



1483



NEWS

IN BRIEF

1474 News at a glance

IN DEPTH

1477 DEEP SPACE NETWORK GLITCHES WORRY SCIENTISTS

NASA's aging radio antennas have faced years of budget cuts *By P. Voosen*

1478 WILL NOBEL PRIZE OVERLOOK LIGO'S MASTER BUILDER?

Barry Barish assembled the gravitational wave detectors *By A. Cho*

1480 CANADA AIMS TO REWRITE ENVIRONMENTAL LAW

Scientists urge government to tighten project reviews *By L. Evans Ogden*

1481 A LIFELINE FOR GREEK SCIENCE—OR LIVING ON BORROWED TIME?

New foundation will fund peer-reviewed grants, but crisis persists *By E. Stokstad*

1482 ROSETTA ENDS 2-YEAR COMET MISSION WITH FINAL DESCENT

Fluffy particles indicate that 67P/Churyumov-Gerasimenko was born gently from flocks of pebbles *By D. Clery*

1483 FOSSIL FISHES CHALLENGE 'URBAN LEGEND' OF EVOLUTION

Genome duplications, thought to power evolutionary radiations, can't explain explosion of fishes *By E. Pennisi*

FEATURES

1484 CRIME FORECASTERS

Police are turning to big data and algorithms to stop crime before it happens. But how biased is predictive policing—and does it even work? *By M. Hvistendahl*

1488 THE BIGGEST EAR

It will take one more burst of ingenuity to get China's massive radio telescope to live up to its promise *By D. Normile*

► VIDEO

INSIGHTS

PERSPECTIVES

1492 DETECTING STRUCTURE IN A PROTOSTELLAR DISK

Spiral structure may provide clues about the early stages of star and planet formation *By K. Rice*

► REPORT P. 1519

1494 A LATITUDINAL GRADIENT FOR GENETIC DIVERSITY

Within-species diversity of amphibians and terrestrial mammals is highest in the tropics *By H. M. Pereira*

► REPORT P. 1532

1495 CONSTRAINING LITHOSPHERIC FLOW

Geophysical data help to determine the viscosity of Earth's crust and upper mantle *By B. J. P. Kaus*

► REPORT P. 1515

1496 SOCIAL MEMORY GOES VIRAL

A precisely mapped brain network discriminates and remembers friends and strangers *By K. Saxena and R. G. M. Morris*

► REPORT P. 1536

1498 IMMUNE RECEPTOR FOR PATHOGENIC α -SYNUCLEIN

An immune protein facilitates neuronal uptake of a Parkinson's disease-associated protein *By M. Jucker and M. Heikenwalder*

► RESEARCH ARTICLE P. 1513

1499 BEE HAPPY

Bumblebees show decision-making that reflects emotion-like states

By M. T. Mendl and E. S. Paul

► REPORT P. 1529

1501 JAMES W. CRONIN (1931–2016)

A Nobel laureate raised the profile of physics worldwide *By A. A. Watson*

POLICY FORUM

1502 GROWING PAINS FOR GLOBAL MONITORING OF SOCIETAL EVENTS

Automated event coding raises promise and concerns *By W. Wang et al.*

► PODCAST

BOOKS ET AL.

1504 RETHINKING THE ARROW OF TIME

Citing shortcomings in Eddington's theory, a physicist proposes a new explanation for the existence of "now" *By L. Jardine-Wright*

1505 LEVELING UP

Advocates aim to stimulate renewed interest in a hierarchical theory of evolution *By B. Autzen*

LETTERS

1506 SCIENTISTS STAND WITH STANDING ROCK

By S. R. Januchowski-Hartley et al.

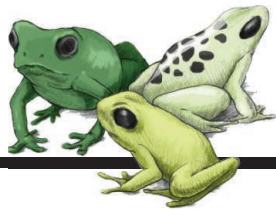
1506 BUILD HABITATS, NOT FENCES, FOR CARIBOU

By G. Proulx and R. A. Powell

1507 ILLEGAL WILDLIFE TRADE: LOOK TO THE ELEPHANTS

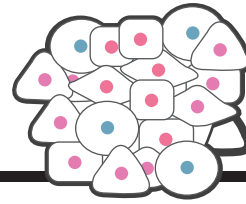
By G. Wittemyer

1507 ERRATA



1494 & 1532

Mapping genetic diversity



1514

Tumor epigenetics

RESEARCH

IN BRIEF

1509 From *Science* and other journals

REVIEW

1512 ADDITIVE MANUFACTURE

Multiprocess 3D printing for increasing component functionality

E. MacDonald and R. Wicker

REVIEW SUMMARY; FOR FULL TEXT:

dx.doi.org/10.1126/science.aaf2093

RESEARCH ARTICLES

1513 NEURODEGENERATION

Pathological α -synuclein transmission initiated by binding lymphocyte-activation gene 3 *X. Mao et al.*

RESEARCH ARTICLE SUMMARY; FOR FULL TEXT:

dx.doi.org/10.1126/science.aah3374

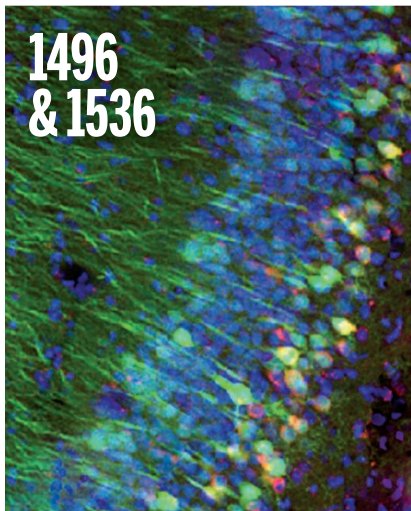
► PERSPECTIVE P. 1498

1514 CANCER

The linker histone H1.0 generates epigenetic and functional intratumor heterogeneity *C. Morales Torres et al.*

RESEARCH ARTICLE SUMMARY; FOR FULL TEXT:

dx.doi.org/10.1126/science.aaf1644



REPORTS

1515 GEOPHYSICS

High-resolution lithosphere viscosity and dynamics revealed by magnetotelluric imaging *L. Liu and D. Hasterok*

► PERSPECTIVE P. 1495

1519 PROTOPLANETARY DISKS

Spiral density waves in a young protoplanetary disk *L. M. Pérez et al.*

► PERSPECTIVE P. 1492

GRAPHENE

1522 Electron optics with p-n junctions in ballistic graphene *S. Chen et al.*

1526 Ballistic miniband conduction in a graphene superlattice *M. Lee et al.*

1529 COGNITION

Unexpected rewards induce dopamine-dependent positive emotion-like state changes in bumblebees *C. J. Perry et al.*

► PERSPECTIVE P. 1499

1532 BIODIVERSITY

An Anthropocene map of genetic diversity *A. Miraldo et al.*

► PERSPECTIVE P. 1494

1536 SOCIAL MEMORY

Ventral CA1 neurons store social memory *T. Okuyama et al.*

► PERSPECTIVE P. 1496

1541 VIROLOGY

MAVS-dependent host species range and pathogenicity of human hepatitis A virus *A. Hirai-Yuki et al.*

1545 ENHANCER FUNCTION

High-resolution interrogation of functional elements in the noncoding genome *N. E. Sanjana et al.*

► REPORT BY C. P. FULCO ET AL.

10.1126/science.aag2445

1549 GENE REGULATION

Cyclin A2 is an RNA binding protein that controls *Mre11* mRNA translation *A. Kanakkanthara et al.*

1553 SIGNALING

Drosophila insulin release is triggered by adipose Stunted ligand to brain Methuselah receptor *R. Delanoue et al.*

1557 HIV-1 VACCINES

Priming HIV-1 broadly neutralizing antibody precursors in human Ig loci transgenic mice *D. Sok et al.*



DEPARTMENTS

1473 EDITORIAL

The boldness of philanthropists
By David Baltimore

1586 WORKING LIFE

Doing science while black
By Edward J. Smith



ON THE COVER

A juvenile Iberian lynx (*Lynx pardinus*). This species, native to the southern Iberian Peninsula, is the most threatened felid in the world. Many other

animals have also suffered the loss of populations and genetic diversity due to past and recent habitat destruction, introduction of disease, or competition with invasive species. See pages 1494 and 1532.

Photo: © Roland Seitre/Minden Pictures

Science Staff	1470
AAAS News & Notes	1508
New Products	1561
Science Careers	1562

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 © 2016 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): \$165 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$1522; foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$89. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #R125488122. 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: \$15.00 current issue, \$20.00 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 \$35.00 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

353 (6307)

Science **353** (6307), 1473-1586.

ARTICLE TOOLS

<http://science.sciencemag.org/content/353/6307>

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.