COVER
X-rays emerge with varying intensity (red/green wave) as an electron is pulled out of and then pushed back into a vibrating N$_2$O$_4$ molecule by an intense laser field. The pattern reveals real-time dynamic changes in electronic spatial configurations, or orbitals, at the compressed (left blue orbital) and stretched (right blue orbital) limits of the vibration cycle. See page 1207.

Image: Greg Kuebler, JILA/University of Colorado

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The Spreading of Disorder
K. Keizer, S. Lindenberg, L. Steg
Upon observing signs of social disorder (such as littering or graffiti), individuals are more likely to disobey a variety of social rules, including prohibitions against theft.
>> News story p. 1175
10.1126/science.1161405

CELL BIOLOGY
Dynamic Proteomics of Individual Cancer Cells in Response to a Drug
A. A. Cohen et al.
Cells that escape death from a chemotherapy drug express a different array of proteins from genetically identical ones that died, which may help to inform cancer therapeutics.
>> News story p. 1176
10.1126/science.1160165

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The Psychology of Transcending the Here and Now
N. Liberman and Y. Trope

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Fossil Pollen as a Guide to Conservation in the Galápagos
J. F. N. van Leeuwen et al.
Fossil pollen shows that six plant species in the Galápagos, presumed to be invasive, had actually been native to the islands for thousands of years before human colonization.
>> Science Podcast

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The 2.6 Angstrom Crystal Structure of a Human A2A Adenosine Receptor Bound to an Antagonist
V.-P. Jaakola et al.
The ligand binding pocket of the caffeine-binding human adenosine receptor has a different position and orientation than that of other G protein–linked receptors.

ASTRONOMY
The Fermi Gamma-Ray Space Telescope Discovers the Pulsar in the Young Galactic Supernova Remnant CTA 1
A. A. Abdo et al.
The Fermi Space Telescope has detected a gamma-ray pulsar associated with a young supernova remnant, implying that such stars may be unidentified gamma-ray sources.
>> Perspective p. 1193

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Ab Initio Determination of Light Hadron Masses
S. Dürr et al.
A quantum electrodynamics model that includes a full representation of quarks and their electromagnetic interactions accurately determines the masses of neutrons and protons.
>> Perspective p. 1198
**DEVELOPMENTAL BIOLOGY**
Canonical Wnt Signaling Regulates Organ-Specific Assembly and Differentiation of CNS Vasculature
J. M. Stenman et al.
In mice, two specialized ligands for a key developmental signaling pathway are produced by neuroepithelial cells and direct endothelial cells to form the blood-brain barrier. **>> Perspective p. 1195**

**MEDICINE**
Regulation of Pancreatic β Cell Mass by Neuronal Signals from the Liver
J. Imai et al.
In obese mice, fat tissue stimulates proliferation of insulin-producing pancreatic cells via a neural relay through the liver, contributing to symptoms of metabolic syndrome.

**ECOLOGY**
Control of Toxic Marine Dinoflagellate Blooms by Serial Parasitic Killers
A. Chambouvet, P. Morin, D. Marie, L. Guillou
As successive populations of protists have caused summer red tides in France, each has been killed off by a distinct, persistent parasite, establishing a self-regulating ecosystem.

**IMMUNOLOGY**
Antimicrobial Defense and Persistent Infection in Insects
E. R. Haine, Y. Moret, M. T. Siva-Jothy, J. Rolff
Flies fight some infections by quickly engulfing bacteria in phagocytic cells then deploying antimicrobial peptides, a system that avoids bacterial resistance. **>> Perspective p. 1199**

**SOCIOLGY**
Multi-University Research Teams: Shifting Impact, Geography, and Stratification in Science
B. F. Jones, S. Wuchty, B. Uzzi
Over the past 30 years, scientific papers have become increasingly likely to be written by teams of authors from more than one of a small number of elite universities.

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**REPORTS CONTINUED...**

**PHYSICS**
4D Imaging of Transient Structures and Morphologies in Ultrafast Electron Microscopy
B. Barwick et al.
Imaging with single electrons can track structural dynamics of gold and graphite in real space with femtosecond temporal resolution and angstrom spatial resolution.

**CHEMISTRY**
High Harmonic Generation from Multiple Orbitals in N₂
B. K. McFarland et al.
Electron ejection from multiple N₂ orbitals, controlled by the molecule’s orientation relative to a laser, produces attosecond light spectra that can reveal molecular dynamics. **>> Perspective p. 1194**

**PLANETARY SCIENCE**
Radar Sounding Evidence for Buried Glaciers in the Southern Mid-Latitudes of Mars
J. W. Holt et al.
Radar data from the Mars Reconnaissance Orbiter show that a series of lobate landforms at low latitudes are composed primarily of massive ice covered by debris.

**EVOLUTION**
Variation in Evolutionary Patterns Across the Geographic Range of a Fossil Bivalve
M. Grey, J. W. Haggart, P. L. Smith
Within a fossil bivalve genus, evolution tended to occur as a random walk at the highest latitudes and to be in stasis mode in deep marine environments.

**EVOLUTION**
Selfish Genetic Elements Promote Polyandry in a Fly
T. A. R. Price et al.
Genes that confer a deleterious sex ratio in Drosophila also decrease male fertility and promote repetitive mating in females, providing a possible explanation of polyandry.

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Regulation of Microtubule Dynamics by Reaction Cascades Around Chromosomes
C. A. Athale et al.
A reaction-diffusion model involving regulatory molecules and a microtubule-stabilizing phosphoprotein predicts the spatial distribution of microtubules during cell division.
Regulating TGF-β signaling from the nucleus.

EDITORIAL GUIDE: Focus Issue—An Expanding World for TGF-β Signaling
N. R. Gough
With new modes of regulation and new functions for members of the pathway, TGF-β breaks the canonical barrier.

PERSPECTIVE: Holding Their Own—The Noncanonical Roles of Smad Proteins
L. L. Hoover and S. W. Kubalak
There are TGF-β–independent regulatory mechanisms and functions of Smads.

PERSPECTIVE: PCTA—A New Player in TGF-β Signaling
F. Liu
The distribution of promyelocytic leukemia protein between the nucleus and cytoplasm controls Smad activation.

FORUM: Highlights from a TGF-β Workshop
N. R. Gough
In addition to talks emphasizing the role of TGF-β in cancer, many speakers shared memories of Anita Roberts, scientist mentor, colleague, and friend.

NETWATCH: Cell Biology Promotion
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