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**COVER**

When certain materials drop below a critical temperature, they enter a superconducting phase characterized by zero electrical resistance. A readily visualized signature of the superconducting state is the ability to expel magnetic fields. In this photo, a magnet placed on top of the ceramic ytrium barium copper oxide levitates as the temperature drops below 123 kelvin and the material becomes superconducting. See the special section beginning on page 189.

Photo: Takeshi Takahara/Photo Researchers, Inc.

## BREVIA

- 205 **Kepler Detected Gravity-Mode Period Spacings in a Red Giant Star**  
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Asteroseismic observations with the Kepler satellite probed the deep interior of an evolved star.  
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- 209 **Ribozyme-Catalyzed Transcription of an Active Ribozyme**  
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A functional RNA has been synthesized by an RNA enzyme from mononucleotide building blocks.  
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Measurements of 500 Sun-like stars show that their properties differ from those predicted by stellar population models.
- 216 **HD 181068: A Red Giant in a Triply Eclipsing Compact Hierarchical Triple System**  
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The Kepler satellite reveals details of the oscillation patterns of an evolved star in an exotic triple-star system.  
>> *Perspective p. 180; Brevia p. 205*
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A technique based on light-induced electronic excitations on a metal-film surface is used for three-dimensional color displays.
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Large parts of eastern Europe experienced exceptional warmth during the summer of 2010.
- 224  **$^{13}\text{C}$  NMR Guides Rational Design of Nanocatalysts via Chemisorption Evaluation in Liquid Phase**  
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Nuclear magnetic resonance spectroscopy can reveal the strength of substrate interactions with heterogeneous catalysts.

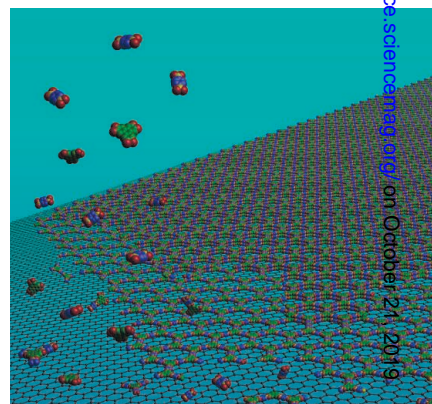
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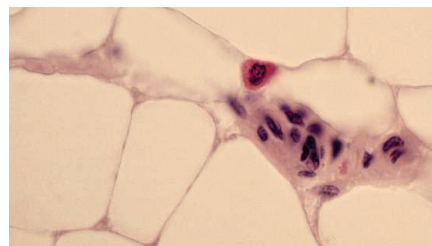
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## SCIENCEONLINE

## SCIENCEEXPRESS

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

**Trans-Endocytosis of CD80 and CD86: A Molecular Basis for the Cell Extrinsic Function of CTLA-4**

*O. S. Qureshi et al.*

An inhibitory T cell receptor acts by stripping activating ligands off dendritic cells.

10.1126/science.1202947

**Neuronal GPCR Controls Innate Immunity by Regulating Noncanonical Unfolded Protein Response Genes**

*J. Sun et al.*

Two nematode worm neurons “smell” disease and promote resistance to pathogens.

10.1126/science.1203411

**Observation of Orbital Currents in CuO**

*V. Scagnoli et al.*

Resonant x-ray scattering is used to detect microscopic loop currents within the plane of cupric oxide.

10.1126/science.1201061

**Orbital-Independent Superconducting Gaps in Iron-Pnictides**

*T. Shimajima et al.*

Bulk photoemission studies of iron pnictides suggest a role for orbital fluctuations in creating the superconducting state.

10.1126/science.1202150

**Venus’s Southern Polar Vortex Reveals Precessing Circulation**

*D. Luz et al.*

Observations with the Venus Express Orbiter reveal complex polar atmospheric dynamics.

10.1126/science.1201629

## TECHNICALCOMMENTS

**Comment on “Calcareous Nannoplankton Response to Surface-Water Acidification Around Oceanic Event 1a”**

*S. J. Gibbs et al.*

Full text at [www.sciencemag.org/cgi/content/full/332/6026/175-b](http://www.sciencemag.org/cgi/content/full/332/6026/175-b)

**Response to Comment on “Calcareous Nannoplankton Response to Surface-Water Acidification Around Oceanic Event 1a”**

*E. Erba et al.*

Full text at [www.sciencemag.org/cgi/content/full/332/6026/175-c](http://www.sciencemag.org/cgi/content/full/332/6026/175-c)

## SCIENCENOW

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

Highlights From Our Daily News Coverage

**Tuberculosis Followed the Fur Trade**  
Genetic fingerprints reveal movement of deadly bacterium from Europeans to native Canadians.

<http://scim.ag/tb-fur>

**The Curse of the Mummies’ Arteries**

A new study traces the origins of heart disease in ancient Egypt.

<http://scim.ag/mummy-curse>

**A Bacterium That Acts Like a Toothbrush**

Oral microbe fights plaque buildup, could lead to development of better toothpaste.

<http://scim.ag/bug-tooth>

## SCIENCE SIGNALING

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

The Signal Transduction Knowledge Environment

**5 April issue:** <http://scim.ag/ss040511>

**RESEARCH ARTICLE: Poly(ADP-Ribose) (PAR) Binding to Apoptosis-Inducing Factor Is Critical for PAR Polymerase-1–Dependent Cell Death (Parthanatos)**

*Y. Wang et al.*

Poly(ADP-ribose) binds to apoptosis-inducing factor to trigger its release from mitochondria and induce cell death.

**RESEARCH ARTICLE: Confinement of Activating Receptors at the Plasma Membrane Controls Natural Killer Cell Tolerance**

*S. Guia et al.*

## PODCAST

*S. Ugolini et al.*

The responsiveness of activating NK cell receptors is determined by the distribution of inhibitory receptors.

**PERSPECTIVE: ATM Is a Redox Sensor Linking Genome Stability and Carbon Metabolism**

*A. Krüger and M. Ralser*

By linking genome stability, the cell cycle, and carbon catabolism, ATM emerges as a central regulator of cancer cell metabolism.

**PERSPECTIVE: All Stressed Out Without ATM Kinase**

*J. J. P. Perry and J. A. Tainer*

Oxidation activates ATM, allowing this kinase to mediate antioxidant responses.

**PRESENTATION: Proteomic Analysis of Integrin Adhesion Complexes**

*A. Byron et al.*

A workflow for the proteomic analysis of integrin-associated complexes reveals ligand-specific adhesion networks.

## SCIENCE CAREERS

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

Free Career Resources for Scientists

**Taken for Granted: Doctoral Candidate**

*B. L. Benderly*

Postdoc-turned-politician Peter Ferguson hopes to bring his scientific insight to Canada’s federal Parliament.

[http://scim.ag/tfg\\_ferguson](http://scim.ag/tfg_ferguson)

**Q&A: Philip Phillips—A Roundabout Approach to Superconductivity**

*E. Pain*

His unconventional training allowed theoretical condensed matter physicist Philip Phillips to tackle superconductivity using a novel and indirect approach.

<http://scim.ag/qaphillips>

>> *Superconductivity section p. 189*

## SCIENCE TRANSLATIONAL MEDICINE

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

Integrating Medicine and Science

**6 April issue:** <http://scim.ag/stm040611>

**STATE OF THE ART REVIEW: Alzheimer’s Disease—The Challenge of the Second Century**

*D. M. Holtzman et al.*

## PODCAST

*D. M. Holtzman and O. M. Smith*

The first article in our State of the Art Review series explores the challenges of translating research advances into clinical treatments for Alzheimer’s disease.

**RESEARCH ARTICLE: Genital HIV-1 RNA Predicts Risk of Heterosexual HIV-1 Transmission**

*J. M. Baeten et al.*

**PERSPECTIVE: HIV Transmission—Time for Translational Studies to Bridge the Gap**

*P. Anton and B. C. Herold*

Genital HIV-1 RNA quantity predicts risk of heterosexual HIV-1 transmission independently of plasma HIV-1 concentration.

**RESEARCH ARTICLE: CD44-SLC1A2 Gene Fusions in Gastric Cancer**

*J. Tao et al.*

One partner of a fusion gene found in gastric cancer, CD44-SLC1A2, may contribute to the tumor’s abnormal metabolism.

## SCIENCEPODCAST

[www.sciencemag.org/multimedia/podcast](http://www.sciencemag.org/multimedia/podcast)

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On the 8 April Science Podcast: connecting disorder and stereotyping, GM-organic coexistence, stellar variations, and more.

## SCIENCEINSIDER

[news.sciencemag.org/scienceinsider](http://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 © 2011 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): \$149 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$990; 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.

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**332 (6026)**

*Science* **332** (6026), 145-257.

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