

EDITORIAL

- 609 Translational Ecology
William H. Schlesinger

NEWS OF THE WEEK

- 614 As Questions Grow, Duke Halts Trials, Launches Investigation
615 Defining Select Agents by DNA Sequence
616 Fresh Start for Fusion Project as New Leader Shakes Up Management
616 Diamond Feats Give Quantum Computing a Solid Boost
617 From the *Science* Policy Blog
618 New Map Illustrates Risk From the 'Other' Malaria
619 From *Science's* Online Daily News Site

NEWS FOCUS

- 620 'Arctic Armageddon' Needs More Science, Less Hype
>> *Science Podcast*
622 Seeing Deeply Into the Sea's Biodiversity
623 The Power of Two

LETTERS

- 626 The Time of Young Scientists
E. P. Diamandis
Response
T. Brück et al.
Readers' Poll: The Time of Young Scientists
The Silver Lining of Language Loss
K. F. J. Heinrich
Cuban Health Care: Consider the Source
K. Hirschfeld
Cuban Health Care: Benefits Without Costs
L. Bodenstein
Response
P. K. Drain and M. Barry

- 628 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

- 629 Decoding Reality
V. Vedral, reviewed by E. Werner
630 Happiness Around the World
C. Graham, reviewed by P. Ak

POLICY FORUM

- 632 China's Innovation Landscape
K. G. Huang

PERSPECTIVES

- 634 Bats, in Black and White
P. Daszak
>> *Reports pp. 676 and 679*
635 The Give and Take of Alcohol Activation
A. J. A. Watson and J. M. J. Williams
636 Which Parental Gene Gets the Upper Hand?
L. S. Wilkinson
>> *Research Article p. 643; Report p. 682*
637 When UV Meets Fresh Water
C. E. Williamson and K. C. Rose
639 In Praise of Exact Quantization
M. Franz
>> *Report p. 659*
640 Versatile Germline Genes
C. Juliano and G. Wessel

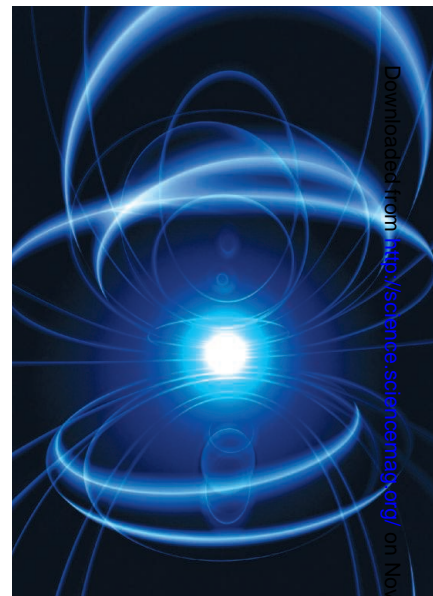
BREVIA

- 642 Vanadium Nitrogenase Reduces CO
C. C. Lee et al.
An enzyme that reduces nitrogen to ammonia can also reduce carbon monoxide to hydrocarbons.

CONTENTS continued >>



page 620



page 629

Downloaded from <http://science.sciencemag.org/> on November 16, 2018



COVER

Mexican free-tailed bats roost at Bracken Cave near San Antonio, Texas. Streicker *et al.* (p. 676) describe how the spread of new forms of rabies virus is restricted between bat species; Frick *et al.* (p. 679) explain how a fungal disease of bats, white-nose syndrome, is likely to lead to local extinctions of once-common bat species.

Photo: © Merlin D. Tuttle, Bat Conservation International, www.batcon.org

DEPARTMENTS

- 606 This Week in *Science*
610 Editors' Choice
612 *Science* Staff
613 Random Samples
697 New Products
698 *Science* Careers

RESEARCH ARTICLES

- 643 **High-Resolution Analysis of Parent-of-Origin Allelic Expression in the Mouse Brain**
C. Gregg et al.
A large repertoire of genes shows preferential expression of the paternally or maternally inherited allele.
>> *Perspective p. 636; Report p. 682*
- 649 **Role of Secondary Sensory Cortices in Emotional Memory Storage and Retrieval in Rats**
T. Sacco and B. Sacchetti
An emotional memory gradually becomes widely distributed throughout the cortex.

REPORTS

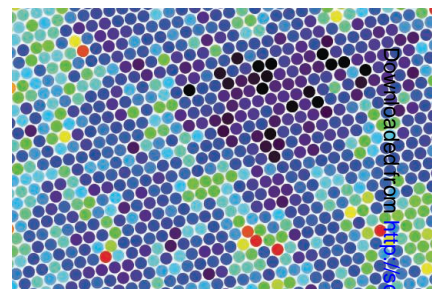
- 656 **Normal Modes and Density of States of Disordered Colloidal Solids**
D. Kaya et al.
The motion of colloidal gel particles is used to determine the mechanical and thermal properties of a disordered system.
- 659 **Massive Dirac Fermion on the Surface of a Magnetically Doped Topological Insulator**
Y. L. Chen et al.
Adding magnetic atoms to a topological insulator breaks its time-reversal symmetry.
>> *Perspective p. 639*
- 662 **Quantum Correlations in Optical Angle–Orbital Angular Momentum Variables**
J. Leach et al.
Strong quantum correlations are induced between the angular position and angular momentum of two photons.
- 665 **MESSENGER Observations of Extreme Loading and Unloading of Mercury’s Magnetic Tail**
J. A. Slavin et al.
Relative to Earth, Mercury’s magnetospheric substorms are more intense and occur on shorter time scales.
- 668 **Evidence for Young Volcanism on Mercury from the Third MESSENGER Flyby**
L. M. Prockter et al.
Volcanism and associated deformation on Mercury may have lasted well into the last half of the history of the solar system.
- 672 **Mercury’s Complex Exosphere: Results from MESSENGER’s Third Flyby**
R. J. Vervack Jr. et al.
Mercury’s exosphere is more varied and more intertwined with its magnetospheric environment than previously thought.

- 676 **Host Phylogeny Constrains Cross-Species Emergence and Establishment of Rabies Virus in Bats**
D. G. Streicker et al.
Rabies virus’ innate capacity to replicate and adapt cannot overcome host genetic barriers to cross-species transfer.
- 679 **An Emerging Disease Causes Regional Population Collapse of a Common North American Bat Species**
W. F. Frick et al.
Like the passenger pigeon, millions of little brown bats face the possibility of rapid extinction, this time from disease.
>> *Perspective p. 634; Science Podcast*
- 682 **Sex-Specific Parent-of-Origin Allelic Expression in the Mouse Brain**
C. Gregg et al.
The relative contributions of the paternal and maternal genomes differ in distinct brain regions and also in males and females.
>> *Perspective p. 636; Research Article p. 643*
- 686 **Nonlinear Elasticity and an 8-nm Working Stroke of Single Myosin Molecules in Myofilaments**
M. Kaya and H. Higuchi
Single-molecule measurements refine our understanding of how muscle myosin works.
- 689 **Long Noncoding RNA as Modular Scaffold of Histone Modification Complexes**
M.-C. Tsai et al.
The long noncoding RNA HOTAIR binds two distinct protein complexes that modify chromatin and repress transcription.
- 693 **FAN1 Acts with FANCI-FANCD2 to Promote DNA Interstrand Cross-Link Repair**
T. Liu et al.
The nuclease FAN1 acts with Fanconi anemia proteins to help repair damaged DNA.

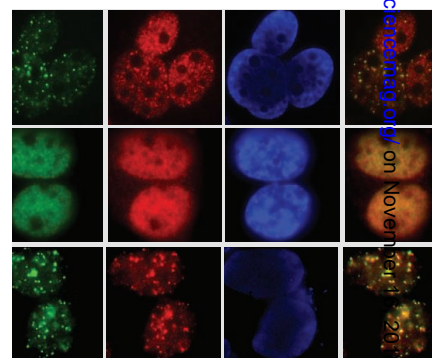
CONTENTS continued >>



page 637



page 656



page 693

SCIENCEONLINE

SCIENCEEXPRESS

www.sciencexpress.org

Strange Metal Transport Realized by Gauge/Gravity Duality

T. Faulkner et al.

Black hole theory is used to develop a mathematical description of a class of metals with unusual electronic properties.

10.1126/science.1189134

The Chlorine Isotope Composition of the Moon and Implications for an Anhydrous Mantle

Z. D. Sharp et al.

The range of chlorine isotope values of the Moon is distinct from those of Earth and meteorites, indicating that the Moon is dry.

10.1126/science.1192606

>> [Science Podcast](#)

Aryl Hydrocarbon Receptor Antagonists Promote the Expansion of Human Hematopoietic Stem Cells

A. E. Boitano et al.

The identification of a mechanism for ex vivo amplification may facilitate clinical application of hematopoietic stem cell therapies.

10.1126/science.1191536

Structural Basis for Activation of Class Ib Ribonucleotide Reductase

A. K. Boal et al.

A single protein activates two different metallofactors by distinct chemistries.

10.1126/science.1190187

Glutamine Deamidation and Dysfunction of Ubiquitin/NEDD8 Induced by a Bacterial Effector Family

J. Cui et al.

Pathogenic bacterial proteins interfere with eukaryotic ubiquitination pathways to induce cytopathic effects.

10.1126/science.1193844

SCIENCE NOW

www.sciencenow.org

Highlights From Our Daily News Coverage

Western Diet Tied to Intestinal Disease and Allergies

Gut bacteria may make people in developed countries more prone to a variety of maladies.

Orangutans Go Green

Apes are amazingly energy efficient for their size.

Marijuana Time Warp

Active ingredient in cannabis disrupts the body's internal clock.

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

RESEARCH ARTICLE: HCMV-Encoded Chemokine Receptor US28 Mediates Proliferative Signaling Through the IL-6–STAT3 Axis

E. Slinger et al.

PODCAST

M. J. Smit and A. M. VanHook

A viral G protein–coupled receptor may initiate a positive feedback loop to promote tumor proliferation and vascularization.

RESEARCH ARTICLE: The Nonphagocytic NADPH Oxidase Duox1 Mediates a Positive Feedback Loop During T Cell Receptor Signaling

J. Kwon et al.

Reactive oxygen species enhance T cell receptor signaling by promoting the phosphorylation of a proximal kinase.

SCIENCE CAREERS

www.sciencereers.org/career_magazine

Free Career Resources for Scientists

Taken for Granted: Creating Their Own Credibility

B. L. Benderly

A nonprofit founded and run by a group of independent researchers has permitted decades of scientific work.

Scientist Dads Step Up

V. Venkatraman

Although women still do most of the parenting, some scientist dads are taking on the role of primary caregiver.

SCIENCE TRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

PERSPECTIVE: PINING Down the Origin of Prostate Cancer

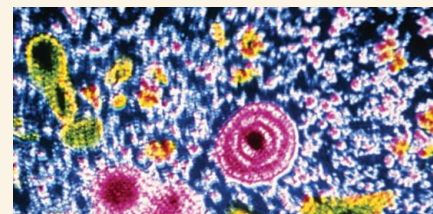
D. Moscatelli and E. L. Wilson

Two distinct cell types give rise to prostate cancer, which might cause differences in the resulting tumor's behavior.

PERSPECTIVE: A Microbe-Dependent Viral Key to Crohn's Box

D. A. Peterson and P. J. Turnbaugh

Multiple facets of the human microbiome must be considered when deciphering complex diseases such as Crohn's.



SCIENCE SIGNALING

How HCMV infection promotes cancer.

RESEARCH ARTICLE: Pathway-Based Identification of Biomarkers for Targeted Therapeutics—Personalized Oncology with PI3K Pathway Inhibitors

J. N. Andersen et al.

Drug-specific modulation of an oncogenic signaling pathway can help predict tumor sensitivity to candidate drugs.

RESEARCH ARTICLE: Ferroportin and Iron Regulation in Breast Cancer Progression and Prognosis

Z. K. Pinnix et al.

An iron efflux pump is a pivotal protein in breast cancer biology and a strong and independent predictor of breast cancer prognosis.

SCIENCE PODCAST

www.sciencemag.org/multimedia/podcast

Free Weekly Show

Download the 6 August *Science* Podcast to hear about bats threatened by white-nose syndrome, Arctic methane, the water content of the Moon's interior, and more.

SCIENCE INSIDER

news.sciencemag.org/scienceinsider

Science Policy News and Analysis

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 © 2010 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): \$146 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$910; 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. **Printed in the U.S.A.**

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 96178, Washington, DC 20090-6178. **Single-copy sales:** \$10.00 current issue, \$15.00 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 \$20.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923. The identification code for *Science* is 0036-8075. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.



ADVANCING SCIENCE. SERVING SOCIETY

Science

329 (5992)

Science **329** (5992), 606-697.

ARTICLE TOOLS

<http://science.sciencemag.org/content/329/5992>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.