COVER
A black-chinned hummingbird (Archilochus alexandri) drinks nectar from a flower of wild tobacco (Nicotiana attenuata). Nicotine in the nectar moderates its consumption by the hummingbird and protects against predators; the flower lip produces benzyl acetone, which attracts pollinators. Together, the repellent and attractant maximize the plant’s reproductive fitness. See page 1200.

Photo: Danny Kessler

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Academies Active in Education by Jorge E. Allende

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**Seeding and Propagation of Untransformed Mouse Mammary Cells in the Lung**

*K. Podsypanina* et al.

In mice, normal mammary cells can colonize the lung, suggesting that metastases might arise from displaced normal cells acquiring genetic changes that confer malignancy.

10.1126/science.1161621

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**APPLIED PHYSICS**

**Time Reversal and Negative Refraction**

*J. B. Pendry*

Optically active materials with nonlinear optical properties are predicted to mimic negatively refractive materials but without losses associated with true negative refraction.

10.1126/science.1162087

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**TECHNICAL COMMENT ABSTRACTS**

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Comment on "Determining Chondritic Impactor Size from the Marine Osmium Isotope Record"

*J. V. Morgan*

Response to Comment on “Determining Chondritic Impactor Size from the Marine Osmium Isotope Record”


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**Cavity Optomechanics: Back-Action at the Mesoscale**

*T. J. Kippenberg and K. J. Vahala*

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Magmatically Triggered Slow Slip at Kilauea Volcano, Hawaii

*B. A. Brooks* et al.

Satellite radar and global positioning data show that intrusion of a dike into Kilauea volcano in June 2007 triggered slip but no earthquakes along a fault 15 to 20 hours later.

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**EVOLUTION**

**Natural Selection on a Major Armor Gene in Threespine Stickleback**

*R. D. H. Barrett, S. M. Rogers, D. Schluter*

In stickleback fish transferred to fresh water, selection against the allele for the costly armor plating only partly explains the changes in allele frequencies over generations.

10.1126/science.1159978

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**REPORTS**

**ASTRONOMY**

Polarized Gamma-Ray Emission from the Crab

*A. J. Dean* et al.

Detection of polarized gamma rays from the Crab Pulsar implies that electrons must be accelerated to extreme energies to emit radiation near the rapidly rotating star.

10.1126/science.1166853

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**ASTRONOMY**

The Metamorphosis of Supernova SN 2008D/XRF 080109: A Link Between Supernovae and GRBs/ Hypernovae

*P. A. Mazzali* et al.

The spectra of a recent supernova evolved from that of a more energetic event to that of a less energetic one, providing a link between previous observations.
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D. L. Brody et al.
After brain injury of normal people, the amount of an Alzheimer’s disease peptide decreases in the extracellular fluid of the brain, returning to normal with recovery. >> Science Podcast

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Field Experiments with Transformed Plants Reveal the Sense of Floral Scents
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Genetic manipulation of wild tobacco plants balances the use of scent to attract pollinators and toxin to limit nectar consumption in order to optimize reproduction. >> Perspective p. 1163; Science Podcast

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Redox-Active Antibiotics Control Gene Expression and Community Behavior in Divergent Bacteria
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A channel that allows diffusion of metabolites across the mitochondrial outer membrane forms an unusual 19-stranded β barrel with a pore size of about 25 angstroms.

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Hydrodefluorination of Perfluoroalkyl Groups Using Silylum-Carborane Catalysts
C. Douvris and O. V. Ozerov
A catalytic cycle using boron-carbon compounds efficiently converts C–F to C–H bonds and thus can destabilize environmentally persistent fluorocarbons. >> Perspective p. 1168

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Inverse Velocity Dependence of Vibrationally Promoted Electron Emission from a Metal Surface
N. H. Nahler et al.
Vibrationally excited nitric oxide molecules unexpectedly ionize a surface more efficiently at slower approach velocities, apparently because there is more time for charge transfer.

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Weak Interplate Coupling by Seamounts and Repeating M ~ 7 Earthquakes
K. Mochizuki et al.
More earthquakes occur in front of a subducting seamount east of Japan than over and behind it, implying that the subducting and overriding plates are weakly coupled. >> Perspective p. 1165

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Limits for Combustion in Low O2 Redefine Paleosmospheric Predictions for the Mesozoic
C. M. Belcher and J. C. McIntaew
Combustion experiments under realistic atmospheric conditions show that charcoal layers in Mesozoic rocks require a higher level of atmospheric oxygen than previously was thought.

PLANT SCience
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Bats: Gone With the Wind
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Rubber-hand illusion makes people forget about a real appendage.

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