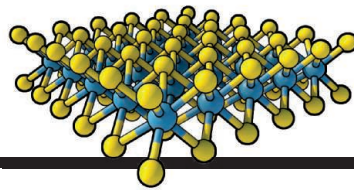


CONTENTS



1239 & 1274

Angling for delayed departure

22 SEPTEMBER 2017 • VOLUME 357 • ISSUE 6357



Tests highlight a parenting deficit in rural China.

NEWS

IN BRIEF

1216 News at a glance

IN DEPTH

1219 A FIERY FINISH TO CASSINI'S LONG RUN AT SATURN

Spacecraft's last orbits could improve understanding of the planet's rings and interior *By P. Voosen*

1220 A legacy of discovery
By P. Voosen

1221 RUSSIA HEIGHTENS DEFENSES AGAINST CLIMATE CHANGE

But carbon emission reductions are off the table *By A. Davydova*

1222 WHY IS THE FLU VACCINE SO MEDIOCRE?

The complex factors behind failure are coming into sharper focus *By J. Cohen*

1223 RESEARCHERS PARSE ECOSYSTEMS FUELED BY CHEMISTRY, NOT LIGHT

New technologies reinvigorate 1977 deep-sea discovery *By E. Pennisi*

1224 HOW *ApoE4* ENDANGERS BRAINS

Study of Alzheimer's risk gene reveals surprise mechanism *By E. Underwood*

1225 DEATH WATCH FOR CLIMATE PROBE

GRACE's demise will leave gap before follow-on can launch *By P. Voosen*

1225 EMBRYO EDIT MAKES HUMAN 'KNOCKOUT'

CRISPR inactivation of gene allows developmental study *By G. Vogel*

FEATURE

1226 CHINA'S CHILDHOOD EXPERIMENT

A U.S. economist hopes to overcome an apocalyptic gap in childhood development between rural and urban China *By D. Normile*

► VIDEO

INSIGHTS

PERSPECTIVES

1232 TOWARD PESTICIDOVIGILANCE

Can lessons from pharmaceutical monitoring help to improve pesticide regulation? *By A. M. Milner and I. L. Boyd*

1235 RNA LOCALIZATION FEEDS TRANSLATION

RNAs of the protein synthesis machinery relocalize to enhance the response to nutrients *By I. Gáspár and A. Ephrussi*

► REPORT P. 1299

1236 THE SOCIAL ORIGINS OF PERSISTENCE

Infants can learn the value of persistence by observing adult behavior *By L. P. Butler*

► REPORT P. 1290

1238 ADVANCES IN ORGAN TRANSPLANT FROM PIGS

Inactivation of PERVs in the pig genome increases the safety of xenotransplantation *By J. Denner*

► REPORT P. 1303

1239 ANGULAR MOMENTUM CAN SLOW DOWN PHOTOEMISSION

Electrons with high angular momentum are the last to emerge from a solid *By V. S. Yakovlev and N. Karpowicz*

► REPORT P. 1274

1240 NEW ANGLE ON COSMIC RAYS

A substantial directional anisotropy is observed for ultrahigh-energy cosmic rays *By J. S. Gallagher III and F. Halzen*

► RESEARCH ARTICLE P. 1266

POLICY FORUM

1242 SOCIOTECHNICAL TRANSITIONS FOR DEEP DECARBONIZATION

Accelerating innovation is as important as climate policy *By F. W. Geels et al.*

BOOKS ET AL.

1245 THE LEGACY OF THE SPANISH FLU

Nearly a century after it killed millions, a journalist reflects on how a pandemic changed the world *By S. Shablovsky*

1246 SLEIGHT OF HAND

A history of handedness shows how attitudes can influence scientific conclusions *By D. Casasanto*



CONTENTS



1261

Avoiding self-poisoning

22 SEPTEMBER 2017 • VOLUME 357 • ISSUE 6357

LETTERS

1248 EDITORIAL EXPRESSION OF CONCERN

By J. Berg

1248 SAVING THE SAOLA FROM EXTINCTION

By A. Tilker et al.

1248 ADDRESSING SCIENTIFIC INTEGRITY SCIENTIFICALLY

By T. Mayer et al.

1249 NORTH KOREA BAN BLOCKS HUMANITARIANS

By T. Kim

1249 ERRATA

RESEARCH

IN BRIEF

1250 From *Science* and other journals

REVIEW

1253 CELLULAR BIOPHYSICS

Liquid phase condensation in cell physiology and disease

Y. Shin and C. P. Brangwynne

REVIEW SUMMARY; FOR FULL TEXT:

dx.doi.org/10.1126/science.aaf4382

RESEARCH ARTICLES

1254 NEUROBIOLOGY

Loss of a mammalian circular RNA locus causes miRNA deregulation and affects brain function M. Piwecka et al.

RESEARCH ARTICLE SUMMARY; FOR FULL TEXT:

dx.doi.org/10.1126/science.aam8526

1255 PARKINSON'S DISEASE

Dopamine oxidation mediates mitochondrial and lysosomal dysfunction in Parkinson's disease

L. F. Burbulla et al.

1261 MOLECULAR EVOLUTION

Interacting amino acid replacements allow poison frogs to evolve epibatidine resistance R. D. Tarvin et al.



1287

1266 COSMIC RAYS

Observation of a large-scale anisotropy in the arrival directions of cosmic rays above 8×10^{18} eV

The Pierre Auger Collaboration

► PERSPECTIVE P. 1240; PODCAST

REPORTS

1271 GEOCHEMISTRY

Titanium isotopic evidence for felsic crust and plate tectonics 3.5 billion years ago N. D. Greber et al.

1274 ULTRAFast OPTICS

Angular momentum-induced delays in solid-state photoemission enhanced by intra-atomic interactions F. Siek et al.

► PERSPECTIVE P. 1239

1277 SEISMOLOGY

The hidden simplicity of subduction megathrust earthquakes

M.-A. Meier et al.

1282 PALEOANTHROPOLOGY

The growth pattern of Neandertals, reconstructed from a juvenile skeleton from El Sidrón (Spain) A. Rosas et al.

1287 ECONOMICS

Teaching personal initiative beats traditional training in boosting small business in West Africa F. Campos et al.

1290 COGNITIVE DEVELOPMENT

Infants make more attempts to achieve a goal when they see adults persist

J. A. Leonard et al.

► PERSPECTIVE P. 1236

1294 TRANSCRIPTION

PAF1 regulation of promoter-proximal pause release via enhancer activation F. X. Chen et al.

1299 RNA LOCALIZATION

Global mRNA polarization regulates translation efficiency in the intestinal epithelium A. E. Moor et al.

► PERSPECTIVE P. 1235

1303 GENOME ENGINEERING

Inactivation of porcine endogenous retrovirus in pigs using CRISPR-Cas9 D. Niu et al.

► PERSPECTIVE P. 1238

DEPARTMENTS

1215 EDITORIAL

Refilling the coral reef glass
By David Obura

1322 WORKING LIFE

Sunshine outside the ivory tower
By Amanda Welch et al.

ON THE COVER



A 2-week-old piglet whose genome has been engineered to inactivate porcine endogenous retroviruses (PERVs).

This animal is from a cell line created using CRISPR technology to inactivate PERVs, the

possible transmission of which has hindered effective xenotransplantation. This work addresses safety concerns about cross-species viral transmission and brings us one step closer to reliable pig-to-human organ transplants. See pages 1238 and 1303.

Photo: K. Fan/Genesis

Science Staff	1214
Gordon Research Conferences	1308
New Products	1317
Science Careers	1319

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 © 2017 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): \$1659. 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 #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: \$23.00 current issue, \$28.00 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

357 (6357)

Science **357** (6357), 1215-1322.

ARTICLE TOOLS

<http://science.sciencemag.org/content/357/6357>

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.