COVER
A lined day gecko (Phelsuma lineata) from Andasibe, eastern Madagascar. This gecko is one of the 2315 species analyzed to identify optimal expansion sites for protected areas within Madagascar, as described on page 222.
Photo: Miroslav Honzák

NEWS OF THE WEEK
New Rules on Saving Wetlands Push the Limits of the Science Drug Bestows Radiation Resistance on Mice and Monkeys >> Report p. 226 HHMI’s Cech Signs Off on His Biggest Experiment An Early Big Hit to Mars May Have Scarred the Planet for Life SCIENCESCOPE At Mixed Odds, Racetrack Memory Charges From Gate >> Report p. 209 Signs of Disease in Fetal Transplants NEWS FOCUS Tackling Alcoholism With Drugs The Blue Revolution, Drop by Drop, Gene by Gene Getting to the Root of Drought Responses Society for American Archaeology Meeting Following an Asphalt Trail to Ancient Olmec Trade Routes Herring and Nuts for the 'Salmon People’ Signs of the First Whale Hunters

LETTERS

CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

POLICY FORUM
Science and the Candidates S. R. Kirshenbaum et al.

PERSPECTIVES

EDITORIAL
Hybrid Vigor in Research by Bruce Alberts
MOLECULAR BIOLOGY
Endogenous siRNAs Derived from Transposons and mRNAs in Drosophila Somatic Cells
M. Ghildiyal et al.
Endogenous small interfering RNAs transcribed from both transposons and messenger RNAs are found in somatic cells of flies and may act to silence “selfish” genetic elements. 10.1126/science.1157396

IMMUNOLOGY
Innate Immune Activation Through Nalp3 Inflammasome Sensing of Asbestos and Silica
C. Dostert et al.
A large multiprotein complex detects particulate airborne pollutants that have been taken up by immune cells in the lung and initiates a potent inflammatory response. 10.1126/science.1156995

APPLIED PHYSICS
Subnanometer Motion of Cargoes Driven by Thermal Gradients Along Carbon Nanotubes
A. Barreiro et al.
A segment of the outer shell of a multiwall carbon nanotube can move back and forth in response to a thermal gradient created by electrical current passing through the nanotube. 10.1126/science.1155559

REVIEW
APPLIED PHYSICS
Magnetic Domain-Wall Racetrack Memory
S. S. P. Parkin, M. Hayashi, L. Thomas

BREVIA
PALEOCLIMATE
Amplification of Cretaceous Warmth by Biological Cloud Feedbacks
L. R. Kump and D. Pollard
The extreme warmth of the Cretaceous may have been a consequence of fewer clouds, caused by a low abundance of organic cloud nuclei from reduced ocean productivity.

RESEARCH ARTICLES
PHYSICS
Electronic Origin of the Inhomogeneous Pairing Interaction in the High-$T_c$ Superconductor
Bi$_2$Sr$_2$CaCu$_2$O$_{8+\delta}$
A. N. Pasupathy et al.
Scanning tunneling microscope measurements around the superconducting transition temperature imply that electron correlations, not a proposed boson glue, pair up electrons.

NEUROSCIENCE
Temperature Sensing by an Olfactory Neuron in a Circuit Controlling Behavior of C. elegans
A. Kuhara et al.
An olfactory neuron in Caenorhabditis elegans also senses the ambient temperature and is necessary for worms’ propensity to seek out the temperature at which they were raised. 10.1126/science.1148922

CHEMISTRY
Gate-Variable Optical Transitions in Graphene
F. Wang et al.
Application of electrical biases to single or double layers of graphene changes its infrared reflectivity, mimicking aspects of transistors and opening up optoelectronic applications.

APPLIED PHYSICS
Current-Controlled Magnetic Domain-Wall Nanowire Shift Register
M. Hayashi, L. Thomas, R. Moriya, C. Rettner, S. S. P. Parkin
Brief, polarized current pulses can create and shift magnetic domain walls along a magnetic nanowire, demonstrating the basis for a racetrack memory. >> News story p. 166

CLIMATE CHANGE
Impact of Artificial Reservoir Water Impoundment on Global Sea Level
B. F. Chao, Y. H. Wu, Y. S. Li
Accounting for water impounded globally in artificial lakes that were filled during the past 80 years raises estimates of natural contributions to recent sea level.
REPORTS CONTINUED...

GEOCHEMISTRY
Determining Chondritic Impactor Size from the Marine Osmium Isotope Record
The difference in osmium concentrations and isotopes between seawater and asteroids allows reconstruction of impact occurrence and size, including for the Cretaceous.

CHEMISTRY
Linked Reactivity at Mineral-Water Interfaces Through Bulk Crystal Conduction
S. V. Yanina and K. M. Rosso
A current flow through a hematite crystal couples dissolution and growth reactions at different surfaces, a finding likely relevant to a broad range of semiconducting minerals.

ECOLOGY
Aligning Conservation Priorities Across Taxa in Madagascar with High-Resolution Planning Tools
C. Kremen et al.
A broad analysis of many taxa throughout Madagascar identifies regions where conservation is likely to protect the most species.

MEDICINE
An Agonist of Toll-Like Receptor 5 Has Radioprotective Activity in Mouse and Primate Models
L. G. Burdelya et al.
A drug that triggers the pathway that cancer cells use to avoid death can protect healthy cells from the harmful effects of radiation treatment.

IMMUNOLOGY
Evidence for Editing of Human Papillomavirus DNA by APOBEC3 in Benign and Precancerous Lesions
A cellular enzyme that defends against infection by causing mutations in retroviruses can also mutate the genome of a DNA virus associated with benign and precancerous cells.

NEUROSCIENCE
Segregation of Axial Motor and Sensory Pathways via Heterotypic Trans-Axonal Signaling
B. W. Gallarda et al.
In mice, axons carrying signals from spinal cord to muscle are kept separate from those going in the opposite direction by ephrin signaling between them.

EVOLUTION
Convergence of Campylobacter Species: Implications for Bacterial Evolution
S. K. Sheppard, N. D. McCarthy, D. Falush, M. C. J. Maiden
A survey of two related human pathogens shows that they are merging, probably as a result of their proximity in a new ecological niche—the intestines of farmed animals.

CELL BIOLOGY
Leiomodin Is an Actin Filament Nucleator in Muscle Cells
D. Chereau et al.
The de novo assembly of the thin filaments in muscle cells is initiated by a newly discovered protein that efficiently nucleates actin polymer formation.

BIOCHEMISTRY
Deconstruction of Iterative Multidomain Polyketide Synthase Function
J. M. Crawford et al.
A eukaryotic polyketide natural product is synthesized by assembling seven malonyl building blocks on a specialized protein template where a cyclization cascade is initiated.

CELL BIOLOGY
Video-Rate Far-Field Optical Nanoscopy Dissects Synaptic Vesicle Movement
V. Westphal et al.
Sequential subdiffraction resolution images of fluorescently labeled synaptic vesicles in live cells reveal that they exhibit several distinct movement patterns.
Eph-ephrin interactions.

SCIENCE NOW

www.sciencenow.org DAILY NEWS COVERAGE

Birds on the Dole
Does the backyard bird feeder help or hurt your feathered friends?

The Long and Short of It
Dozens of genes and DNA regions linked to height.

Converted Cells Show Promise for Parkinson’s
Induced pluripotent stem cells mitigate movement disorder in rats.

SCIENCE SIGNALING

www.sciencesignaling.org THE SIGNAL TRANSDUCTION KNOWLEDGE ENVIRONMENT

REVIEW: Eph, a Protein Family Coming of Age—More Confusion, Insight, or Complexity?
M. Lackmann and A. W. Boyd
Eph receptors and their ephrin ligands coordinate cell-positioning programs during development and oncogenesis.

JOURNAL CLUB: GABA Effects on Neurogenesis—An Arsenal of Regulation
T.-F. Yuan
γ-aminobutyric acid (GABA) regulates neurogenesis in various circumstances.

SCIENCE CAREERS

www.sciencecareers.org/career_development CAREER RESOURCES FOR SCIENTISTS

Special Feature: Undergraduates
J. Austin
Today’s college kids are the scientists of the future—and in some cases, the present.

The Truth About Gen Y
E. Pain
Experts consider “millennials” one of the greatest generations ever to hit the workplace.

Does Grad School Make Financial Sense?
S. Webb
Although a Ph.D. in science may work out financially over an entire career, money woes can be considerable in the short term.

Community Colleges Fuel the Science Workforce
S. Carpenter
With minority scientists in short supply, officials turn to 2-year colleges as a source of talent.

Today’s undergrads, tomorrow’s scientists.

SCIENCEPODCAST

Download the 11 April Science Podcast to hear about possible radioprotective drugs, modeling the Cretaceous supergreenhouse, new treatments for alcoholism, and more.

www.sciencemag.org/about/podcast.dtl
Science 320 (5873), 151-250.