COVER
A mosaic of visible to near-infrared images of the surface of Mercury, obtained by the MESSENGER spacecraft on 14 January 2008. The circular feature in the upper right is the Caloris impact basin, 1500 kilometers in diameter. Results from the flyby are discussed in a special section beginning on page 58.

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10.1126/science.1160342

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Laboratory studies affirm that the oxidation of chloride ions in aerosols by N₂O₅ is a significant source of chlorine in the troposphere, a major reactant that helps form ozone.
10.1126/science.1158777

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G. Hlawacek et al.
In contrast to the growth of inorganic films, bending of a rod-shaped organic molecule at step edges and its anisotropy leads to a change from growth of layers to terraced mounds.

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Large and Rapid Melt-Induced Velocity Changes in the Ablation Zone of the Greenland Ice Sheet
R. S. W. van de Wal et al.
Measurements of ice velocity across western Greenland show that the ice sheet responds within days to excess meltwater, although annual flow has slowed a bit over 17 years.

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Mg/Al Ordering in Layered Double Hydroxides Revealed by Multinuclear NMR Spectroscopy
Rapid sample spinning during nuclear magnetic resonance spectroscopy reveals a highly ordered cation distribution in layered materials.

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Autophagy Is Essential for Preimplantation Development of Mouse Embryos
S. Tsukamoto et al.
As fertilized mouse eggs develop into embryos and maternal proteins are eliminated, the degradative process of autophagy is required for proper growth.

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Phylogenetic Signal in the Eukaryotic Tree of Life
M. J. Sanderson
A survey of sequences in GenBank, which represent about 10 percent of described species, shows that the patchy distribution of data is insufficient to build a eukaryotic tree of life.

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Accelerated Human Population Growth at Protected Area Edges
G. Wittemyer et al.
Contrary to expectations, human populations living near protected areas in 45 countries in Africa and Latin America are increasing nearly twice as fast as other rural ones.

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Robust, Tunable Biological Oscillations from Interlinked Positive and Negative Feedback Loops
T. Y.-C. Tsai et al.
Analysis of known and theoretical oscillatory circuits in cells shows that those with both negative and positive feedback are more robust and allow frequency control independent of amplitude.

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Sporadic Autonomic Dysregulation and Death Associated with Excessive Serotonin Autoinhibition
E. Audero et al.
In young mice, expression of higher than normal levels of a type of serotonin receptor causes sporadic death with features reminiscent of sudden infant death syndrome.

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Myosin I Can Act As a Molecular Force Sensor
Myosin I, a motor protein that plays a role in hearing, is a sensitive tension sensor, reacting to small loads (less than 2 picoNewtons) by binding for much longer times to actin.

NEUROSCIENCE
The Spread of Ras Activity Triggered by Activation of a Single Dendritic Spine
C. D. Harvey, R. Yasuda, H. Zhong, K. Svoboda
When strengthened, individual synapses on dendritic spines contain an activated small regulatory protein that spreads to nearby spines, possibly altering their sensitivity.

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Finite Scale of Spatial Representation in the Hippocampus
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The rat hippocampus provides a representation of the animal’s entire spatial environment, coding distances up to 1 meter away in the dorsal region and up to 15 meters at the ventral tip.

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**REVIEW:** Tissue Inhibitors of Metalloproteinases in Cell Signaling—Metalloproteinase-Independent Biological Activities

W. G. Stetler-Stevenson

TIMPs can act directly through cell surface receptors or indirectly through modulation of proteases.

**PERSPECTIVE:** The Cytoplasmic Tail of MUC1—A Very Busy Place

D. D. Carson

The cytoplasmic domain of mucin 1 (MUC1) plays numerous roles in intracellular signaling pathways.

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**Why It’s Hard to Say Goodbye**
Study links loss of a loved one to the brain’s pleasure center.

**Don’t Judge a Plant by Its Species**
An ant, an aphid, and a milkweed are changing thoughts about community ecology.

**African Lion-Killer Had Help**
Virus conspired with tick-borne parasites and extreme droughts.

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Micella Phoenix DeWhyse celebrates her Independence Day—and we’re sad; with related podcast interview.

**Taken for Granted: By the Numbers**

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A committee calls for better government data collection about jobs for scientists.

**In Person: Research in France**

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Understanding the French public research system is critical to foreign scientists coming into the country.

**July 2008 Funding News**

J. Fernández

Learn about the latest in research funding, scholarships, fellowships, and internships.

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