THIS WEEK

EDITORIALS

5 ENVIRONMENT

Reach out about climate

Where political leadership is lacking, scientists must take the lead in communicating about climate change

WORLD VIEW



7 Blue-sky bias should be brought down to Earth Daniel Sarewitz US agencies that conduct missionbased research must be protected from the worst of the spending cuts

SEVEN DAYS

8 THE NEWS IN BRIEF

Scientist accused of supplying stem cells illegally / University of California faces charges over lab fire / More retractions for work on viral link with chronic fatigue syndrome / Japan's neutrino experiment comes back online / Clean-up plan for Fukushima unveiled / Environmental Protection Agency announces curbs on mercury / Targacept sees stock price plummet as antidepressant candidate fails second clinical trial

CAREERS

103 WOMEN IN BUSINESS

Finding a way in

Would-be female entrepreneurs face a struggle — but there is help out there

105 TURNING POINT

The recession is biting, says award-winning neuroscientist Tiago Branco



NEWS IN FOCUS

9 BIOSECURITY

Fears over modified flu virus expose holes in oversight mechanisms



10 COSMOLOGY

Sonic yardstick aims to refine understanding of dark energy

12 PROSPECTS

From Mars landings to genomic insights, what does 2012 hold in store?

13 0&4

Nancy Hopkins, renowned champion of gender equality, looks back over her career

FEATURES

Tough science Five experiments as hard to complete as finding the Higgs boson PAGE 14

18 **ASTRONOMY
The sounds of the stars
The unexpected benefits gleaned from
the Kepler telescope

COMMENT

21 ETHICS

How to stop plagiarism

Harold Garner; Bernd Pulverer; Ana Marušić & Mladen Petrovečki; John Loadsman; Yuehong Zhang & Ian McIntosh; Sandra Titus; Miguel Roig; Melissa Anderson Ten experts offer their prescriptions

24 HIGH-ENERGY PHYSICS

The need for new physics

John Ellis

Higgs boson notwithstanding, the standard model needs to be revamped

25 PUBLICATION

Keep standards high

Jerome Ravetz

The review process is never-ending in the digital age

BOOKS & ARTS



27 BOOKS IN BRIEF

28 Q&A

The science showman

Chemist Bassam Shakhashiri on the merits of explosions as educational aids

CORRESPONDENCE

29 Brazil weak on forest protection / Mauritian conservation / A first for Phoenix Lander / Science and politics

FUTURES

108 1-9-4-blue-3-7-2-6-gammatetrahedron lan Randal Strock

5 JANUARY 2012 | VOL 481 | NATURE | 1

CONTENTS

5 January 2012 / Vol 481 / Issue No 7379

RESEARCH

NEW ONLINE

31 Papers published this week at nature.com

NEWS & VIEWS

32 ASTROPHYSICS

The final plunge

Gas cloud on its way towards Milky Way's black hole Mark Morris SEE LETTER P.51

33 SYNTHETIC BIOLOGY

Bacteria collaborate to sense arsenic

A practical application of a genetic oscillator Christopher A Voigt SEE ARTICLE P.39

35 OPTICAL PHYSICS

How to hide in time

Temporal cloaking demonstrated Robert W Boyd & Zhimin Shi SEE LETTER P.62

36 NEUROSCIENCE

Behavioural effects of cocaine reversed

Undoing drug-induced synaptic plasticity Marina E Wolf SEE LETTER P.71

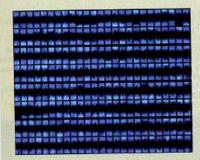
ARTICLES

- 39 SYNTHETIC BIOLOGY A sensing array of radically coupled genetic 'biopixels' A Prindle et al. SEE N&V P.33
- 45 STRUCTURAL BIOLOGY Antiparallel EmrE

SYNTHETIC BIOLOGY

Biopixels

Harnessing the power of millions of bacteria in an LCD-like array. PAGE 39





exports drugs by exchanging between asymmetric structures

F. A. Morrison et al.

LETTERS

- 51 ASTRONOMY A gas cloud on its way towards the supermassive black hole at the Galactic Centre S Gillessen et al. SEE N&V P.32
- 55 ASTRONOMY Fast core rotation in red-giant stars as revealed by gravity-dominated mixed modes P G Beck et al.
- 58 PLANETARY SCIENCES Polar methane accumulation and rainstorms on Titan from simulations of the methane cycle T Schneider, S D B Graves, E L Schaller & M E Brown
- 62 APPLIED PHYSICS Demonstration of temporal cloaking M Fridman, A Farsi, Y Okawachi & A L Gaeta SEE N&V P.35
- 66 CLIMATE SCIENCE Changing Arctic Ocean freshwater pathways J Morison et al.

- 71 NEUROSCIENCE Reversal of cocaine-evoked synaptic potentiation resets drug-induced adaptive behaviour V Pascoli, M Turiault & C Lüscher SEE N&V P.36
- 76 NEUROBIOLOGY Modulation of TRPA1 thermal sensitivity enables sensory discrimination in *Drosophila* K Kang et al.
- 81 IMMUNOLOGY Antibody-based protection against HIV infection by vectored immunoprophylaxis

 A B Balazs et al.
- 85 CANCER Interactions between cancer stem cells and their niche govern metastatic colonization / Malanchi et al.
- 90 CANCER FBX011 targets BCL6 for degradation and is inactivated in diffuse large B-cell lymphomas S Duan et al.
- 94 STRUCTURAL BIOLOGY Open structure of the Ca²⁺ gating ring in the high-conductance Ca²⁺activated K⁺ channel P Yuan, M D Leonetti, Y Hsiung & R MacKinnon
- 98 STRUCTURAL BIOLOGY Structure of a methyl-coenzyme M reductase from Black Sea mats that oxidize methane anaerobically S Shima et al.

NEUROBIOLOGY

Twin track

Warmth and chemical irritants — two signals sharing one receptor. PAGE 76



5 JANUARY 2012 | VOL 481 | NATURE | 3