

# nature

THE INTERNATIONAL WEEKLY JOURNAL OF SCIENCE



## MELTING MOMENTS

*Accidental separation of crystal defect pairs  
triggers ice-to-water transition* **PAGE 350**

### COMPUTERS

#### **BUT DOES IT ADD UP?**

*D-Wave stirs controversy  
in quantum computing*

**PAGE 286**

### CLIMATE AND ENERGY

#### **POSITIVE THINKING**

*Up-beat messages are more  
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### EVOLUTION

#### **BACK ON ITS PERCH**

*Archaeopteryx restored to  
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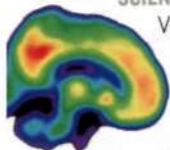
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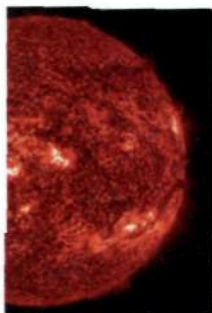
Carolyn Beans

The man or woman in the street can learn a lot from a chatty scientist — and vice versa

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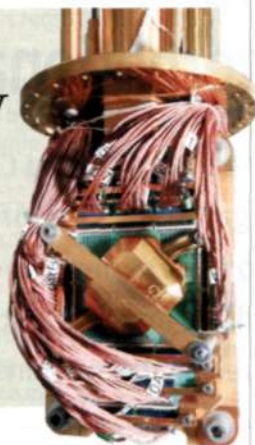
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Thomas Koop; Natalie Mahowald

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#### 303 BEHAVIOURAL BIOLOGY

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#### 306 BIOMIMETICS

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#### 318 DEVELOPMENTAL BIOLOGY The linear ubiquitin-specific deubiquitinase gumbly regulates angiogenesis

E Rivkin et al.



### CHEMISTRY

## Meltdown

Ice usually melts at the surface where the crystal structure readily transforms into liquid water. A new molecular dynamics study shows that in bulk ice, however, accidental separation of crystal defect pairs is required for melting to take place. The cover illustrates liquid emerging in the crystalline structure. PAGE 350

#### 325 NEUROSCIENCE RAS-MAPK-MSK1 pathway modulates ataxin 1 protein levels and toxicity in SCA1

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#### 332 STRUCTURAL BIOLOGY Structural mechanism of cytosolic DNA sensing by cGAS

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#### 342 PLANETARY SCIENCE Volcanism on Mars controlled by early oxidation of the upper mantle

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#### 346 NUCLEAR PHYSICS Masses of exotic calcium isotopes pin down nuclear forces

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#### 350 CHEMISTRY Defect pair separation as the controlling step in homogeneous ice melting

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#### 355 CLIMATE SCIENCE The importance of feldspar for ice nucleation by mineral dust in mixed-phase clouds

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#### 359 PALAEOONTOLOGY A Jurassic avialan dinosaur from China resolves the early phylogenetic history of birds

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#### 363 NEUROSCIENCE Distinct behavioural and network correlates of two interneuron types in prefrontal cortex

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#### 367 HEALTH SCIENCE Topographic diversity of fungal and bacterial communities in human skin

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#### 371 CELL BIOLOGY Neutrophil swarms require LTβ4 and integrins at sites of cell death *in vivo*

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#### 376 MICROBIOLOGY HIV-1 causes CD4 cell death through DNA-dependent protein kinase during viral integration

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#### 380 IMMUNOLOGY cGAS produces a 2'-5'-linked cyclic dinucleotide second messenger that activates STING

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#### 385 PLANT SCIENCES Polymerase IV occupancy at RNA-directed DNA methylation sites requires SHH1

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#### 390 BIOPHYSICS Modulation of allostery by protein intrinsic disorder

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### EVOLUTION

## Flight path

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