

CONTENTS

17 July 2014 / Vol 511 / Issue No 7509

THIS WEEK

EDITORIALS

263 FUNDING

Struggle for independence

The Scripps Institute is taking an alternative route to financial planning

263 INFECTIOUS DISEASE

Within reach

One last concerted push could finally eradicate polio

264 AGRICULTURE

Food for thought

Is a taste for organic farming a good thing?

WORLD VIEW

265 Misjudgements will drive social trials underground

Michelle Meyer

Facebook study was justifiable and scientifically useful

RESEARCH HIGHLIGHTS

266 SELECTIONS FROM THE SCIENTIFIC LITERATURE

'Dead Sea' on Titan / Blood tumour cells isolated / Ocean-reserve reefs at risk / Wheat vulnerable to warming / Open peer review raises Twitter ire / A component for Internet of things



SEVEN DAYS

268 THE NEWS IN BRIEF

Smallpox found in US lab / HIV returns to 'Mississippi baby' / Russia test fires Angara rocket / Dark-matter projects get green light

CAREERS

371 INTERDISCIPLINARY RESEARCH

Break out

Impressive advances are being made in cross-discipline research — is there a career path to match?

373 TURNING POINT

Global agriculture and all life on Earth are all in a day's work for computational ecologist Drew Purves

NEWS IN FOCUS



271 PHYSICS

UK government chooses finalists for quantum research centres

272 GEOLOGY

Researchers seek ways to forecast landslide risks



274 FINANCE

Collapse of Scripps merger leaves books unbalanced

276 OUTREACH

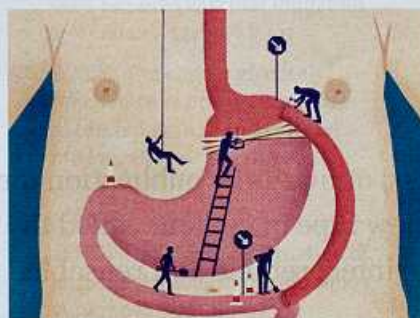
CERN establishes charity in bid to raise cash for non-core projects

FEATURES

278 PHYSICS

Wave of the future

LIGO detector homes in on gravitational waves



WEIGHT-LOSS SURGERY

A taste of success

Why does gastric-bypass surgery help curb diabetes? **PAGE 282**

COMMENT

INFECTIOUS DISEASE

Beat polio in Pakistan

Zulfiqar Ahmed Bhutta

Basic medical services, not travel vaccinations, are key to quashing the virus **PAGE 285**



287 PSYCHOLOGICAL TREATMENTS

A call for mental-health science

Emily A Holmes, Michelle G Craske & Ann M Graybiel

Clinicians and neuroscientists must forge stronger links

BOOKS & ARTS

291 HISTORY OF MEDICINE

Typhus and tyranny

Tilli Tansey

CORRESPONDENCE

292 Take note of social scientists / Merits of virtual mobility / China closing education gap / Brain project needs transparency



FUTURES

376

Are you receiving?

Rebecca Birch

CONTENTS

17 July 2014 / Vol 511 / Issue No 7509

RESEARCH

NEW ONLINE

293 Papers published this week at nature.com

NEWS & VIEWS

294 HIGH-PRESSURE PHYSICS

Piling on the pressure

Compressing diamond up to a pressure of 5 terapascals

Chris J Pickard & Richard J Needs

SEE LETTER P. 330

295 ECOLOGY

Pesticides linked to bird declines

Spatial correlations between neonicotinoid concentration and bird losses

Dave Goulson SEE LETTER P. 341

296 ASTROPHYSICS

Survival of the largest

Detection of telltale signatures from dust in a distant supernova

Haley Gomez SEE LETTER P. 326

297 NEUROBIOLOGY

Keeping a lid on it

Homeostatic regulation of neocortical neuronal circuits by Npas4

Gina Turrigiano

298 CANCER

Sugar-coated cell signalling

Structure of the glycocalyx influences cell survival and metastasis

Andrew J Ewald & Mikala Egeblad

SEE ARTICLE P. 319

300 MATERIALS SCIENCE

A superelastic organic crystal

Discovery of superelasticity in a single crystal of terephthalamide

Tomiki Ikeda & Toru Ube

301 STEM CELLS

Reprogramming finds its niche

A supportive microenvironment aids haematopoietic stem-cell production

Daniel Lucas & Paul S Frenette

SEE ARTICLE P. 312

ANALYSIS

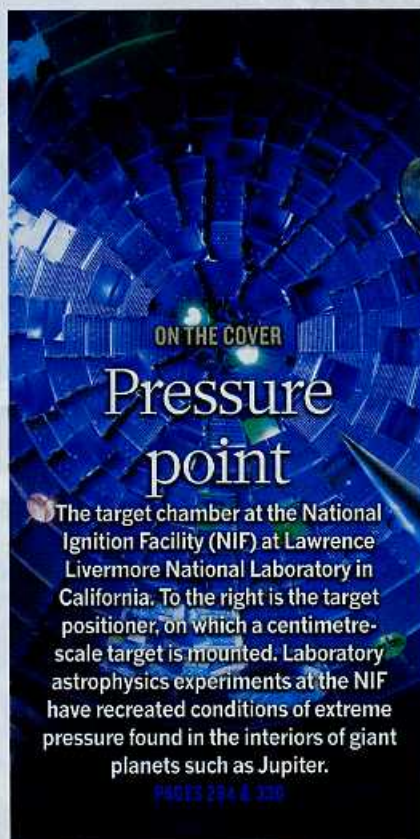
303 PLANETARY SCIENCE A deep crust–mantle boundary in the asteroid 4 Vesta

H Clenet et al.

ARTICLES

307 EVOLUTION Genetics of ecological divergence during speciation

M E Arnegard et al.



312 STEM CELLS Reprogramming human endothelial cells to haematopoietic cells requires vascular induction

V M Sandler SEE N&V P.301

319 CANCER The cancer glycocalyx mechanically primes integrin-mediated growth and survival

M J Paszek et al. SEE N&V P.298

LETTERS

326 ASTROPHYSICS Rapid formation of large dust grains in the luminous supernova 2010jl

C Gall et al. SEE N&V P.296

330 PLANETARY SCIENCE Ramp compression of diamond to five terapascals

R F Smith et al. SEE N&V P.294

334 MATERIALS SCIENCE A low-cost non-toxic post-growth activation step for CdTe solar cells

J D Major, R E Treharne, L J Phillips & K Durose

338 GEOPHYSICS Pathway from subducting slab to surface for melt and fluids beneath Mount Rainier

R S McGary, R L Evans, P E Wannamaker, J Elsenbeck & S Rondenay

341 ECOLOGY Declines in insectivorous birds are associated with high neonicotinoid concentrations

C A Hallmann, R P B Foppen, C A M van Turnhout, H de Kroon & E Jongejans SEE N&V P.295

344 NEUROSCIENCE Genome sequencing identifies major causes of severe intellectual disability

C Gillissen et al.

348 NEUROSCIENCE Engineering a memory with LTD and LTP

S Nabavi et al.

353 STEM CELLS ABCB5 is a limbal stem cell gene required for corneal development and repair

B R Ksander et al.

358 STEM CELLS WNT7A and PAX6 define corneal epithelium homeostasis and pathogenesis

H Ouyang et al.

362 CANCER BRCA2 prevents R-loop accumulation and associates with TREX-2 mRNA export factor PCID2

V Bhatia et al.

366 STRUCTURAL BIOLOGY The structural basis of transfer RNA mimicry and conformational plasticity by a viral RNA

T M Colussi et al.

370 CORRIGENDUM Sustained translational repression by eIF2α-P mediates prion neurodegeneration

J A Moreno et al.

370 ERRATUM CTP synthase 1 deficiency in humans reveals its central role in lymphocyte proliferation

E Martin et al.

370 RETRACTION Generation of cell polarity in plants links endocytosis, auxin distribution and cell fate decisions

P Dhonukshe et al.

LAWRENCE LIVERMORE NATIONAL LABORATORY