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Minimal strain has accumulated across the New Madrid seismic zone of the Central United States during the past several years.

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## COVER

False-color scanning electron micrograph of oriented vaterite, a crystalline polymorph of calcium carbonate, formed through template-controlled nucleation. Formation starts with the aggregation of prenucleation clusters forming an amorphous phase from which the crystals develop at the template surface. This experimental process may be analogous to the natural formation of seashells and other marine skeletons. See page 1455.

*Image: W. J. E. M. Habraken and C. J. van den Hoogen/  
Eindhoven University of Technology*

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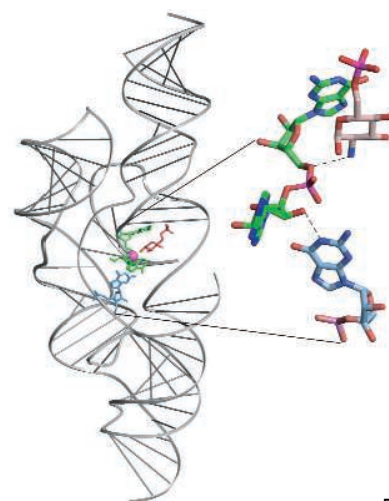
## RESEARCH ARTICLES

- 1443** Wind-Driven Upwelling in the Southern Ocean and the Deglacial Rise in Atmospheric CO<sub>2</sub>  
*R. F. Anderson et al.*  
Ventilation of carbon dioxide from the Southern Ocean preceded the last deglaciation.  
>> *Perspective p. 1434*
- 1448** The Dynamic Control of Kiss-And-Run and Vesicular Reuse Probed with Single Nanoparticles  
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A transient form of vesicle fusion that allows vesicle reuse is more prevalent early during synaptic response to a train of stimuli.

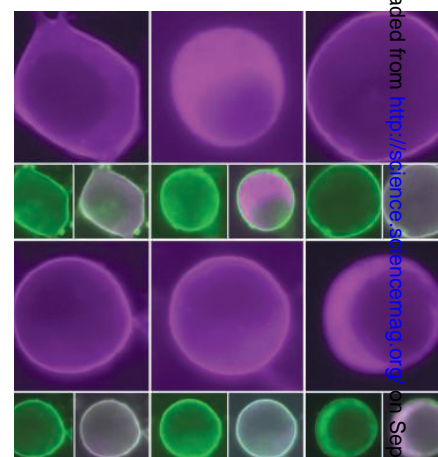
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- 1455** The Initial Stages of Template-Controlled CaCO<sub>3</sub> Formation Revealed by Cryo-TEM  
*E. M. Pouget et al.*  
Amorphous mineral particles attached to an ordered organic monolayer play a role in the crystallization of calcium carbonate.
- 1458** Self-Repairing Oxetane-Substituted Chitosan Polyurethane Networks  
*B. Ghosh and M. W. Urban*  
A polymer is modified to include a reactive group that can repair mechanical damage by exposure to ultraviolet light.  
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- 1461** Nonporous Organic Solids Capable of Dynamically Resolving Mixtures of Diiodoperfluoroalkanes  
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- 1464** Time-Resolved Molecular Frame Dynamics of Fixed-in-Space CS<sub>2</sub> Molecules  
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- 1468** Clear Sky Visibility Has Decreased over Land Globally from 1973 to 2007  
*K. Wang et al.*  
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- 1470** Recent Changes in Phytoplankton Communities Associated with Rapid Regional Climate Change Along the Western Antarctic Peninsula  
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Chlorophyll concentration has decreased by 12% over 30 years of ice retreat, with consequences for vertebrate populations.
- 1473** A Recessive Mutation in the APP Gene with Dominant-Negative Effect on Amyloidogenesis  
*G. Di Fede et al.*  
A mutation in the amyloid precursor protein gene causes Alzheimer's disease in homozygotic patients.
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- 1481** A Functional Genomics Approach Reveals CHE as a Component of the *Arabidopsis* Circadian Clock  
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- 1485** Paternal Control of Embryonic Patterning in *Arabidopsis thaliana*  
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*M. Tsuji et al.*  
Suppressor T cells selectively differentiate into helper T cells in the mouse gut and thereby promote immune homeostasis.
- 1492** Selective Erasure of a Fear Memory  
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- 1496** Human Substantia Nigra Neurons Encode Unexpected Financial Rewards  
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## SCIENCEONLINE

## SCIENCEEXPRESS

[www.sciencexpres.org](http://www.sciencexpres.org)

### Local DNA Topography Correlates with Functional Noncoding Regions of the Human Genome

S. C. J. Parker et al.

The molecular shape of DNA, as well as the nucleotide sequence itself, can have functional consequences and constrain evolution.

10.1126/science.1169050

### Circadian Control of the NAD<sup>+</sup> Salvage Pathway by CLOCK-SIRT1

Y. Nakahata et al.

A transcriptional-enzymatic feedback loop controls interactions between metabolism and circadian rhythms in mouse cells.

10.1126/science.1170803

### In Vivo Analysis of Dendritic Cell Development and Homeostasis

K. Liu et al.

The developmental pathway of lymphoid dendritic cells from myeloid progenitors is traced in mice.

10.1126/science.1170540

### Solar Power Wires Based on Organic Photovoltaic Materials

M. R. Lee et al.

A transparent polymer coating allows optics to compensate for the shadowing effects of a metal wire electrode.

10.1126/science.1168539

## TECHNICALCOMMENTS

### Comment on "Detection, Stimulation, and Inhibition of Neuronal Signals with High-Density Nanowire Transistor Arrays"

P. Fromherz and M. Voelker

full text at [www.sciencemag.org/cgi/content/full/323/5920/1429b](http://www.sciencemag.org/cgi/content/full/323/5920/1429b)

### Response to Comment on "Detection, Stimulation, and Inhibition of Neuronal Signals with High-Density Nanowire Transistor Arrays"

B. P. Timko et al.

full text at [www.sciencemag.org/cgi/content/full/323/5920/1429c](http://www.sciencemag.org/cgi/content/full/323/5920/1429c)

## SCIENCENOW

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Highlights From Our Daily News Coverage

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Stone-throwing ape's actions are premeditated, researchers say.

### A Curious Case of Genetic Resurrection

Series of unlikely events brings dead gene back to life.

### Two Black Holes on a Collision Course

Astronomers find cosmic beasts in close orbit.

## SCIENCE SIGNALING

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The Signal Transduction Knowledge Environment

### RESEARCH ARTICLE: *Rac1* Is a Critical Mediator of Endothelium-Derived Neurotrophic Activity

N. Sawada et al.

*Rac1* drives transcriptional programs in endothelial cells that alter endothelial barrier property and expression of neurotrophic factors.

### PERSPECTIVE: When the Endogenous Hallucinogenic Trace Amine N,N-Dimethyltryptamine Meets the Sigma-1 Receptor

T.-P. Su et al.

An endogenous hallucinogenic compound binds to a ligand-gated chaperone.

### PERSPECTIVE: Reversible Phosphorylation of Histidine Residues in Proteins from Vertebrates

S. Klumpp and J. Kriegstein

The importance of kinases and phosphatases to signaling mechanisms is extended by their regulation of histidine residues.

### NETWATCH: PubChem

Access a database of structural, chemical, and functional attributes of small bioactive molecules; in Bioinformatics Resources.

### NETWATCH: OncoPrint Research Platform

Compare data from various sources to identify commonalities in cancer gene expression profiles; in Bioinformatics Resources.

## SCIENCE CAREERS

[www.sciencereers.org/career\\_magazine](http://www.sciencereers.org/career_magazine)

Free Career Resources for Scientists

### The One-Minute Talk

V. McGovern

You need to know how to respond quickly when asked "Tell me about yourself," whether in an elevator or anywhere else.

### Opportunities: Kauffman's Twelve

P. Fiske

A new fellowship program will prepare 12 life scientists each year to commercialize their research findings.

### Adding an Artistic Dimension to Science

E. Pain

Blending a passion for arts into a scientific career can greatly enrich both experiences.

## SCIENCEPODCAST

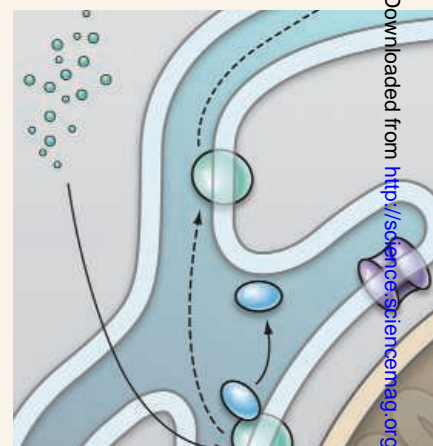
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