

EDITORIAL

- 1611 The Royal Society's Wider Role
Martin Rees

NEWS OF THE WEEK

- 1618 Looking Beyond the Spill, Obama Highlights Long-Term Restoration
- 1619 Lucy's 'Big Brother' Reveals New Facets of Her Species
- 1620 Amid War, Appraising the Mineral Wealth of Afghanistan
- 1621 Invisibility Cloaks for Visible Light Must Remain Tiny, Theorists Predict
- 1621 From the *Science* Policy Blog
- 1622 Another Quarry Sighted in the Great Mantle Plume Hunt?
- 1622 Critics Are Far Less Prominent Than Supporters
- 1623 From *Science's* Online Daily News Site

NEWS FOCUS

- 1624 Natural Gas From Shale Bursts Onto the Scene
Not Under My Backyard, Thank You
>> *Science Podcast*
- 1627 A WEIRD View of Human Nature Skews Psychologists' Studies
- 1628 Pushing DAISY
- 1630 Could East Antarctica Be Headed for Big Melt?

LETTERS

- 1633 Time for a Sea Change in Chinese Collaboration
D. B. Abramson
- Benefits of Self-Reporting
J. M. Hutton and B. Dickson
- Consequences of Legal Ivory Trade
J. F. Walker and D. Stiles
- Response
S. Wasser et al.

- 1634 CORRECTIONS AND CLARIFICATIONS
- 1634 TECHNICAL COMMENT ABSTRACTS

BOOKS ET AL.

- 1636 Miracle Cures
R. A. Scott, reviewed by E. M. Sternberg
- 1637 Here Be Dragons
D. McCarthy, reviewed by D. Benu

POLICY FORUM

- 1638 Increased Food and Ecosystem Security via Perennial Grains
J. D. Glover et al.

PERSPECTIVES

- 1640 Time to Tap Africa's Livestock Genomes
O. Hanotte et al.
- 1641 Tackling Two Diseases with HDL
G. K. Hansson and M. Björkholm
>> Report p. 1689
- 1642 Dry Times Ahead
J. Overpeck and B. Udall
- 1644 Membrane Protein Gymnastics
C. G. Tate
>> Report p. 1698
- 1645 When Does Photoemission Begin?
H. W. van der Hart
>> Research Article p. 1658
- 1646 IgA Changes the Rules of Memory
A. Cerutti
>> Report p. 1705

SCIENCE PRIZE ESSAY

- 1648 Resources for Anyone Interested in the Brain
E. H. Chudler

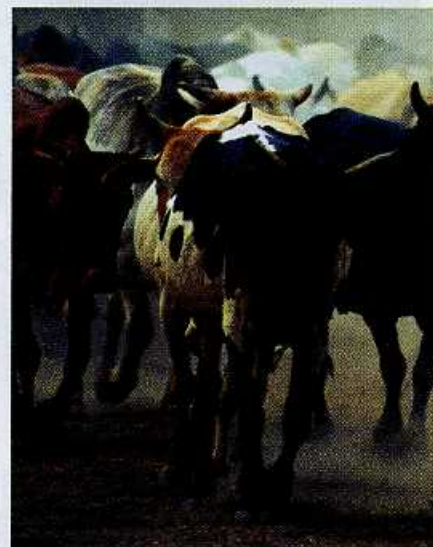
REVIEW

- 1652 The Last Glacial Termination
G. H. Denton et al.

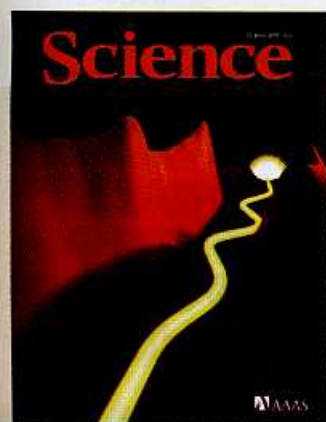
CONTENTS continued >>



page 1624



page 1640



COVER

Three-dimensional representation of the emission of electrons from a neon atom upon absorption of a photon from an attosecond extreme ultraviolet pulse. The orange surface plot represents the resulting electron energy distribution, which, when probed by an ultrashort light wave (yellow line), reveals an unexpected time delay between the emission of electrons from different atomic orbitals. See page 1658.

Image: *Christian Hackenberger/Ludwig-Maximilians-Universität, Munich, Germany*

DEPARTMENTS

- 1609 This Week in *Science*
- 1613 Editors' Choice
- 1614 *Science* Staff
- 1617 Random Samples
- 1650 AAAS News & Notes
- 1716 New Products
- 1717 *Science* Careers

BREVIA

- 1657 **Plants Integrate Information About Nutrients and Neighbors**
J. F. Cahill Jr. et al.
Plant root growth is modified in the presence of within-species competition and uneven local resource distributions.

RESEARCH ARTICLES

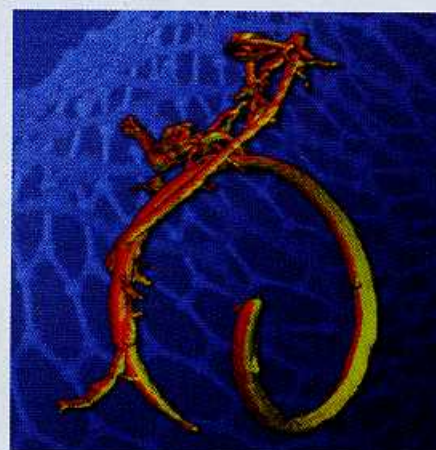
- 1658 **Delay in Photoemission**
M. Schultze et al.
Ultrafast metrology reveals a 20-attosecond delay between photoemission from different electronic orbitals in neon atoms.
>> Perspective p. 1645
- 1662 **Reconstituting Organ-Level Lung Functions on a Chip**
D. Huh et al.
Endothelial and epithelial cells grown in a microfluidics apparatus mimic the alveolar-capillary interface of the lung.

REPORTS

- 1668 **4D Electron Tomography**
O.-H. Kwon and A. H. Zewail
Nanotube vibrations are visualized in three dimensions by varying the incident angle of an ultrashort electron probe burst.
- 1673 **Measurement of the Instantaneous Velocity of a Brownian Particle**
T. Li et al.
An optically trapped silica bead in solution is used to probe assumptions underlying statistical theories of Brownian motion.
- 1676 **Glass Transition Dynamics and Surface Layer Mobility in Unentangled Polystyrene Films**
Z. Yang et al.
Thin films of short, unentangled polystyrene chains possess a highly mobile surface layer.
- 1679 **The Palladium-Catalyzed Trifluoromethylation of Aryl Chlorides**
E. J. Cho et al.
Careful catalyst tuning enables addition of trifluoromethyl groups to many intermediates in pharmaceutical and agrochemical synthesis.
- 1682 **Detection of Hydrated Silicates in Crustal Outcrops in the Northern Plains of Mars**
J. Carter et al.
The extent of the alteration of the crust of Mars by liquid water is greater than previously estimated.
- 1686 **Hydrogen Isotopes Preclude Marine Hydrate CH_4 Emissions at the Onset of Dansgaard-Oeschger Events**
M. Bock et al.
Catastrophic destabilization of marine methane clathrates did not trigger rapid warming episodes 39,000 and 35,000 years ago.

- 1689 **ATP-Binding Cassette Transporters and HDL Suppress Hematopoietic Stem Cell Proliferation**
L. Yan-Charvet et al.
Pathways that reduce cholesterol in atherosclerosis also suppress increased immune cell numbers associated with the disease.
>> Perspective p. 1641
- 1694 **A Novel miRNA Processing Pathway Independent of Dicer Requires Argonaute2 Catalytic Activity**
D. Cifuentes et al.
The unusual secondary structure of a precursor microRNA determines its noncanonical processing.
- 1698 **Control of Membrane Protein Topology by a Single C-Terminal Residue**
S. Seppälä et al.
The orientation of a multispanning inner membrane protein can be engineered by a single positively charged residue.
>> Perspective p. 1644
- 1700 **A Generalization of Hamilton's Rule for the Evolution of Microbial Cooperation**
J. Smith et al.
A rule for the evolution of cooperation in microbes shows how bacteria resist cheaters.
- 1703 **c-di-AMP Secreted by Intracellular *Listeria monocytogenes* Activates a Host Type I Interferon Response**
J. J. Woodward et al.
Within the host cell, a small secondary signaling molecule from a pathogen triggers a pathway of innate immunity.
- 1705 **Reversible Microbial Colonization of Germ-Free Mice Reveals the Dynamics of IgA Immune Responses**
S. Hapfelmeier et al.
Immunoglobulin responses against nonpathogenic bacteria in the gut are specific for the resident microbial flora.
>> Perspective p. 1646
- 1709 **Transition to Addiction Is Associated with a Persistent Impairment in Synaptic Plasticity**
F. Kasanetz et al.
Loss of glutamate receptor-dependent synaptic plasticity in the brain is associated with the transition to cocaine addiction.
- 1712 **Incidental Haptic Sensations Influence Social Judgments and Decisions**
J. M. Ackerman et al.
A seat-of-the-pants impression (tactile sensation influencing decisions) is a reality and not just a metaphor.

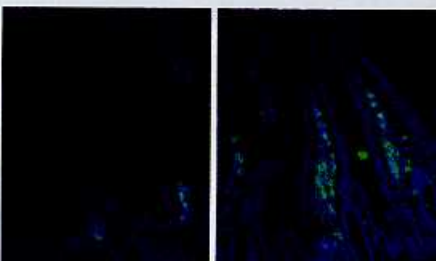
CONTENTS continued >>



page 1668



page 1673



pages 1646 & 1705