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Special Issue

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## Cosmic Web

### Warp and Woof

David Voss and Robert Coontz  
*Science* 4 January 2008: 46.  
[Summary »](#) [PDF »](#)

## News

### NEWS: Untangling the Celestial Strings

Adrian Cho  
*Science* 4 January 2008: 47-49.

Summary: In an effort that weaves together astronomy, astrophysics, and cosmology, scientists are mapping the filamentary framework that gives shape to the cosmos.

[Full Text »](#) [PDF »](#)

## Perspectives

### The Cosmic Web in Our Own Backyard

Rodrigo A. Ibata and Geraint F. Lewis  
*Science* 4 January 2008: 50-52.  
[Abstract »](#) [Full Text »](#) [PDF »](#)

### Numerical Simulations Unravel the Cosmic Web

Claude-André Faucher-Giguère, Adam Lidz, and Lars Hernquist  
*Science* 4 January 2008: 52-55.  
[Abstract »](#) [Full Text »](#) [PDF »](#)

### Missing Baryons and the Warm-Hot Intergalactic Medium

Fabrizio Nicastro, Smita Mathur, and Martin Elvis  
*Science* 4 January 2008: 55-57.  
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### This Week in *Science*

Editor summaries of this week's papers.  
*Science* 4 January 2008: 11.  
[Full Text »](#)

Editorial:

**Science and God in the Election**

Donald Kennedy

*Science* 4 January 2008: 12.

[Summary](#) » [Full Text](#) » [PDF](#) »

**Editors' Choice**

Highlights of the recent literature.

*Science* 4 January 2008: 13.

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**Science Podcast**

*Science* 4 January 2008: 107.

[Summary](#) » [Transcript](#) »

**NEW PRODUCTS**

*Science* 4 January 2008: 107.

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**News of the Week**

**2008 U.S. BUDGET: Promising Year Ends Badly After Fiscal Showdown Squeezes Science**

Jeffrey Mervis

*Science* 4 January 2008: 18-19.

Summary: The Democratic-controlled Congress lost a showdown with the Republican White House on overall domestic spending levels, resulting in much smaller numbers than science boosters had thought likely for the 2008 fiscal year that began on 1 October 2007.

[Full Text](#) » [PDF](#) »

**GENETICS: The Elusive ALS Genes**

Ken Garber

*Science* 4 January 2008: 20.

Summary: Gene scans for amyotrophic lateral sclerosis, or Lou Gehrig's disease, have one big problem: Each one identifies a different gene.

[Full Text](#) » [PDF](#) »

**PLANETARY SCIENCE: Saturn's Rings Look Ancient Again**

Richard A. Kerr

*Science* 4 January 2008: 21.

Summary: At last month's meeting of the American Geophysical Union, it was reported that the still-orbiting Cassini spacecraft is getting a longer look at Saturn's rings and finding further signs of old age, including a tendency to put on weight.

[Full Text »](#) [PDF »](#)

#### ScienceScope

*Science* 4 January 2008: 21.

[Full Text »](#)

#### Random Samples

*Science* 4 January 2008: 15.

[Full Text »](#)

#### Newsmakers

*Science* 4 January 2007: 17.

[Full Text »](#)

#### News Focus

##### SCIENCE POLICY: Science and the Next U.S. President

Jeffrey Mervis

*Science* 4 January 2008: 22.

Summary: How do the candidates view science? Sometimes it's hard to tell from the campaign trail, but they have offered opinions on topics from evolution to global warming.

[Full Text »](#) [PDF »](#)

##### DEMOCRAT: Hillary Clinton

Eli Kintisch

*Science* 4 January 2008: 23.

Summary: Senator Hillary Clinton's speech on the 50th anniversary of the launch of Sputnik was the most detailed examination of science policy that any presidential candidate has offered to date. That's not surprising given the extensive network of former advisers to her husband that the Democratic front-runner has tapped.

[Full Text »](#) [PDF »](#)

##### DEMOCRAT: John Edwards

Jocelyn Kaiser and Eliot Marshall

*Science* 4 January 2008: 24-25.

Summary: Former senator John Edwards made a fortune as a personal-injury lawyer in the 1980s and was John Kerry's vice president on the unsuccessful Democratic presidential ticket in 2004. But this year, he is campaigning as a populist and a Washington outsider.

[Full Text »](#) [PDF »](#)

**REPUBLICAN: Rudolph Giuliani**

Eliot Marshall

*Science* 4 January 2008: 24-25.

Summary: Republican former New York City mayor Rudolph Giuliani's public career suggests that he is a pragmatist with a quick grasp of issues, a lover of statistics, and a firm believer that most tasks can be done better by private institutions than by government.

[Full Text »](#) [PDF »](#)

**REPUBLICAN: Mike Huckabee**

Jennifer Couzin

*Science* 4 January 2008: 26-27.

Summary: Republican former Arkansas governor Mike Huckabee holds many staunchly conservative positions, including opposition to the use of embryonic stem cells for research. But when it comes time to act, Huckabee has often veered toward the center of the political road.

[Full Text »](#) [PDF »](#)

**REPUBLICAN: John McCain**

Constance Holden

*Science* 4 January 2008: 26-27.

Summary: Republican Senator John McCain doesn't have any scientific training or expertise. But he trusts the experts. They've told him that global warming is the most urgent issue facing the world, and that makes climate change one of the three issues that he's emphasizing in his presidential campaign.

[Full Text »](#) [PDF »](#)

**SCIENCE POLICY: Other Democrats in the Race**

*Science* 4 January 2008: 27.

Summary: Other Democrats in the race include Joe Biden, Chris Dodd, Mike Gravel, and Dennis Kucinich.

[Full Text »](#) [PDF »](#)

**DEMOCRAT: Barack Obama**

Yudhijit Bhattacharjee

*Science* 4 January 2008: 28-29.

Summary: Democratic Senator Barack Obama has accused the Bush Administration of ignoring or distorting data to shape its decisions on science-related issues, promising that his policies would be based on "evidence and facts."

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**DEMOCRAT: Bill Richardson**

Jeffrey Mervis

*Science* 4 January 2008: 28-29.

Summary: As New Mexico's new governor, Democrat Bill Richardson enlisted experts from in-state Los Alamos National Laboratory to help him with technical issues. But Richardson isn't above embracing his own scientific illiteracy as a way to identify with the average voter.

[Full Text »](#) [PDF »](#)

### **SCIENCE POLICY: Other Republicans in the Race**

*Science* 4 January 2008: 29.

Summary: Other Republicans in the race include Duncan Hunter, Alan Keyes, and Ron Paul.

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### **REPUBLICAN: Mitt Romney**

Andrew Lawler

*Science* 4 January 2008: 30-31.

Summary: Republican Mitt Romney's wooing of conservative Christian voters this year, by citing his opposition to stem cell research and doubts about global warming, is a far cry from 5 years ago, when he became governor of Massachusetts by wooing the state's biotech and academic business leaders.

[Full Text »](#) [PDF »](#)

### **REPUBLICAN: Fred Thompson**

Eli Kintisch and Benjamin Lester

*Science* 4 January 2008: 30-31.

Summary: Republican former Tennessee senator Fred Thompson won points from scientists for helping the home state Spallation Neutron Source in 2000. But his recent stances on several issues have not endeared him to researchers.

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## Letters

### **This Week's Letters**

*Science* 4 January 2008: 32.

[Summary »](#) [PDF »](#)

### **In Search of Peer Reviewers**

William F. Perrin

*Science* 4 January 2008: 32.

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### **A Peer Review How-To**

Robert S. Zucker

*Science* 4 January 2008: 32.

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### **Climate Change Goals: Where to Begin?**

Bernard D. Goldstein; and Colin Challen

*Science* 4 January 2008: 33.

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### **Beyond Bed Nets**

Thomas F. McCutchan

*Science* 4 January 2008: 33.

[Full Text »](#) [PDF »](#)

## Books *et al.*

### **HISTORY OF SCIENCE: The Fertile Banks of the Thames**

Nicholas S. Popper

*Science* 4 January 2008: 34-35.

Summary: The author discusses the activities of Francis Bacon's London contemporaries whose practices helped set the stage for the scientific revolution.

[Full Text »](#) [PDF »](#)

### **ARTS AND NEUROSCIENCE: Connecting Blazons and Neurons**

Caroline A. Jones

*Science* 4 January 2008: 35-36.

Summary: The author explores connections between the worlds of images and current neuroscience.

[Full Text »](#) [PDF »](#)

### **Books Received**

*Science* 4 January 2008: 35.

[Summary »](#)

## Policy Forum

### **SCIENCE AND GOVERNMENT: Revolutionizing China's Environmental Protection**

Jianguo Liu and Jared Diamond

*Science* 4 January 2008: 37-38.

Summary: China's growth has created severe environmental problems that will require fundamental changes in China's administrative system and its model of economic development.

[Full Text »](#) [PDF »](#) [Supporting Online Material »](#)

## Perspectives

### **NEUROSCIENCE: Rules of Plasticity**

Michael Brecht and Dietmar Schmitz

*Science* 4 January 2008: 39-40.

Summary: Ongoing sensory experience may improve performance through a signaling mechanism that strengthens synapses beyond their initial potential.

[Full Text »](#) [PDF »](#)

### **CHEMISTRY: Beyond Born-Oppenheimer**

Joel M. Bowman

*Science* 4 January 2008: 40-41.

Summary: A combined experimental and theoretical study sheds light on the intricate effects that can occur during chemical reactions.

[Full Text »](#) [PDF »](#)

#### **CHEMISTRY: A Phase Transition Hidden in Higher Dimensions**

Philip Coppens

*Science* 4 January 2008: 41-42.

Summary: A molecular solid can change from one structure to another in a way that can only be described properly using four-dimensional space.

[Full Text »](#) [PDF »](#)

#### **GENETICS: Functionally Degenerate--Y Not So?**

William R. Rice and Urban Friberg

*Science* 4 January 2008: 42-43.

Summary: The Y chromosome of the common fruit fly has few functional genes but regulates the expression of hundreds of autosomal and X-linked genes.

[Full Text »](#) [PDF »](#)

#### **ENVIRONMENTAL SCIENCE: How Green Are Biofuels?**

Jorn P. W. Scharlemann and William F. Laurance

*Science* 4 January 2008: 43-44.

Summary: Many biofuels are associated with lower greenhouse-gas emissions but have greater aggregate environmental costs than gasoline.

[Full Text »](#) [PDF »](#) [Supporting Online Material »](#)

#### **RETROSPECTIVE: Seymour Benzer (1921-2007)**

Yuh-Nung Jan and Lily Jan

*Science* 4 January 2008: 45.

Summary: The adventurous spirit of a molecular geneticist launched an era of behavioral genetic studies, all on the wings of a fruit fly.

[Full Text »](#) [PDF »](#)

### Brevia

#### **Rarity of Males in Pea Aphids Results in Mutational Decay**

Jennifer A. Brisson and Sergey V. Nuzhdin

*Science* 4 January 2008: 58.

Genes used preferentially by female pea aphids are under stronger selection than those used by males, probably because females mainly reproduce asexually.

[Abstract »](#) [Full Text »](#) [PDF »](#) [Supporting Online Material »](#)

#### **Physiological Sex Predicts Hybrid Sterility Regardless of Genotype**



John H. Malone and P. Michalak  
*Science* 4 January 2008: 59.

An apparent violation of Haldane's rule (in hybrid organisms the heterogametic sex tends to be sterile) in frogs can be explained by postulating that males have evolved faster.

[Abstract »](#) [Full Text »](#) [PDF »](#) [Supporting Online Material »](#)

## Research Articles

### Reduced North Atlantic Deep Water Coeval with the Glacial Lake Agassiz Freshwater Outburst

Helga (Kikki) Flesche Kleiven, Catherine Kissel, Carlo Laj, Ulysses S. Ninnemann, Thomas O. Richter, and Elsa Cortijo  
*Science* 4 January 2008: 60-64.  
Published online 6 December 2007 [DOI: 10.1126/science.1148924] (in *Science Express Research Articles*)

Data on deep water formation in the North Atlantic indicate that the sudden draining of a huge glacial lake south of Hudson Bay led to dramatic cooling 8200 years ago.

[Abstract »](#) [Full Text »](#) [PDF »](#) [Supporting Online Material »](#)

### The *Physcomitrella* Genome Reveals Evolutionary Insights into the Conquest of Land by Plants

Stefan A. Rensing, Daniel Lang, Andreas D. Zimmer, Astrid Terry, Asaf Salamov, Harris Shapiro, Tomoaki Nishiyama, Pierre-François Perroud, Erika A. Lindquist, Yasuko Kamisugi, Takako Tanahashi, Keiko Sakakibara, Tomomichi Fujita, Kazuko Oishi, Tadasu Shin-I, Yoko Kuroki, Atsushi Toyoda, Yutaka Suzuki, Shin-ichi Hashimoto, Kazuo Yamaguchi, Sumio Sugano, Yuji Kohara, Asao Fujiyama, Aldwin Anterola, Setsuyuki Aoki, Neil Ashton, W. Brad Barbazuk, Elizabeth Barker, Jeffrey L. Bennetzen, Robert Blankenship, Sung Hyun Cho, Susan K. Dutcher, Mark Estelle, Jeffrey A. Fawcett, Heidrun Gundlach, Kousuke Hanada, Alexander Heyl, Karen A. Hicks, Jon Hughes, Martin Lohr, Klaus Mayer, Alexander Melkozernov, Takashi Murata, David R. Nelson, Birgit Pils, Michael Prigge, Bernd Reiss, Tanya Renner, Stephane Rombauts, Paul J. Rushton, Anton Sanderfoot, Gabriele Schween, Shin-Han Shiu, Kurt Stueber, Frederica L. Theodoulou, Hank Tu, Yves Van de Peer, Paul J. Verrier, Elizabeth Waters, Andrew Wood, Lixing Yang, David Cove, Andrew C. Cuming, Mitsuyasu Hasebe, Susan Lucas, Brent D. Mishler, Ralf Reski, Igor V. Grigoriev, Ralph S. Quatrano, and Jeffrey L. Boore  
*Science* 4 January 2008: 64-69.  
Published online 13 December 2007 [DOI: 10.1126/science.1150646] (in *Science Express Research Articles*)

Comparison of the moss genome sequence with those of other plants reveals hallmarks of colonization of land, including genes to manage terrestrial stresses such as dehydration.

[Abstract »](#) [Full Text »](#) [PDF »](#) [Supporting Online Material »](#)

## Reports

### Hidden Degrees of Freedom in Aperiodic Materials

Bertrand Toudic, Pilar Garcia, Christophe Odin, Philippe Rabiller, Claude Ecolivet, Eric Collet, Philippe Bourges, Garry J. McIntyre, Mark D. Hollingsworth, and Tomasz Breczewski  
*Science* 4 January 2008: 69-71.

Neutron diffraction shows how a host-guest crystal can undergo a phase transition that affects only higher-dimensional parameters that relate two simple sublattices.

[Abstract »](#) [Full Text »](#) [PDF »](#) [Supporting Online Material »](#)

### Nonadiabatic Interactions in the Cl + H<sub>2</sub> Reaction Probed by ClH<sub>2</sub><sup>-</sup> and ClD<sub>2</sub><sup>-</sup> Photoelectron Imaging

Etienne Garand, Jia Zhou, David E. Manolopoulos, Millard H. Alexander, and Daniel M. Neumark  
*Science* 4 January 2008: 72-75.

Comparison of high-resolution spectra with theoretical simulations reveals that electronically excited ions subtly participate in an

elementary reaction.

[Abstract](#) » [Full Text](#) » [PDF](#) »

#### **Helium and Neon Abundances and Compositions in Cometary Matter**

Bernard Marty, Russell L. Palma, Robert O. Pepin, Laurent Zimmermann, Dennis J. Schlutter, Peter G. Burnard, Andrew J. Westphal, Christopher J. Snead, Sasa Bajt, Richard H. Becker, and Jacob E. Simones  
*Science* 4 January 2008: 75-78.

The amount and isotopic composition of helium and neon in Stardust samples imply that comet Wild 2 acquired these gases in a high-energy environment near the young Sun.

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#### **Temperature and Composition of Saturn's Polar Hot Spots and Hexagon**

L. N. Fletcher, P. G. J. Irwin, G. S. Orton, N. A. Teanby, R. K. Achterberg, G. L. Bjoraker, P. L. Read, A. A. Simon-Miller, C. Howett, R. de Kok, N. Bowles, S. B. Calcutt, B. Hesman, and F. M. Flasar  
*Science* 4 January 2008: 79-81.

Cassini observations show that Saturn's atmosphere has stable, unusually hot vortices around both poles, even though its north pole is shrouded in darkness.

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#### **The Avalon Explosion: Evolution of Ediacara Morphospace**

Bing Shen, Lin Dong, Shuhai Xiao, and Michal Kowalewski  
*Science* 4 January 2008: 81-84.

Earth's first complex life 575 million years ago rapidly encompassed the full range of ediacara morphologies before declining, a pattern like that in the later Cambrian explosion.

[Abstract](#) » [Full Text](#) » [PDF](#) » [Supporting Online Material](#) »

#### **Intermittent Plate Tectonics?**

Paul G. Silver and Mark D. Behn  
*Science* 4 January 2008: 85-88.

Subduction may have stopped at times in Earth's past as supercontinents formed, thus slowing the planet's heat loss.

[Abstract](#) » [Full Text](#) » [PDF](#) » [Supporting Online Material](#) »

#### **A Mosaic of Chemical Coevolution in a Large Blue Butterfly**

David R. Nash, Thomas D. Als, Roland Maile, Graeme R. Jones, and Jacobus J. Boomsma  
*Science* 4 January 2008: 88-90.

Because they are coated with a specific chemical, the larvae of a butterfly are adopted and cared for by an ant species, a relationship that shows signs of ongoing coevolution.

[Abstract](#) » [Full Text](#) » [PDF](#) » [Supporting Online Material](#) »

#### **Polymorphic Y Chromosomes Harbor Cryptic Variation with Manifold Functional Consequences**

Bernardo Lemos, Luciana O. Araripe, and Daniel L. Hartl  
*Science* 4 January 2008: 91-93.

Unexpectedly, the Y chromosome exerts strong regulatory effects on X-linked and autosomal genes in *Drosophila*.

[Abstract](#) » [Full Text](#) » [PDF](#) » [Supporting Online Material](#) »

#### **Heterochromatin and RNAi Are Required to Establish CENP-A Chromatin at Centromeres**

Hernan Diego Folco, Alison L. Pidoux, Takeshi Urano, and Robin C. Allshire  
*Science* 4 January 2008: 94-97.

Formation of the centromere, the specialized region by which chromosomes are pulled apart during cell division, requires the presence of RNAi-induced heterochromatin.

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#### **Assembly Mechanism of the Contractile Ring for Cytokinesis by Fission Yeast**

Dimitrios Vavylonis, Jian-Qiu Wu, Steven Hao, Ben O'Shaughnessy, and Thomas D. Pollard  
*Science* 4 January 2008: 97-100.

Published online 13 December 2007 [DOI: 10.1126/science.1151086] (in *Science Express Reports*)

The contractile ring of cell division is powered by myosin motors on the cell equator, which capture and pull actin filaments growing randomly from the equator.

[Abstract](#) » [Full Text](#) » [PDF](#) » [Supporting Online Material](#) »

#### **Ongoing in Vivo Experience Triggers Synaptic Metaplasticity in the Neocortex**

Roger L. Clem, Tansu Celikel, and Alison L. Barth  
*Science* 4 January 2008: 101-104.

During continuous sensory stimulation, NMDA receptors in the mouse cortex switch from enhancing synaptic potentiation to opposing it.

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#### **Small Circuits for Large Tasks: High-Speed Decision-Making in Archerfish**

Thomas Schlegel and Stefan Schuster  
*Science* 4 January 2008: 104-106.

Archerfish shoot their insect prey with a stream of water and then use sensory information and just a few neurons to calculate how to retrieve their food.

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### Technical Comments

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

Mike Buckley, Angela Walker, Simon Y. W. Ho, Yue Yang, Colin Smith, Peter Ashton, Jane Thomas Oates, Enrico Cappellini, Hannah Koon, Kirsty Penkman, Ben Elsworth, Dave Ashford, Caroline Solazzo, Phillip Andrews, John Strahler, Beth Shapiro, Peggy Ostrom, Hasand Gandhi, Webb Miller, Brian Raney, Maria Ines Zylber, M. Thomas P. Gilbert, Richard V. Prigodich, Michael Ryan, Kenneth F. Rijdsdijk, Anwar Janoo, and Matthew J. Collins  
*Science* 4 January 2008: 33.

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John M. Asara and Mary H. Schweitzer  
*Science* 4 January 2008: 33.

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