

SPECIAL SECTION

Curiosity at Gale Crater

INTRODUCTION

1475 Analysis of Surface Materials by the Curiosity Mars Rover
J. P. Grotzinger

RESEARCH ARTICLE ABSTRACTS

1476 The Petrochemistry of Jake_M: A Martian Mugarite
E. M. Stolper et al.
Soil Diversity and Hydration as Observed by ChemCam at Gale Crater, Mars
P.-Y. Meslin et al.

X-ray Diffraction Results from Mars Science Laboratory: Mineralogy of Rocknest at Gale Crater
D. L. Bish et al.

Curiosity at Gale Crater, Mars: Characterization and Analysis of the Rocknest Sand Shadow
D. F. Blake et al.

Volatile, Isotope, and Organic Analysis of Martian Fines with the Mars Curiosity Rover
L. A. Leshin et al.

>> *Science Podcast*

>> For full text: www.sciencemag.org/extra/curiosity



pages 1430, 1442, & 1457

EDITORIAL

1430 Mercury and Health
Marcia McNutt
>> *News package p. 1442; Perspective p. 1457*

NEWS OF THE WEEK

1434 A roundup of the week's top stories

NEWS & ANALYSIS

1437 Sequester Takes Uneven Bite From Agency Budgets
1438 U.S. Carbon Plan Relies on Uncertain Capture Technology
1439 Will New Government Overcome 'Symbolically Challenged' Start?
1440 DNA Sleuths Track *C. difficile* Infection Routes
1441 Zombie Endocrine Disruptors May Threaten Aquatic Life
>> *Science Express Report by S. Qu et al.*

NEWS FOCUS

1442 Taming a Mercurial Element
1443 With Pact's Completion, the Real Work Begins
>> *Science Podcast*
1446 In Minamata, Mercury Still Divides
1448 Gold's Dark Side
>> *Editorial p. 1430; Perspective p. 1457*

LETTERS

1451 L'Aquila's Aftershocks Shake Scientists
E. Boschi
Low Marks for Education Funding Priorities
J. D. McInerney
Bayes' Confidence
D. A. S. Fraser
Research Funders Should Take the Field
E. Allen et al.

1452 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

1453 Experiencing Art
A. P. Shimamura, reviewed by N. Hutton and L. Kelly
1454 Behind the Shock Machine
G. Perry, reviewed by R. Abma

EDUCATION FORUM

1455 Increasing Persistence of College Students in STEM
M. J. Graham et al.

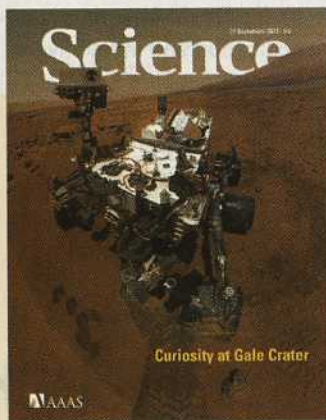
PERSPECTIVES

1457 Global Change and Mercury
D. P. Krabbenhoft and E. M. Sunderland
>> *Editorial p. 1430; News package p. 1442*
1458 A Coat of Many Functions
D. Shchukin and H. Möhwald
1460 Sources of Antimicrobial Resistance
M. E. J. Woolhouse and M. J. Ward
>> *Report p. 1514*

CONTENTS continued >>

ON THE WEB THIS WEEK

>> **Science Podcast**
Listen to stories on monitoring mercury in the environment, news from the Curiosity rover, codon bias in bacterial genes, and more.
>> **Find More Online**
Check out *Science Express*, our podcast, videos, daily news, our research journals, and *Science Careers* at www.sciencemag.org.



COVER

NASA's Mars Science Laboratory rover, Curiosity, at its Rocknest sample-collection site, Gale crater, Mars, on 31 October 2012. This is a mosaic of 59 images acquired by the Mars Hand Lens Imager, a camera mounted at the end of Curiosity's robotic arm (both partly not visible during imaging and cropped out during processing). Four scoop troughs are shown; a fifth was created after the mosaic was obtained. The width of each rover wheel is 40 cm.* See page 1475.

Image: NASA/JPL-Caltech/Malin Space Science Systems

DEPARTMENTS

1429 This Week in *Science*
1431 Editors' Choice
1432 *Science* Staff
1469 AAAS News & Notes
1526 Gordon Research Conferences
1537 New Products
1538 *Science Careers*

1461 **A New Route for Growing Large Grains in Metals**

E. M. Taleff and N. A. Pedraza
 >> Report p. 1500

1462 **Some Monocytes Got Rhythm**

D. Druzd and C. Scheiermann
 >> Research Article p. 1483

1464 **Small Volumes Create Super(elastic) Effects**

K. T. Faber
 >> Report p. 1505

1465 **Stalemate in the Golgi Battle**

B. Morriswood and G. Warren

SCIENCE PRIZE ESSAY1467 **Students Propose Genetic Solutions to Societal Problems**

S. Wick et al.

RESEARCH ARTICLES1478 **Electromagnetic Energy Conversion at Reconnection Fronts**

V. Angelopoulos et al.
 Data from various satellites in Earth's magnetotail clarify where and how electromagnetic energy conversion occurs.

1483 **Circadian Gene *Bmal1* Regulates Diurnal Oscillations of Ly6C^{hi} Inflammatory Monocytes**

K. D. Nguyen et al.
 The clock protein *Bmal1* regulates daily changes in white blood cell trafficking and susceptibility to inflammation in mice.
 >> Perspective p. 1462

REPORTS1489 **In Situ Observations of Interstellar Plasma with Voyager 1**

D. A. Gurnett et al.
 Electron densities detected by Voyager 1 show that the spacecraft is in the interstellar plasma.

1492 **Distances, Luminosities, and Temperatures of the Coldest Known Substellar Objects**

T. J. Dupuy and A. L. Kraus
 Observations with the Spitzer Space Telescope strengthen the link between the coolest brown dwarfs and gas-giant exoplanets.

1496 **Observation of Dirac Node Formation and Mass Acquisition in a Topological Crystalline Insulator**

Y. Okada et al.
 Scanning tunneling spectroscopy of $\text{Pb}_{1-x}\text{Sn}_x\text{Se}$ in a magnetic field reveals two types of Dirac fermions.

1500 **Abnormal Grain Growth Induced by Cyclic Heat Treatment**

T. Otori et al.
 Thermal cycling of a copper-based shape-memory alloy leads to abnormal grain growth and very large grains.
 >> Perspective p. 1461

1502 **Cation Intercalation and High Volumetric Capacitance of Two-Dimensional Titanium Carbide**

M. R. Lukatskaya et al.
 The layered material Ti_3C_2 can intercalate much larger cations than Li^+ , allowing for energy storage applications.

1505 **Shape Memory and Superelastic Ceramics at Small Scales**

A. Lai et al.
 Fine-scale shape memory ceramics are capable of many actuation cycles to strains up to 7%.
 >> Perspective p. 1464

1508 **Near-Complete Extinction of Native Small Mammal Fauna 25 Years After Forest Fragmentation**

L. Gibson et al.
 The rapid loss of native mammals from isolated Thai forests suggests that forest fragments cannot maintain biodiversity.

1511 **Safeguards for Cell Cooperation in Mouse Embryogenesis Shown by Genome-Wide Cheater Screen**

M. Dejosez et al.
 During embryogenesis, a network of genes centered on *p53*, *topoisomerase 1*, and olfactory receptors helps to ensure cell cooperation.

1514 **Distinguishable Epidemics of Multidrug-Resistant *Salmonella* Typhimurium DT104 in Different Hosts**

A. E. Mather et al.
 Antibiotic resistance travels in independent epidemics in humans and their livestock.
 >> Perspective p. 1460

1517 **The Inhibitory Circuit Architecture of the Lateral Hypothalamus Orchestrates Feeding**

J. H. Jennings et al.
 A specific brain circuit drives the consumption of highly palatable food, even when energy needs are satisfied.

1521 **Cocaine Disinhibits Dopamine Neurons by Potentiation of GABA Transmission in the Ventral Tegmental Area**

C. Bocklisch et al.
 Changes in specific neuronal circuits suggest that drug-evoked synaptic plasticity facilitates drug-adaptive behavior.



page 1453



pages 1460 & 1514



pages 1461 & 1500

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 #R1254 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.