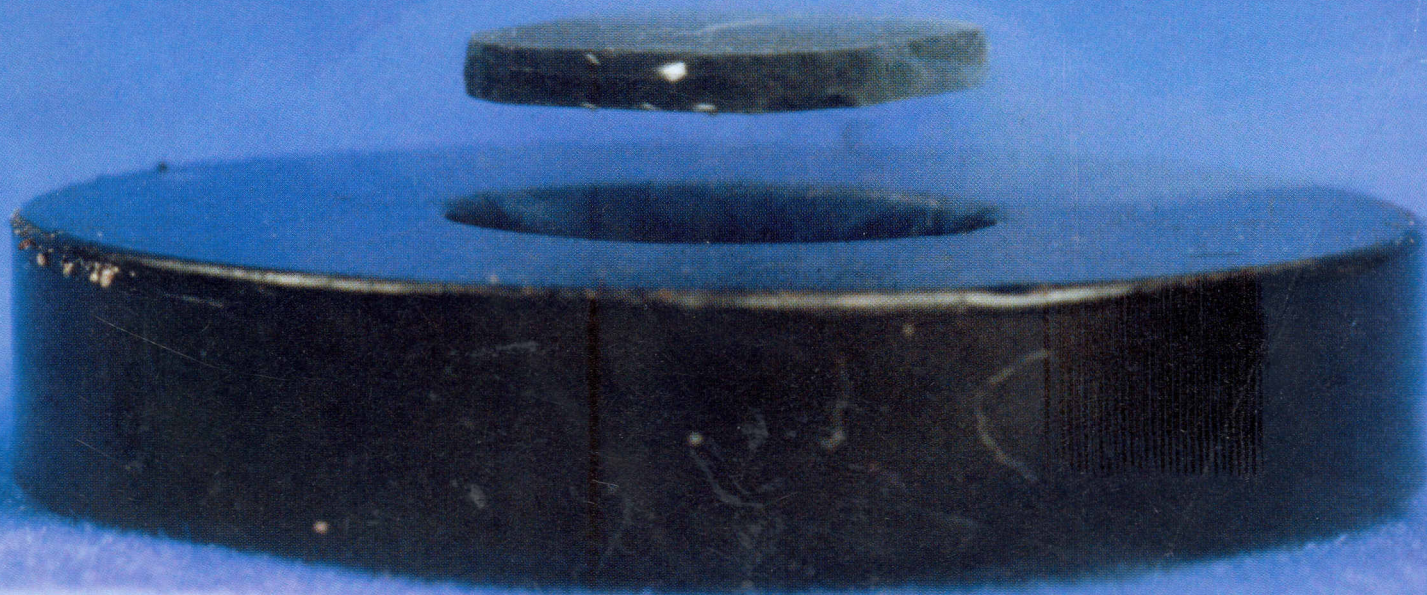


# Science

8 April 2011 | \$10

Superconductivity



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# Superconductivity

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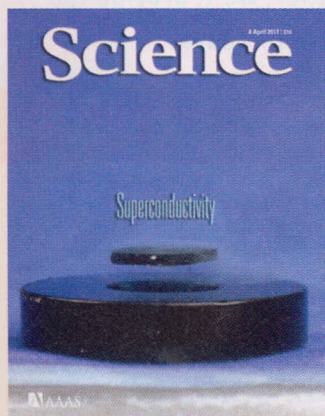
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When certain materials drop below a critical temperature, they enter a superconducting phase characterized by zero electrical resistance. A readily visualized signature of the superconducting state is the ability to expel magnetic fields. In this photo, a magnet placed on top of the ceramic yttrium 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.

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The Kepler satellite reveals details of the oscillation patterns of an evolved star in an exotic triple-star system.  
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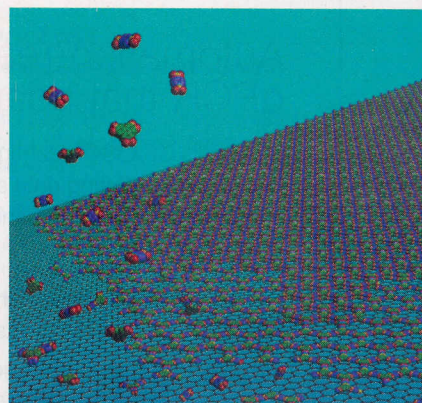
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## SCIENCEONLINE

## SCIENCEEXPRESS

[www.scienceexpress.org](http://www.scienceexpress.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

## TECHNICAL COMMENTS

**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)

## SCINCENOW

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Genetic fingerprints reveal movement of deadly bacterium from Europeans to native Canadians.

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

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**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

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*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>

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## SCIENCE TRANSLATIONAL MEDICINE

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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.

## SCIENCE PODCAST

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