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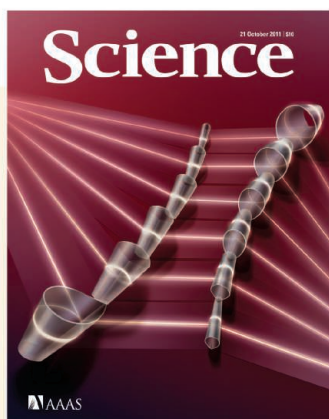


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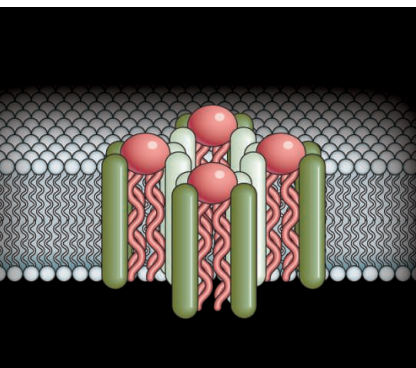
## COVER

Illustration of a generalized form of Snell's Law that fully accounts for light interaction with subwavelength structured materials, which can produce phase jumps at the interface between media. To illustrate this effect, origami ribbons are folded into tapered cylinders (phase jumps at interfaces), and the lines (light rays) form angles that depend on the degree of taper. Initially diverging rays converge after passing through two interfaces. See page 333.

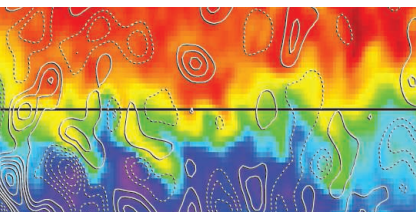
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*D. B. Chelton et al.*  
Large ocean eddies are the cause of some sea-surface height and chlorophyll anomalies previously ascribed to Rossby waves.  
>> *Perspective p. 318*
- 333** Light Propagation with Phase Discontinuities: Generalized Laws of Reflection and Refraction  
*N. Yu et al.*  
Light propagation can be controlled with plasmonic interfaces that introduce abrupt phase shifts along the optical path.  
>> *Perspective p. 317*
- 338** Detection of the Water Reservoir in a Forming Planetary System  
*M. R. Hogerheijde et al.*  
The detection of cold water vapor in a nearby planet-forming disk suggests that water ice exists in its outer regions.  
>> *Perspective p. 316*
- 340** Supramolecular Linear Heterojunction Composed of Graphite-Like Semiconducting Nanotubular Segments  
*W. Zhang et al.*  
A supramolecular self-assembly approach is used to make a nanotubular heterojunction.
- 343** Dynamics of the Reaction of Methane with Chlorine Atom on an Accurate Potential Energy Surface  
*G. Czako and J. M. Bowman*  
Theory helps explain the counterintuitive impacts of vibrational excitation in a widely studied reaction.
- 347** 800,000 Years of Abrupt Climate Variability  
*S. Barker et al.*  
Greenland climate variability for the past 800,000 years was inferred from the Antarctic ice-core temperature record.
- 351** Pre-Clovis Mastodon Hunting 13,800 Years Ago at the Manis Site, Washington  
*M. R. Waters et al.*  
Further dating of the Manis site shows that people were hunting mastodons in North America by 14,000 years ago.  
>> *News story p. 302; Science Podcast*
- 354** Information Transduction Capacity of Noisy Biochemical Signaling Networks  
*R. Cheong et al.*  
Noise limits information transfer through a single signaling pathway in a single cell to just one bit.  
>> *Perspective p. 321*
- 358** ER Tubules Mark Sites of Mitochondrial Division  
*J. R. Friedman et al.*  
Mitochondrial division occurs at positions where endoplasmic reticulum tubules contact mitochondria and mediate constriction.
- 362** Antimicrobial Peptides Keep Insect Endosymbionts Under Control  
*F. H. Login et al.*  
A beetle species synthesizes an antimicrobial peptide to constrain a bacterial symbiont in specialized organs.
- 366** Stochastic Pulse Regulation in Bacterial Stress Response  
*J. C. W. Locke et al.*  
Energy stress activates an alternative sigma factor in stochastic pulses and modulates pulse frequency to control activity.
- 369** Transgenerational Epigenetic Instability Is a Source of Novel Methylation Variants  
*R. J. Schmitz et al.*  
Spontaneous methylation rates that may affect phenotype in the plant *Arabidopsis* are higher than the mutation rate.
- 373** Computation-Guided Backbone Grafting of a Discontinuous Motif onto a Protein Scaffold  
*M. L. Azoitei et al.*  
A two-segment HIV epitope grafted into a scaffold protein maintains high affinity for a broadly neutralizing antibody.
- 376** Antagonists Induce a Conformational Change in cIAP1 That Promotes Autoubiquitination  
*E. C. Dueber et al.*  
Antagonist binding to an apoptosis inhibitor releases inhibition by promoting dimerization required for autoubiquitination.
- 380** Mass Spectrometry of Intact V-Type ATPases Reveals Bound Lipids and the Effects of Nucleotide Binding  
*M. Zhou et al.*  
The effect of lipids and nucleotides on the soluble head domain and membrane base domain is examined in an intact adenosine triphosphatase.  
>> *Perspective p. 320*
- 385** Cerebellum Shapes Hippocampal Spatial Code  
*C. Rochefort et al.*  
Cerebellar protein kinase C-dependent mechanisms process self-motion information needed for spatial representation and accurate navigation.
- 389** Activity-Dependent Long-Term Depression of Electrical Synapses  
*J. S. Haas et al.*  
Paired bursting in coupled neurons depresses electrical synapses while their asymmetry increases after unidirectional use.  
>> *Perspective p. 315*

## SCIENCEONLINE

## SCIENCEEXPRESS

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

**Structural Dynamics of a Catalytic Monolayer Probed by Ultrafast 2D IR Vibrational Echoes**

*D. E. Rosenfeld et al.*

A method to track fast vibrational motion in solution has been extended to catalytically important solid/liquid interfaces.

10.1126/science.1211350

**Wolbachia Enhance *Drosophila* Stem Cell Proliferation and Target the Germline Stem Cell Niche**

*E. M. Fast et al.*

A bacterial endosymbiont up-regulates mitosis of *Drosophila* germline stem cells and blocks programmed cell death.

10.1126/science.1209600

**Endocannabinoid Hydrolysis Generates Brain Prostaglandins That Promote Neuroinflammation**

*D. K. Nomura et al.*

A new tissue-specific pathway for the synthesis of proinflammatory prostaglandins is described.

10.1126/science.1209200

**Recent Synchronous Radiation of a Living Fossil**

*N. S. Nagalingum et al.*

Despite their ancient origin, the majority of extant cycad species radiated within the past 10 million years.

10.1126/science.1209926

**Polarization of PAR Proteins by Advective Triggering of a Pattern-Forming System**

*N. W. Goehring et al.*

Patterning of *Caenorhabditis elegans* zygotes involves passive as well as active mechanisms.

10.1126/science.1208619

## TECHNICALCOMMENTS

**Comment on "How Cats Lap: Water Uptake by *Felis catus*"**

*M. Nauenberg*

Full text at [www.sciencemag.org/cgi/content/ful/334/6054/311-b](http://www.sciencemag.org/cgi/content/ful/334/6054/311-b)

**Response to Comment on "How Cats Lap: Water Uptake by *Felis catus*"**

*R. Stocker et al.*

Full text at [www.sciencemag.org/cgi/content/ful/334/6054/311-c](http://www.sciencemag.org/cgi/content/ful/334/6054/311-c)

## SCIENCENOW

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

Highlights From Our Daily News Coverage

**Cute TV Chimps May Harm Their Wild Brethren Seeing dressed-up chimpanzees doesn't make viewers care more.**

<http://scim.ag/chimpads>

**Seaweed With a Deadly Touch**

Toxins on the surfaces of common South Pacific algae are deadly to corals.

<http://scim.ag/CSlamphora>

**Winged Robots Hint at the Origins of Flight**

What were primitive wings used for before bird ancestors could fly?

<http://scim.ag/robot-flight>

## SCIENCE SIGNALING

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

The Signal Transduction Knowledge Environment

**18 October issue: <http://scim.ag/ss101811>**

**RESEARCH ARTICLE: *Agrobacterium* Counteracts Host-Induced Degradation of Its Effector F-Box Protein**

*S. Magori and V. Citovsky*

A plant pathogen prevents degradation of its key virulence factor in infected host cells.

**REVIEW: Structural Basis for Activation and Inhibition of Class I Phosphoinositide 3-Kinases**

*O. Vadas et al.*

The regulatory interactions between PI3Ks and their binding partners could be exploited for therapies.

**JOURNAL CLUB:  $\alpha$ -Synuclein Promotes Neuroprotection Through NF- $\kappa$ B-Mediated Transcriptional Regulation of Protein Kinase C $\delta$**

*R. Aoki and Y. R. Li*

$\alpha$ -Synuclein may protect dopaminergic neurons from apoptosis by reducing the abundance of a kinase involved in cell death.

## FUNDING SOURCES

Check out the latest update in opportunities for funding signaling research and training.

## SCIENCE TRANSLATIONAL MEDICINE

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

Integrating Medicine and Science

**19 October issue: <http://scim.ag/stm101911>**

**FOCUS: Containing the *Contagion*—Treating the Virus That Inspired the Film**

*B. Lee*

**RESEARCH ARTICLE: A Neutralizing Human Monoclonal Antibody Protects African Green Monkeys from Hendra Virus Challenge**

*K. N. Bossart et al.*

A neutralizing human monoclonal antibody can fully protect nonhuman primates from disease after a lethal Hendra virus challenge.

**PERSPECTIVE: Hedgehog Rushes to the Rescue of the Developing Cerebellum**

*O. Baud and P. Gressens*

**RESEARCH ARTICLE: A Small-Molecule Smoothed Agonist Prevents Glucocorticoid-Induced Neonatal Cerebellar Injury**

*V. M. Heine et al.*

**RESEARCH ARTICLE: Preterm Cerebellar Growth Impairment After Postnatal Exposure to Glucocorticoids**

*E. W. Y. Tam et al.*

A small molecule that targets the sonic hedgehog pathway protects against cerebellar injury caused by glucocorticoids, which may be given to preterm infants for treating lung disease.

## SCIENCE CAREERS

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

Free Career Resources for Scientists

**Tooling Up: Views on an Interview, Part 1**

*D. Jensen*

Scott Jackson's interview at ABC technologies ranges from mundane to terrifying.

[http://scim.ag/TU\\_Views\\_1](http://scim.ag/TU_Views_1)

**Perspective: An Auxiliary (Research) Engine**

*D. Albert*

To attain your goals, it is sometimes necessary to employ indirect means.

[http://scim.ag/Aux\\_Engine](http://scim.ag/Aux_Engine)

**Content Collection: Careers at Nonprofits**

*E. Pain*

Scientists interested in a social or humanitarian cause can find diverse research or alternative careers within nonprofit organizations.

[http://scim.ag/CC\\_Nonprofits](http://scim.ag/CC_Nonprofits)

## SCIENCEPODCAST

[www.sciencemag.org/multimedia/podcast](http://www.sciencemag.org/multimedia/podcast)

Free Weekly Show

On the 21 October *Science* Podcast: mastodon hunting before Clovis, globalization and West Nile virus, the search for the "sterile neutrino," 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. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2011 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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**334 (6054)**

*Science* **334** (6054), 285-395.

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