

COVER

Two direct detections of extrasolar planet candidates. Top: Keck Telescope colored infrared image of star HR 8799, for which the starlight is masked, showing three surrounding planets (red dots). Bottom: Superposed Hubble Space Telescope visible images from 2 years apart, tracing the orbit of a planet surrounding the star Fomalhaut. See pages 1345 and 1348.

Images: Christian Marois/NRC Herzberg Institute of Astrophysics, Canada; Paul Kalas/University of California, Berkeley

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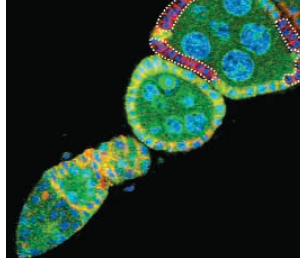
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SCIENCE EXPRESS

www.scienceexpress.org

MICROBIOLOGY

AMPylation of Rho GTPases by *Vibrio* VopS Disrupts Effector Binding and Downstream Signaling

M. L. Yarbrough, Y. Li, L. N. Kinch, N. V. Grishin, H. L. Ball, K. Orth

A GI-active pathogen destroys intestinal cells, in part by improperly modifying a host signaling protein, causing loss of cell shape and contributing to cell death.

10.1126/science.1166382

PHYSICS

Universal Theory of Nonlinear Luttinger Liquids

A. Imambekov and L. I. Glazman

A theory of one-dimensional quantum liquids is generalized from linear interactions among particles to nonlinear ones, affecting, for example, predicted tunneling dynamics.

10.1126/science.1165403

DEVELOPMENTAL BIOLOGY

Drosophila Stem Cells Share a Common Requirement for the Histone H2B Ubiquitin Protease Scrawny

M. Buszczak, S. Paterno, A. C. Spradling

Stem cells in the germ line, epithelium, and intestine all require a particular modification of histone H2B to repress key differentiation genes and maintain pluripotency.

10.1126/science.1165678

MATERIALS SCIENCE

Direct Measurement of Molecular Mobility in Actively Deformed Polymer Glasses

H.-N. Lee, K. Paeng, S. F. Swallen, M. D. Ediger

Optical bleaching of a dilute molecular probe shows that when a rubbery polymer begins to flow, polymer chains become more mobile than predicted from a classical model.

10.1126/science.1165995

TECHNICAL COMMENT ABSTRACTS

ECOLOGY

Comment on "Climate-Driven Ecosystem Succession in the Sahara: The Past 6000 Years" 1326

V. Brovkin and M. Claussen

[full text at www.sciencemag.org/cgi/content/full/322/5906/1326b](http://www.sciencemag.org/cgi/content/full/322/5906/1326b)

Response to Comment on "Climate-Driven Ecosystem Succession in the Sahara: The Past 6000 Years"

S. Kröpelin, D. Verschuren, A.-M. Lézine

[full text at www.sciencemag.org/cgi/content/full/322/5906/1326c](http://www.sciencemag.org/cgi/content/full/322/5906/1326c)

BREVIA

CLIMATE CHANGE

A Simple Law for Ice-Shelf Calving 1344

R. B. Alley et al.

An empirical model of iceberg production as an ice shelf that buttresses a glacier spread may help to predict glacial flow and sea level rise as Earth's climate warms.



RESEARCH ARTICLES

ASTRONOMY

Optical Images of an Exosolar Planet 25 Light-Years from Earth 1345

P. Kalas et al.

Images from the Hubble Space Telescope reveal a Jupiter-sized planet, perhaps with a surrounding dust disk, orbiting about 115 astronomical units from a nearby main sequence star.

>> Perspective p. 1335

ASTRONOMY

Direct Imaging of Multiple Planets Orbiting the Star HR 8799 1348

C. Marois et al.

Infrared images from the Keck and Gemini telescopes reveal three giant planets orbiting counterclockwise around a young star, in a scaled-up version of our solar system.

>> Perspective p. 1335

CELL BIOLOGY

Detection of GTP-Tubulin Conformation in Vivo Reveals a Role for GTP Remnants in Microtubule Rescues 1353

A. Dimitrov et al.

GTP-bound tubulin is found at microtubule ends in living cells and also within microtubules, where it may promote repolymerization and avert microtubule collapse.

REPORTS

PHYSICS

Resolving Vacuum Fluctuations in an Electrical Circuit by Measuring the Lamb Shift 1357

A. Fragner et al.

A solid-state qubit in an electrical circuit connected to a vacuum field shows a shift in its transition energy level, a classic quantum effect typically seen in isolated atoms.

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CHEMISTRY

A Cryptand-Encapsulated Germanium(II) Dication 1360*P. A. Rugar, V. N. Staroverov, K. M. Baines*

A cage-like molecule typically used to sequester hard metal cations such as Ca^{2+} in solution proves capable of capturing the softer, elusive free germanium ion Ge^{2+} . >> *Perspective p. 1333*

GEOCHEMISTRY

Carbonatite Melts and Electrical Conductivity in the Asthenosphere 1363*F. Gaillard et al.*

The electrical conductivity of molten carbonates is higher than that of silicate minerals; thus, minor amounts of carbonate melt could explain electrical signals of Earth's mantle.

>> *Perspective p. 1338*

BIOCHEMISTRY

Tight Regulation of Unstructured Proteins: From Transcript Synthesis to Protein Degradation 1365*J. Gsponer et al.*

Yeast proteins with unstructured regions tend to be highly regulated, consistent with the idea that these regions may mediate critical regulatory protein-protein interactions.

>> *Perspective p. 1340*

BIOCHEMISTRY

Structural Evidence for Common Ancestry of the Nuclear Pore Complex and Vesicle Coats 1369*S. G. Brohawn et al.*

The protein complex that controls entry and exit from the cell nucleus shares a structural element with vesicle coat proteins, suggesting that it is built around a lattice-like scaffold.

ECOLOGY

The Widespread Threat of Calcium Decline in Fresh Waters 1374*A. Jeziorski et al.*

As calcium levels decline in Canadian lakes, populations of a keystone prey crustacean are being depleted, with likely consequences for freshwater food webs.

MEDICINE

Genomic Analysis of the Clonal Origins of Relapsed Acute Lymphoblastic Leukemia 1377*C. G. Mullighan et al.*

The cells responsible for relapse of a particular type of leukemia are often not the same cells that gave rise to the original disease.

>> *Science Podcast*

PLANT SCIENCE

A Genetic Framework for the Control of Cell Division and Differentiation in the Root Meristem 1380*R. Dello Iorio et al.*

The number of stem cells in plant roots is controlled by an auxin-cytokine feedback loop in which a particular gene integrates signals from both hormones.



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MOLECULAR BIOLOGY

Chromosome Alignment and Transvection Are Antagonized by Condensin II 1384*T. A. Hartl, H. F. Smith, G. Bosco*

A *Drosophila* protein required for dissolution of homologous chromosome bundles independently prevents long-distance effects of one allele on the transcription of its homolog.

MOLECULAR BIOLOGY

An Epigenetic Role for Maternally Inherited piRNAs in Transposon Silencing 1387*J. Brennecke et al.*

In *Drosophila*, small RNAs derived from transposons are inherited from the mother and directly inhibit activation of these potentially detrimental transposons in offspring. >> *Science Podcast*

MICROBIOLOGY

PA-824 Kills Nonreplicating *Mycobacterium tuberculosis* by Intracellular NO Release 1392*R. Singh et al.*

An unusual drug candidate for resistant tuberculosis generates nitrous acid and thus acts as an intracellular nitric oxide donor, augmenting the innate immune system. >> *Perspective p. 1337*

CELL BIOLOGY

Absence of the SRC-2 Coactivator Results in a Glycogenopathy Resembling Von Gierke's Disease 1395*A. R. Chopra et al.*

In mice, a coactivator binds to a nuclear orphan receptor and regulates glucose-6-phosphatase transcription and thus glucose homeostasis.



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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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A migrating iceberg in the Atlantic.

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Did Icebergs Warm the World?

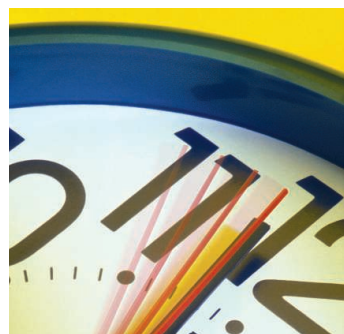
Errant ice might have driven ancient surges of carbon dioxide.

Scientists Untangle Woolly Mammoth Genome

New data give clues to creature's evolution and hardiness.

When a Flood Beats a Trickle

Old-fashioned irrigation saves water.



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SCIENCE CAREERS

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FREE CAREER RESOURCES FOR SCIENTISTS

Tooling Up: 15 Minutes to a Better Interview

D. Jensen

The basic rules of interview courtesy and etiquette are worth reviewing.

Young Italian Scientists Take to the Streets

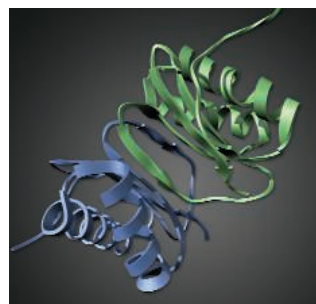
E. Pain

Italian scientists on short-term contracts protest cuts in research funding and jobs.

From the Archives: Cheating, Betrayal, Denial, and Lies

M. P. DeWhyse

As Thanksgiving approached, our Educated Woman realized that grad school was not everything she had anticipated.



Dynein light chain dimer.

SCIENCE SIGNALING

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THE SIGNAL TRANSDUCTION KNOWLEDGE ENVIRONMENT

EDITORIAL GUIDE: How to "Cell" a Genomic or Proteomic Screen

M. B. Yaffe

With the amount of data from screens increasing, researchers need better ways to make the information most useful.

RESEARCH ARTICLE: Identification of ROCK1 as an Upstream Activator of the JIP-3 to JNK Signaling Axis in Response to UVB Damage

P. P. Ongusaha, H. H. Qi, L. Raj, Y.-B. Kim, S. A. Aaronson, R. J. Davis, Y. Shi, J. K. Liao, S. W. Lee

The Rho-associated kinase ROCK1 mediates the cellular response to UV radiation.

RESEARCH ARTICLE: γ -Secretase Limits the Inflammatory Response Through the Processing of LRP1

K. Zurhove, C. Nakajima, J. Herz, H. H. Bock, P. May

Cleavage of the intracellular domain of the lipoprotein receptor LRP1 allows it to transcriptionally inhibit inflammatory responses.

PERSPECTIVE: An All-Purpose Tool for Axon Guidance

L. C. Schecterson and M. Bothwell

The p75 neurotrophin receptor functions as a co-receptor in three distinct systems that mediate repellant signals.

PERSPECTIVE: Dynein-Independent Functions of DYNLL1(LC8)—Redox State Sensing and Transcriptional Control

S. M. King

Stimuli that alter the dimerization state of the dynein light chain DYNLL1 influence its regulatory functions.

PODCAST

P. May and A. M. VanHook

Petra May discusses new findings about a role for LRP1 in inhibiting inflammation.

SCIENCE PODCAST

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