Three-dimensional computer models such as this one help researchers explore the mechanisms behind core-collapse supernovae, the violent death of short-lived massive stars. In the image, tubes represent paths of gas falling into a supernova, deflected by an accretion shockwave (horizontal width of 600 km); colors represent different velocities. The question of how stars explode is one of the "Mysteries of Astronomy" described in a special News package beginning on page 1090.

Visualization: Hongfeng Yu and Kwan-Liu Ma, University of California-Davis and the SciDAC Institute for Ultra-Scale Visualization; Simulation: John Blondin, North Carolina State University
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Y.-T. Lai et al.
A general computational method allows the design of proteins that self-assemble into a desired symmetric architecture.

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A quantum computer may be able to efficiently simulate theories used to describe particle scattering in accelerators.

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D. Nesvorný et al.
Analysis of the deviations in the orbit of a transiting exoplanet revealed an outer planet in the same planetary system.

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C. L. Smallwood et al.
Time-resolved spectroscopy is used to probe the dynamics of electron pairing recovery in a high-temperature superconductor.

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The absence of defects and surface oxides at a graphene-silicon interface enables voltage control of graphene devices.

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High-level calculations assign the unusually complex spectrum of a molecular pair implicated in interstellar chemistry.

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The elusive enzyme that modifies proteins involved in building bone and teeth has now been identified.

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L. A. O’Connell and H. A. Hofmann
Across vertebrates, behaviorally relevant brain regions are remarkably conserved over 450 million years of evolution.

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The fitness of an organism can be modeled to determine how phenotypic trade-offs are maximized.

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Triple-color microscopy suggests two factors interact to initiate actin formation and then separate as the filament grows.

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The structure of the APP transmembrane domain allows processive cleavage and cholesterol binding that may enhance cleavage.

1171 Computational Design of Self-Assembling Protein Nanomaterials with Atomic Level Accuracy
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A general computational method is used to design protein building blocks that self-assemble into target architectures.

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L. Dai et al.
Experiments in yeast confirm that statistical indicators can signal the approach of population crashes.

1182 Restoring Voluntary Control of Locomotion after Paralyzing Spinal Cord Injury
R. van den Brand et al.
A rehabilitation program involving robotic neuroprosthetics restores previously paralyzed hindlimb function.
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