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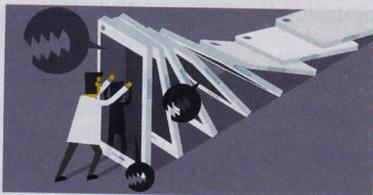
Soyuz rocket crash / Funding for rice institute / Alcohol warnings / AI investment / Hayabusa2 delay

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#### 316 FUNDING

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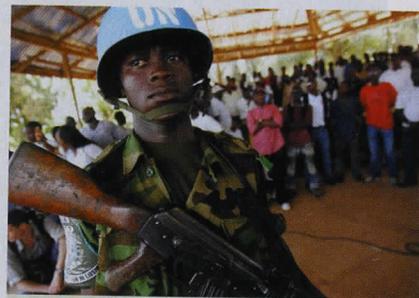
## SPOTLIGHT

#### S105 SPOTLIGHT

##### Strength in isolation

Western Australia offers deep collaborations and local character

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## Retool AI to reduce war

With more data, machine learning could boost ability to predict and limit conflicts, say Weisi Guo, Kristian Gleditsch & Alan Wilson **PAGE 331**

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Felicity Lawrence

#### 336 HISTORY

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#### 338 MEDICAL RESEARCH

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#### 339 PHYSICS

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#### 342 ATOMIC PHYSICS

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344 Chemical weapons / Research co-production / Early-career researchers / Juvenile language

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#### 454 Ferromagnetism

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## RESEARCH

### NEW ONLINE

345 Papers published this week at nature.com

### NEWS & VIEWS

#### 346 MATERIALS SCIENCE

##### A composite that takes the heat

A cermet designed for use in high-temperature heat exchangers

*Craig Turchi* [SEE LETTER P.406](#)

#### 347 BIOTECHNOLOGY

##### CRISPR tool puts RNA on the record

RNA expression can be recorded in bacterial cells

*Chase L Beisel* [SEE ARTICLE P.380](#)

#### 349 IN RETROSPECT

##### Method for studying dark matter turns 25

The impact of gravitational-microlensing observations from 1993

*Grzegorz Pietrzyński*

#### 350 NEUROSCIENCE

##### A living display system

Tracking the dynamics of individual chromatophores on cuttlefish skin

*Adrien Jouary & Christian K Machens*  
[SEE ARTICLE P.361](#)

#### 351 QUANTUM PHYSICS

##### Exploring the Universe with matter waves

Formation of a Bose–Einstein condensate in space

*Liang Liu* [SEE LETTER P.391](#)

#### 352 CELLULAR EVOLUTION

##### The eukaryotic ancestor shapes up

Evidence for a profilin-regulated actin cytoskeleton in Asgard archaea

*Laura Eme & Thijs J G Ettema*  
[SEE LETTER P.439](#)

### ARTICLES

#### 355 PARTICLE PHYSICS Improved limit on the electric dipole moment of the electron

*ACME Collaboration*

#### 361 NEUROSCIENCE Elucidating the control and development of skin patterning in cuttlefish

*S Reiter et al.* [SEE N&V P.350](#)

#### 367 GENETICS Single-cell transcriptomics of 20 mouse organs creates a

*Tabula Muris*  
*The Tabula Muris Consortium*

#### 373 CANCER GENETICS The genetic basis and cell of origin of mixed phenotype



ON THE COVER

## Mind reading

Uniquely among all animals, cuttlefish, squid and octopuses control their appearance by the direct action of neurons onto expandable pixels called chromatophores in their skin. In this issue, Gilles Laurent and colleagues infer the putative structure of control networks in the cuttlefish brain by analysing the dynamics of tens of thousands of chromatophores during naturalistic behaviour. [PAGES 350 & 361](#)

#### acute leukaemia

*T B Alexander et al.*

#### 380 BIOTECHNOLOGY Transcriptional recording by CRISPR spacer acquisition from RNA

*F Schmidt, M Y Cherepkova & R J Platt*  
[SEE N&V P.347](#)

### LETTERS

#### 386 ASTRONOMY The dispersion–brightness relation for fast radio bursts from a wide-field survey

*R M Shannon et al.*

#### 391 QUANTUM PHYSICS Space-borne Bose–Einstein condensation for precision interferometry

*D Becker et al.* [SEE N&V P.351](#)

#### 396 CONDENSED-MATTER PHYSICS Subcycle observation of lightwave-driven Dirac currents in a topological surface band

*J Reimann et al.*

#### 401 OPTICAL PHYSICS Battery-operated integrated frequency comb generator

*B Stern, X Ji, Y Okawachi, A L Gaeta & M Lipson*

#### 406 MATERIALS SCIENCE Ceramic–metal composites for heat exchangers in concentrated solar power plants

*M Caccia et al.* [SEE N&V P.346](#)

#### 410 CLIMATE SCIENCES Glacial expansion of oxygen-depleted seawater in the eastern tropical Pacific

*B A A Hoogakker et al.*

#### 414 BIOPHYSICS A separated vortex ring underlies the flight of the dandelion

*C Cummins et al.*

#### 419 NEUROSCIENCE Cervical excitatory neurons sustain breathing after spinal cord injury

*K Satkunendrarajah et al.*

#### 423 IMMUNOLOGY IRE1 $\alpha$ -XBP1 controls T cell function in ovarian cancer by regulating mitochondrial activity

*M Song et al.*

#### 429 CANCER A cell identity switch allows residual BCC to survive Hedgehog pathway inhibition

*B Biehs et al.*

#### 434 CANCER A slow-cycling LGR5 tumour population mediates basal cell carcinoma relapse after therapy

*A Sánchez-Danés et al.*

#### 439 CELLULAR EVOLUTION Genomes of Asgard archaea encode profilins that regulate actin

*C Akil & R C Robinson* [SEE N&V P.352](#)

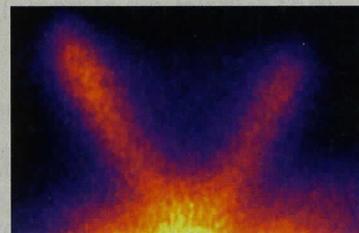
#### 444 STRUCTURAL BIOLOGY Handover mechanism of the growing pilus by the bacterial outer-membrane usher FimD

*M Du et al.*

### CONDENSED-MATTER PHYSICS

## Light work

Observing the acceleration of Dirac fermions. [PAGE 396](#)



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