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602 Facile Synthesis of AsP3
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The question of the stability of solid AsP3, a simple inorganic molecule, has been settled by its synthesis.

COVER
Desert locusts, Schistocerca gregaria, are normally solitary and avoid each other (green individual, lower right). Forced proximity between them leads to the release of the neurotransmitter serotonin, which changes their behavior to mutual attraction and initiates a cascade of events leading to swarm formation, including a change in appearance (black and yellow group). See page 627.

Image: Tom Fayle, Swidbert Ott, and Stephen Rogers/University of Cambridge

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603 Anomalous Criticality in the Electrical Resistivity of La$_2$-$\delta$Sr$_x$CuO$_4$
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607 Revealing the Maximum Strength in Nanotwinned Copper
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Gold-platinum nanoparticles, held in polymer networks on latex beads, are converted into platinum nanocrystals.

620 Cascadia Tremor Located Near Plate Interface Constrained by S Minus P Wave Times
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627 Serotonin Mediates Behavioral Gregarization Underlying Swarm Formation in Desert Locusts
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A Role for RNAi in the Selective Correction of DNA Methylation Defects
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An RNA interference–dependent DNA methylation rescue system helps to preserve a subset of DNA methylation marks in Arabidopsis.
10.1126/science.1165313

The Role of Fingerprints in the Coding of Tactile Information Probed with a Biomimetic Sensor
J. Scheibert et al.
Fingertip ridges improve the tactile perception of fine features.
10.1126/science.1166467

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Zircons from the slow-spreading mid-Atlantic Ridge show that magmatic intrusions formed new oceanic crust regularly and evenly, thereby providing cooling times.
10.1126/science.1167330

Inducing a Magnetic Monopole with Topological Surface States
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10.1126/science.1167747

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B. Schoepf-Cohen et al.
Full text at www.sciencemag.org/cgi/content/full/323/5914/583c

Response to Comment on “Arsenic(III) Fuels Anoxic Photosynthesis in Hot Spring Biofilms from Mono Lake, California”
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Full text at www.sciencemag.org/cgi/content/full/323/5914/583d

Comment on “Arsenic (III) Fuels Anoxic Photosynthesis in Hot Spring Biofilms from Mono Lake, California”
B. Schoepf-Cohen et al.
Full text at www.sciencemag.org/cgi/content/full/323/5914/583c

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The Signal Transduction Knowledge Environment
EDITORIAL GUIDE: Freedom of Materials
M. B. Yaffe

RESEARCH ARTICLE: Direct Response to Notch Activation—Signaling Crosstalk and Incoherent Logic
A. Krejcí et al.
Identification of the direct target genes of Notch reveals complex input into multiple signaling pathways that goes beyond coordination of transcriptional networks.

RESEARCH ARTICLE: Differential Requirement of mTOR in Postmitotic Tissues and Tumorigenesis
C. Nardella et al.
Conditional inactivation of mTOR has little effect in the adult mouse prostate, but it suppresses tumor initiation and progression.

RESEARCH ARTICLE: Characterization of the Intrinsic and TSC2-GAP–Regulated GTPase Activity of Rheb by Real-Time NMR
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RESEARCH ARTICLE: EGFR Signals to mTOR Through PKC and Independently of Akt in Glioma Q.-W. Fan et al.
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PERSPECTIVE: Grab Your Partner with mTOR in glioma cells, whereas PKC is critical.

PODCAST
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A computer game teaches students about the energetics and dynamics of protein folding; in Educator Sites.

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K. Hede
Physician-scientists urge a focus on solutions, not problems, to advance women in academic medicine.

Perspective: Ensuring Retention of Women in Physician-Scientist Training
J. M. Pauff and M. C. Richards
Why do more women than men drop out of M.D.-Ph.D. programs?

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E. Pain
Spain’s Juan A. Åtel has quickly established himself in the field of atmospheric physics.

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The physics of global warming would make for essentially irreversible global damage.

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Death March of the Penguins?
Shrinking sea ice may decimate penguin population that starred in 2005 movie.

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Physician-scientists urge a focus on solutions, not problems, to advance women in academic medicine.

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