

## COVER

Graphic representation of an integrated quantum optics controlled-NOT chip. Single photons (represented as flashes) propagate on the chip, confined by silica waveguides, and are then coupled into optical fibers for detection. See page 646.

*Image: W. Amery/Bristol University*

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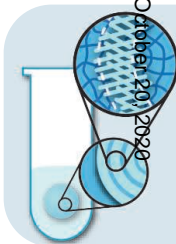
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## SCIENCE EXPRESS

[www.sciencexpress.org](http://www.sciencexpress.org)

### MATERIALS SCIENCE

#### Dislocation-Driven Nanowire Growth and Eshelby Twist

*M. J. Bierman, Y. K. A. Lau, A. V. Kvit, A. L. Schmitt, S. Jin*

A screw dislocation drives the growth of a nanowire pine tree, in which branches regularly extend from the trunk in a spiral, confirming Eshelby's theory of dislocations.

10.1126/science.1157131

### MEDICINE

#### A Polymorphism Within the *G6PC2* Gene Is Associated with Fasting Plasma Glucose Levels

*N. Bouatia-Naji et al.*

Variation in a gene for a protein in the pancreas may help explain why people have different levels of fasting blood glucose, a factor that affects disease risk.

10.1126/science.1156849

### MOLECULAR BIOLOGY

#### The Transcriptional Landscape of the Yeast Genome Defined by RNA Sequencing

*U. Nagalakshmi et al.*

A more complete catalog of transcribed DNA of yeast is assembled by shotgun sequencing of messenger RNA and reveals numerous previously unknown transcribed regions.

10.1126/science.1158441

### CELL BIOLOGY

#### The Serine Protease *TMPRSS6* Is Required to Sense Iron Deficiency

*X. Du et al.*

A cell-surface enzyme that cleaves proteins is unexpectedly necessary for sensing when iron levels are low and thereby triggering compensatory absorption of iron from food.

10.1126/science.1157121

## TECHNICAL COMMENT ABSTRACTS

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#### Comment on "Long-Lived Giant Number Fluctuations in a Swarming Granular Nematic" 612

*I. S. Aranson, A. Snezhko, J. S. Olafsen, J. S. Urbach*

full text at [www.sciencemag.org/cgi/content/full/320/5876/612c](http://www.sciencemag.org/cgi/content/full/320/5876/612c)

#### Response to Comment on "Long-Lived Giant Number Fluctuations in a Swarming Granular Nematic"

*V. Narayan, S. Ramaswamy, N. Menon*

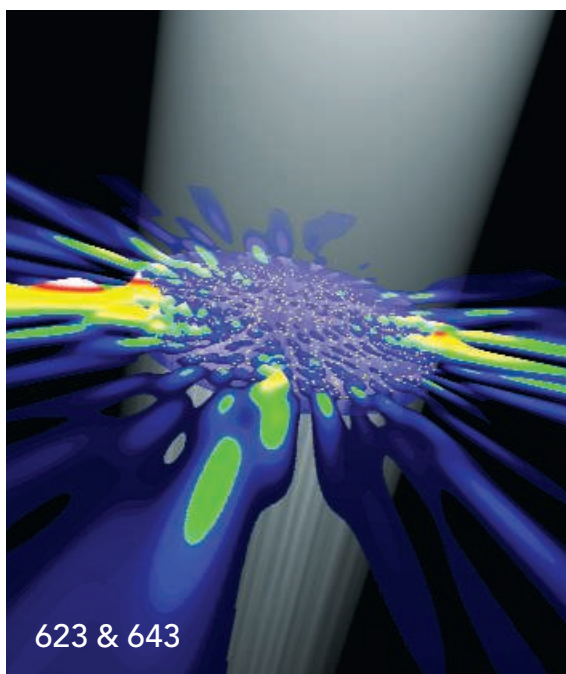
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*E. J. Garnero and A. K. McNamara*



## BREVIA

### CLIMATE CHANGE

#### Fire-Derived Charcoal Causes Loss of Forest Humus 629

*D. A. Wardle, M.-C. Nilsson, O. Zackrisson*

Charcoal enhances the microbial activity in soils, which in turn decreases the amount of carbon and humus in forests over time.

## RESEARCH ARTICLES

### NEUROSCIENCE

#### A Specialized Forebrain Circuit for Vocal Babbling in the Juvenile Songbird 630

*D. Aronov, A. S. Andalman, M. S. Fee*

The babbling of young zebra finches learning to sing is produced by a brain region distinct from the adult song center, a pattern that may also apply to other motor systems.

### MATERIALS SCIENCE

#### High-Thermoelectric Performance of Nanostructured Bismuth Antimony Telluride Bulk Alloys 634

*B. Poudel et al.*

Milling a thermoelectric alloy, which produces electricity from a thermal gradient, into a nanopowder, then pressing it into a bulk form, greatly improves its performance.

## REPORTS

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#### Coherent Control of Decoherence 638

*M. P. A. Branderhorst et al.*

Iterative shaping of a laser pulse using feedback from a fluorescence signal extends the phase stability of a molecular vibration in the face of rotational jostling.

### PHYSICS

#### Strong Interactions in Multimode Random Lasers 643

*H. E. Türeci, L. Ge, S. Rotter, A. D. Stone*

A theoretical approach describes lasing in strongly disordered media where multiple excitation modes may switch on and off to emit light over a range of wavelengths.

>> *Perspective p. 623*

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### APPLIED PHYSICS

#### Silica-on-Silicon Waveguide Quantum Circuits 646

*A. Politi, M. J. Cryan, J. G. Rarity, S. Yu, J. L. O'Brien*

Quantum circuits—in which individual photons interfere, entangle, and form logic gates—have been realized on silicon chips.

### CHEMISTRY

#### Practical Synthesis of Prostratin, DPP, and Their Analogs, Adjuvant Leads Against Latent HIV 649

*P. A. Wender, J.-M. Kee, J. M. Warrington*

A four-step synthesis starting from an abundant natural material yields large quantities of prostratin, a scarce natural product that may be useful in combating HIV.

### OCEAN SCIENCE

#### Marine Polyphosphate: A Key Player in Geologic Phosphorus Sequestration 652

*J. Diaz et al.*

Polyphosphates derived from diatoms may help crystallize calcium phosphate (apatite) in marine sediments globally, explaining how this large sink for phosphorus forms.

### OCEAN SCIENCE

#### Expanding Oxygen-Minimum Zones in the Tropical Oceans 655

*L. Stramma, G. C. Johnson, J. Sprintall, V. Mohrholz*

Since the 1950s, dissolved oxygen concentrations have decreased in low-oxygen zones of the tropical Atlantic and equatorial Pacific, and the zones have expanded toward the surface.

### ECOLOGY

#### A General Model for Food Web Structure 658

*S. Allesina, D. Alonso, M. Pascual*

A model based on likelihood analysis is able to replicate the actual structure of food web networks derived from experimental data.

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#### ROS-Generating Mitochondrial DNA Mutations Can Regulate Tumor Cell Metastasis 661

*K. Ishikawa et al.*

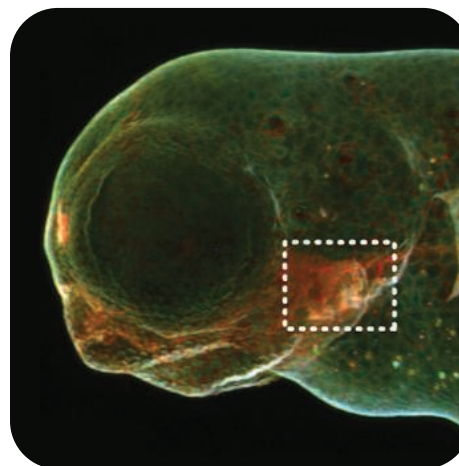
Mutations in mitochondrial DNA that cause enhanced production of reactive oxygen species can increase the propensity of tumor cells to metastasize.

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*S. T. Laughlin, J. M. Baskin, S. L. Amacher, C. R. Bertozzi*

Imaging of cell-surface sugars in developing zebrafish reveals dramatic bursts of sugar production in the jaw, olfactory organ, and pectoral fin 60 to 72 hours after fertilization.



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*T. M. Thornton et al.*

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*G. Drin, V. Morello, J.-F. Casella, P. Gounon, B. Antonny*

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*C. Dostert et al.*

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*B. Vanhollebeke et al.*

A lipoprotein in human blood protects against an African parasite by binding to a parasite receptor and triggering uptake of the lipoprotein, which contains a toxic component.



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Exercise, a natural antidepressant.

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### PERSPECTIVE: VGF, a New Player in Antidepressant Action?

*J. E. Malberg and L. M. Monteggia*

The neuropeptide VGF appears to play a role in the antidepressant effects of exercise, the neurotrophic factor BDNF, and the neurotransmitter serotonin.

### PERSPECTIVE: Synaptic Patterning by Morphogen Signaling

*W. R. Williamson and P. R. Hiesinger*

The morphogen Activin acts as a permissive and local motility restriction signal around individual photoreceptor terminals.

### PODCAST

*E. M. Adler and A. M. VanHook*

Some glial cells can generate action potentials and are hypersensitive to ischemic injury.



New structure for university careers in Europe.

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*C. Wald*

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*B. L. Benderly*

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*P. Gosling*

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*J. Fernández*

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