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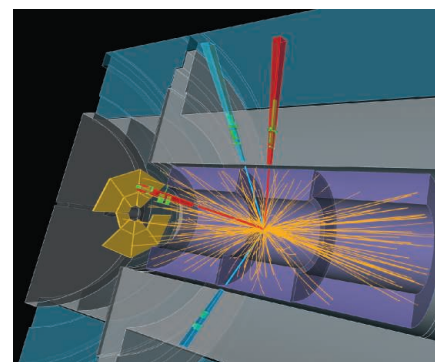
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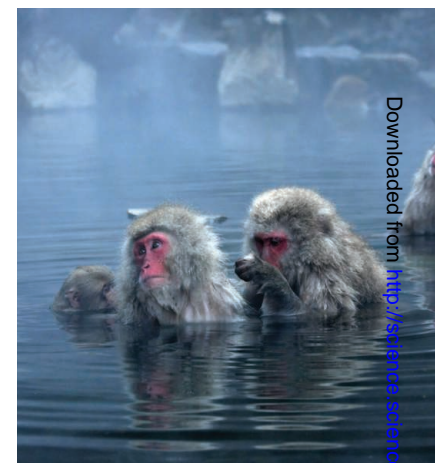
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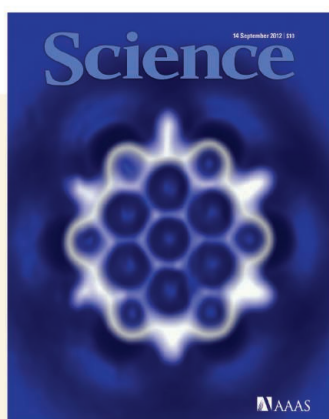


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COVER

A hexabenzocoronene molecule (diameter: 1.4 nanometers) imaged by noncontact atomic force microscopy using a microscope tip terminated with a single carbon monoxide molecule. The carbon-carbon bonds in the imaged molecule appear with different contrast and apparent lengths. Based on these disparities, the bond orders and lengths of the individual bonds can be distinguished. See page 1326.

Image: Leo Gross, IBM Research - Zurich

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- 1313 Adaptive Prolonged Postreproductive Life Span in Killer Whales
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Killer whale mothers continue to help their adult male offspring to survive long after ceasing reproduction.
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- 1318 Relaxation and Prethermalization in an Isolated Quantum System
M. Gring et al.
Two halves of a split ultracold gas of rubidium atoms retain memory of the initial state for an extended time.
- 1322 Oxidative Aliphatic C-H Fluorination with Fluoride Ion Catalyzed by a Manganese Porphyrin
W. Liu et al.
A catalyst introduces fluorine in a convenient, mild fashion to a range of relatively inert hydrocarbons.
- 1326 Bond-Order Discrimination by Atomic Force Microscopy
L. Gross et al.
Images detected with an atomic force microscope tip decorated with a carbon monoxide molecule could distinguish Pauling bond order.
>> *Perspective p. 1305*
- 1330 Glacier Extent During the Younger Dryas and 8.2-ka Event on Baffin Island, Arctic Canada
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Cooling during the event that occurred 8.2 thousand years ago was less extreme but more evenly distributed across the seasons than during the Younger Dryas.

- 1333 Initiation of Cell Wall Pattern by a Rho- and Microtubule-Driven Symmetry Breaking
Y. Oda and H. Fukuda
A Rho guanosine triphosphatase-based regulatory mechanism reveals how plants remodel membranes and cell walls to produce various cell shapes.
- 1336 A Killer-Protector System Regulates Both Hybrid Sterility and Segregation Distortion in Rice
J. Yang et al.
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- 1340 Single Reconstituted Neuronal SNARE Complexes Zipper in Three Distinct Stages
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C. Dreyfus et al.
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- 1357 A Critical Period for Social Experience-Dependent Oligodendrocyte Maturation and Myelination
M. Makinodan et al.
In mice, early social experience regulates prefrontal cortex myelination that is essential for normal cognitive development.
- 1360 Active DNA Demethylation in Plant Companion Cells Reinforces Transposon Methylation in Gametes
C. A. Ibarra et al.
Activation of transposable elements in the companion cells of plant gametes can silence transposable elements in the gamete.

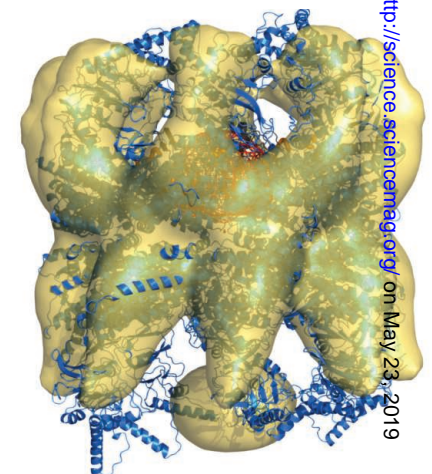
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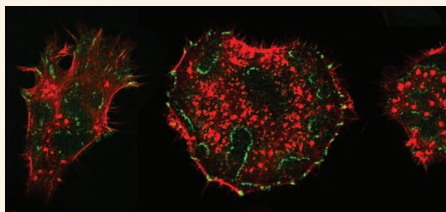


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SCIENCE SIGNALING

Focal adhesions and invadopodia.

SCIENCE EXPRESS

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Dynamics of DNA Supercoils

M. T. J. van Loenhout et al.

The movement of intertwined loops, or plectonemes, along a twisted DNA molecule was visualized.

10.1126/science.1225810

Cilia at the Node of Mouse Embryos Sense Fluid Flow for Left-Right Determination via Pkd2

S. Yoshida et al.

A Ca²⁺ channel implicated in polycystic kidney disease helps to establish the left-right body axis of the mammalian embryo.

10.1126/science.1222538

Shared Synaptic Pathophysiology in Syndromic and Nonsyndromic Rodent Models of Autism

S. J. Baudouin et al.

Deficiency or mutation of the postsynaptic adhesion protein Neuroligin-3 may contribute to cognitive defects in autism.

10.1126/science.1224159

A Genomic Regulatory Element That Directs Assembly and Function of Immune-Specific AP-1-IRF Complexes

E. Glasmacher et al.

Cooperative binding of transcription factors to composite genomic elements regulates T helper 17 cell differentiation.

10.1126/science.1228309

Metagenome Mining Reveals Polytheonamides as Posttranslationally Modified Ribosomal Peptides

M. F. Freeman et al.

Large toxins that comprise many modified and D-amino acids are ribosomally synthesized and then derivatized.

10.1126/science.1226121

TECHNICAL COMMENTS

Comment on "Climate Sensitivity Estimated from Temperature Reconstructions of the Last Glacial Maximum"

J. Fyke and M. Eby

Full text at www.sciencemag.org/cgi/content/full/337/6100/1294-b

Response to Comment on "Climate Sensitivity Estimated from Temperature Reconstructions of the Last Glacial Maximum"

A. Schmittner et al.

Full text at www.sciencemag.org/cgi/content/full/337/6100/1294-c

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Highlights From Our Daily News Coverage

Slippery When Windy

Spray from whitecaps inside strong hurricanes renders a wavy ocean aerodynamically smooth.

<http://scim.ag/Slippery-Windy>

Human Genome Is Much More Than Just Genes

The genome has billions of elements that switch genes on and off.

<http://scim.ag/Genome-Elements>

Hunting Kills Boldest Elk, Spares Shiest

The behavior of elk could shift over time because of hunters' preferences.

<http://scim.ag/Elk-Behavior>

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The Signal Transduction Knowledge Environment

11 September issue: <http://scim.ag/ss091112>

RESEARCH ARTICLE: Network Analysis of the Focal Adhesion to Invadopodia Transition

Identifies a PI3K-PKC α Invasive Signaling Axis

D. Hoshino et al.

PODCAST

A. M. Weaver and A. M. VanHook

The activity of the lipid kinase PI3K governs whether the protein kinase PKC α promotes invasive behavior of cancer cells.

RESEARCH ARTICLE: The Membrane-Bound Enzyme CD38 Exists in Two Opposing Orientations

Y. J. Zhao et al.

Flipping the catalytic domain of the enzyme CD38 from outside to inside cells may regulate its activity.

PERSPECTIVE: Revisiting the Nucleolus—From Marker to Dynamic Integrator of Cancer Signaling

D. Ruggero

Deregulations in ribosome biogenesis contribute to tumorigenesis and could be targeted to treat cancer.

SCIENCE CAREERS

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Free Career Resources for Scientists

Communications Tech Transforms Laboratories

J. Austin

The Internet and ubiquitous video are changing how science is done.

<http://scim.ag/CommTechLab>

Must a Paper Trail Be Paper?

S. Carpenter

Most scientists continue to use tried-and-true paper lab notebooks, but electronic alternatives beckon some.

<http://scim.ag/PaperBePaper>

YouTube at the Bench

V. Venkatraman

Video technology has the potential to dramatically improve the dissemination of lab protocols and techniques.

<http://scim.ag/VideoBench>

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12 September issue: <http://scim.ag/stm091212>RESEARCH ARTICLE: Sinus Microbiome Diversity Depletion and *Corynebacterium tuberculo*stearicum Enrichment Mediates Rhinosinusitis

N. A. Abreu et al.

Enrichment of *Corynebacterium tuberculo*stearicum caused by depletion of the sinus microbiome contributes to chronic rhinosinusitis.

RESEARCH ARTICLE: Emtricitabine-Tenofovir Concentrations and Pre-Exposure Prophylaxis Efficacy in Men Who Have Sex with Men

P. L. Anderson et al.

PrEP drug concentrations associated with $\geq 90\%$ reduction in HIV acquisition in men who have sex with men are achieved with daily dosing.

RESEARCH ARTICLE: Anthrax Vaccine-Induced Antibodies Provide Cross-Species Prediction of Survival to Aerosol Challenge

M. P. Fay et al.

Lethal toxin-neutralizing activity in serum after vaccination can provide cross-species predictions of survival against inhalation anthrax.

FOCUS: Extrapolating from Animals to Humans

J. P. A. Ioannidis

Clinical effectiveness for interventions in humans can only be speculated from animal studies.

COMMENTARY: Stem Cells, Dot-Com

B. A. Liang and T. K. Mackey

Unregulated and medically unsupported stem cell-based treatments are being advertised online directly to consumers, requiring policy reform to protect patient safety.

SCIENCE PODCAST

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Free Weekly Show

On the 14 September Science Podcast: grandma killer whales, who invented the Higgs, do-it-yourself lab equipment, and more.

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