

CONTENTS

18/25 December 2014 / Vol 516 / Issue No 7531

COVER: CGI ILLUSTRATION BY PETER CROWDER ASSOCIATES/DEBUT ART

2014 THE YEAR IN REVIEW

NEWS

300 12 months of science

Comets, stem cells, cosmic dust and more

304 Images of the year

FEATURES

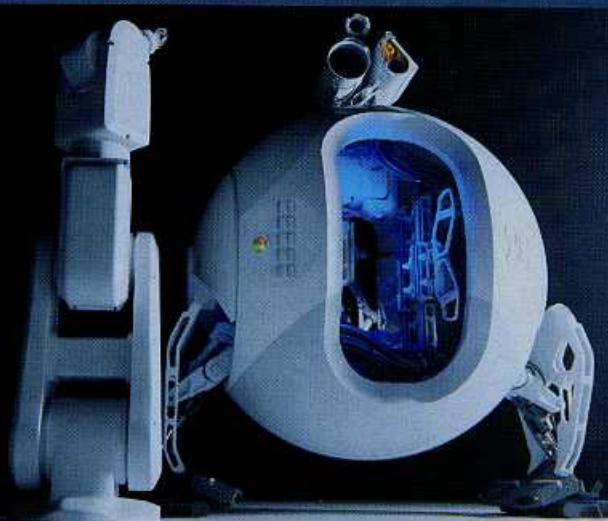
311 Nature's 10

Who were the people who made a mark in science this year?

NEWS & VIEWS

340 Editors' choice

A round-up of the highlights from this year's News & Views



365 DAYS:

the year in science

 www.nature.com/2014

THIS WEEK

EDITORIALS

287 SCIENCE & SOCIETY

Keep asking the question

The US Census Bureau should not abandon data on working scientists

287 PUBLISHING

Spin cycle

Media hype does science no favours

288 CLIMATE CHANGE

Honest brokers

The deal struck in Lima is too weak

WORLD VIEW

289 Challenge the abuse of science in setting policy

Guillaume Chapron

Beware politicians misusing data

RESEARCH HIGHLIGHTS

290 SELECTIONS FROM THE SCIENTIFIC LITERATURE

Evidence for 'Kamikaze' typhoons / Hailstone dynamics / Indirect neonicotinoid action / Drought claimed Mayan city

SEVEN DAYS

292 THE NEWS IN BRIEF

Protesters damage archaeology / LHC ready for return / US budget passed

NEWS IN FOCUS



295 FIELD REPORT

Local customs present challenges for Ebola control

297 EVOLUTION

Meet the collaboration behind the latest bird family tree

298 POLITICS

Russian scientists divided over Putin's policies

CAREERS

441 COLUMN

Nurture your online persona

Peter Fiske

The Internet offers contacts and can help you find a job

nature events

Your guide to global scientific events and courses in 2015

COMMENT

321 SCIENTIFIC METHOD

Defend the integrity of physics

George Ellis & Joe Silk

Speculative theories on the Universe need experimental testing

323 INFECTIOUS DISEASE

Mobilizing Ebola survivors to curb the epidemic

Joshua M Epstein, Lauren M Sauer,

Julia Chelem, Erez Hatna, Jon Parker,

Richard E Rothman & Lewis Rubinson

A proposal to alter the dynamics

BOOKS & ARTS

326 IN RETROSPECT

Between Pacific Tides

Aaron Hirsh

CORRESPONDENCE

329 Comets and life / Conservation areas that work / Hungary's grants body / Flood protection / Peer-review panel

OBITUARY

330 Martin L Perl (1927–2014)

Valerie Halyo

FUTURES

444 The chains of plenty

S R Algernon

CONTENTS

18/25 December 2014 / Vol 516 / Issue No 7531

RESEARCH

NEW ONLINE

331 Papers published this week at nature.com

NEWS & VIEWS

332 ORGANIC SYNTHESIS

Better chemistry through radicals

An iron-catalysed alkene-coupling reaction

Steven L Castle SEE ARTICLE P.343

333 SYNTHETIC BIOLOGY

Toehold gene switches make big footprints

A class of riboregulator that can be tailored to desired trigger RNAs

Simon Ausländer & Martin Fussenegger

334 MALARIA

How vector mosquitoes beat the heat

Related mosquito species show distinct dry-season survival strategies

Nora J Besansky SEE LETTER P.387

336 CONSERVATION

Mind the gaps

Global analysis of protected areas and of future gains and threats

Thomas M Brooks SEE LETTER P.383

337 MATERIALS SCIENCE

Two steps for a magnetoelectric switch

Reversal of magnetization using an electric field

Kathrin Dörr & Andreas Herklotz

SEE LETTER P.370

338 INFLUENZA

An RNA-synthesizing machine

Crystal structures of the viral RNA polymerases of influenza A and B

Robert M Krug

SEE ARTICLES P.355 & P.361

340 EDITORS' CHOICE

The News & Views highlights of 2014

ARTICLES

343 ORGANIC CHEMISTRY Functionalized olefin cross-coupling to construct carbon–carbon bonds

J C Lo et al. SEE N&V P.332

349 BIOCHEMISTRY An AUTS2–Polycomb complex activates gene expression in the CNS

Z Gao et al.

355 VIROLOGY Structure of influenza A polymerase bound to the viral RNA promoter



MATERIALS SCIENCE

Taking spin

A two-step switch to make electrical control of ferromagnetism — and multiferroic spintronics — possible.

PAGES 337 & 370

A Pflug, D Guilligay, S Reich & S Cusack SEE N&V P.338

LETTERS

367 ASTROPHYSICS The exclusion of a significant range of ages in a massive star cluster

C Li, R de Grijs & L Deng

370 MATERIALS SCIENCE Deterministic switching of ferromagnetism at room temperature using an electric field

J T Heron et al. SEE N&V P.337

374 MOLECULAR PHYSICS Reconstruction and control of a time-dependent two-electron wave packet

C Ott et al.

379 HYDROGEOLOGY The contribution of the Precambrian continental lithosphere to global H₂ production

B Sherwood Lollar, T C Onstott, G Lacrampe-Couloume & C J Ballentine

383 CONSERVATION Global protected area expansion is compromised by projected land-use and parochialism

F Montesino Pouzols et al. SEE N&V P.336

387 MALARIA Signatures of aestivation and migration in Sahelian malaria mosquito populations

A Dao et al. SEE N&V P.334

391 EVOLUTIONARY DEVELOPMENTAL BIOLOGY A relative shift in cloacal location repositions external genitalia in amniote evolution

P Tschopp et al.

395 OBESITY Adenosine activates brown adipose tissue and recruits beige adipocytes via A_{2A} receptors
T Gnad et al.

400 STEM CELLS Modelling human development and disease in pluripotent stem-cell-derived gastric organoids
K W McCracken et al.

405 STEM CELLS Primate-specific endogenous retrovirus-driven transcription defines naive-like stem cells
J Wang et al.

410 CELL BIOLOGY Protein quality control at the inner nuclear membrane
A Khmelinskii et al.

414 IMMUNOLOGY Mitochondrial UPR-regulated innate immunity provides resistance to pathogen infection
M W Pellegrino et al.

418 IMMUNOLOGY Rapid development of broadly influenza neutralizing antibodies through redundant mutations
L Pappas et al.

423 CANCER *In vivo* engineering of oncogenic chromosomal rearrangements with the CRISPR/Cas9 system
D Maddalo et al.

428 CANCER Rapid modelling of cooperating genetic events in cancer through somatic genome editing
F J Sánchez-Rivera et al.

432 MICROBIOLOGY Cohesin-dependent globules and heterochromatin shape 3D genome architecture in *S. pombe*
T Mizuguchi et al.

436 GENETICS R-loops induce repressive chromatin marks over mammalian gene terminators
K Skourtis-Stathaki, K Kamieniarz-Gdula & N J Proudfoot

440 ADDENDUM Editorial Expression of Concern: Non-adaptive origins of interactome complexity
A Fernández & M Lynch

440 CORRIGENDUM Activation and repression by oncogenic MYC shape tumour-specific gene expression profiles
S Walz et al.