



COVER

A dynamic aurora borealis during a storm over Canada. Energy from the Sun's extended atmosphere is stored at Earth's magnetic field and is released explosively, powering the aurorae. Previously stable aurorae brighten, filament, expand poleward, and cover the sky within 1 to 2 minutes. The energy release starts at an altitude of 130,000 kilometers, at the magnetic equator, near local midnight. See page 931.

Image: Norbert Rosing/National Geographic/Getty Images

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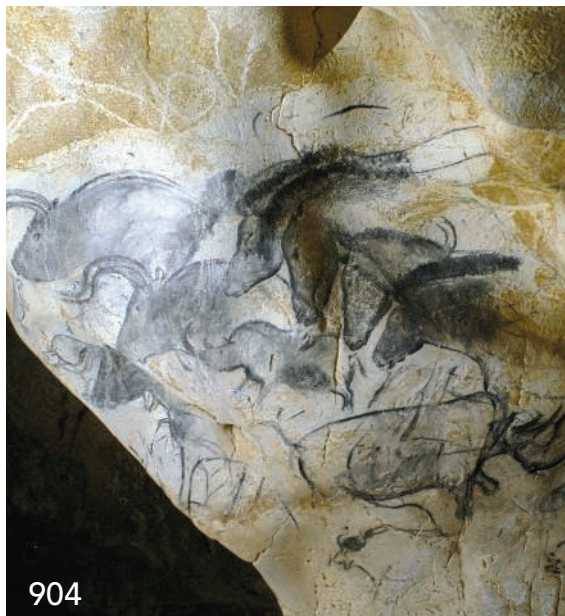
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www.sciencexpress.org

COMPUTER SCIENCE

reCAPTCHA: Human-Based Character Recognition via Web Security Measures
L. von Ahn, B. Maurer, C. McMillen, D. Abraham, M. Blum

A security system that relies on the superior performance of humans in comparison to computers in reading distorted text can be harnessed for digitized scanned documents.
 10.1126/science.1160379

MATERIALS SCIENCE

Polymer Pen Lithography

F. Huo et al.

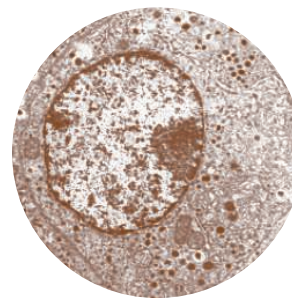
An array that can support millions of thin, flexible polymer pens can be used to deposit tiny molecular ink dots of variable size over large areas.
 10.1126/science.1162193

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Transient Electronic Structure and Melting of a Charge Density Wave in TbTe₃

F. Schmitt et al.

Photoemission spectroscopy is extended to reveal the dynamics of correlated electronic phase transitions, showing how ordered electrons "melt" upon heating of TbTe₃.
 10.1126/science.1160778



CELL BIOLOGY

Conformational Switch of Syntaxin-1 Controls Synaptic Vesicle Fusion
S. H. Gerber et al.

The synaptic vesicle protein that mediates membrane fusion during exocytosis also regulates the rate and extent of this process by controlling vesicle tethering.
 10.1126/science.1163174

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Germline Allele-Specific Expression of *TGFBR1* Confers an Increased Risk of Colorectal Cancer

L. Valle et al.

In patients with colorectal cancer, one allele of the transforming growth factor- β gene produces less messenger RNA and thus less protein, a likely contributor to disease risk.
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full text at www.sciencemag.org/cgi/content/full/321/5891/912c

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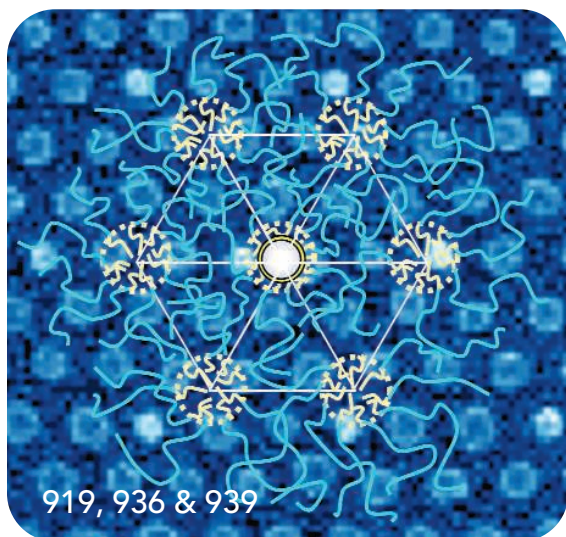
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Ferruginous Conditions Dominated Later Neoproterozoic Deep-Water Chemistry 949

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Y. Tada et al.

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Small CRISPR RNAs Guide Antiviral Defense in Prokaryotes 960

S. J. J. Brouns et al.

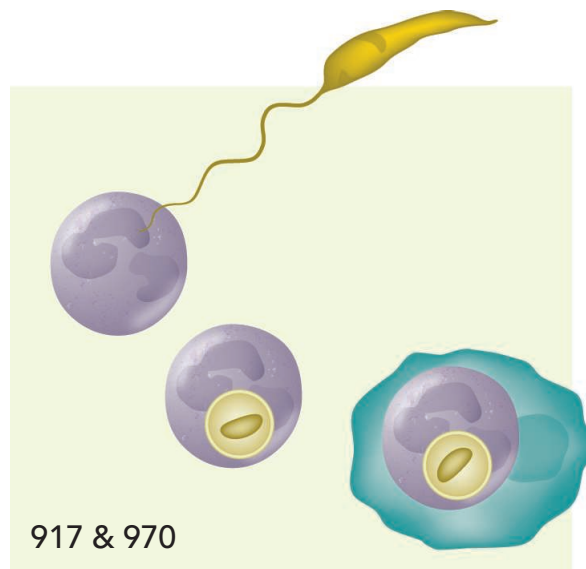
Some bacterial genomes contain remnant sequences from previous viral infections, which are transcribed into RNA to guide inactivation of the virus in subsequent infections. >> *Perspective p. 922*

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A. Arenz, R. A. Silver, A. T. Schaefer, T. W. Margrie

Only 100 synapses are required to accurately code for the animals' velocity in the mouse cerebellum; the charge transfer into neurons is linearly related to acceleration.



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Water walker.

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Water Striders Put Best Foot Forward

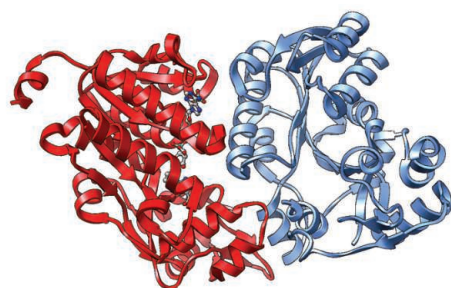
New calculation shows water-walking bugs have evolved feet of optimal length.

Threading Light Through the Opaque

Experiment confirms that light can be passed through disordered materials.

They Smell Like Twins

Sweaty study reveals that genetics determines body odor.



NADP-binding produces an asymmetric dimer.

SCIENCE SIGNALING

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PERSPECTIVE: Dinucleotide-Sensing Proteins—Linking Signaling Networks and Regulating Transcription

H. K. Lamb, D. K. Stammers, A. R. Hawkins

Proteins that bind NAD(H) or NADP(H) may couple cellular redox state to transcription or other signaling pathways.

PERSPECTIVE: Great Times for Small Molecules—c-di-AMP, a Second Messenger Candidate in Bacteria and Archaea

U. Römling

The bacterial checkpoint protein DisA has diadenylate cyclase activity, suggesting that c-di-cAMP acts as a second messenger.



The basics of peer review.

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E. Pain

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L. Laursen

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