CONTENTS
23 JANUARY 2015 • VOLUME 347 • ISSUE 6220

NEWS

IN BRIEF
356 Roundup of the week’s news

IN DEPTH
358 COMET CLOSE-UP REVEALS A WORLD OF SURPRISES
Diverse landscape of 67P suggests an unexpectedly complicated origin
By E. Hand
▶ CATCHING A COMET SECTION P. 387

359 SURVEYS REVEAL STATE OF AFGHAN POPULATION
From fertility to mortality, new data will help guide aid efforts By M. Hvistendahl

361 JAPAN’S NUCLEAR RENAISSANCE DOGGED BY WASTE CHALLENGE
Nuclear reprocessing is years late; repository is in limbo By D. Normile

362 MALARIA MAY ACCELERATE AGING IN BIRDS
Infection erodes telomeres and life spans—hinting that there are no benign parasites By G. Vogel
▶ REPORT P. 436

FEATURES
363 PROBING THE PROTON
A newly upgraded accelerator explores the seething maelstrom at the heart of matter By A. Cho

366 THE INSURGENT
Animal rights activist Justin Goodman is using science’s own tools to combat animal research By D. Grimm

INSIGHTS

PERSPECTIVES
370 PLAY IT AGAIN, SAM
Lasers shine new light on the drying of Mars while reviving the mystery of methane
By K. Zahnle
▶ REPORTS PP. 412 & 415

371 FLEXIBILITY FOR SPECIFICITY
Human T cells show remarkable differentiation plasticity in responding to pathogens
By M. M. Davis
▶ RESEARCH ARTICLE P. 400

373 UNDERSTANDING ARTEMISININ RESISTANCE
Genetic studies provide clues to how malaria parasites become drug resistant By C. H. Sibley
▶ REPORTS PP. 428 & 431

375 SMOKE AND FIRE OVER E-CIGARETTES
As nations adopt regulatory measures for e-cigarettes, it is imperative to understand how approaches to risk, cost-benefit, and trade-offs have shaped interpretations of evidence
By A. L. Fairchild and R. Bayer

377 BRAZIL’S SOY MORATORIUM
Supply-chain governance is needed to avoid deforestation By H. K. Gibbs et al.

BOOKS ET AL.
379 THE ALTRUISTIC BRAIN
By D. W. Pfaff, reviewed by F. B. M. de Waal

380 THE NEW MATH
By C. J. Phillips, reviewed by J. Kilpatrick

LETTERS
382 CARNIVORE COEXISTENCE:
VALUE THE WILDERNESS
By J. J. Gilroy et al.

382 CARNIVORE COEXISTENCE:
AMERICA'S RECOVERY
By M. E. Gompper et al.

383 CARNIVORE COEXISTENCE:
TROPHIC CASCADES
By T. M. Newsome and W. J. Ripple

383 FERNS TO FULFILLMENT
By L. Reynolds

DEPARTMENTS
355 EDITORIAL
Rethink the Nicaragua Canal
By Jorge A. Huete-Perez et al.

450 WORKING LIFE
Teaming up against tsunamis
By Elisabeth Pain

Science Staff .............................................. 354
New Products ............................................ 443
Science Careers ........................................ 444

Downloaded from http://science.sciencemag.org/ on April 14, 2017
SPECIAL SECTION

Catching a comet

INTRODUCTION

387 Rosetta begins its comet tale
M. G. T. Taylor et al.

RESEARCH ARTICLE ABSTRACTS

On the nucleus structure and activity of comet 67P/Churyumov-Gerasimenko
H. Sierks et al.

The morphological diversity of comet 67P/Churyumov-Gerasimenko
N. Thomas et al.

Dust measurements in the coma of comet 67P/Churyumov-Gerasimenko
inbound to the Sun A. Rotundi et al.

SEE ALSO ▶ NEWS STORY P. 356 ▶ PODCAST ▶ SLIDESHOW ▶ sciencemag.org/site/special/rosetta

REPORT ABSTRACTS

67P/Churyumov-Gerasimenko, a Jupiter family comet with a high D/H ratio K. Altwegg et al.

The organic-rich surface of comet 67P/Churyumov-Gerasimenko as seen by VIRTIS/Rosetta F. Capaccioni et al.

Time variability and heterogeneity in the coma of 67P/Churyumov-Gerasimenko M. Hässig et al.

Birth of a comet magnetosphere: A spring of water ions H. Nilsson et al.

Subsurface properties and early activity of comet 67P/Churyumov-Gerasimenko S. Gulkis et al.

RESEARCH

IN BRIEF

384 From Science and other journals

REVIEW

393 SEA LEVEL CHANGE

Inherited landscapes and sea level change S. Croot and B. U. Haq

REVIEW SUMMARY: FOR FULL TEXT:
dx.doi.org/10.1126/science.1258375

394 PROTEOMICS

Tissue-based map of the human proteome M. Uhlen et al.

RESEARCH ARTICLE SUMMARY: FOR FULL TEXT:
dx.doi.org/10.1126/science.1260419

395 HUMAN EVOLUTION

Human-like hand use in Australopithecus africanus M. M. Skinner et al.

400 T CELL IMMUNITY

Functional heterogeneity of human memory CD4+ T cell clones primed by pathogens or vaccines S. Becattini et al.

REPORTS

406 ASTROPHYSICS

The exceptionally powerful TeV γ-ray emitters in the Large Magellanic Cloud The H.E.S.S. Collaboration

MARS ATMOSPHERE

412 The imprint of atmospheric evolution in the D/H of Hesperian clay minerals on Mars P. R. Mahaffy et al.

415 Mars methane detection and variability at Gale crater C. R. Webster et al.

418 PLANETARY SCIENCE

Shock induced melting of silica at planetary interior conditions M. Millot et al.

420 MAGNETIC MATERIALS

Tilt engineering of spontaneous polarization and magnetization above 300 K in a bulk layered perovskite M. J. Pitcher et al.

425 MATERIALS CHEMISTRY

Composition-matched molecular “solders” for semiconductors D. S. Dolzhnikov et al.

431 Population transcriptomics of human malaria parasites reveals the mechanism of artemisinin resistance S. Mok et al.

436 CHRONIC INFECTION

Hidden costs of infection: Chronic malaria accelerates telomere degradation and senescence in wild birds M. Asghar et al.

439 PROTEOMES

A molecular census of 26S proteasomes in intact neurons S. Asano et al.

ON THE COVER

View of a cliff and gravel field on the small lobe of Comet 67P/Churyumov-Gerasimenko from a distance of 8 kilometers to the surface, as seen by Rosetta/OSIRIS. See pages 358 and 387 and sciencemag.org/site/special/rosetta. Image: ESA/Rosetta/MPG Team MPS/UPD/LAM/IAA/SSO/INTA/UPM/DASP/IDA

439 Counting proteasomes one at a time