Tomato (*Solanum lycopersicum*) domestication and selection resulted in an explosion of different fruit shapes and sizes, as exemplified by heirloom varieties. Wild ancestors of tomatoes such as *S. pimpinellifolium*, the smallest fruit shown here, were round (middle row, second from left). See page 1527.

*Image: Kelly Krause/Science; photos: Esther van der Knaap*
PHYSICS
Coherent Dynamics of a Single Spin Interacting with an Adjustable Spin Bath
R. Hanson, V. V. Dobrovitski, A. E. Feiguin, O. Gywat, D. D. Awschalom
Simulations successfully show how the spin of a nitrogen vacancy in diamond is coupled to those of surrounding nitrogen impurities and how coherence between them is lost.
10.1126/science.1155400

CHEMISTRY
Gate-Variable Optical Transitions in Graphene
F. Wang et al.
Application of electrical biases to single or double layers of graphene changes its infrared reflectivity, mimicking aspects of transistors and opening up optoelectronic applications.
10.1126/science.1152793

CLIMATE CHANGE
Impact of Artificial Reservoir Water Impoundment on Global Sea Level
B. F. Chao, Y. H. Wu, Y. S. Li
Accounting for water impounded globally in artificial lakes that were filled during the past 80 years raises estimates of natural contributions to recent sea level.
10.1126/science.1154580

MOLECULAR BIOLOGY
Nutritional Control of Reproductive Status in Honeybees via DNA Methylation
R. Kucharski, J. Maleszka, S. Foret, R. Maleszka
Epigenetic modifications that involve methylation cause female honeybee larvae to become queens rather than workers when they are fed royal jelly.
10.1126/science.1153069

NEUROSCIENCE
Insect Odorant Receptors Are Molecular Targets of the Insect Repellent DEET
M. Ditzen, M. Pellegrino, L. B. Vosshall
The widely used insect repellent DEET acts by inhibiting olfactory neurons that respond to odors such as those that attract insects to their hosts.
>> News story p. 1471
10.1126/science.1153121

REPORTS
ASTRONOMY
Organic Molecules and Water in the Planet Formation Region of Young Circumstellar Disks
J. S. Carr and J. R. Najita
Simple organic molecules and water are abundant in the inner disk of a star like our early Sun, implying that organic synthesis is occurring there.
>> Perspective p. 1488

PHYSICS
Superconductivity in Hydrogen-Dominant Materials: Silane
M. I. Eremets, I. A. Trojan, S. A. Medvedev, J. S. Tse, Y. Yao
Under pressure, the insulator silane (SiH\textsubscript{4}) transforms to a metallic phase and, at even higher pressures and low temperatures, becomes superconducting.

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.
>> Perspective p. 1492

CHEMISTRY
Synthesis of Macrocyclic Copolymer Brushes and Their Self-Assembly into Supramolecular Tubes
M. Schappacher and A. Defieux
A three-block polymer can generate long cyclic polymers in solution, which can be further functionalized to form polymer brushes and tubular assemblies.
Solenoid with a Triangular Hydrophobic Core

The unusual lack of accumulated mutations in asexual Giardia can be explained by the exchange of plasmid DNA between its two nuclei during the cyst phase.

Direct Visualization of Horizontal Gene Transfer

Visualization of DNA exchange between two bacteria reveals that the process is highly efficient, is mediated by the pilus, and occurs about once per replication cycle.

Neurokinin 1 Receptor Antagonism as a Possible Therapy for Alcoholism

A drug that inhibits a neural signaling pathway linked to behavioral stress may be a useful therapy in preventing relapse in alcoholics.

Using Engineered Scaffold Interactions to Reshape MAP Kinase Pathway Signaling Dynamics

A yeast signaling pathway acquires new regulatory properties (such as adaptation) when additional protein-protein interaction sites are engineered into a scaffolding protein.

Therapy for Alcoholism

Neurokinin 1 Receptor Antagonism as a Possible Therapy for Alcoholism

D. T. George et al.

Stronger synapses induced by calcium currents are responsible for working memory rather than the more metabolically expensive action potential firing, as had been thought.

Synaptic Theory of Working Memory

G. Mongillo, O. Barak, M. Tsodyks

A reaction in calcium-rich rocks in Earth’s mantle can explain a seismic signal that varies geographically and with depth, providing a means to map mantle compositions.

A structural model of a yeast prion shows that the amyloid fibrils have not required high coral diversity.

Coral Diversity over 28 Million Years

An analysis of fossil and modern Caribbean corals shows that, for the last 28 million years, coral reef growth and persistence have not required high coral diversity.

Amyloid Fibrils of the HET-s(218–289) Prion Form a β Solenoid with a Triangular Hydrophobic Core

A structural model of a yeast prion shows that the amyloid fibrils form a left-handed β solenoid stabilized by hydrophobic and polar interactions and salt bridges.

Solving the puzzle of coral diversity over millions of years can help us understand the impact of environmental change on these ecosystems.

Coral Reef Development Was Independent of Caribbean Reef Development Was Independent of Coral Diversity over 28 Million Years

K. G. Johnson, J. B. C. Jackson, A. F. Budd

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Science 319 (5869), 1453-1551.