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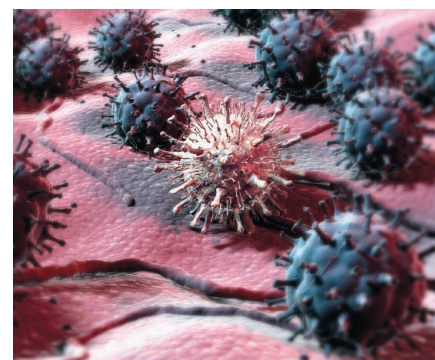
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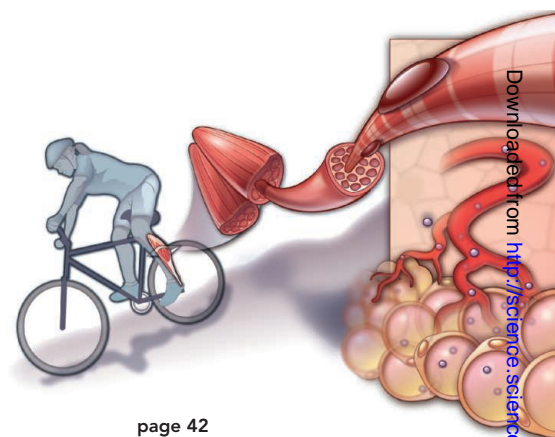
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COVER

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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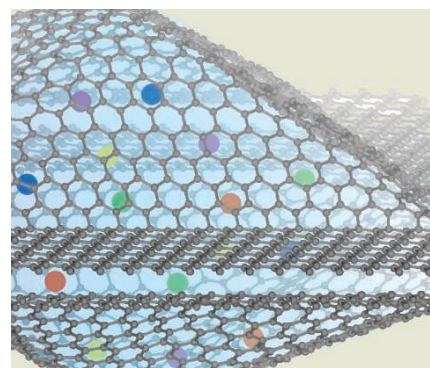
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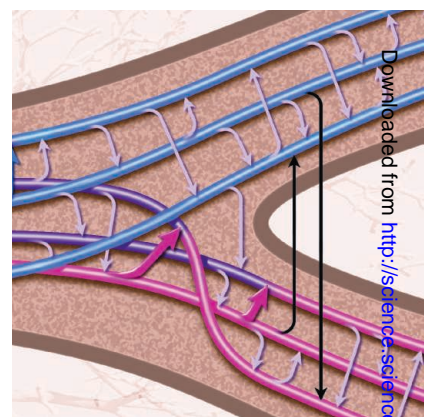
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- 55 A 2D Quantum Walk Simulation of Two-Particle Dynamics
A. Schreiber et al.
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- 59 Mechanical Writing of Ferroelectric Polarization
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The stress gradient created with the tip of an atomic force microscope can locally change the polarization of a barium titanate film.
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- 61 High-Resolution EM of Colloidal Nanocrystal Growth Using Graphene Liquid Cells
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- 64 Copper Systematics in Arc Magmas and Implications for Crust-Mantle Differentiation
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- 69 The Role and Implications of Bassanite as a Stable Precursor Phase to Gypsum Precipitation
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W. Huang et al.
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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.

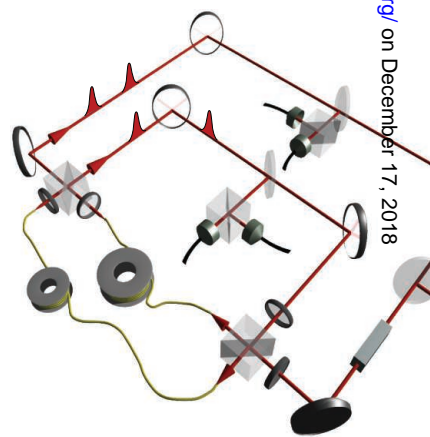
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SCIENCEONLINE

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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

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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

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

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

RESEARCH ARTICLE: Astrocytes Modulate Neural Network Activity by Ca²⁺-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.

SCIENCE TRANSLATIONAL 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

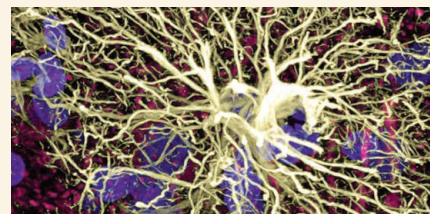
M. Politis et al.

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.

CD8⁺ 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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Free Career Resources for Scientists

Taken for Granted: What the Doctors Ordered

B. L. Benderly

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. Beggs

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

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