COVER
Like a cauliflower, the quantum critical regime has the same appearance irrespective of viewing distance. Fluctuations prevent a stable phase from developing; instead a patchwork of mixed phases arises. See the special section on quantum matter beginning on page 1201.

Image: Getty Images

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Quantum Matter

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A 500,000-year record shows that more dust, which provides iron and other nutrients, was blown into the equatorial Pacific during glacial periods than during warm periods.
10.1126/science.1150595

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Graphite Whiskers in CV3 Meteorites
M. Fries and A. Steele
Graphite whiskers, a naturally occurring allotrope of carbon, have been found in primitive grains in several meteorites and may explain spectral features of supernovae.
10.1126/science.1153578

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J. Sreedharan et al.
Mutations in a gene that encodes a protein that aggregates in several neurodegenerative disorders are linked to amyotrophic lateral sclerosis (Lou Gehrig’s disease).
10.1126/science.1154584

NEUROSCIENCE
Protein Synthesis and Neurotrophin-Dependent Structural Plasticity of Single Dendritic Spines
J. Tanaka et al.
Pairing of stimuli in hippocampal cells induces secretion of the growth factor BDNF, causing enlargement of individual spines and strengthening of synapses.
10.1126/science.1152864

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Membrane Proteins of the Endoplasmic Reticulum Induce High-Curvature Tubules

J. Hu et al.

Integral membrane proteins from the endoplasmic reticulum induce the development of tubular structures in vitro by forming oligomers in the plane of the membrane.

PHYSIOLOGY

Leading-Edge Vortex Improves Lift in Slow-Flying Bats

F. T. Muijres et al.

Flying bats generate high lift forces similar to those used by insects, creating a vortex of air that stays attached to the wing on the downward stroke.

NEUROSCIENCE

Synaptic Protein Degradation Underlies Destabilization of Retrieved Fear Memory

S.-H. Lee et al.

Upon recollection, mouse memories of fearful situations become labile, as postsynaptic proteins are degraded by proteosomes and are then reconsolidated via protein synthesis.

NEUROSCIENCE

Hybrid Neurons in a MicroRNA Mutant Are Putative Evolutionary Intermediates in Insect CO2 Sensory Systems

P. Cayirlioglu et al.

Loss of a microRNA in Drosophila leads to misexpression of CO2-sensing neurons in the mouthparts, creating a possible evolutionary hybrid between the fruit fly and mosquito.

NEUROSCIENCE

Transgenic Inhibition of Synaptic Transmission Reveals Role of CA3 Output in Hippocampal Learning

T. Nakashiba et al.

Blockade of neural activity in the CA3 region of the hippocampus with a reversible, inducible transgenic method inhibits rapid learning but spares certain spatial tasks.

PSYCHOLOGY

BOLD Responses Reflecting Dopaminergic Signals in the Human Ventral Tegmental Area

K. D’Ardenne, S. M. McClure, L. E. Nystrom, J. D. Cohen

In humans, activity measurements in a small midbrain region show rewards in a learning task.
Bigger amygdalas in aggressive teens.

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cGMP is a therapeutic target.

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MEETING REPORT: cGMP Matters
B. Kemp-Harper and R. Feil
Emerging therapies for treating cardiovascular disorders target the cGMP signaling system.

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