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A cotton bollworm larva (Helicoverpa armigera) feeds on a cotton boll. Transgenic Bt cotton was designed to resist this and other caterpillar pests. See page 1676.
Image: Nigel Cattlin/Visuals Unlimited Inc.

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PHYSICS
A High Phase-Space-Density Gas of Polar Molecules
K.-K. Ni et al.
Raman laser irradiation can cool a cloud of KRb molecules to ultralow translational, vibrational, and rotational temperatures, a step toward forming molecular condensates.
10.1126/science.1163861

IMMUNOLOGY
Innate Immunity in Caenorhabditis elegans Is Regulated by Neurons Expressing NPR-1/GPCR
K. L. Styer et al.
In the nematode Caenorhabditis elegans, sensory neurons surprisingly can inhibit innate immune responses, in part through the mitogen-activated protein kinase signaling pathway.
10.1126/science.1163673

TECHNICAL COMMENT ABSTRACTS
GEOLOGY
Comment on “Age and Evolution of the Grand Canyon Revealed by U-Pb Dating of Water Table-Type Speleothems”
J. Pederson et al.
full text at www.sciencemag.org/cgi/content/full/321/5896/1634b
Comment on “Age and Evolution of the Grand Canyon Revealed by U-Pb Dating of Water Table-Type Speleothems”
P. A. Pearthree, J. E. Spencer, J. E. Faulds, P. K. House
full text at www.sciencemag.org/cgi/content/full/321/5896/1634c
Response to Comment on “Age and Evolution of the Grand Canyon Revealed by U-Pb Dating of Water Table-Type Speleothems”
V. Polyak, C. Hill, Y. Asmerom
full text at www.sciencemag.org/cgi/content/full/321/5896/1634d

BREVIA
CLIMATE CHANGE
Ancient Permafrost and a Future, Warmer Arctic
D. G. Froese et al.
The existence of a 700,000-year-old patch of permafrost in sub-Arctic Canada shows that ground ice far from the pole can resist melting during warm intervals.

CHEMISTRY
Catalytic Conversion of Biomass to Monofunctional Hydrocarbons and Targeted Liquid-Fuel Classes
E. L. Kunkes et al.
A set of two reactors, one that breaks down biomass sugars and a second that directs chain formation, can synthesize various hydrocarbon fuels.
10.1126/science.1159210
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GEOCHEMISTRY
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T. Nakamura et al.
Stardust samples from a comet, thought to be from the outer solar system, include grains like those in chondrules, primitive grains that formed in the inner solar system. >> Science Podcast

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D. R. Oxley et al.
Individuals’ views on political issues relate to their physiological reactions to threatening stimuli: Desire to protect their group’s interests correlates with greater reactivity to threat.

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An Alternative Menaquinone Biosynthetic Pathway Operating in Microorganisms 1670
T. Hiratsuka et al.
Some pathogens synthesize the essential vitamin menaquinone by an unusual pathway, presenting a potential target for new antibiotics. >> Perspective p. 1644

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An Inhibitor of FtsZ with Potent and Selective Anti-Staphylococcal Activity 1673
D. J. Haydon et al.
A small synthetic molecule directed against a microbial protein required for cell division protects mice infected with Staphylococcus aureus from death. >> Perspective p. 1644

ECOLOGY
Suppression of Cotton Bollworm in Multiple Crops in China in Areas with Bt Toxin–Containing Cotton 1676
K.-M. Wu, Y.-H. Lu, H.-Q. Feng, Y.-Y. Jiang, J.-Z. Zhao
Planting engineered cotton that expresses a natural toxin reduces pest damage to both the cotton itself and to other crops planted nearby, reducing the need for insecticidal spray.

ECOLOGY
Can Catch Shares Prevent Fisheries Collapse? 1678
C. Costello, S. D. Gaines, J. Lynham
Global catch statistics since 1950 suggest that fisheries will be half as likely to collapse if fisherman have a sustainability incentive through a guaranteed right of harvest. >> News story p. 1619

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Parasite Treatment Affects Maternal Investment in Sons 1681
T. E. Reed et al.
Mother seabirds that are infected by parasitic nematodes are less able to gather food and feed their fast-growing sons, shifting the sex ratio and affecting population viability.

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In a mouse model of Alzheimer’s disease, neurons close to the characteristic deposits of amyloid show high activity, in contrast to the overall reduction in brain function.

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Reward-Predictive Cues Enhance Excitatory Synaptic Strength onto Midbrain Dopamine Neurons 1690
G. D. Stuber et al.
When a rat learns to associate a cue with a reward, dopamine-containing neurons in the midbrain acquire an enhanced response to that cue through the action of glutamate.

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Molecular Coupling of Xist Regulation and Pluripotency 1693
P. Navarro et al.
X chromosome inactivation in stem cells is reversed, a step in allowing them to become pluripotent, when three factors repress the inactivation RNA.

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Plaques in a Mouse Model of Alzheimer’s Disease 1690
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Mouthful.

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Facial muscles tell us whether we are pronouncing words correctly.

No Glee for Grandma?
Brains of the young and old process rewards in different ways.

China Quake No Stress Reliever
Temblor last May could have activated adjoining fault lines.

SDF-1 bound to CXCR4.

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RESEARCH ARTICLE: Structural Basis of CXCR4 Sulfotyrosine Recognition by the Chemokine SDF-1/CXCL12
The structure of SDF-1 bound to an extracellular domain of CXCR4 illustrates how chemokines recognize receptor sulfotyrosines and helps to identify an inhibitor of leukocyte chemotaxis.

PROTOCOL: Analysis of Signaling Events by Combining High-Throughput Screening Technology with Computer-Based Image Analysis
M. Kodiha, C. M. Brown, U. Stochaj
High-throughput screening and MetaXpress software modules can be adapted to quantify the subcellular localization of fluorescently labeled molecules.

PRESENTATION: Dynamic Visualization of Signaling Activities in Living Cells
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A. Di Trapani
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