

740 & 790

The immediate aftermath of ionization

13 NOVEMBER 2015 • VOLUME 350 • ISSUE 6262





IN BRIEF

722 Roundup of the week's news

IN DEPTH

725 FIRE DOWN BELOW

New study shows that Mount St. Helens may share magma with other volcanoes nearby By E. Hand

726 THORIUM SEEN AS NUCLEAR'S **NEW FRONTIER**

Unsung reactor fuel is more abundant than uranium and, proponents say, safer By P. Bagla

728 HOW WARMING OCEANS UNLEASHED AN ICE STREAM

Accelerating retreat of a Greenland glacier could raise sea level for decades to come By C. Gramling ▶ OCEANS AND CLIMATE CHANGE SECTION P. 750;

J. MOUGINOT ET AL. 10.1126/science.aac7111

SPECIAL SECTION Oceans and climate change

INTRODUCTION

750 Oceans of change

NEWS

752 Ghosts of oceans past By W. Cornwall

756 Breaking the waves By G. Popkin

760 Moveable feast By M. Lavelle

PERSPECTIVES

764 The silent services of the world ocean T. F. Stocker

766 The deep ocean under climate change L. A. Levin and N. Le Bris

769 Warm-water coral reefs and climate change M. D. Spalding and B. E. Brown

REVIEWS

772 Climate change and marine vertebrates W.J. Sydeman et al.

778 Climate change in the oceans: Human impacts and responses E. H. Allison and H. R. Bassett

729 FOSSILS, CELLS POINT TO **EARLY APPEARANCE OF THE BRAIN**

Nervous systems were well developed by the Cambrian explosion, having evolved in earlier organisms By E. Pennisi

730 CANCER RESEARCH CENTERS POOL TUMOR GENOME DATA

DNA registry could lead to new treatments By J. Kaiser

731 BABY'S LEUKEMIA RECEDES AFTER NOVEL CELL THERAPY

Gene editing used to create "off-theshelf "T cells By J. Couzin-Frankel

FEATURE

732 NOT GUILTY AS CHARGED

Several cases have unraveled lately against Chinese-born scientists accused of stealing industrial secrets. Critics smell a witch-hunt By M. Hvistendahl

ON THE COVER



Melting water streams from an iceberg in Disko Bay on the western coast of Greenland. The iceberg calved from the Ilulissat Glacier

(also known as Sermeq Kujalleq or Jakobshavn Glacier), one the world's fastest-moving and most-studied glaciers. Melting polar ice sheets are one consequence of human-induced global warming and could contribute to a substantial increase in global sea levels in the future. See page 750. Photo: © Paul Souders/Corbis

SEE ALSO ► EDITORIAL P. 721 ► NEWS STORY P. 728 ► REPORT P. 809 ► REPORT BY J. MOUGINOT ET AL. 10.1126/science.aac7111

INSIGHTS

PERSPECTIVES

736 ONE ERA YOU ARE IN-THE NEXT **YOU ARE OUT**

Evolutionary trends in body size changed during a past mass extinction event By P. J. Wagner ▶ REPORT P. 812

738 MORE EFFICIENT TOGETHER

Hybrid bioinorganic photosynthesis yields a wide range of chemicals By T. Zhang

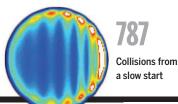
739 FLOW CYTOMETRY STRIKES GOLD

Flow cytometry remains unparalleled as a high-throughput, high-content single-cell analysis technology By J. P. Robinson and M. Roederer

740 TO CATCH AND SMASH CHARGE **ON THE HOP**

High-harmonic spectroscopy can probe charge migration controlled by a laser field By K. Ueda ▶ REPORT P. 790





13 NOVEMBER 2015 • VOLUME 350 • ISSUE 6262

742 BREACHING THE GUT-VASCULAR BARRIER

A vascular barrier in the intestinal tract controls pathogen dissemination By R. Bouziat and B. Jabri ▶ REPORT P. 830

743 STAKEHOLDERS IN CLIMATE SCIENCE: BEYOND LIP SERVICE?

Local knowledge coproduction must be rewarded By N. L. Klenk et al.

BOOKS ET AL.

745 THE PLANET REMADE By O. Morton, reviewed by E. Oelkers

746 THE BRAIN ELECTRIC By M. Gay, reviewed by A. A. Faisal

LETTERS

747 PUTTING RUSSIA ON THE GENOME MAP By T. K. Oleksyk et al.

747 TEMPERING THREATS TO TEMPERATE FORESTS

By D. Waller et al.

748 HOW TO MEASURE SUSTAINABLE PROGRESS

By P. Dasgupta et al.



IN BRIEF 783 From Science and other journals

RESEARCH ARTICLE

786 GROWTH CONTROL

A brain circuit that synchronizes growth and maturation revealed through Dilp8 binding to Lgr3 D. M. Vallejo et al. RESEARCH ARTICLE SUMMARY; FOR FULL TEXT:

dx.doi.org/10.1126/science.aac6767

REPORTS

787 SCATTERING DYNAMICS

Imaging resonances in low-energy NO-He inelastic collisions S. N. Vogels et al.

790 ATTOSECOND DYNAMICS

Measurement and laser control of attosecond charge migration in ionized iodoacetylene P. M. Kraus et al. ▶ PERSPECTIVE P. 740

795 GEOCHEMISTRY

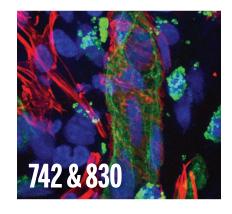
Evidence for primordial water in Earth's deep mantle L. J. Hallis et al.

798 MAGNETIC RESONANCE

Torque-mixing magnetic resonance spectroscopy J. E. Losby et al.

801 GAMMA-RAY ASTRONOMY

An extremely bright gamma-ray pulsar in the Large Magellanic Cloud The Fermi LAT Collaboration



805 MAMMALIAN EVOLUTION

Evolution and dispersal of mammoths across the Northern Hemisphere A. M. Lister and A. V. Sher

809 CLIMATE CHANGE

Slow adaptation in the face of rapid warming leads to collapse of the Gulf of Maine cod fishery A. J. Pershing et al.

▶ OCEANS AND CLIMATE CHANGE SECTION P. 750

812 EXTINCTION EVENTS

Body-size reduction in vertebrates following the end-Devonian mass extinction L. Sallan and A. K. Galimberti ▶ PERSPECTIVE P. 736; PODCAST

815 SMALL RNAS

MicroRNA-encoded behavior in Drosophila J. Picao-Osorio et al.

820 HUMAN EVOLUTION

Ancient Ethiopian genome reveals extensive Eurasian admixture throughout the African continent M. Gallego Llorente et al.

823 GENOME EDITING

Dynamics of CRISPR-Cas9 genome interrogation in living cells S. C. Knight et al.

826 ANTIVIRAL IMMUNITY

Nlrp6 regulates intestinal antiviral innate immunity P. Wang et al.

830 MUCOSAL IMMUNITY

A gut-vascular barrier controls the systemic dissemination of bacteria I. Spadoni et al. ▶ PERSPECTIVE P. 742

DEPARTMENTS

721 EDITORIAL

Climate warning, 50 years later By Marcia McNutt ▶ OCEANS AND CLIMATE CHANGE SECTION P. 750

882 WORKING LIFE

1

Leaping into the unknown By Jeremy C. Borniger

Science Staff	718
New Products	871
Science Careers	872

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 © 2015 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 © 2015 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): \$153 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$1282; Foreign postage extra: Mexico, Caribbean (strate mail) \$55\$; other countries (air assist delivery) \$85\$. First Audent, and emeritus rates on request. Canadian rates with 657 available puor request. Carib \$77 allocated to \$1254 81022. Publications Mail Agreement Number 1069624. Printed in the US.A. Change of address: Allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to AAAS, PO. 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 AAS to libraries and other users registered with the Copyright Clearance Conter (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.



350 (6262) (November 13, 2015) *Science* **350** (6262), 721-882.

Editor's Summary

This copy is for your personal, non-commercial use only.

Article Tools	Visit the online version of this article to access the personalization and article tools: http://science.sciencemag.org/content/350/6262
Permissions	Obtain information about reproducing this article: http://www.sciencemag.org/about/permissions.dtl

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published weekly, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. Copyright 2016 by the American Association for the Advancement of Science; all rights reserved. The title *Science* is a registered trademark of AAAS.