Cover
Individuals with autism, a neurodevelopmental disorder, show impairment in social communication and language. Genetic analysis of closely related people reveals clues to the neural deficits that may underlie the disorder. See page 218.
Image: Kenneth Xavier/Xavier Studio

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Suppressing Spin Qubit Dephasing by Nuclear State Preparation
D. J. Reilly et al.
A series of voltage pulses can mitigate the detrimental influence of background spins in gallium arsenide, allowing the spin of quantum dots to remain coherent for microseconds.
10.1126/science.1159221

IMMUNOLOGY
Regulation of CD45 Alternative Splicing by Heterogeneous Ribonucleoprotein, HnRNPLL
S. Oberdoerffer et al.
A ribonucleoprotein directs the splicing of the transcript for CD45, a transmembrane tyrosine phosphatase that initiates signaling through antigen receptors.
10.1126/science.1157610

ECOLOGY
One-Third of Reef-Building Corals Face Elevated Extinction Risk from Climate Change and Local Impacts
K. E. Carpenter et al.
The viability of the world’s major coral reefs is endangered both by direct human disturbance and by disease and bleaching events brought on by climate change.
10.1126/science.1159196

PHYSICS
Quantum Gas of Deeply Bound Ground State Molecules
J. G. Danzl et al.
A coherent Raman pumping scheme cools cesium molecules to a state with minimal rotational energy, needed for producing cold molecular Bose-Einstein condensates.
10.1126/science.1159909

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Comment on “Genetically Determined Differences in Learning from Errors”
M. Lucht and D. Rosskopf
full text at www.sciencemag.org/cgi/content/full/321/5886/200a
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T. A. Klein et al.
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GEOPHYSICS
Source Analysis of the Crandall Canyon, Utah, Mine Collapse
D. S. Dreger, S. R. Ford, W. R. Walter
The anomalous seismic event in Utah on 6 August 2007 was produced by the collapse of a mine chamber 1 kilometer beneath the surface, which induced faulting of rocks above it.

RESEARCH ARTICLE
GENETICS
Identifying Autism Loci and Genes by Tracing Recent Shared Ancestry
E. M. Morrow et al.
A genetic analysis of autism in closely related individuals suggests that defects in proteins that control neural activity may produce this cognitive disorder.

ASTRONOMY
Supernova Shock Breakout from a Red Supergiant
K. Schawinski et al.
A burst of ultraviolet light reveals the initial expansion of a star leading to a supernova and identifies the star as a red supergiant.

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High-Efficiency Organic Solar Concentrators for Photovoltaics
M. J. Currie, J. K. Mapel, T. D. Heidel, S. Goffri, M. A. Baldo
Thin films with low concentrations of phosphorescent dyes that only weakly absorb their own emitted light concentrate sunlight, improving solar cell efficiency 10-fold.
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APPLIED PHYSICS
Control of Exciton Fluxes in an Excitonic Integrated Circuit
A. A. High et al.
Coupled quantum-wells structures, patterned to create electron-hole circuits, can perform simple logic operations on the optical input signals.

PHYSICS
Optical Pumping and Vibrational Cooling of Molecules
M. Viteau et al.
A broadband laser pulse can remove residual vibrational energy from molecules via excitation and relaxation cycles, allowing them to be cooled to low temperatures.

GEOLGY
A Positive Test of East Antarctica—Laurentia Juxtaposition Within the Rodinia Supercontinent
J. W. Goodge et al.
A glacial boulder in Antarctica, and other data, confirm that East Antarctica and Australia were linked to western North America in a supercontinent 1 billion years ago.

GEOPHYSICS
Anticrack Nucleation as Triggering Mechanism for Snow Slab Avalanches
J. Heierli, P. Gumbsch, M. Zaiser
The nature of microcracks in snow on a steep slope, not just their angle, helps determine whether the pile simply collapses under its own weight or shears off as an avalanche.

BIOCHEMISTRY
Micelles Protect Membrane Complexes from Solution to Vacuum
N. P. Barrera, N. Di Bartolo, P. J. Booth, C. V. Robinson
Gas-phase lipid micelles protect a large complex of membrane proteins, allowing its subunit composition and ligand binding to be assessed by mass spectrometry.

BIOCHEMISTRY
Structural Basis of Trans-Inhibition in a Molybdate/Tungstate ABC Transporter
S. Gerber, M. Comellas-Bigler, B. A. Goetz, K. P. Locher
A class of membrane transporters is subject to product inhibition: The imported substrate binds to a regulatory domain that sterically inhibits further ATP hydrolysis.

BIOCHEMISTRY
The High-Affinity E. coli Methionine ABC Transporter: Structure and AllostERIC Regulation
N. S. Kadaba, J. T. Kaiser, E. Johnson, A. Lee, D. C. Rees
The structure of the methionine transporter illustrates how increased levels of methionine stabilize an inactive state to inhibit further translocation.

BIOCHEMISTRY
Structural Basis for Specific Substrate Recognition by the Chloroplast Signal Recognition Particle Protein cpSRP43
K. F. Stengel et al.
A protein subunit of the signal recognition particle that directs chlorophyll binding proteins to the chloroplast replaces RNA and causes posttranslational function.

MICROBIOLOGY
Genetic Determinants of Self Identity and Social Recognition in Bacteria
K. A. Gibbs, M. L. Urbanowski, E. P. Greenberg
The ability of clones of a pathogenic bacterium to distinguish themselves from one another resides in a six-gene locus with interrelated recognition functions.

IMUNMOLOGY
Modulation of Gene Expression via Disruption of NF-κB Signaling by a Bacterial Small Molecule
V. V. Kravchenko et al.
A small molecule produced by common pathogenic bacterium inhibits the activity of a key immune transcription factor.

MEDICINE
Drug Target Identification Using Side-Effect Similarity
M. Campillos et al.
By finding drugs that share similar side effects, several new drug targets were predicted and experimentally confirmed, suggesting a route to identifying new therapeutic agents.
Ethanol stabilization of protein substate.

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REVIEW: Ethanol’s Molecular Targets
R. A. Harris, J. R. Trudell, S. J. Mihic
Ethanol affects the functions of specific proteins through its interaction with a select few amino acids in those proteins.

PODCAST
J. F. Foley and A. M. VanHook
Inhibition of NF-κB activation in macrophages results in a proinflammatory outcome.

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Science 321 (5886), 172-276.

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