

# CONTENTS

14 June 2012 / Vol 486 / Issue No 7402

## THIS WEEK

### EDITORIALS

#### 157 RESEARCH

##### Reply to all

Beware what you write in an e-mail. A court judgment shows it may not be a private matter

#### 157 ANNOUNCEMENT

##### Calling Nordic mentors

Applications are invited for *Nature's* mentoring awards



### WORLD VIEW

#### 159 Researchers can't regulate climate engineering alone

Jason Blackstock  
Politics cannot be avoided when it comes to schemes for cooling the planet

### RESEARCH HIGHLIGHTS

#### 160 SELECTIONS FROM THE SCIENTIFIC LITERATURE

Family value / Synthetic silk / Mass observation / Embryonic oxygen / Natural domestication / Tsunami tracking / Early music

### SEVEN DAYS

#### 162 THE NEWS IN BRIEF

Coastal development threatens Great Barrier Reef / NASA cancels X-ray mission / UN warns of slow progress on the environment / The rise of open-access publishing / Ray Bradbury dies

## CAREERS

#### 281 PHARMACEUTICAL SECTOR

##### Delicate transition

The big companies are in decline — time to look elsewhere

#### 283 TURNING POINT

Scripps molecular biologist Jim Hoch has a long-term interest in signalling proteins

### NATUREJOBS ADVERTISING FEATURES

Spotlight on biotech/pharma  
Spotlight on Boston

## NEWS IN FOCUS

#### 165 GLOBAL HEALTH

Mortality measure calls into question Millennium Villages assessments

#### 166 RESEARCH

Journal 'club' offers fresh route to open-access publishing

#### 167 GENETICS

Hungarian company under fire for certifying genome as 'racially pure'

#### 168 ASTRONOMY

Demise of UK telescope spells trouble for medium-sized instruments

#### 169 FUNDING

Grant row escalates at Texas cancer institute

#### 172 PHYSICS

Compact device brings tabletop X-ray analysis a step closer

### FEATURES

#### 174 MATERIALS SCIENCE

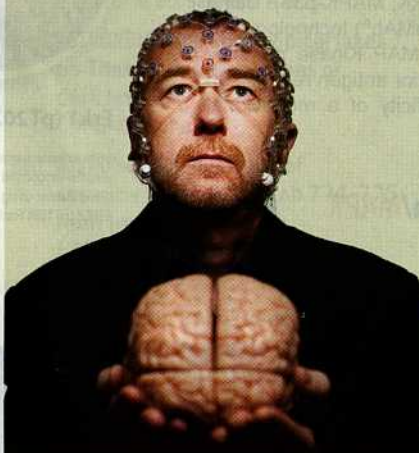
##### Hard pressed

Two researchers who claim to have made metallic hydrogen find themselves under pressure

### NEUROSCIENCE

## The mind reader

Adrian Owen is opening lines of communication with patients in a vegetative state **PAGE 178**



## COMMENT

### COSMOLOGY

## Priced out

Only a drastic reduction in space launch costs can save X-ray astronomy, says Martin Elvis **PAGE 181**

#### 183 CLIMATE CHANGE

##### Climate models at their limit?

Mark Maslin & Patrick Austin

As modelling improves, uncertainty will increase

#### 185 PUBLIC HEALTH

##### Sanitation for all

Sunita Narain

India has the technology — and should use it urgently to improve sanitation

### BOOKS & ARTS

#### 186 ECODSIGN

##### The bottom line

Peter Morgan, Ralf Otterpohl, Shunmuga Paramasivan & Ed Harrington

Four designers explain the benefits of 'green sanitation'

#### 190 Q&A

##### Architect of change

Arif Hasan is on a mission to bring sustainable design to the world's poorest cities

### CORRESPONDENCE

191 Rio meeting must consider health too / Global Research Council / In support of planetary boundaries / Brazil's revised forest code

### FUTURES

#### 286 Squealer

Robert Nathan Correll



# CONTENTS

14 June 2012 / Vol 486 / Issue No 7402

## RESEARCH

### NEW ONLINE

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

### NEWS & VIEWS

#### 194 MICROBIOLOGY

##### Learning about who we are

Cataloguing the human microbiome at multiple body habitats

David A Relman

SEE ARTICLES P.207 & P.215

#### 195 QUANTUM PHYSICS

##### Majorana modes materialize

Emergent exotica in a hybrid semiconductor–superconductor system

Frank Wilczek

#### 197 MICROSCOPY

##### Reconstructing the third dimension

Depth information from electron microscopy

Dilano Saldin SEE LETTER P.243

#### 198 PLANT IMMUNOLOGY

##### A life or death switch

NPR3 and NPR4 identified as receptors for salicylic acid

Andrea A Gust & Thorsten Nürnberger

SEE LETTER P.228

#### 199 ASTRONOMY

##### An infant giant

Nascent galaxy cluster at a scant one billion years after the Big Bang

Alberto D Bolatto

SEE LETTER P.233

### ARTICLES

#### 201 PHYSICS Visualizing heavy fermions emerging in a quantum critical Kondo lattice

P Aynajian et al.

#### 207 MICROBIOLOGY Structure, function and diversity of the healthy human microbiome

The Human Microbiome Project Consortium SEE N&V P.194

#### 215 MICROBIOLOGY A framework for human microbiome research

The Human Microbiome Project Consortium SEE N&V P.194

#### 222 MICROBIOLOGY Human gut microbiome viewed across age and geography

T Yatsunen et al.

### ON THE COVER

## Another self

The cover is inspired by the original painting *Our Self-Portrait: the Human Microbiome* by scientific artist Joana Ricou ([go.nature.com/XrDb9o](http://go.nature.com/XrDb9o)). In this issue, the Human Microbiome Project Consortium presents the first results of a major study of microbial communities that inhabit the healthy human body.

PAGES 194, 207 & 215



#### 228 PLANT SCIENCES NPR3 and NPR4 are receptors for the immune signal salicylic acid in plants

Z Q Fu et al. SEE N&V P.198

### LETTERS

#### 233 ASTRONOMY The intense starburst HDF 850.1 in a galaxy overdensity at $z \approx 5.2$ in the Hubble Deep Field

F Walter et al. SEE N&V P.199

#### 237 ASTRONOMY Possible tropical lakes on Titan from observations of dark terrain

C A Griffith et al.

#### 240 ASTRONOMY A signature of cosmic-ray increase in AD 774–775 from tree rings in Japan

F Miyake, K Nagaya, K Masuda & T Nakamura

#### 243 PHYSICS 'Big Bang' tomography as a new route to atomic-resolution electron tomography

D Van Dyck & F-R Chen SEE N&V P.197

#### 247 PALAEOLOGY *Acanthodes* and

#### shark-like conditions in the last common ancestor of modern gnathostomes

S P Davis, J A Finarelli & M I Coates

#### 251 NEUROSCIENCE Covert skill learning in a cortical-basal ganglia circuit

J D Charlesworth, T L Warren & M S Brainard

#### 256 NEUROSCIENCE Autistic-like behaviours and hyperactivity in mice lacking ProSAP1/Shank2

M J Schmeisser et al.

#### 261 NEUROSCIENCE Autistic-like social behaviour in *Shank2*-mutant mice improved by restoring NMDA receptor function

H Won et al.

#### 266 CANCER The deubiquitinase USP9X suppresses pancreatic ductal adenocarcinoma

P A Pérez-Mancera et al.

#### 271 MICROBIOLOGY Control of a *Salmonella* virulence locus by an ATP-sensing leader messenger RNA

E-J Lee & E A Groisman

#### 276 STRUCTURAL BIOLOGY Atomic model of the type III secretion system needle

A Loquet et al.

#### 280 RETRACTION DNA demethylation in hormone-induced transcriptional derepression

M-S Kim et al.



### ASTRONOMY

## Field sport

Delving into the Hubble Deep Field for glimpses of the early Universe PAGE 233