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#### 557 NANOTECHNOLOGY

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Transparency is key to the acceptance of nanotechnology

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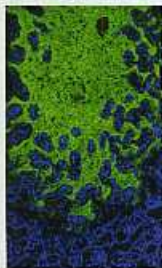
#### 559 What matters for science is who runs the country

Colin Macilwain

The 'scientific adviser' role should be replaced by 'scientists who govern'

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#### 560 SELECTIONS FROM THE SCIENTIFIC LITERATURE



Cancer sugar use a drug target / Blood-vessel pruning / Gene testing neonates / Friendly microbes attacked / Leave out equations to get citations / Super suture

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Neil Armstrong dies / Curiosity makes tracks / Appeals court rules in favour of NIH funding stem-cell research / Eli Lilly's

Alzheimer's drug fails clinical trial / FDA approves combination drug for HIV / Arctic sea ice hits all-time low

## CAREERS

#### 685 JOB SATISFACTION

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Nature's 2012 Salary and Satisfaction Survey finds many researchers happy with their lot — except for the money, that is

## NEWS IN FOCUS

#### 565 ANIMAL HEALTH

Russia wrestles with outbreak of African swine fever

#### 566 PHYSICS

US heavy-ion facility at risk of closure

#### 568 PUBLIC HEALTH

US doctors endorse circumcision for young boys



#### 569

##### AGEING

Link between calorie intake and longevity suffers serious blow

#### 570 DEFORESTATION

Saving trees takes time to cut carbon emissions

#### 571 ASTRONOMY

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### FEATURES

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##### The new particle landscape

Physicists lay plans for the successor to the Large Hadron Collider

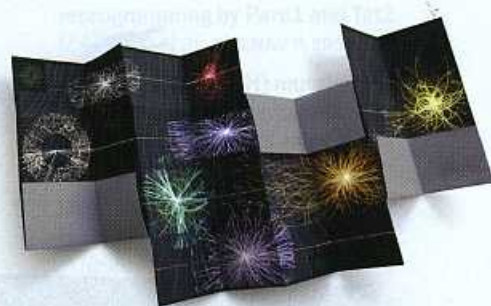


#### NANOTECHNOLOGY

## Armed resistance

Mexican researchers under pressure from extremist protest groups **PAGE 576**

## COMMENT



#### 581 PARTICLE PHYSICS

##### Beyond the Higgs

Jon Butterworth

Extreme-energy physicists have new and exciting frontiers to explore

#### 583 CLIMATE SCIENCE

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Chris Rapley

Climate scientists need to pull together to get their message across

### BOOKS & ARTS

#### 586 HISTORY

##### Darwin the eroticist

William Byrum

#### 587 BOOKS IN BRIEF

#### 588 NEUROSCIENCE

##### The ears have it

Andrew King

#### 589 Q&A

##### Species futurologist

Jon McCormack evolves artworks with algorithms



### CORRESPONDENCE

590 Sex disparity in *Nature* / Competing interests / The promise of biomass / Beware the quality-control gap / Scientific misconduct / New life for PhDs / New Zealand research station still open for business / Jargon busting

### OBITUARY

#### 592 Bernard Lovell (1913–2012)

Francis Graham Smith, Rodney Davies & Andrew Lyne

### FUTURES

#### 690 Growth

William Meikle



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## RESEARCH

### NEW ONLINE

593 Papers published this week at nature.com

### NEWS & VIEWS

#### 594 ENVIRONMENTAL SCIENCE

##### Scorecard for the seas

A single-value index to assess and compare the health of the oceans

Derek P Tittensor **SEE ARTICLE P.615**

#### 595 IMMUNOLOGY

##### Licensed in the lungs

Encephalitogenic T cells transit the lungs on the way to the CNS

Richard M Ransohoff **SEE LETTER P.675**

#### 596 OCEAN SCIENCE

##### Ancient burial at sea

A record of calcium carbonate accumulation in the Pacific Ocean

Heather Stoll **SEE ARTICLE P.609**

#### 598 OPTICS

##### Mixing waves in a diamond

X-ray and optical sum-frequency generation

Nina Rohringer **SEE ARTICLE P.603**

#### 599 EPIGENETICS

##### Actors in the cell reprogramming drama

Early molecular events during fibroblast conversion into stem cells

Kyle M Loh & Bing Lim **SEE LETTER P.652**

#### 600 ASTRONOMY

##### Collision course

Cosmic encounter between the Milky Way and the Andromeda galaxy

R Brent Tully

#### 601 MICROBIOLOGY

##### Antibiotics and adiposity

Low-dose antibiotic therapy alters gut microbial composition in mice

Harry J Flint **SEE ARTICLE P.621**

### ARTICLES

#### 603 PHYSICS X-ray and optical wave mixing

T E Glover et al. **SEE N&V P.598**

#### 609 EARTH SCIENCE A Cenozoic record of the equatorial Pacific carbonate compensation depth

H Pälike et al. **SEE N&V P.596**

#### 615 ENVIRONMENTAL SCIENCE An index to assess the health and benefits of the global ocean

B S Halpern et al. **SEE N&V P.594**



### ON THE COVER

## Gait keeper

A competitor in the Landsmót horse festival in Hella, Iceland. A premature stop codon in the *DMRT3* gene gives pure-bred Icelandic horses, and the American Standardbred used in harness racing, the ability to perform novel gaits, including this one where the two legs on the same side of the body move in unison. **PAGE 642**

#### 621 MICROBIOLOGY Antibiotics in early life alter the murine colonic microbiome and adiposity

I Cho et al. **SEE N&V P. 601**

### LETTERS

#### 627 MATERIALS Graphene and boron nitride lateral heterostructures for atomically thin circuitry

M P Levendort et al.

#### 633 CLIMATE SCIENCE Potential methane reservoirs beneath Antarctica

J L Wadham et al.

#### 638 EARTH SCIENCE 'Melt welt' mechanism of extreme weakening of gabbro at seismic slip rates

K M Brown & Y Fialko

#### 642 GENETICS Mutations in *DMRT3* affect locomotion in horses and spinal circuit function in mice

L S Andersson et al.

#### 647 NEUROSCIENCE Autistic-like behaviour and cerebellar dysfunction in Purkinje cell *Tsc1* mutant mice

P T Tsai et al.

#### 652 STEM CELLS Early-stage epigenetic modification during somatic cell

reprogramming by Parp1 and Tet2  
C A Doege et al. **SEE N&V P. 599**

#### 656 CANCER IDH1(R132H) mutation increases murine haematopoietic progenitors and alters epigenetics

M Sasaki et al.

#### 660 CANCER Recurrent R-spondin fusions in colon cancer

S Seshagiri et al.

#### 665 CANCER Tumour suppressor RNF43 is a stem-cell E3 ligase that induces endocytosis of Wnt receptors

B-K Koo et al.

#### 670 IMMUNOLOGY Novel role of PKR in inflammasome activation and HMGB1 release

B Lu et al.

#### 675 IMMUNOLOGY T cells become licensed in the lung to enter the central nervous system

F Odoardi et al. **SEE N&V P. 595**

#### 680 DEVELOPMENTAL BIOLOGY The prokaryote messenger c-di-GMP triggers stalk cell differentiation in *Dictyostelium*

Z-h Chen & P Schaap

#### 684 CORRIGENDUM Inhibitory receptors bind ANGPTLs and support blood stem cells and leukaemia development

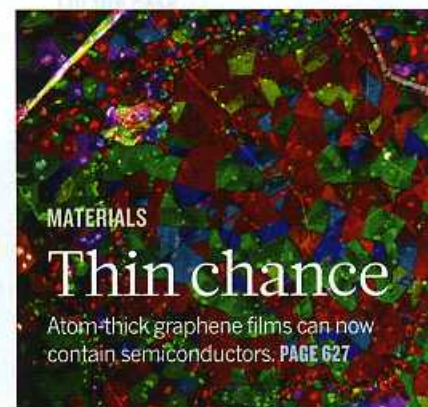
J Zheng et al.

#### 684 CORRIGENDUM The age of the Milky Way inner halo

J S Kalirai

#### 684 CORRIGENDUM Atomic model of the type III secretion system needle

A Loquet et al.



### MATERIALS

## Thin chance

Atom-thick graphene films can now contain semiconductors. **PAGE 627**