

# CONTENTS

18 October 2012 / Vol 490 / Issue No 7420

## THE NEW MAP OF SCIENCE

### EDITORIAL

- 309 Global reach**  
Beware the limits of internationalization



### FEATURES

- 325 Science mapped out**  
Plotting the course of international research
- 326 Science on the move**  
How money and culture shape the international migration of scientists

### COMMENT

- 331 How to build science capacity**  
*Lim Chuan Poh; Bernie Fānaroff; Patrick Aebischer; Rafael Camacho; Ismail Serageldin; Nikolay Suetin; Carlos Henrique de Brito Cruz; June Seung Lee*  
Experts recommend ways for countries to give their science a boost
- 335 The rise of research networks**  
*Jonathan Adams*  
Science superpowers could get left behind as collaboration rules

- 337 Global challenges need global solutions**  
*Subra Suresh*  
Laying the foundations for a future of international collaboration



COVER ILLUSTRATION BY JASIEK KRZYŻTOFIK

## THIS WEEK

### EDITORIALS

- 309 EPIDEMIOLOGY**  
**Life after death**  
Restricting access to US death records will do more harm than good
- 310 ANIMAL HEALTH**  
**Badger away**  
The scientific evidence behind England's impending badger cull is not black and white



### WORLD VIEW

- 311 The secrets of my prizewinning research**  
*Serge Haroche*  
The switch to short-termism, will stifle science says the co-winner of this year's physics Nobel

### RESEARCH HIGHLIGHTS

- 312 SELECTIONS FROM THE SCIENTIFIC LITERATURE**  
An attractive asteroid / Another obesity-cancer link / Stem cells boost myelin / A strong La Niña / Moa hunted down

### SEVEN DAYS

- 314 THE NEWS IN BRIEF**  
Author ID scheme launches / A fall that was faster than sound / Dragon makes first cargo delivery / Keith Campbell dies

## NEWS IN FOCUS

- 317 ANIMAL HEALTH**  
English badger cull sparks schism in the countryside
- 318 FOOD SCIENCE**  
Lack of funding leaves US work on genetically engineered animals languishing
- 320 NOBEL PRIZE**  
Cell signals claim chemistry prize
- 321 REGENERATIVE MEDICINE**  
Scandal erupts over Japanese stem-cell claims
- 322 BIOMEDICINE**  
Drug industry's data on clinical trials emerge from the shadows
- 323 ASTRONOMY**  
Earth-sized exoplanet identified orbiting nearest star system to us
- 324 CONSERVATION**  
Protection bid for Antarctic seas faces stormy waters

## CAREERS

- 435 INNOVATION**  
**Brushing up on business**  
Entrepreneurs are trained, not born
- 437 TURNING POINT**  
Craig Bennett takes the positives from a share of the 2012 Ig Nobel Prize

## COMMENT

### BOOKS & ARTS

- 339 BIOPHYSICS**  
**Tales from the canopy**  
*Sandra Knapp*



- 340 ZOOLOGY**  
**The animal inside**  
*Josie Glausiusz*
- 341 BOOKS IN BRIEF**

### CORRESPONDENCE

- 342** Crowd sourcing in forests / Share equipment in austerity / Publish and be paid / Metrics — good or bad? / Evolving libraries / Greener stoves

### FUTURES

- 440 The tell-tale ear**  
*Alex Shvartsman*



# CONTENTS

18 October 2012 / Vol 490 / Issue No 7420

## RESEARCH

### NEW ONLINE

- 345 Papers published this week at [nature.com](http://nature.com)

### NEWS & VIEWS

#### 346 PLANETARY SCIENCE

##### Galvanized lunacy

Zinc isotopic composition of the Moon  
Tim Elliott [SEE LETTER P.376](#)

#### 347 CANCER THERAPY

##### Tumours switch to resist

Adoptive cell transfer therapy leads to loss of melanocytic antigens  
Antoni Ribas & Paul C Tumeh  
[SEE LETTER P.412](#)

#### 348 STRUCTURAL BIOLOGY

##### Bundles of insights into sugar transporters

Precise molecular models for human glucose transporters  
Peter J F Henderson & Stephen A Baldwin  
[SEE ARTICLE P.361](#)

#### 350 HIV

##### Design by trial

Higher vaccine efficacy against viruses with specific envelope sequences  
David V Glidden [SEE LETTER P.417](#)

#### 351 MOLECULAR BIOLOGY

##### Choose your protein partners

How the chaperone HSP90 selects its protein-kinase clients  
Rahul S Samant & Paul Workman

#### 352 ECOLOGY

##### The big picture of marsh loss

Excessive nutrient levels cause salt-marsh loss  
Steven C Pennings [SEE LETTER P.388](#)

### ARTICLES

#### 355 STEM CELLS The aged niche disrupts muscle stem cell quiescence

J V Chakkalakal, K M Jones, M A Basson & A S Brack

#### 361 STRUCTURAL BIOLOGY Crystal structure of a bacterial homologue of glucose transporters GLUT1-4

L Sun et al. [SEE N&V P.348](#)

#### 367 STRUCTURAL BIOLOGY Structure of AMP-PNP-bound vitamin B<sub>12</sub> transporter BtuCD-F

V M Korkhov, S A Mireku & K P Locher

### LETTERS

#### 373 ASTRONOMY Hard-X-ray emission lines from the decay of <sup>44</sup>Ti in the remnant of supernova 1987A

S A Grebenev, A A Lutovinov, S S Tsygankov & C Winkler

#### 376 PLANETARY SCIENCES Zinc isotopic evidence for the origin of the Moon

R C Paniello, J M D Day & F Moynier  
[SEE N&V P.346](#)

#### 380 PHYSICS Circuit quantum electrodynamics with a spin qubit

K D Petersson et al.

#### 384 MATERIALS SCIENCE Bonding and structure of a reconstructed (001) surface of SrTiO<sub>3</sub> from TEM

G-z Zhu, G Radtke & G A Botton

#### 388 EARTH SCIENCE Coastal eutrophication as a driver of salt marsh loss

L A Deegan et al. [SEE N&V P.352](#)

#### 393 CLIMATE SCIENCE Delayed build-up of Arctic ice sheets during 400,000-year minima in insolation variability

Q Hao et al.

#### 397 NEUROSCIENCE Nonlinear dendritic processing determines angular tuning



### EARTH SCIENCE

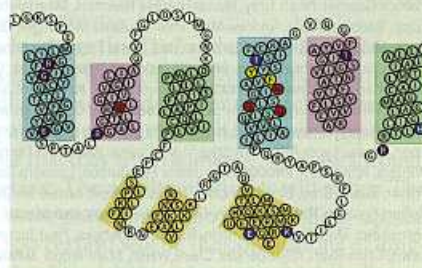
## Drying out

Coastal areas are threatened as salt marshes give way to mud flats. [PAGE 388](#)

### STRUCTURAL BIOLOGY

## Sugar rush

The crystal structure of a disease-related glucose transporter. [PAGE 361](#)



#### of barrel cortex neurons *in vivo*

M Lavzin, S Rapoport, A Polsky, L Garion & J Schiller

#### 402 NEUROSCIENCE Severe stress switches CRF action in the nucleus accumbens from appetitive to aversive

J C Lemos et al.

#### 407 STEM CELLS Androgenetic haploid embryonic stem cells produce live transgenic mice

W Li et al.

#### 412 CANCER Melanomas resist T-cell therapy through inflammation-induced reversible dedifferentiation

J Landsberg et al. [SEE N&V P.347](#)

#### 417 IMMUNOLOGY Increased HIV-1 vaccine efficacy against viruses with genetic signatures in Env V2

M Rolland et al. [SEE N&V P.350](#)

#### 421 IMMUNOLOGY A FOXO3-IRF7 gene regulatory circuit limits inflammatory sequelae of antiviral responses

V Litvak et al.

#### 426 METABOLISM Targeting VEGF-B as a novel treatment for insulin resistance and type 2 diabetes

C E Hagberg et al.

#### 431 MOLECULAR BIOLOGY Initiation of transcription-coupled repair characterized at single-molecule resolution

K Howan et al.