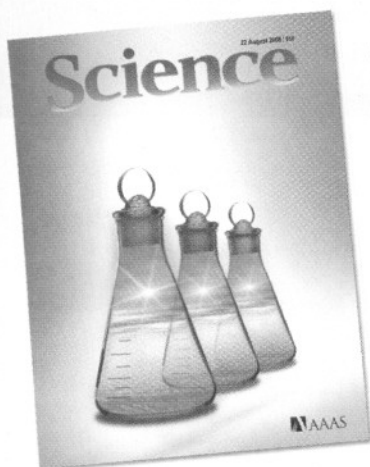




COVER

Using sunlight to rearrange the chemical bonds of water into hydrogen and oxygen, as in photosynthesis, would constitute a practical way to store solar energy as a fuel. Such an energy source will depend on new catalysts that promote this fuel-forming reaction cheaply and efficiently. See page 1072.

Photo illustration: Paul Montie
(images: iStockphoto.com; Getty Images)

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SCIENCE EXPRESS

www.sciencexpress.org

PHYSICS

Quantum Communication with Zero-Capacity Channels

G. Smith and J. Yard

Two quantum communication channels, each of which is so noisy that it has zero-capacity to independently transmit information, can do so when used together.

10.1126/science.1162242

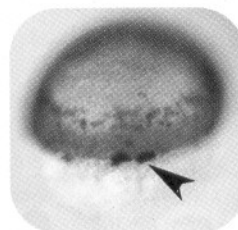
CELL BIOLOGY

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

H. Yu et al.

Comparison of existing methods for mapping protein-protein interactions in yeast cells shows that the high-throughput approaches are complementary to one another.

10.1126/science.1158684



DEVELOPMENTAL BIOLOGY

Chemokine Signaling Controls Endodermal Migration During Zebrafish Gastrulation

S. Nair and T. F. Schilling

During zebrafish gastrulation, chemokines are required for integrin-dependent adhesion of endodermal cells to mesoderm, a role distinct from their action as chemoattractants.

10.1126/science.1160038

PHYSICS

Coupled Superconducting and Magnetic Order in CeCoIn₅

M. Kenzelmann et al.

Unlike other superconductors, magnetic ordering coexists with and is stabilized by superconductivity in the exotic superconductor CeCoIn₅.

10.1126/science.1161818

TECHNICAL COMMENT ABSTRACTS

PALEONTOLOGY

Comment on "Protein Sequences from Mastodon and *Tyrannosaurus rex* Revealed by Mass Spectrometry"

P. A. Pevzner, S. Kim, J. Ng

full text at www.sciencemag.org/cgi/content/full/321/5892/1040b

Response to Comment on "Protein Sequences from Mastodon and *Tyrannosaurus rex* Revealed by Mass Spectrometry"

J. M. Asara, M. H. Schweitzer, L. C. Cantley, J. S. Cottrell

full text at www.sciencemag.org/cgi/content/full/321/5892/1040c

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GEOLOGY

The Geological Evolution of the Tibetan Plateau

L. H. Royden, B. C. Burchfiel, R. D. van der Hilst

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ATMOSPHERIC SCIENCE

N₂O₅ Oxidizes Chloride to Cl₂ in Acidic Atmospheric Aerosol

J. M. Roberts et al.

Laboratory studies affirm that the oxidation of chloride ions in aerosols by N₂O₅ is a significant source of chlorine in the troposphere, a major reactant that helps form ozone.

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ASTRONOMY

Star Formation Around Supermassive Black Holes

I. A. Bonnell and W. K. M. Rice

Simulations show that the disruption of a molecular cloud by a black hole can lead to the formation of nearby stars with eccentric orbits, explaining observations in our Galaxy.

>> Perspective p. 1047

PHYSICS

Quantum Gas of Deeply Bound Ground State Molecules

J. G. Danzl et al.

A coherent Raman pumping scheme cools cesium molecules to a state with minimal rotational energy, needed for producing cold molecular Bose-Einstein condensates.

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MATERIALS SCIENCE

Observation of Atomic Diffusion at Twin-Modified Grain Boundaries in Copper

K.-C. Chen, W.-W. Wu, C.-N. Liao, L.-J. Chen, K. N. Tu

The presence of twinned grains at grain boundaries reduces current-induced diffusion of atoms in small copper wires, which can produce voids or even breaks.

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- A Stable Silicon(0) Compound with a Si=Si Double Bond** 1069

Y. Wang et al.

Carbene ligands stabilize diatomic silicon without oxidizing it, an unusual motif for a light element.

>> *Perspective p. 1050*

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- In Situ Formation of an Oxygen-Evolving Catalyst in Neutral Water Containing Phosphate and Co²⁺** 1072

M. W. Kanan and D. G. Nocera

A catalyst that precipitates in situ when cobalt ions are reduced in a phosphate buffer efficiently forms oxygen from water needed for electrochemical applications.

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- The Global Atmospheric Circulation on Moist Isentropes** 1075

O. Pauluis, A. Czaja, R. Korty

An analysis of global atmospheric circulation from 1970 to 2004 shows that more mid-latitude air rose into the upper troposphere than current models would suggest.

MICROBIOLOGY

- Targeting QseC Signaling and Virulence for Antibiotic Development** 1078

D. A. Rasko et al.

A small, nontoxic antibiotic candidate interferes with bacterial detection of the host and inhibits infection, in a therapeutic approach that may avoid development of resistance.

>> *Science Podcast*

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- Variability and Robustness in T Cell Activation from Regulated Heterogeneity in Protein Levels** 1081

O. Feinerman et al.

Variations in component levels of the antigen-induced signaling pathway affect the final response of activated immune cells, conferring flexibility on the system.

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- Adenovirus Small e1a Alters Global Patterns of Histone Modification** 1084

G. A. Horwitz et al.

- Epigenetic Reprogramming by Adenovirus e1a** 1086

R. Ferrari et al.

Upon infection, an adenovirus protein causes global epigenetic changes in the host that repress antiviral responses and differentiation and activate cell-cycle genes.

MOLECULAR BIOLOGY

- Heterochromatin Integrity Affects Chromosome Reorganization After Centromere Dysfunction** 1088

K. Ishii et al.

When the centromere is removed from a yeast chromosome, a new one forms near the end of the chromosome, over a cluster of poorly expressed genes.

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- Grueneberg Ganglion Cells Mediate Alarm Pheromone Detection in Mice** 1092

J. Brechbühl, M. Klaey, M.-C. Broillet

A mysterious ganglion at the tip of the nose is an olfactory subsystem that senses alarm pheromones in mice.

CELL BIOLOGY

- Control of the Reversibility of Cellular Quiescence by the Transcriptional Repressor HES1** 1095

L. Sang, H. A. Collier, J. M. Roberts

For quiescent cells to periodically divide and then rest, a member of the Notch signaling pathway HES1 must be present; this protein is also activated in some tumors.

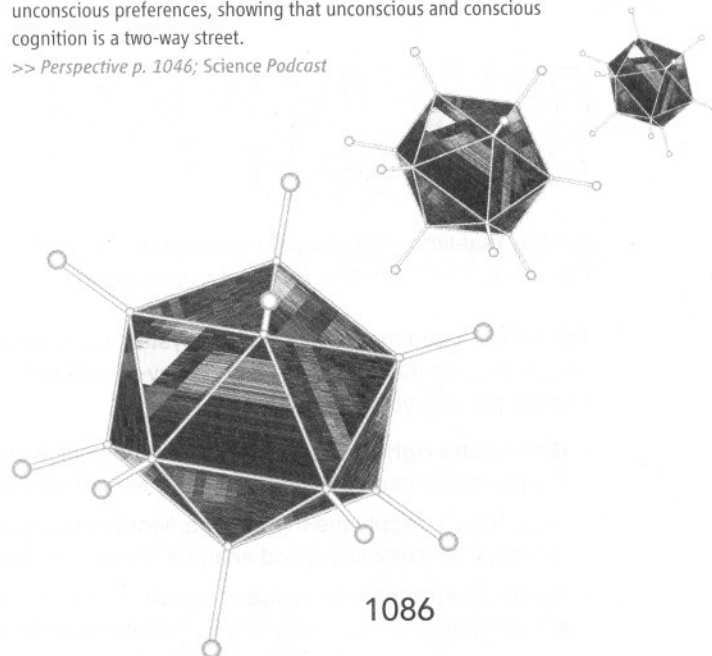
PSYCHOLOGY

- Automatic Mental Associations Predict Future Choices of Undecided Decision-Makers** 1100

S. Galdi, L. Arcuri, B. Gawronski

Unexpectedly, consciously expressed voting choices predict later unconscious preferences, showing that unconscious and conscious cognition is a two-way street.

>> *Perspective p. 1046; Science Podcast*



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