

CONTENTS

29 September 2016 / Vol 537 / Issue No 7622

THIS WEEK

EDITORIALS

585 CAREERS

Life after academia

The scientific community should embrace alternative career paths

585 GLOBAL WARMING

Climate ambition

Time to push for more research on aggressive action



WORLD VIEW

587 Encourage governments to heed scientific advice

Bill Colglazier
Researchers must engage with policymakers

RESEARCH HIGHLIGHTS

588 SELECTIONS FROM THE SCIENTIFIC LITERATURE

Greenland ice loss / Rats and cats on the prowl / Ants get high / Leviticus revealed / Portable vaccine factory / Graphene gets shaky



SEVEN DAYS

590 THE NEWS IN BRIEF

African elephants decline / Forensic methods in doubt / China opens genebank / Plumes confirmed on Europa

CAREERS

703 REPRODUCIBILITY

Seek out stronger science

Excellent training resources for statistics and experimental design are readily available — if you know where to look

FUTURES

706 The sixth circle

J W Armstrong

NEWS IN FOCUS

593 ASTRONOMY

China starts to debug huge telescope

595 MEDICAL RESEARCH

Facebook profits fund commitment to end disease



596 ECOLOGY

Endangered Cuban crocodiles are losing their genetic identity

597 NEUROSCIENCE

Global push to align brain initiatives sparks concern

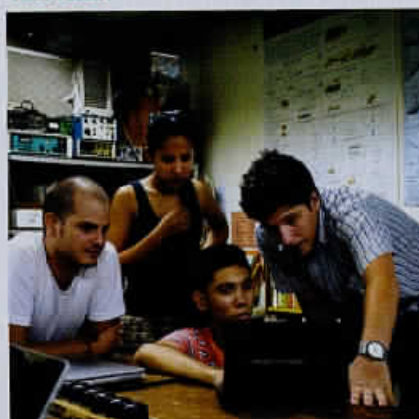
598 RENEWABLE ENERGY

Ukraine rethinks reliance on Russia's fossil fuels

599 FUNDING

Zimbabwe Academy of Science pleads for support

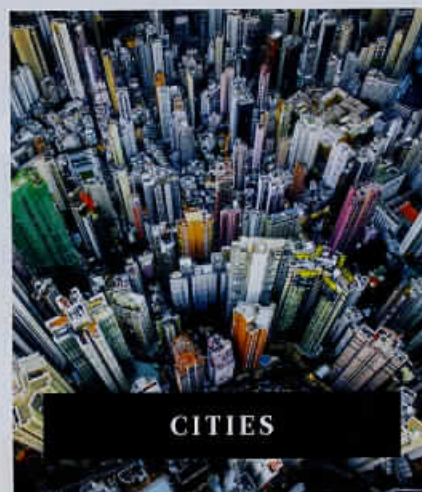
FEATURES



CARIBBEAN

Cuban science

Eased restrictions are fuelling evolution of research **PAGE 600**



COVER: ANDY YEUNG

CITIES

EDITORIALS

586 CITIES

Twenty years on

High stakes for the United Nations' urbanization congress, Habitat III

COMMENT

605 VULNERABILITY

Boost resilience of small and mid-sized cities

Joern Birkmann et al.

608 PLANNING

Where to put the next billion people

Richard T T Forman & Jianguo Wu

611 GOVERNANCE

Give cities a seat at the top table

Michele Acuto

BOOKS & ARTS

614 BIOGRAPHY

Humanizing the urban fabric

Austin Williams

COMMENT

BOOKS & ARTS

615 BOOKS IN BRIEF

616 PHYSICS

Finding the time

Andrew Jaffe

CORRESPONDENCE

617 More food and better / Farmers need diversity / Climate and biodiversity / Mobile networks read the weather

CONTENTS

29 September 2016 / Vol 537 / Issue No 7622

RESEARCH

NEW ONLINE

- 619 Papers published AOP this week at nature.com

NEWS & VIEWS

- 620 **PLANT SCIENCE**
Hybrid vigour characterized
A dissection of the genomic architecture that underlies heterosis
James A Birchler [SEE ARTICLE P.629](#)
- 621 **IMAGING TECHNIQUES**
MRI illuminated by γ -rays
An imaging technique that combines MRI and γ -ray detection
Richard Bowtell [SEE LETTER P.652](#)
- 622 **MICROBIOLOGY**
The bacterial cell wall takes centre stage
A revised model of bacterial cell-wall synthesis
Kevin D Young [SEE ARTICLE P. 634](#)
- 624 **FOOD SECURITY**
A collaboration worth its weight in grain
Direct interaction between farmers and researchers brings benefits
Leah H Samberg [SEE LETTER P.671](#)
- 625 **BIOGEOCHEMISTRY**
Long-term effects of permafrost thaw
Drainage of Arctic tundra can increase CO_2 flux
Donatella Zona
- 626 **PHYSIOLOGY**
Forecast for water balance
Two pathways that respond to and anticipate thirst in mice
Michael J Krashes
[SEE LETTERS P.680 & P.685](#)
- 627 **CHEMISTRY**
Small molecular replicators go organic
An autocatalytic reaction network involving small organic molecules
Annette F Taylor [SEE LETTER P.656](#)
- ARTICLES**
- 629 **PLANT GENETICS** Genomic architecture of heterosis for yield traits in rice
X Huang et al. [SEE N&V P.620](#)
- 634 **MICROBIOLOGY** SEDS proteins are a widespread family of bacterial cell wall polymerases
A J Meeske et al. [SEE N&V P.622](#)



GEODYNAMICS

Hard evidence

Diamond inclusions hold clues to the origin of the high U/Pb component in ocean island basalts. [PAGE 666](#)

- 639 **STRUCTURAL BIOLOGY** The architecture of the mammalian respirasome
J Gu et al.
- 644 **STRUCTURAL BIOLOGY** The architecture of respiratory supercomplexes
J A Letts, K Fiedorczuk & L A Sazanov

LETTERS

- 649 **ASTRONOMY AND ASTROPHYSICS**
The awakening of a classical nova from hibernation
P Mróz et al.
- 652 **MOLECULAR IMAGING** A method for imaging and spectroscopy using γ -rays and magnetic resonance
Y Zheng, G W Miller, W A Tobias & G D Cates [SEE N&V P.621](#)
- 656 **CHEMISTRY** Autocatalytic, bistable, oscillatory networks of biologically relevant organic reactions
S N Semenov et al. [SEE N&V P.627](#)
- 661 **BIOCATALYSIS** Directed evolution of artificial metalloenzymes for *in vivo* metathesis
M Jeschek et al.
- 666 **GEODYNAMICS** Key new pieces to the HIMU puzzle from olivines and diamond inclusions
Y Weiss, C Class, S L Goldstein & T Hanyu

- 671 **FOOD SECURITY** Closing yield gaps in China by empowering smallholder farmers
W Zhang et al. [SEE N&V P.624](#)
- 675 **NEUROSCIENCE** CHD8 haploinsufficiency results in autistic-like phenotypes in mice
Y Katayama et al.
- 680 **NEUROSCIENCE** Thirst neurons anticipate the homeostatic consequences of eating and drinking
C A Zimmerman et al. [SEE N&V P.626](#)
- 685 **NEUROSCIENCE** Clock-driven vasopressin neurotransmission mediates anticipatory thirst prior to sleep
C Gizowski, C Zaelzer & C W Bourque
[SEE N&V P.626](#)
- 689 **ENVIRONMENTAL MICROBIOLOGY**
Ecogenomics and potential biogeochemical impacts of globally abundant ocean viruses
S Roux et al.
- 694 **INDUSTRIAL MICROBIOLOGY** Rewriting yeast central carbon metabolism for industrial isoprenoid production
A L Meadows et al.
- 698 **COMPUTATIONAL BIOLOGY** Single-cell analysis of mixed-lineage states leading to a binary cell fate choice
A Olsson et al.

MOLECULAR IMAGING

Dual focus

PNI combines the strengths of magnetic resonance imaging and gamma-ray detection. [PAGE 652](#)

