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Synthetic image of the north polar cap of Mars, about 1000 kilometers across, with cutaway revealing interior structure as imaged by the Shallow Radar (SHARAD) on the Mars Reconnaissance Orbiter mission. Vertical exaggeration is about 60:1. In this false-color rendition, bright lines in the cross section are reflections from internal layer boundaries within the icy cap; their depth distribution provides clues to recent climate history. See page 1182.

Image: NASA/JPL-Caltech/Agenzia Spaziale Italiana/Università di Roma/Southwest Research Institute; additional data credits: Mars Orbiter Laser Altimeter Science Team, Mars Orbiter Camera (NASA/JPL/Malin Space Science Systems); digital graphics: JPL/Eric De Jong/Mike Stetson/Jason Craig

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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 adenosine triphosphate hydrolysis.
10.1126/science.1156213

GENETICS
Paleo-Eskimo mtDNA Genome Reveals Matrilineal Discontinuity in Greenland
M. T. P. Gilbert et al.
Ancient human DNA sequences from Greenland suggest that the earliest inhabitants of the far north were from a lineage distinct from extant Native Americans and Eskimos.
10.1126/science.1159750

PHYSICS
Probing Cold Dense Nuclear Matter
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10.1126/science.1156675

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Mars North Polar Deposits: Stratigraphy, Age, and Geodynamical Response
R. J. Phillips et al.
Radar mapping shows that Mars’ thick north polar ice cap contains four dust-rich layers recording variation in the planet’s orbit and only slightly depresses the underlying crust. 

MOLECULAR BIOLOGY
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A supernova seen 300 years ago is now seen again as infrared echoes scattered by interstellar dust, showing that it formed from the helium core of a red supergiant star. >> Perspective p. 1167; Science Podcast

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Massive Horizontal Gene Transfer in Bdelloid Rotifers
E. A. Gladyshev, M. Meselson, I. R. Arkhipova
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EVOLUTION
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W. O. H. Hughes et al.
Monogamy prevailed in the ancestral lineages of bees and wasps, suggesting that high relatedness was critical to the evolution of their complex, cooperative social systems. >> Science Podcast

PSYCHOLOGY
Log or Linear? Distinct Intuitions of the Number Scale in Western and Amazonian Indigene Cultures
S. Dehaene, V. Izard, E. Spelke, P. Pica
Adults from an Amazonian tribe view numbers as a logarithmic progression (e.g., 10 is halfway to 100), suggesting that our linear view of numbers is culturally learned.

IMMUNOLOGY
Coordination of Early Protective Immunity to Viral Infection by Regulatory T Cells
J. M. Lund, L. Hsing, T. T. Pham, A. Y. Rudensky
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A transcription factor implicated in autism and learning disorders is unexpectedly found to activate a large number of genes in the hypothalamus, not just a few. >> Perspective p. 1172
Inhibiting PKA with Rp-cAMPS.

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E. Pain
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REVIEW: Pharmacological PKA Inhibition—All May Not Be What It Seems
A. J. Murray
 Widely used inhibitors of cAMP-dependent protein kinase (PKA) have nonspecific side effects.

PERSPECTIVE: Steering in Quadruplet—The Complex Signaling Pathways Directing Chemotaxis
E. C. Rericha and C. A. Parent
 Multiple pathways act in concert to direct a cell’s migration.

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