A growing number of U.S. corporations are reacting to reports of poor student performance on national and international tests by contributing time and money to efforts aimed at improving math and science education in U.S. schools. To find out what they are doing and how well it’s working, see page 1030.

Photo illustration: Kelly Krause/Science (images: Jupiter Images; Getty)
MOLECULAR BIOLOGY
Selective Blockade of MicroRNA Processing by Lin-28
S. R. Viswanathan, G. Q. Daley, R. I. Gregory
A protein necessary for reprogramming skin fibroblasts to pluripotent stem cells is an RNA-binding protein that normally inhibits microRNA processing in embryonic cells.
10.1126/science.1154040

CELL BIOLOGY
Video-Rate Far-Field Optical Nanoscopy Dissects Synaptic Vesicle Movement
V. Westphal et al.
Sequential subdiffraction resolution images of fluorescently labeled synaptic vesicles in live cells reveal that they exhibit several distinct movement patterns.
10.1126/science.1154228

ASTROPHYSICS
Magnetar-like Emission from the Young Pulsar in Kes 75
F. P. Gavriil et al.
A pulsar exhibits x-ray bursts like that seen only in magnetars, which have ultrahigh magnetic fields, implying that neutron stars exhibit a continuum of magnetic activity.
10.1126/science.1153465

PHYSICS
Energy Gaps and Kohn Anomalies in Elemental Superconductors
P. Aynajian et al.
High-resolution neutron scattering experiments reveal behavior in pure lead and niobium superconductors beyond that described by the standard theoretical framework.
10.1126/science.1154115

TECHNICAL COMMENT ABSTRACTS
ECOLOGY
Comment on "International Conservation Policy Delivers Benefits for Birds in Europe"
R. Rodríguez-Muñoz, A. F. Ojanguren, T. Tregenza
Response to Comment on "International Conservation Policy Delivers Benefits for Birds in Europe"
P. F. Donald et al.

REVIEW
CHEMISTRY
Nuclear Coupling and Polarization in Molecular Transport Junctions: Beyond Tunneling to Function
M. Galperin, M. A. Ratner, A. Nitzan, A. Troisi

BREVIA
DEVELOPMENTAL BIOLOGY
Juvenile Hormone Regulates Butterfly Larval Pattern Switches
R. Futahashi and H. Fujiwara
In swallowtail butterflies, a hormone regulates a dramatic developmental shift as the young caterpillars, which mimic bird droppings, grow into the green cryptic larva.

REPORTS
PHYSICS
A Photon Turnstile Dynamically Regulated by One Atom
B. Dayan et al.
A single atom interacting with an optical microresonator can convert an influx of photons into a regular output of single photons.
MATERIALS SCIENCE
The Force Needed to Move an Atom on a Surface
M. Ternes et al.
An atomic force microscope can be tuned to measure the lateral and vertical forces required to move atoms or molecules on a surface, thus probing the bond strengths.
MATERIALS SCIENCE
Bioinspired Design and Assembly of Platelet Reinforced Polymer Films
L. J. Bonderer, A. R. Studart, L. J. Gauckler
In a design borrowed from biomaterials, ceramic plates less than 1 millimeter thick are sequentially deposited between flexible organic layers to yield strong, flexible films.
MATERIALS SCIENCE
Atomic-Scale Chemical Imaging of Composition and Bonding by Aberration-Corrected Microscopy
D. A. Muller et al.
Correcting electron optical aberrations to fifth order increases the beam current of an electron microscope enough for atomic-scale mapping of chemical species and bonds.
emissions have already greatly changed
caused by a previously uncharacterized human polyomavirus.
H. Feng, M. Shuda, Y. Chang, P. S. Moore
Merkel Cell Carcinoma
Clonal Integration of a Polyomavirus in Human

A rare, but highly aggressive, form of human skin cancer may be

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Mohr's lymphoma is a rare but highly aggressive form of human skin cancer that is

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GEOPHYSICS
Extending Earthquakes’ Reach Through Cascading
D. Marsan and O. Lengliné
A model of earthquake connectivity implies that small quakes may
collectively trigger more quakes than larger ones and that cascades of
triggered quakes are common.

CLIMATE CHANGE
Human-Induced Changes in the Hydrology of the Western United States
T. P. Barnett et al.
Combining a regional hydrologic and global climate model implies
that human-caused CO₂ emissions have already greatly changed
river flows and snow pack in the western United States.

BIOCHEMISTRY
Atomic-Level Models of the Bacterial Carboxysome Shell
S. Tanaka et al.
Pentameric proteins around the carboxysome, an organelle involved
in carbon fixation, fit together with hexagonally packed proteins to
form the organelle’s icosahedral shell.

CELL BIOLOGY
Differential Regulation of Dynein and Kinesin Motor Proteins by Tau
R. Dixit, J. L. Ross, Y. E. Goldman, E. L. F. Holzbaur
When molecular motors move along microtubules, they encounter
the bound protein tau; the dynein motor then reverses direction,
whereas the kinesin motor detaches.

MOLECULAR BIOLOGY
NADP Regulates the Yeast GAL Induction System
P. R. Kumar et al.
The structure of a repressor-activator complex for galactose
metabolism shows that its assembly is controlled by the ratio
of two cofactors that reflect the cell’s metabolism.

MOLECULAR BIOLOGY
A Shared Docking Motif in TRF1 and TRF2 Used for Differential Recruitment of Telomeric Proteins
Y. Chen et al.
Two similar members of the protein complex that protects the free
ends of chromosomes have distinct binding sites for other complex
members and accessory proteins.

NEUROSCIENCE
Spine-Type–Specific Recruitment of Newly Synthesized AMPA Receptors with Learning
N. Matsuo, L. Reijmers, M. Mayford
Mushroom-shaped synaptic spines activated during learning
preferentially capture newly synthesized glutamate receptors,
which may contribute to memory storage.

NEUROSCIENCE
Rapid Neural Coding in the Retina with Relative Spike Latencies
T. Gollisch and M. Meister
In salamanders, ganglion cells, which project from the retina to the
brain, use the relative timing of single spikes in each cell to quickly
encode a visual scene.

PSYCHOLOGY
Predicting Human Interactive Learning by Regret-Driven Neural Networks
D. Marchiori and M. Warglien
An unexpectedly simple neural network model that includes feedback
driven by regret predicts human behavior in strategic games and out-
performs existing models of learning.

GENETICS
Worldwide Human Relationships Inferred from Genome-Wide Patterns of Variation
J. Z. Li et al.
Analysis of variation in 51 human populations reveals details
of European subpopulations and confirms that humans formed
a chain of colonies as they radiated out from Africa.

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Kremen regulates Wnt signaling.

SCIENCE SIGNALING
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PERSPECTIVE: Context-Dependent Activation or Inhibition of Wnt-β-Catenin Signaling by Kremen
C. S. Cselemyi and E. Lee
The effect of Kremen 2 on Wnt signaling depends on the presence or absence of the Wnt antagonist Dickkopf1.

PERSPECTIVE: A Cytoskeletal Platform for Local Translation in Axons
F. P. G. Van Horck and C. E. Holt
Mutual interactions between the cytoskeleton and local translation may mediate growth cone steering response.

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Rising temperatures and acidity in the ocean cause deformities and death.

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Model predicts how much wetlands would benefit from shunting Mississippi River.

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New research helps explain why finding new love—and other experiences—don’t always meet expectations.

The effect of Kremen 2 on Wnt signaling depends on the presence or absence of the Wnt antagonist Dickkopf1.