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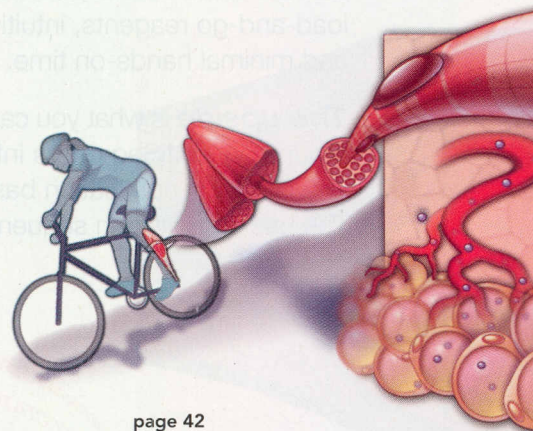
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COVER

Polarized light micrograph of a thin section of gypsum crystals ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$). Vertical field of view ~4 millimeters. This natural and industrial mineral unexpectedly crystallizes from solution at room temperature upon a transition through a precursor, nanocrystalline bassanite ($\text{CaSO}_4 \cdot 0.5\text{H}_2\text{O}$), a usually high-temperature phase. A detailed understanding of this crystallization route could lead to a new strategy to control gypsum scale and may open an alternative route for the production of "plaster of Paris" (bassanite).

Photo: Alfred Pasiaka/Photo Researchers, Inc.

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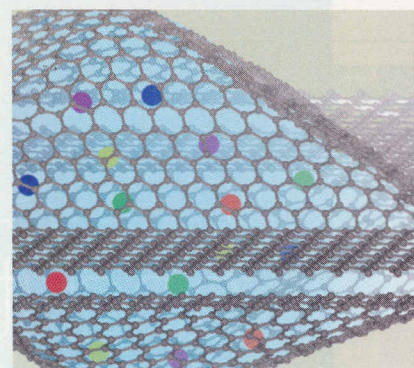
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Ecologically separated *Vibrio* populations diverge by gene-specific rather than genome-wide selective sweeps.
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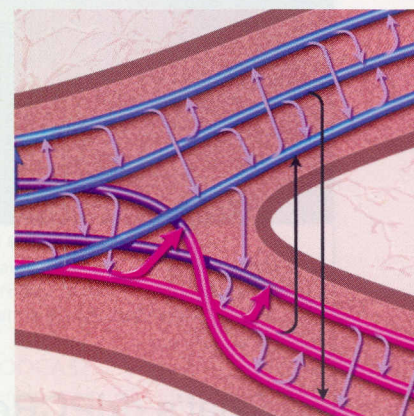
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- 55 A 2D Quantum Walk Simulation of Two-Particle Dynamics
A. Schreiber et al.
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- 59 Mechanical Writing of Ferroelectric Polarization
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The stress gradient created with the tip of an atomic force microscope can locally change the polarization of a barium titanate film.
>> *Perspective p. 41*; *Science Podcast*
- 61 High-Resolution EM of Colloidal Nanocrystal Growth Using Graphene Liquid Cells
J. M. Yuk et al.
Encapsulating a liquid film between two graphene layers allows the film and growing crystals from the graphene sheets to be studied at an atomic scale.
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The copper contents of magmas imply that the formation of sulfide-bearing cumulates under reducing conditions is a critical step in the formation of continental crust.
- 69 The Role and Implications of Bassanite as a Stable Precursor Phase to Gypsum Precipitation
A. E. S. Van Driessche et al.
The common mineral gypsum forms when nanoparticles of an undersaturated precursor phase, bassanite, self-assemble into nanorods, followed by ripening.

- 72 Late Accretion on the Earliest Planetesimals Revealed by the Highly Siderophile Elements
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Analysis of meteorites shows that unprocessed material was accreted to both planets and asteroids 150 million years after the start of the solar system.
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In mice, a population of tissue-resident macrophages arises independently of bone marrow-derived stem cells.
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Damage to the thymus caused by infection or radiation is reversed by a cytokine.
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- 95 Neural Mechanisms of Foraging
N. Kolling et al.
A brain signal in the dorsal anterior cingulate cortex tracks the average value of a person's environment.

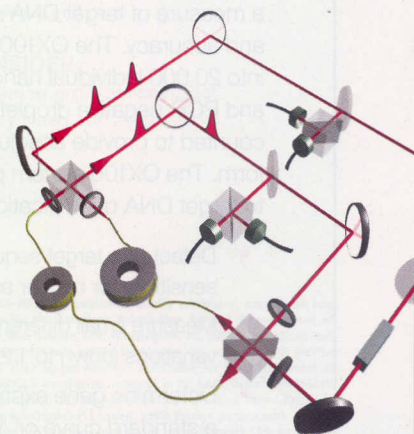
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SCIENCEONLINE

SCIENCEEXPRESS

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Magnetic Reconnection in the Near Venusian Magnetotail

T. L. Zhang et al.

Venus Express observations show that magnetic reconnection occurs in the magnetotail of an unmagnetized planet.

10.1126/science.1217013

Coupling Quantum Tunneling with Cavity Photons

P. Cristofolini et al.

Optical coupling is used to control the tunneling of electrons between a pair of quantum wells.

10.1126/science.1219010

A Stem Cell–Based Approach to Cartilage Repair

K. Johnson et al.

A chemical screen using mesenchymal stem cells identifies a small molecule, kartogenin, that can promote chondrogenesis.

10.1126/science.1215157

Transcription-Independent Function of Polycomb Group Protein PSC in Cell Cycle Control

A. Mohd-Sarip et al.

A Polycomb group protein regulates the cell cycle by promoting cyclin B ubiquitylation and degradation.

10.1126/science.1215927

SCIENCENOW

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Highlights From Our Daily News Coverage

Quest for Fire Began Earlier Than Thought

A new study indicates that humans tamed the flame at least 1 million years ago.

http://scim.ag/Quest_Fire

How Facebook 'Contagion' Spreads

A study finds surprising incentive for people to join the social-networking site.

http://scim.ag/Facebook_Contagion

A Reality Check for Personal Genomes

Having one's genome sequenced will not be very useful for most people, a new study concludes.

http://scim.ag/Personal_Genomes

SCIENTESIGNALING

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The Signal Transduction Knowledge Environment

3 April issue: <http://scim.ag/ss040312>

RESEARCH ARTICLE: Astrocytes Modulate Neural Network Activity by Ca^{2+} -Dependent Uptake of Extracellular K^{+}

F. Wang et al.

Astrocytes modulate synaptic activity by changing the local concentration of extracellular K^{+} .

RESEARCH ARTICLE: Receptor-Selective Diffusion Barrier Enhances Sensitivity of Astrocytic Processes to Metabotropic Glutamate Receptor Stimulation

M. Arizono et al.

An mGluR5-selective diffusion barrier enriches mGluR5 in astrocytic processes, enabling compartmentalized calcium signaling.

RESEARCH ARTICLE: A Large Bioactive BMP Ligand with Distinct Signaling Properties Is Produced by Alternative Proconvertase Processing

T. Akiyama et al.

PERSPECTIVE: You're Going to Need a Bigger (Glass Bottom) Boat

A. J. Peterson and M. B. O'Connor

Alternative processing of ligands in the transforming growth factor- β family may fine-tune signaling outputs.

PODCAST

J. A. Baur et al.

Rapamycin's effects on longevity and insulin sensitivity are mediated by different molecular targets.

SCIENTETRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

4 April issue: <http://scim.ag/stm040412>

COMMENTARY: ADITEC—Joining Forces for Next-Generation Vaccines

R. Rappuoli and D. Medaglini

Through the Advanced Immunization Technologies project, scientists join forces to fashion next-generation vaccines with technologies that no lab can master alone.

RESEARCH ARTICLE: Preclinical Development and Clinical Translation of a PSMA-Targeted Docetaxel Nanoparticle with a Differentiated Pharmacological Profile

J. Hrkach et al.

A targeted nanoparticle containing docetaxel displays antitumor activity in animals and differentiated pharmacological properties in patients with advanced solid tumors.

RESEARCH ARTICLE: A Noncoding RNA Antisense to Moesin at 5p14.1 in Autism

T. Kerin et al.

An antisense RNA, transcribed from an autism-associated region on chromosome 5, is highly expressed in autism brains and could regulate the developmental brain protein moesin.

RESEARCH ARTICLE: Serotonin Neuron Loss and Non-Motor Symptoms Continue in Parkinson's Patients Treated with Dopamine Grafts

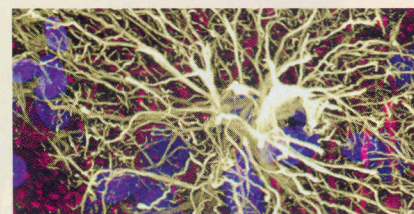
M. Politis et al.

Dopamine-rich fetal tissue grafts relieve motor but not nonmotor symptoms in PD patients requiring additional therapeutic interventions to treat continuing serotonergic denervation.

RESEARCH ARTICLE: T Cell Receptor $\alpha\beta$ Diversity Inversely Correlates with Pathogen-Specific Antibody Levels in Human Cytomegalovirus Infection

G. C. Wang et al.

$\text{CD}8^{+}$ T cell diversity may be more important than T cell abundance in limiting the negative consequences of cytomegalovirus persistence.



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Astrocyte signals.

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www.sciencereers.org/career_magazine

Free Career Resources for Scientists

Taken for Granted: What the Doctors Ordered

B. L. Brenderly

Medical practice has changed to meet the needs of female physicians. How likely is academic science to make a similar adjustment?

http://scim.ag/TFG_WomenDoctors

Perspective: Troubled by Interdisciplinarity?

S. Pfirman and M. Begg

If you choose an interdisciplinary research career, it is up to you to create a context in which you can succeed.

<http://scim.ag/InterdisciplinaryTrouble>

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On the 6 April Science Podcast: the genetics of antimalarial resistance, exploring flexoelectricity, a Nobel Prize fight, and more.

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Science Policy News and Analysis

SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484660) paid at Washington, DC, and additional mailing offices. Copyright © 2012 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$149 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$990; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$85. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request. GST #1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A.

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