CONTENTS

EDITORIAL
503 The Global Knowledge Society
Nina V. Fedoroff

NEWS OF THE WEEK
508 A roundup of the week’s top stories

NEWS & ANALYSIS
512 The Limits of Avian Flu Studies in Ferrets
514 Donation Spurs a Cell Observatory—And Bigger Plans
515 Celebrated Exoplanet Vanishes in a Cloud of Dust—Or Maybe Not

NEWS FOCUS
516 China’s Sequencing Powerhouse Comes of Age
520 Rebuilding Wetlands by Managing the Muddy Mississippi
522 Technology Is Turning U.S. Oil Around But Not the World’s

SPECIAL FEATURE
525 2011 International Science & Engineering Visualization Challenge
>> For related online content, go to www.sciencemag.org/site/special/vis2011/
Science Podcast

LETTERS
537 Investing in Libya’s Education
S. K. Sgaier
Invasive Species Unchecked by Climate
P. E. Hulme
Response
M. T. Burrows et al.

Proceed with Planning Despite Multiple Models
R. Dickinson

CORRECTIONS AND CLARIFICATIONS
538

TECHNICAL COMMENT ABSTRACTS
538

BOOKS ET AL.
540 American Anthrax
J. Guillemin, reviewed by D. A. Relman
541 Strings Attached
R. W. Grant, reviewed by T. Cowen

POLICY FORUM
542 Coercive Citation in Academic Publishing
A. W. Wilhite and E. A. Fong

PERSPECTIVES
544 Ready, Steady, Compete
M. C. Villeval
>> Report p. 579
545 Surviving in a Toxic World
A. J. Wolstenholme
>> Report p. 574
546 To Stop or Not to Stop?
N. D. Volkow and R. D. Baler
>> Report p. 601
548 Marching in Near Lock-Step
D. T. Rodbell
>> Report p. 570
549 Seeing the Superfluid Transition of a Gas
W. Zwerger
>> Report p. 564

CONTENTS continued >>

COVER
Computer illustration of streams of matter delineating the network of cosmic voids, each tens of millions of light years across. Matter accumulates where the voids meet, forming a cosmic web of walls, filaments, and clusters of galaxies. This illustration was awarded first place in the informational graphics category in the 2011 Science/NSF International Science & Engineering Visualization Challenge. The winning entries are featured in a special section starting on page 525 and at www.sciencemag.org/site/special/vis2011/.

Image: Miguel A. Aragon Calvo, Julieta Aguilera, Mark Subbarao

DEPARTMENTS
501 This Week in Science
504 Editors’ Choice
506 Science Staff
605 New Products
606 Science Careers

www.sciencemag.org  SCIENCE  VOL 335  3 FEBRUARY 2012
Published by AAAS
BREVIA
551 Nanoscopy in a Living Mouse Brain
S. Berning et al.
Super high-resolution microscopy resolves neuron dynamics in the cerebral cortex of a living mouse.

RESEARCH ARTICLES
552 High-Resolution View of the Yeast Meiotic Program Revealed by Ribosome Profiling
G. A. Brar et al.
During yeast sporulation, the production of most proteins is tightly regulated by both messenger RNA levels and translational control.

557 The Southern Ocean’s Role in Carbon Exchange During the Last Deglaciation
A. Burke and L. F. Robinson
Radiocarbon measurements of deep-sea corals reveal the presence of old, carbon-rich water in the Southern Ocean.

REPORTS
561 Spin-Down of Radio Millisecond Pulsars at Genesis
T. M. Tauris
Numerical calculations show that processes responsible for spinning up millisecond pulsars may also lead them to slow down.

563 Revealing the Superfluid Lambda Transition in the Universal Thermodynamics of a Unitary Fermi Gas
M. J. H. Ku et al.
Thermodynamic quantities for the superfluid transition of a strongly interacting atomic Fermi gas were measured.

567 Iron Catalysts for Selective Anti-Markovnikov Alkene Hydrosilylation Using Tertiary Silanes
A. M. Tondreau et al.
Iron catalysts offer a potentially cheaper route than platinum for certain commercially useful carbon-silicon compounds.

570 High-Latitude Forcing of the South American Summer Monsoon During the Last Glacial
L. C. Kanner et al.
High-latitude processes in the Northern and Southern Hemispheres both influence the South American Summer Monsoon.

574 Natural Variation in a Chloride Channel Subunit Confers Avermectin Resistance in C. elegans
R. Ghosh et al.
Resistance to avermectin, an anti-nematode drug, is conferred by a deletion in a glutamate-gated chloride channel.

579 Affirmative Action Policies Promote Women and Do Not Harm Efficiency in the Laboratory
L. Balafoutas and M. Sutter
Increasing the representation of competition-averse individuals does not alter overall output.

582 Female Leadership Raises Aspirations and Educational Attainment for Girls: A Policy Experiment in India
L. Beaman et al.
The effects of female leaders on girls occur via policy changes in the short run and parental aspirations in the longer run.

587 Untangling Genomes from Metagenomes: Revealing an Uncultured Class of Marine Euryarchaeota
V. Iverson et al.
Reconstruction of whole genomes from a complex microbial community has revealed an evolutionary surprise.

590 Sequential Signaling Crosstalk Regulates Endomesoderm Segregation in Sea Urchin Embryos
A. J. Sethi et al.
Separation of deuterostome endoderm and mesoderm occurs through sequential interactions between Notch and Wnt signaling.

593 Growth of Western Australian Corals in the Anthropocene
T. F. Cooper et al.
Cores taken from massive corals indicate that temperature rather than ocean acidification has governed reef growth.

597 Innate Response Activator B Cells Protect Against Microbial Sepsis
P. J. Rauch et al.
A specialized population of B lymphocytes is important for controlling bacterial infections and preventing sepsis.

601 Abnormal Brain Structure Implicated in Stimulant Drug Addiction
K. D. Ersche et al.
A neurological marker of addiction vulnerability occurs in sibling pairs who do not take drugs.
**MEETING REPORT: Geomapping Health-Related Data**  
S. Sayani  
Geographical information systems can be used to analyze health data and drive improvements.

**SCIENCECAREERS**  
www.sciencecareers.org/career_magazine  
Free Career Resources for Scientists  

**The America Invents Act for Academic Scientists**  
J. Austin  
Here is what academic scientists need to know about the biggest change to U.S. patent law in 60 years.  
http://scim.ag/AmericaInvents

**Game On: Education as Play**  
D. Strain  
Game designer and former biologist Jeremy Friedberg won an honorable mention in this year’s Science and Engineering Visualization Challenge.  
http://scim.ag/JeremyFriedberg

**Content Collection: Mentoring Advice**  
E. Pain  
A good mentor at each career stage can greatly enhance your professional and personal achievement.  
http://scim.ag/CC_Mentoring

**SCIENCEPODCAST**  
www.sciencemag.org多imedia/podcast  
Free Weekly Show  

On the 3 February Science Podcast: how corals respond to climate change, inherited factors for drug addiction, 2011 Visualization Challenge winners, and more.

**SCIENCEINSIDER**  
news.sciencemag.org/scienceinsider  
Science Policy News and Analysis

**SCIENCEEXPRESS**  
www.sciencexpress.org  
Field-Effect Tunneling Transistor Based on Vertical Graphene Heterostructures  
L. Britnell et al.  
Boron nitride or molybdenum disulfide layers sandwiched between graphene sheets act as tunneling barriers to minimize device leakage currents.  
10.1126/science.1218461

**Extremely Long-Lived Nuclear Pore Proteins in the Rat Brain**  
J. N. Savas et al.  
Individual components of rat brain nuclear pores can be as old as the animal itself.  
10.1126/science.1217421

**Pollinator-Mediated Selection on Flower Color Allele Drives Reinforcement**  
R. Hopkins and M. D. Rauscher  
Butterfly behavior reduces hybridization and reinforces speciation among Phlox plants.  
10.1126/science.1215198

**Founder Effects Persist Despite Adaptive Differentiation: A Field Experiment with Lizards**  
J. J. Kolbe et al.  
Introduced populations of anoles retain characteristics of their founders and acquire adaptations to their new environment.  
10.1126/science.1209566

**Adaptations of Avian Flu Virus Are a Cause for Concern**  
K. I. Berns et al.  
10.1126/science.1217994

**SCIENCEONLINE**  

**Killer Whale Menu Finally Revealed**  
Inuit hunters provide a glimpse of what these giant predators eat in the remote Arctic.  
http://scim.ag/Killer_Whales

**SCIENCE SIGNALING**  
www.sciencesignaling.org  
The Signal Transduction Knowledge Environment  
31 January issue: http://scim.ag/ss013112

**RESEARCH ARTICLE: PAS Kinase Promotes Cell Survival and Growth Through Activation of Rho1**  
C. M. Cardon et al.  
**PODCAST**  
J. Rutter and A. M. VanHook  
Signaling through PAS kinases bypasses the pro-growth requirement of Torz1 in yeast.  
**RESEARCH ARTICLE: Myosin I Links PIP3 Signaling to Remodeling of the Actin Cytoskeleton in Chemotaxis**  
C.-L. Chen et al.  
Some myosin motor proteins use the phospholipid PIP3, to link membrane and cytoskeletal dynamics.

**ST NETWATCH: Mouse Genome Informatics**  
This site includes information about genes, phenotypes, and disease models.

**SCIENCE TRANSLATIONAL MEDICINE**  
www.sciencetranslationalmedicine.org  
Integrating Medicine and Science  
1 February issue: http://scim.ag/stm020112

**RESEARCH ARTICLE: Massage Therapy Attenuates Inflammatory Signaling After Exercise-Induced Muscle Damage**  
J. D. Crane et al.  
Massage abrogates inflammatory processes resulting from exercise-induced muscle damage.

**RESEARCH ARTICLE: CXCL12-Induced Monocyte-Endothelial Interactions Promote Lymphocyte Transmigration Across an in Vitro Blood-Brain Barrier**  
S. Man et al.  
In an in vitro model of the human blood-brain barrier, chemokine receptors regulate the transmigration of leukocytes.

**REPORT: The Anti-Trypanosome Drug Fexinidazole Shows Potential for Treating Visceral Leishmaniasis**  
S. Wyllie et al.  
Fexinidazole, a drug in clinical testing for African sleeping sickness, may prove useful for another neglected tropical disease.

**MEETING REPORT: Using Health Information Technology to Engage Communities**  
L. K. Marrriott et al.  
The Internet can be used for personal health management and to facilitate partnerships and data-sharing in a community setting.

**MEETING REPORT: Real-Time Assessment of Community Health Needs and Concerns**  
L. B. Cotler and R. Nagarajan  
Interfacing the efforts of community health workers with Web-based systems will facilitate ongoing assessment of community needs.

**MEETING REPORT: Meaningful Use of Electronic Behavioral Health Data in Primary Health Care**  
B. Tai et al.  
Treatment of mental health and substance abuse issues requires the delivery of services through a primary-care—based integrated system.

**CONTENTS**  

www.sciencemag.org  
SCIENCE  
VOL 335  
3 FEBRUARY 2012  
Published by AAAS

---

**Change of address:** Allow 4 weeks, giving old and new addresses and 8-digit account number.  
**Postmaster:** Send change of address to AAAS, P.O. Box 95176, Washington, DC 20090-9517.  
**Single-copy sales:** 100.00 current issue, 115.00 back issue prepaid includes surface postage; bulk rates on request.  
**Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that 10.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923.  
The identification code for Science is 0036-8075.  
**Copyright (c) 2012 American Association for the Advancement of Science.**  
www.sciencemag.org