lipid signaling at the mitochondria is necessary for the germ cell death that follows radiation damage, but not for normal developmental cell death.

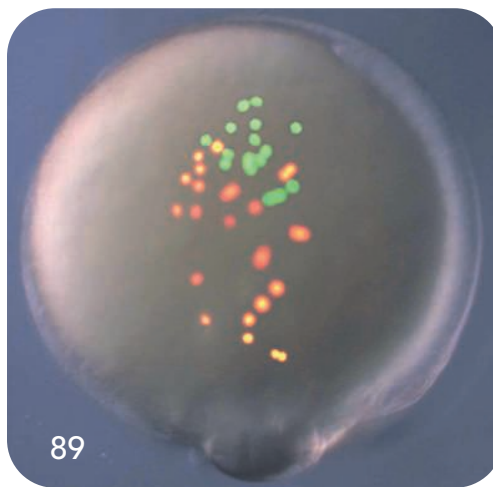
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Lacking Control Increases Illusory Pattern Perception 115

J. A. Whitson and A. D. Galinsky

When subjects receive false feedback in lab tests and so feel a loss of control, they are more apt to perceive patterns in random visual static and imagine conspiracies.

>> *Science Podcast*



SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2008 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$144 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$770; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$85. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Publications Mail Agreement Number 1069624. SCIENCE is printed on 30 percent post-consumer recycled paper. Printed in the U.S.A.

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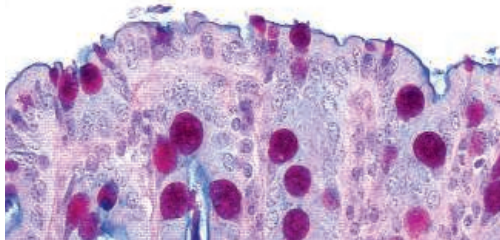
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The biggest challenges in moving abroad are not always scientific.

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J. Fernández

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Purinergic receptor antagonists inhibit inflammation.

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RESEARCH ARTICLE: Purinergic Control of T Cell Activation by ATP Released Through Pannexin-1 Hemichannels

U. Schenk, A. M. Westendorf, E. Radaelli, A. Casati, M. Ferro, M. Fumagalli, C. Verderio, J. Buer, E. Scanziani, F. Grassi

Pannexin hemichannel-mediated release of ATP provides an autocrine, costimulatory signal for T cell activation.

RESEARCH ARTICLE: Kinome siRNA Screen Identifies Regulators of Ciliogenesis and Hedgehog Signal Transduction

M. Evangelista, T. Y. Lim, J. Lee, L. Parker, A. Ashique, A. S. Peterson, W. Ye, D. P. Davis, F. J. de Sauvage

Cdc2l1 is a component of the Hh signaling pathway and opposes the activity of the negative regulator Sufu.

PERSPECTIVE: A Wnt-fall for Gene Regulation—Repression

N. P. Hoverter and M. L. Waterman

Recognition of a nonclassical Wnt-response element by the transcription factor TCF results in β -catenin acting as a transcriptional repressor of certain Wnt target genes.

PRESENTATION: Somatic Cell Genetics for the Study of NF- κ B Signaling in Innate Immunity

R. Krumbach, S. Bloor, G. Ryzhakov, F. Randow

A forward genetic screen in immortalized cells identifies NF- κ B signaling components required to transduce signals from Toll-like receptors.

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