COVER
A male lark bunting in the Pawnee National Grassland, Colorado. The plumage quality of the males determines their reproductive success, but different aspects of the black and white markings are preferred by females in different years. This variability alters the long-term sexual selection dynamics and may favor the evolution of multiple sexual ornaments. See page 459.
Photo: Bruce Lyon

DEPARTMENTS
379 Science Online
381 This Week in Science
387 Editors’ Choice
388 Contact Science
391 Random Samples
393 Newsmakers
422 AAAS News & Notes
486 AAAS Meeting Program
497 New Products
498 Science Careers

EDITORIAL
385 Solutions for Nigeria
by Rita R. Colwell and Michael Greene

NEWS OF THE WEEK
Dust Storm Rising Over Threat to Famed Rock Art in Utah 394
A Plan to Capture Human Diversity in 1000 Genomes 395
Max Planck Accused of Hobbling Universities 396
France Launches Public Health School à l’Anglo-Saxonne 397

SCIENTESCOPE
Got Data Questions? NSF’s Indicators Has (Most of) the Answers 398
“Little” Cosmic Ray Observatory Aims to Make a Big Mark 400
Where Has All the Stardust Gone? 401
>> Report p. 447
Dutch Universities Split Over Nobel Laureate’s Rehabilitation 401

NEWS FOCUS
A Time War Over the Period We Live In 402
Why We’re Different: Probing the Gap Between Apes and Humans 404
Shell Shock Revisited: Solving the Puzzle of Blast Trauma 406

LETTERS
Antarctica Invaded A. Ricciardi 409
A Closer Look at the IPCC Report S. Solomon, R. Alley, J. Gregory, P. Lemke, M. Manning
Response M. Oppenheimer et al.

CORRECTIONS AND CLARIFICATIONS
410

BOOKS ET AL.
Vienna in the Age of Uncertainty
D. R. Coen, reviewed by M. D. Laubichler 412
Musicophilia Tales of Music and the Brain
O. Sacks, reviewed by J. Phillips-Silver 413

EDUCATION FORUM
Application of Bloom’s Taxonomy Debunks the “MCAT Myth”
A. Y. Zheng, J. K. Lawhorn, T. Lumley, S. Freeman 414

PERSPECTIVES
Lining Up to Avoid Bias A. Rokas >> Report p. 473
Enlightening Rhythms O. Lipan >> Report p. 482
The Rise and Fall of a Great Idea A. Meibom >> Report p. 453
Structural Nanocomposites Y. Dzenis 419
Adaptive Composites R. Vaia and J. Baur 420

ASSOCIATION AFFAIRS
Science and Technology for Sustainable Well-Being J. P. Holdren 424

CONTENTS continued >>
SCIENCE EXPRESS
www.sciencexpress.org

APPLIED PHYSICS
Chemically Derived, Ultrasmooth Graphene Nanoribbon Semiconductors
X. Li, X. Wang, L. Zhang, S. Lee, H. Dai
Unlike nanotubes, 10-nanometer-wide graphene nanoribbons have smooth edges
and can act as semiconductors.
10.1126/science.1150878

IMMUNOLOGY
Innate Immune Homeostasis by the Homeobox Gene Caudal and
Commensal-Gut Mutualism in Drosophila
J.-H. Ryu et al.
A Drosophila gene important in development also inhibits the production of harmful
antimicrobial peptides that could kill off beneficial gut microbes.
10.1126/science.1149357

IMMUNOLOGY
The Right Resident Bugs
N. Silverman and N. Paquette
10.1126/science.1154209

BREVIA
COMPUTER SCIENCE
100% Accuracy in Automatic Face Recognition
R. Jenkins and A. M. Burton
The simple process of image averaging can boost the performance of
a commercial face recognition system to 100% accuracy.
435

REPORTS
PHYSICS
Probing the Carrier Capture Rate of a
Single Quantum Level
M. Berthe et al.
Scanning tunneling microscopy reveals how electrons tunnel
through a single dangling silicon bond and shows that local
subsurface doped holes greatly affect the dynamics.
436

CHEMISTRY
Spin Conservation Accounts for Aluminum Cluster
Anion Reactivity Pattern with O₂
R. Burgert et al.
Small metal clusters with an even number of atoms react rapidly with
oxygen because electron spin is conserved, whereas odd clusters are
more stable because it is not.

CHEMISTRY
NMR Imaging of Catalytic Hydrogenation in
Microreactors with the Use of para-Hydrogen
L.-S. Bouchard et al.
The flow of para-hydrogen through industrial catalytic reactors
allows magnetic resonance imaging of the gas flow and of the
hydrogenation reactions, facilitating optimization.

APPLIED PHYSICS
GaN Photonic-Crystal Surface-Emitting Laser at
Blue-Violet Wavelengths
H. Matsubara et al.
Surface-emitting lasers fabricated with photonic crystal structures
can now emit at technologically relevant blue-violet wavelengths.

GEOCHEMISTRY
Comparison of Comet 81P/Wild 2 Dust with
Interplanetary Dust from Comets
H. A. Ishii et al.
The silicate minerals found in interplanetary dust particles are not
seen in Comet 81P/Wild 2, implying that the comet is devoid of
material from the outer solar system.
>> News story p. 401

438
442
445
447

CONTENTS continued >>
REPORTS CONTINUED...

GEOCHEMISTRY
Elasticity of (Mg,Fe)O Through the Spin Transition of Iron in the Lower Mantle
Gradual softening of a prominent mineral in Earth’s lower mantle in response to an electronic phase transition may explain the seismic properties of this region.

GEOCHEMISTRY
Enriched Pt-Re-Os Isotope Systematics in Plume Lavas Explained by Metasomatic Sulfides
A. Luguet et al.
An isotopic signal thought to be a fingerprint of material from Earth’s core in ocean magmas may instead reflect the presence of sulfide mineralization in the melting region. >> Perspective p. 418

CLIMATE CHANGE
Irreconcilable Differences: Fine-Root Life Spans and Soil Carbon Persistence
A. E. Strand et al.
Two common ways to measure residence times of root carbon in soils measure different things; neither is correct for inferring carbon cycling in ecosystems.

EVOlUTION
Adaptive Plasticity in Female Mate Choice Dampens Sexual Selection on Male Ornaments in the Lark Bunting A. S. Chaine and B. E. Lyon
Female lark buntings prefer different male traits from year to year, suggesting how multiple ornamental features might evolve as a result of female mate choice.

MOLECULAR BIOLOGY
Control of Genic DNA Methylation by a jmjC Domain–Containing Protein in Arabidopsis thaliana
H. Saze, A. Shiraishi, A. Miura, T. Kakutani
A plant demethylase checks the spread of DNA methylation from silenced transposons and repetitive DNA to nearby genes, preventing their inappropriate inhibition.

MOLECULAR BIOLOGY
Concurrent Fast and Slow Cycling of a Transcriptional Activator at an Endogenous Promoter
T. S. Karpova et al.
A yeast transcription factor binds onto and off its promoter rapidly, controlling initiation, but also shows a 30-min cycle as the number of accessible promoters varies.

CELL BIOLOGY
Centromeric Aurora-B Activation Requires TD-60, Microtubules, and Substrate Priming Phosphorylation
S. E. Rosasco-Nitcher et al.
A kinase that regulates chromosome segregation to daughter cells during metaphase is confined to the inner centromere through its interactions with other centromeric proteins.

GENETICS
Alignment Uncertainty and Genomic Analysis
K. M. Wong, M. A. Suchard, J. P. Huelsenbeck
Comparative evolutionary genomics can be improved by taking into account the uncertainties inherent in aligning genes from organism to organism. >> Perspective p. 416

IMMUNOLOGY
NFAT Binding and Regulation of T Cell Activation by the Cytoplasmic Scaffolding Homer Proteins
G. N. Huang et al.
Signals coming into the T cell are coordinated by two scaffolding proteins, which determine whether the cell will be activated or permanently shut down.

CELL BIOLOGY
The Frequency Dependence of Osmo-Adaptation in Saccharomyces cerevisiae
J. T. Mettetal et al.
Modeling the dynamics of the osmotic stress response in yeast reveals an unexpected, rapid nontranscriptional mechanism that may involve glycerol transport. >> Perspective p. 417
Human ITPK1.

SCIENCE SIGNALING
www.stke.org  THE SIGNAL TRANSDUCTION KNOWLEDGE ENVIRONMENT

PERSPECTIVE: Human ITPK1—A Reversible Inositol Phosphate Kinase/Phosphatase that Links Receptor-Dependent Phospholipase C to Ca\(^{2+}\)-Activated Chloride Channels
A. Saiardi and S. Cockcroft
Studies of ITPK1 reveal subtle interconnections between simple metabolism and regulation of a signaling event.

GLOSSARY
Find out what NOSIP, SIPK, and STAND mean in the world of cell signaling.

Handling troublesome lab colleagues.

SCIENCE CAREERS
www.sciencecareers.org  CAREER RESOURCES FOR SCIENTISTS

Mastering Your Ph.D.: Dealing With Difficult Colleagues
P. Gosling and B. Noordam
Some troublesome types who frequent laboratories require special handling.

M. P. DeWhysse
The fog on Micella’s steamy mirror starts to clear.

Opportunities: The Curse of Brains
P. Fiske
Effectiveness requires more than just intellectual smarts.

From the Archives: Scientists as Parents
When it comes to the question of balancing parenting and careers, the answers are contingent on one or two (and eventually more) individuals.

Repeat information: Handling troublesome lab colleagues.

No Recovery Plan for U.S. Jaguars
In controversial decision, Fish and Wildlife Service says plan would not promote conservation.

The Secret Ingredient in Yellowstone’s Travertine
Researcher presents first evidence that microbes are key to Mammoth Hot Springs mineralization.

An Eye for Sexual Orientation
People are able to spot a gay or straight face in less than a second.