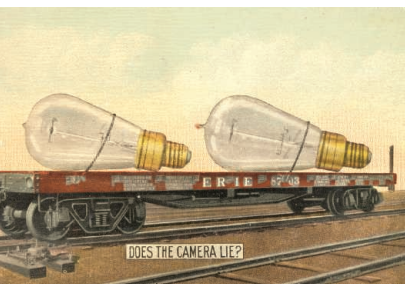




page 546



page 551

SPECIAL SECTION

Exoplanets

INTRODUCTION

565 Alien Worlds Galore

NEWS

566 Gallery of Planet Hunters

570 ... And a Glossary of Their Quarry

>> *Science Podcast*

REVIEWS

572 Observed Properties of Extrasolar Planets
A. W. Howard

577 Exoplanet Habitability
S. Seager
>> *Science Podcast*

>> *News story p. 542; Report p. 587; Planet Hunters slideshow; and more at www.sciencemag.org/special/exoplanets*

EDITORIAL

525 Is Any Science Safe?
Kenneth Prewitz

NEWS OF THE WEEK

530 A roundup of the week's top stories

NEWS & ANALYSIS

534 Bill Would Set New Rules for Choosing NSF Grants

535 Research in Limbo as Harvard Moves to Close Center

536 Bill and Melinda Gates Talk Science

539 Scientists Clash Swords Over Future of GM Food Crops in India

540 Hansen's Retirement From NASA Spurs Look at His Legacy

NEWS FOCUS

542 Mr. Borucki's Lonely Road to the Light
>> *Exoplanets section p. 565; Report p. 587*

546 Taking the Pulse of a Ravaged Ocean
The Pacific Swallows Fukushima's Fallout

LETTERS

548 Geoengineering: Guidance Exists
P. S. Corden

Geoengineering: Perilous Particles
B. Fadeel et al.

549 Life in Science: The Legend of Owen

549 TECHNICAL COMMENT ABSTRACTS

BOOKS ET AL.

550 Surfaces and Essences
D. Hofstadter and E. Sander,
reviewed by *K. J. Holyoak*

551 Faking It
M. Fineman, curator;
Faking It
M. Fineman

POLICY FORUM

552 Global Research Integrity Training
N. H. Steneck

ON THE WEB THIS WEEK

>> **Special Issue Slideshow**
Check out a gallery of planet hunters.

>> **Find More Online**
Check out *Science Express*, our podcast, videos, daily news, our research journals, and *Science Careers* at www.sciencemag.org.



COVER

Stylized comparison of the inner solar system (top) and Kepler-62 (bottom), a five-planet system about 1200 light-years away. Like our solar system, Kepler-62 hosts two planets in its habitable zone (depicted in green), the region around a star where a planet could conceivably maintain liquid water on its surface. The special section beginning on page 565 summarizes what we currently know about extrasolar planets.

Illustration: NASA/Jet Propulsion Laboratory-Caltech/T. Pyle

DEPARTMENTS

523 *This Week in Science*
526 *Editors' Choice*
528 *Science Staff*
643 *New Products*
644 *Science Careers*

PERSPECTIVES

- 554 **Recombinatorial Logic**
Y. Benenson
>> Report p. 599
- 555 **Seeing Gravitational Waves**
M. M. Kasliwal
- 556 **Tracking Marine Pollution**
J. E. Elliott and K. H. Elliott
- 558 **Silencing a Metabolic Oncogene**
J. Kim and R. J. DeBerardinis
>> Reports pp. 622 and 626
- 559 **Unconventional Secretion, Unconventional Solutions**
M. Zhang and R. Schekman
- 561 **Obey the Peptide Assembly Rules**
M. S. Ardejani and B. P. Orner
>> Report p. 595
- 562 **As Good as Chocolate**
K. Palczewski and P. D. Kiser
>> Reports pp. 610 and 615

RESEARCH ARTICLE

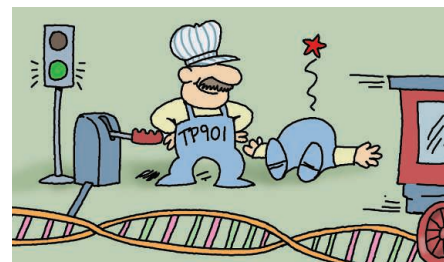
- 583 **Emergence and Frustration of Magnetism with Variable-Range Interactions in a Quantum Simulator**
R. Islam et al.
Coulomb interactions in a system of 16 trapped ions are used to simulate magnetism with varying degrees of frustration.

REPORTS

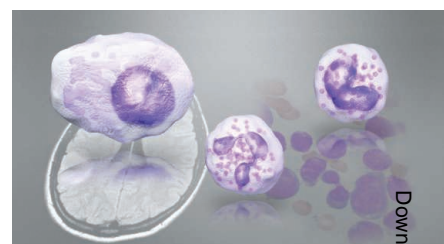
- 587 **Kepler-62: A Five-Planet System with Planets of 1.4 and 1.6 Earth Radii in the Habitable Zone**
W. J. Borucki et al.
The Kepler mission detected a five-planet system with two small planets in the habitable zone of a star lighter than the Sun.
>> News story p. 542; Exoplanets section p. 565
- 591 **Complex N-Heterocycle Synthesis via Iron-Catalyzed, Direct C–H Bond Amination**
E. T. Hennessy and T. A. Betley
An iron catalyst facilitates carbon–nitrogen bond formation in previously unreactive substrates.
- 595 **Self-Assembling Cages from Coiled-Coil Peptide Modules**
J. M. Fletcher et al.
Hexagonal networks form from heterodimeric and homotrimeric coiled coils and create ~100-nanometer-diameter cages.
>> Perspective p. 561

- 599 **Amplifying Genetic Logic Gates**
J. Bonnet et al.
A genetic circuit architecture resembling a transistor can be engineered into individual live cells.
>> Perspective p. 554
- 603 **Controlled Flight of a Biologically Inspired, Insect-Scale Robot**
K. Y. Ma et al.
A fly-scale, flapping-wing robot has been fabricated and can be controlled to perform unconstrained flight maneuvers.
- 607 **3D Reconstruction of the Source and Scale of Buried Young Flood Channels on Mars**
G. A. Morgan et al.
Radar data taken from orbit reveal the complex morphology of buried flood channels in a young region of Mars.
- 610 **Structural Basis for Molecular Recognition at Serotonin Receptors**
C. Wang et al.
- 615 **Structural Features for Functional Selectivity at Serotonin Receptors**
D. Wacker et al.
Structures of serotonin receptor family members in complex with the fungal alkaloid ergot offer clues for drug designers.
>> Perspective p. 562
- 619 **R-Loop Stabilization Represses Antisense Transcription at the *Arabidopsis* FLC Locus**
Q. Sun et al.
A homeodomain protein limits expression of antisense transcripts involved in flowering time control.
- 622 **Targeted Inhibition of Mutant IDH2 in Leukemia Cells Induces Cellular Differentiation**
F. Wang et al.
- 626 **An Inhibitor of Mutant IDH1 Delays Growth and Promotes Differentiation of Glioma Cells**
D. Rohle et al.
A small molecule that inhibits a mutant enzyme in tumors slows malignant growth by inducing cancer cell differentiation.
>> Perspective p. 558

- 630 **Disparate Individual Fates Compose Robust CD8⁺ T Cell Immunity**
V. R. Buchholz et al.
- 635 **Heterogeneous Differentiation Patterns of Individual CD8⁺ T Cells**
C. Gerlach et al.
The single-cell dynamics as cytotoxic T cells respond to a bacterial infection are analyzed in mice.
- 639 **Neural Decoding of Visual Imagery During Sleep**
T. Horikawa et al.
Machine-learning models can predict specific visual dream contents from brain activity measurement alone.



pages 554 & 599



pages 558, 622, & 626

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 © 2013 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.

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 \$30.00 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.

Science

340 (6132)

Science **340** (6132), 523-643.

ARTICLE TOOLS

<http://science.sciencemag.org/content/340/6132>

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.