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BOOKS ET AL.

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Aging Infrastructure and Ecosystem Restoration M. W. Doyle et al.

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Organizing the Source of Memory E. A. Grove 288
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Dreams of Natural Streams D. R. Montgomery
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Probing Quantum Magnetism with Cold Atoms M. Lewenstein and A. Sanpera
>> Research Article p. 295

COVER
Laser-surveyed topography of the elevation in a Pennsylvania landscape, showing evidence of sediment-filled early American millponds along a stream valley. Terraces around the stream channel descend stepwise from upstream to downstream (dark purple, light purple, pink), each associated with a dam. The deeper stream incision into the two downstream terraces is due to more complete dam breaching.
See page 299.
Image: U.S. Geological Survey (LIDAR data and preliminary processing); Michael Rahnis (image analysis and generation)

EDITORIAL
258 Engaging Iran by Glenn Schweitzer and Norman Neureiter
**MOLECULAR BIOLOGY**

A Shared Docking Motif in TRF1 and TRF2 Used for Differential Recruitment of Telomeric Proteins

Y. Chen et al.

Two similar members of the protein complex that protects the free ends of chromosomes have distinct binding sites for other complex members and accessory proteins.

10.1126/science.1151804

**CELL BIOLOGY**

Differential Regulation of Dynein and Kinesin Motor Proteins by Tau

R. Dixit, J. L. Ross, Y. E. Goldman, E. L. F. Holzbaur

The motor proteins dynein and kinesin both encounter the protein tau as they move along the microtubules; the former reverses direction, whereas the latter detaches.

10.1126/science.1152993

**MEDICINE**

Clonal Integration of a Polyomavirus in Human Merkel Cell Carcinoma

H. Feng, M. Shuda, Y. Chang, P. S. Moore

A rare, but highly aggressive, form of human skin cancer may be caused by a previously uncharacterized human polyomavirus.

10.1126/science.1152586

**GEOPHYSICS**

Rogue Mantle Helium and Neon

F. Albarède

Anomalously high ratios of $^3\text{He}$ to $^4\text{He}$ in the recycled basalts under ocean islands may result from helium diffusing in from more pristine, primitive mantle.

10.1126/science.1150060

**RESEARCH ARTICLES**

**PHYSICS**

Time-Resolved Observation and Control of Superexchange Interactions with Ultracold Atoms in Optical Lattices

S. Trotzky et al.

Ultracold atoms trapped at sites of optical lattices are used to investigate the superexchange interaction between neighboring spins. >> Perspective p. 292

**GEOMORPHOLOGY**

Natural Streams and the Legacy of Water-Powered Mills

R. C. Walter and D. J. Merritts

Floodplains and streams in the eastern United States were altered extensively by milldams in the 1700s and 1800s, challenging recent hydrologic interpretations and restoration approaches.

>> Perspective p. 291

**NEUROSCIENCE**

Lhx2 Selector Activity Specifies Cortical Identity and Suppresses Hippocampal Organizer Fate

V. S. Mangale et al.

The brain’s cortex begins as a one-cell-thick sheet of stem cells, whose ultimate identity is specified by a gene that suppresses noncortical cell fates.

>> Perspective p. 288

**REPORTS**

**ASTRONOMY**

Million-Degree Plasma Pervading the Extended Orion Nebula

M. Güdel et al.

Million-degree gas fills the Orion Nebula, implying that shock-heated gas from stellar outflows is common in our Galaxy.

>> Perspective p. 289
CHEMISTRY
Elementary Structural Motifs in a Random Network of Cytosine Adsorbed on a Gold(111) Surface
R. Otero et al.
Upon cooling, cytosine molecules on a gold surface form a disordered network based on the assembly of three elementary structural units, which may have analogies with glasses.

GEOPHYSICS
The Subduction Zone Flow Field from Seismic Anisotropy: A Global View
M. D. Long and P. G. Silver
Identification of the fastest seismic-wave propagation speed in subduction zones reveals that trench migration induces flow in the mantle above and beneath the subducting slab.

EVOLUTION
A Localized Negative Genetic Correlation Constrains Microevolution of Coat Color in Wild Sheep
J. Gratten et al.
Although the fitness of wild sheep increases with size, large, dark sheep are becoming rarer because color is genetically linked to genes that decrease fitness.

ECOLOGY
Coastal Ecosystem-Based Management with Nonlinear Ecological Functions and Values
E. B. Barbier et al.
Taking into account the nonlinear relation between preserved habitat area and wave attenuation facilitates integrated management of coastal conservation and development.

CELL BIOLOGY
Dual Positive and Negative Regulation of Wingless Signaling by Adenomatous Polyposis Coli
C. M. Takacs et al.
An important developmental signaling molecule known to be a tumor suppressor can also activate growth, possibly explaining the responses of some cancers.

MEDICINE
Initiating and Cancer-Propagating Cells in TEL-AML1–Associated Childhood Leukemia
D. Hong et al.
Identical twins each carry preleukemic cells containing the characteristic chromosomal translocation, but only one undergoes further genetic changes and develops leukemia.

BIOCHEMISTRY
Effects of Molecular Memory and Bursting on Fluctuations in Gene Expression
J. M. Pedraza and J. Paulsson
A theory of stochastic gene expression suggests that noise can be modulated without feedback loops, complicating interpretation of single-cell experiments.
Perspective: The Endoplasmic Reticulum Takes Center Stage in Cell Cycle Regulation
P. Fearon and O. Cohen-Fix
The ER appears to play a key role in controlling the spatial localization of proteins involved in the cell cycle.

ST NetWatch: UCSC Genome Bioinformatics
Analyze your gene of interest in a range of organisms using the tools available at the UCSC Genome Browser; in Bioinformatics Resources.

Proteins escape from the ER surface.

SCIENCE NOW
www.sciencenow.org DAILY NEWS COVERAGE

Building a New Heart From Old Tissue
When newborn cells are transplanted onto a “skeleton” of an adult heart, it becomes a pumping organ in the lab.

How to Make a Submarine Disappear
Researchers think objects can be made acoustically “invisible.”

High Prices Just Feel Good
Anticipation of quality activates our brain’s pleasure center.

Making a graceful exit.

SCIENCE CAREERS
www.sciencecareers.org CAREER RESOURCES FOR SCIENTISTS

MiSciNet: Following the Image
A. Sasso
Ahna Skop built a career from things others pass over, from cellular detritus to shy high school students.

Mind Matters: Leaving a Lab Gracefully
I. S. Levine
When it’s time to leave the lab, the key is to make sure the end isn’t bitter.

Tooling Up: Dealing With Men Who Have a Problem With Women
D. Jensen
You’re likely to encounter men who have never learned how to relate to strong, competent women.

From the Archives: You’ve Worked Hard to Get This Far
J. Austin
Don’t blow your academic job interview.

Listen to the 18 January Science podcast to hear about genetic testing for psychiatric disorders, a possible viral culprit in a rare skin cancer, the legacy of water-powered mills, and more.
www.sciencemag.org/about/podcast.dtl

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