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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G. Winckler, R. F. Anderson, M. Q. Fleisher, D. McGee, N. Mahowald
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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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

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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

RESEARCH ARTICLE
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K. Maeda et al.
Spectroscopic signatures show that supernova explosions of stars that have lost their hydrogen envelopes are strongly aspherical and may be jetlike.

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Calcium entry and directional growth. Hair cells generate reactive oxygen species, which in turn trigger Accumulation of an oxidase enzyme at one end of Arabidopsis root hair cells generates reactive oxygen species, which in turn trigger calcium entry and directional growth.

Cell biology: Local Positive Feedback Regulation Determines Cell Shape in Root Hair Cells. S. Takeda, C. Gapper, H. Kaya, E. Bell, K. Kuchitsu, L. Dolan. Accumulation of an oxidase enzyme at one end of Arabidopsis root hair cells generates reactive oxygen species, which in turn trigger calcium entry and directional growth.

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.

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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.

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.

Bigger amygdalas in aggressive teens.

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