

CONTENTS

12 February 2015 / Vol 518 / Issue No 7538

LIGHT

EDITORIAL

138 A single light

There is much to celebrate in the International Year of Light

FEATURES

153 Light fantastic

The hot topics in optics, illuminated

154 Leading lights

Meet the scientists who take light to extremes

158 Super vision

Physicists give fresh meaning to the idea of X-ray specs

COMMENT

161 Trading at the speed of light

Mark Buchanan

High-frequency trading has been called socially useless, but that does not stop the race to make it faster

BOOKS & ARTS

164 In retrospect: Book of Optics

Jim Al-Khalili

NEWS & VIEWS

170 The oldest cosmic light

David Spergel; Brian Keating

Seeking clues to the origin of the Universe

 nature.com/light2015

COVER ILLUSTRATION: VIKTOR KOEN

THIS WEEK

EDITORIALS

137 FUNDING

Telling stories

UK impact assessment highlights the power of science

137 PUBLIC HEALTH

Spot the difference

US measles outbreak should be used to boost vaccination uptake



WORLD VIEW

139 And the winner is: not science

Colin Macilwain

Portrayals of scientists on the silver screen still lack the ring of truth

RESEARCH HIGHLIGHTS

140 SELECTIONS FROM THE SCIENTIFIC LITERATURE

How nanoparticles get taped / Solvent capsules for CO₂ capture / Stressed bees / Optimal lab size / Chimps call the tune / Hearing before ears

SEVEN DAYS

142 THE NEWS IN BRIEF

Dangers of climate change feature in US security strategy / UK academies seek hike in science spending / Census of aquarium microbes launched

NEWS IN FOCUS

145 REPRODUCTIVE BIOLOGY

UK vote sets fresh agenda for fertility treatment

146 POLICY

NIH seeks way to free up funds for young researchers

147 EVOLUTIONARY BIOLOGY

Gene sequences reveal pecking order of Darwin's finches

148 PUBLIC HEALTH

The race to eradicate measles

150 POLICY

Nature analysis seeks language of success in UK research assessment

CAREERS

263 SOCIAL MEDIA

A network boost

Judicious use of LinkedIn, Twitter and other platforms adds a new dimension to networking and job hunting

265 CAREER BRIEFS

NATUREJOBS ADVERTISING FEATURE

Spotlight on postgraduate opportunities

COMMENT

BOOKS & ARTS

165 BOOKS IN BRIEF



NEUROSCIENCE

Mind games

Alison Abbott reviews Tom Stoppard's latest play, *The Hard Problem* **PAGE 166**

CORRESPONDENCE

167 Greek problems mount / Brazil weakens fisheries rules / EU woes / Aquatic biodiversity

OBITUARY

168 Hubert Markl (1938–2015)

Wilhelm Krull

FUTURES

268 The last one

Iulia Georgescu

CONTENTS

12 February 2015 / Vol 518 / Issue No 7538

RESEARCH

NEW ONLINE

169 Papers published this week at nature.com

NEWS & VIEWS

170 FORUM: COSMOLOGY

The oldest cosmic light

Seeking clues to the origin of the Universe
David Spergel; Brian Keating

171 CELL BIOLOGY

Death drags down the neighbourhood

Apoptosis in epithelial cells causes contraction in their neighbours
Claudia G Vasquez & Adam C Martin
SEE LETTER P.245

173 STAR FORMATION

Sibling rivalry begins at birth

A quadruplet of stars in the act of formation
Kaitlin M Kratter SEE LETTER P.213

174 DNA REPAIR

Familiar ends with alternative endings

DNA repair by the microhomology-mediated end-joining pathway
Nam Woo Cho & Roger A Greenberg
SEE LETTERS P.254 & P.258

176 GEOCHEMISTRY

When carbon escaped from the sea

Evidence of CO₂ degassing from the ocean at the end of the last ice age
Katherine A Allen SEE LETTER P.219

177 NEURODEGENERATION

Cold shock protects the brain

he RBM3 protein preserves synaptic connectivity during hypothermia
Graham Knott SEE LETTER P.236

REVIEW

179 SUPERCONDUCTIVITY From quantum matter to high-temperature superconductivity in copper oxides

B Keimer, S A Kivelson, M R Norman, S Uchida & J Zaanen

ARTICLES

187 GENETICS New genetic loci link adipose and insulin biology to body fat distribution

D Shungin et al.

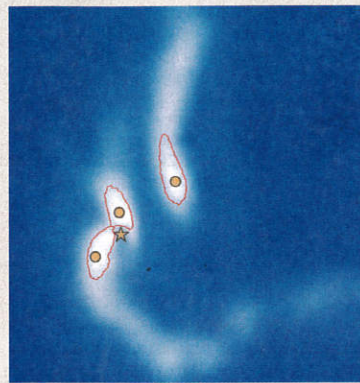
197 GENETICS Genetic studies of body mass index yield new insights for obesity biology

A E Locke et al.

ASTRONOMY

Four-star gas

Very deep images of dense gas in the Barnard 5 region reveal a multiple star forming system in action. **PAGE 213**



207 NEUROSCIENCE Shearing-induced asymmetry in entorhinal grid cells

T Stensola, H Stensola, M-B Moser & E I Mose

LETTERS

213 ASTRONOMY The formation of a quadruple star system with wide separation

J E Pineda et al. SEE N&V P.173

216 PLANETARY SCIENCE Comet 67P/Churyumov-Gerasimenko sheds dust coat accumulated over the past four years

R Schulz et al.

219 CLIMATE SCIENCES Boron isotope evidence for oceanic carbon dioxide leakage during the last deglaciation

M A Martínez-Botí et al.
SEE N&V P.176

223 CLIMATE SCIENCES Recharge of a subglacial lake by surface meltwater in northeast Greenland

M J Willis, B G Herried, M G Bevis & R E Bell

228 ARCHAEOLOGY *Homo erectus* at Trinil in Java used shells for tool production and engraving

J C A Joordens et al.

232 NEUROSCIENCE Grid cell symmetry is shaped by environmental geometry

J Krupic, M Bauza, S Burton, C Barry & J O'Keefe

236 NEUROSCIENCE RBM3 mediates structural plasticity and protective effects of cooling in neurodegeneration

D Peretti et al. SEE N&V P.177

240 TRANSLATIONAL RESEARCH Convergent loss of PTEN leads to clinical resistance to a PI(3)K α inhibitor

D Juric et al.

245 CANCER Apico-basal forces exerted by apoptotic cells drive epithelium folding

B Monier et al. SEE N&V P.171

249 MOLECULAR BIOLOGY RNA helicase DDX21 coordinates transcription and ribosomal RNA processing

E Calo et al.

254 MOLECULAR BIOLOGY Mammalian polymerase θ promotes alternative NHEJ and suppresses recombination

P A Mateos-Gomez et al. SEE N&V P.174

258 MOLECULAR BIOLOGY Homologous-recombination-deficient tumours are dependent on Pol θ -mediated repair

R Ceccaldi et al. SEE N&V P.174

CLIMATE SCIENCES

Ice sculpted

Elevation gains on the ice surface above a subglacial lake are evidence of meltwater storage. **PAGE 223**

