

## EDITORIAL

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- 1126 **As Research Funding Declines, Chávez, Scientists Trade Charges**
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## EDUCATION FORUM

- 1147 **Tenure and the Future of the University**  
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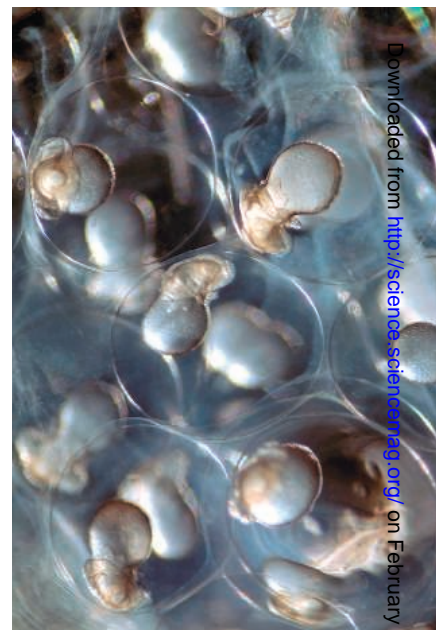
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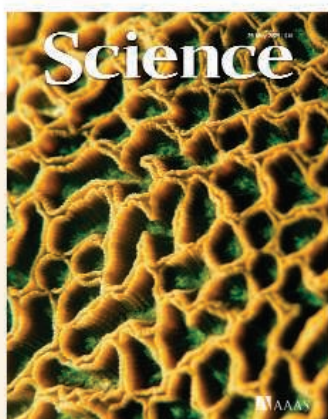
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## COVER

A close-up of the tropical coral *Favia speciosa*. The position and age of related fossil corals have been used to constrain the timing of sea-level rise during the penultimate deglacial period. The timing of past sea-level change, relative to potential forcings, can help determine the mechanisms of climate change and the speed of ice sheet collapse. See page 1186.

*Photo: Getty Images*

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## REVIEW

- 1160 The Computation of Social Behavior  
*T. E. J. Behrens et al.*

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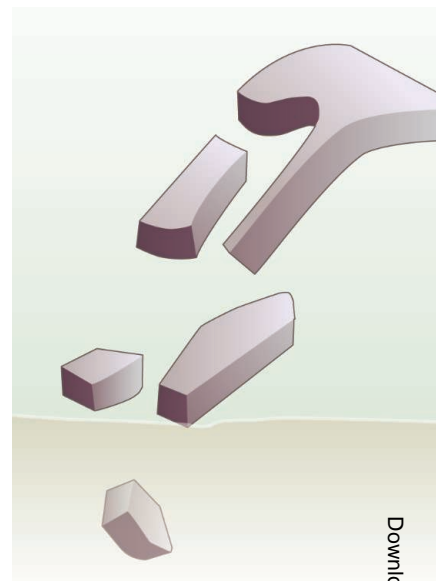
- 1165 Entropic Evidence for Linguistic Structure in the Indus Script  
*R. P. N. Rao et al.*  
Analysis of the pattern of symbols confirms the linguistic role of ancient signs.

## REPORTS

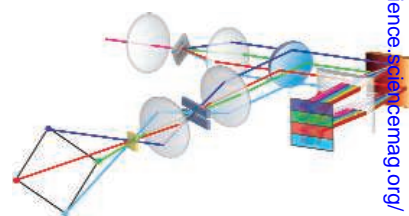
- 1166 Magnetic Field Sensing Beyond the Standard Quantum Limit Using 10-Spin NOON States  
*J. A. Jones et al.*  
Quantum mechanical entanglement of nuclei in a single molecule results in an enhancement of the magnetic field sensitivity.
- 1169 Two-Quantum 2D FT Electronic Spectroscopy of Biexcitons in GaAs Quantum Wells  
*K. W. Stone et al.*  
Controlling the phase and timing of four optical pulses enables measurement of correlations between the electronic semiconductor carriers.
- 1173 Tearing of Stagnant Slab  
*M. Obayashi et al.*  
A tear in the plate in the mantle provides information on the subduction history of the western Pacific.  
>> *Perspective p. 1152*
- 1175 Assessment of Undiscovered Oil and Gas in the Arctic  
*D. L. Gautier et al.*  
About 30 percent of the world's undiscovered gas and 13 percent of the world's undiscovered oil probably exist north of the Arctic Circle.  
>> *Science Podcast*
- 1179 Volcanism, Mass Extinction, and Carbon Isotope Fluctuations in the Middle Permian of China  
*P. B. Wignall et al.*  
Fossiliferous rocks from southwest China show that a major extinction in the Middle Permian coincided with extensive volcanic eruptions.
- 1183 Implications of Limiting CO<sub>2</sub> Concentrations for Land Use and Energy  
*M. Wise et al.*  
Technologies for growing crops are potentially as important for limiting the concentration of atmospheric CO<sub>2</sub> as are those for capture and storage.

- 1186 Penultimate Deglacial Sea-Level Timing from Uranium/Thorium Dating of Tahitian Corals  
*A. L. Thomas et al.*  
Sea levels rose during the penultimate deglaciation while Northern Hemisphere insolation was at a minimum.
- 1190 Topographical and Temporal Diversity of the Human Skin Microbiome  
*E. A. Grice et al.*  
The human skin provides a landscape of dry, damp, and greasy niches for a diversity of symbiotic microorganisms.
- 1192 A Role for the CHC22 Clathrin Heavy-Chain Isoform in Human Glucose Metabolism  
*S. Vassilopoulos et al.*  
A human-specific vesicle-forming protein regulates relocation of a glucose transporter to the cell membrane.  
>> *Perspective p. 1155*
- 1196 Proteasomal Regulation of the Hypoxic Response Modulates Aging in *C. elegans*  
*R. Mehta et al.*  
Induction of the hypoxic response in a worm slows aging and enhances resistance to proteotoxicity.
- 1199 Synthetic Gene Networks That Count  
*A. E. Friedland et al.*  
Genetic counters with the ability to count up to three induction events are constructed in *Escherichia coli*.  
>> *Perspective p. 1156*
- 1203 Structural Basis of Transcription: Backtracked RNA Polymerase II at 3.4 Angstrom Resolution  
*D. Wang et al.*  
A backtracked RNA polymerase II reveals how the enzyme proofreads the RNA transcript.
- 1207 High-Frequency, Long-Range Coupling Between Prefrontal and Visual Cortex During Attention  
*G. G. Gregoriou et al.*  
Synchrony in neuronal firing within a specific frequency range may regulate interactions between brain structures.
- 1210 Genome-Wide Identification of Human RNA Editing Sites by Parallel DNA Capturing and Sequencing  
*J. B. Li et al.*  
Hundreds of new RNA editing sites are identified in the human genome.
- 1213 Unstable Tandem Repeats in Promoters Confer Transcriptional Evolvability  
*M. D. Vences et al.*  
Unstable repetitive DNA in the control regions of yeast genes modulates the evolution of chromatin structure and gene expression.

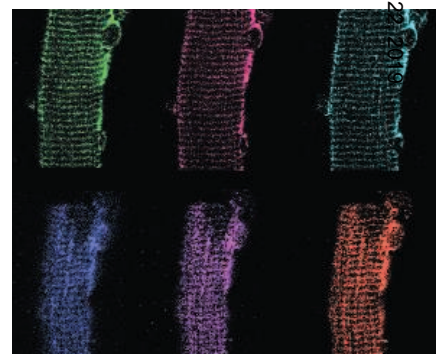
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## SCIENCEONLINE

## SCIENCEEXPRESS

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

**Antigenic and Genetic Characteristics of Swine-Origin 2009 A(H1N1) Influenza Viruses Circulating in Humans**

*R. J. Garten et al.*

Evolutionary analysis suggests a triple reassortant avian-to-pig origin for the 2009 influenza A(H1N1) outbreak.

10.1126/science.1176225

>> *News story p. 1127*

**Essential Role of the Glycosyltransferase Sxc/Ogt in Polycomb Repression**

*M. C. Gambetta et al.*

The Polycomb-group protein super sex combs acts to glycosylate a second Polycomb repressor protein.

10.1126/science.1169727

**IL-21R on T Cells Is Critical for Sustained Functionality and Control of Chronic Viral Infection**

*A. Fröhlich et al.*

Thymus cells of the immune system require the cytokine interleukin-21 to control chronic viral infections.

10.1126/science.1172815

**Structure and Mechanism of an Amino Acid Antiporter**

*X. Gao et al.*

The architecture of a membrane protein channel helps explain how *Escherichia coli* survive the acidic conditions of the stomach.

10.1126/science.1173654

**Ventral Tegmental Area BDNF Induces an Opiate-Dependent-Like Reward State in Naïve Rats**

*H. Vargas-Perez et al.*

A growth factor involved in neuronal plasticity alters neurons in a specific area of the brain after chronic exposure to opioid drugs.

10.1126/science.1168501

**Venezuelan Science at Risk**

*C. Bifano*

10.1126/science.1176733

## TECHNICALCOMMENTS

**Comment on "A Large Excess in Apparent Solar Oblateness Due to Surface Magnetism"**

*J. R. Kuhn et al.*

full text at [www.sciencemag.org/cgi/content/full/324/5931/1143-b](http://www.sciencemag.org/cgi/content/full/324/5931/1143-b)

**Response to Comment on "A Large Excess in Apparent Solar Oblateness Due to Surface Magnetism"**

*M. D. Fivian et al.*

full text at [www.sciencemag.org/cgi/content/full/324/5931/1143-c](http://www.sciencemag.org/cgi/content/full/324/5931/1143-c)

## SCIENCENOW

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

Highlights From Our Daily News Coverage

**Compact Discs Enter the Fifth Dimension**

A new technology could boost the storage capacity of conventional optical discs 10,000-fold.

**Martian Water Had Antifreeze**

Dissolved minerals might have kept liquid flowing on the Red Planet.

**Tumors Trigger Cancer Blues**

Biochemical signals from tumors cause anxiety and depression in rats.

## SCIENCE SIGNALING

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

The Signal Transduction Knowledge Environment

**EDITORIAL GUIDE: "Omic" Risk Assessment**

*M. B. Major and R. T. Moon*

Integration of multiple data sets is the key to hit validation.

**RESEARCH ARTICLE: System-Wide Changes to SUMO Modifications in Response to Heat Shock**

*F. Golebiowski et al.*

SUMO is redistributed among many targets to mediate both short- and long-term signaling events.

**RESEARCH ARTICLE: Bruton's Tyrosine Kinase Revealed as a Negative Regulator of Wnt-β-Catenin Signaling**

*R. G. James et al.*

Combining an siRNA screen with a small-molecule screen reveals a negative pathway regulator.

**REVIEW: CD36, a Scavenger Receptor Involved in Immunity, Metabolism, Angiogenesis, and Behavior**

*R. L. Silverstein and M. Febbraio*

Signaling by CD36 is ligand and cell specific and is implicated in multiple human diseases.

## EVENTS

Plan your travel with this list of meetings, conferences, and workshops related to cell signaling.

## SCIENCECAREERS

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

Free Career Resources for Scientists

**In Person: Breaking All the Rules**

*R. Ley*

Two-scientist couples do not have to compromise their research careers.

>> *News story p. 1136*

**A Tale of Two Pathologists**

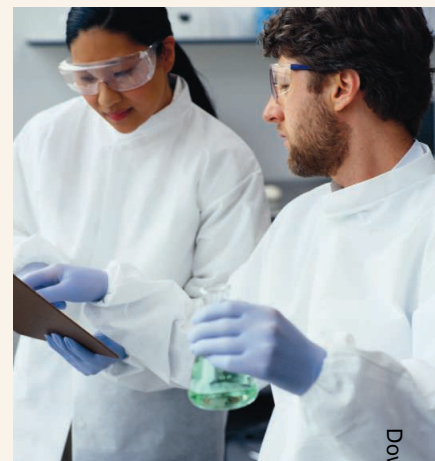
*A. Sasso*

Terrill Topps and Dorkina Myrick have two careers, three doctoral degrees, and one life together.

**Finding His Voice by Silencing Genes**

*E. Pain*

Molecular biologist Olivier Voinnet early on bet his career on gene silencing—and won.



## SCIENCECAREERS

Balancing two science careers in one family.

## SCIENCEPODCAST

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Download the 29 May *Science* Podcast to hear about assessing Arctic oil and gas reserves, bat white-nose syndrome, your letters to *Science*, and more.

## ORIGINSBLOG

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A History of Beginnings

## SCIENCEINSIDER

[blogs.sciencemag.org/scienceinsider](http://blogs.sciencemag.org/scienceinsider)

Science Policy News and Analysis

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