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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Published by AAAS
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Shotgun sequencing of 27-base pair segments of messenger RNA from human kidney and immune cells identifies previously undescribed transcriptional units and splice junctions.

10.1126/science.1160342

BIOCHEMISTRY
The Crystal Structure of a Sodium Galactose Transporter Reveals Mechanistic Insights into Na+/Sugar Symport
S. Faham et al.
The structure of a sugar transporter suggests how these proteins may rearrange to permit the sugar to enter and leave the binding site on opposite sides of the membrane.

10.1126/science.1160406

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R. P. Breton et al.

Four years of data track the spin precession of a pulsar orbiting a second pulsar, providing a positive test of general relativity in a strong gravitational field.

MATERIALS SCIENCE

Characterization of Step-Edge Barriers in Organic Thin-Film Growth
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.

CLIMATE CHANGE

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.

CHEMISTRY

Mg/Al Ordering in Layered Double Hydroxides

Rapid sample spinning during nuclear magnetic resonance spectroscopy reveals a highly ordered cation distribution in layered materials.

DEVELOPMENTAL BIOLOGY

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.

EVOLUTION

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.

ECOLOGY

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.

CELL BIOLOGY

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.

MEDICINE

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.

BIOCHEMISTRY

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.

NEUROSCIENCE

Finite Scale of Spatial Representation in the Hippocampus
K. B. Kjelstrup et al.

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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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.

Farewell, Micella.

SCIENCE CAREERS
www.sciencecareers.org/career_development
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Educated Woman, Postdoc Edition, Chapter 18:
End of the Road
M. P. DeWhyse
Micella Phoenix DeWhyse celebrates her Independence Day—and we’re sad; with related podcast interview.

Taken for Granted: By the Numbers
B. L. Benderly
A committee calls for better government data collection about jobs for scientists.

In Person: Research in France
A. Bikfalvi
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.

SCIENCE SIGNALING
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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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