# CONTENTS

1135
An electric field manipulates terbium nuclear spin

6 JUNE 2014 · VOLUME 344 · ISSUE 6188

#### BOOKS ET AL.

#### 1097 SOCIAL PHYSICS

By A. Pentland, reviewd by W. P. Butz

#### LETTERS

# 1098 OVERLOOKED LOCAL BIODIVERSITY LOSS

By B. Cardinale

#### 1098 RESPONSE

By M. Dornelas et al.

# 1099 TALK THERAPIES: ONE SIZE DOES NOT FIT ALL

By M. Keshavan

1099 TECHNICAL COMMENT ABSTRACTS

# RESEARCH

#### IN RRIEF

1128 From Science and other journals

#### RESEARCH ARTICLE

#### 1131 CALCIUM CHANNELS

Structural basis for a pH-sensitive calcium leak across membranes *Y. Chang* et al.

## REPORTS

# 1135 QUANTUM INFORMATION

Electrically driven nuclear spin resonance in single-molecule magnets S. Thiele et al.





#### 1138 INTERFACIAL CHEMISTRY

Liquid flow along a solid surface reversibly alters interfacial chemistry D. Lis et al.

▶ PERSPECTIVE P. 1094

#### 1143 CLOUD PHYSICS

From aerosol-limited to invigoration of warm convective clouds *I. Koren* et al.

▶ PERSPECTIVE P. 1089

#### 1146 LUNAR FORMATION

Identification of the giant impactor Theia in lunar rocks D. Herwartz et al.

#### 1150 PLANETARY FORMATION

Protracted core formation and rapid accretion of protoplanets T. S. Kruijer et al.

PERSPECTIVE P. 1086

## 1154 SENSORY BIOLOGY

Marine teleost locates live prey through pH sensing J. Caprio et al.

# 1156 PLURIPOTENCY PROGRAM

Defining an essential transcription factor program for naïve pluripotency *S.-J. Dunn* et al.

### 1160 PLANT GROWTH

A mutually assured destruction mechanism attenuates light signaling in *Arabidopsis W. Ni* et al.

#### 1164 MEMBRANE BIOLOGY

Caspase-mediated cleavage of phospholipid flippase for apoptotic phosphatidylserine exposure *K. Segawa* et al.

#### 1168 SHEEP GENOME

The sheep genome illuminates biology of the rumen and lipid metabolism *Y. Jiang* et al.

#### 1173 SLEEP AND LEARNING

Sleep promotes branch-specific formation of dendritic spines after learning *G. Yang* et al.

▶ PERSPECTIVE P. 1087

#### 1178 SCHIZOPHRENIA

Specific disruption of thalamic inputs to the auditory cortex in schizophrenia models *S. Chun* et al.

#### 1182 NEURODEVELOPMENT

Cell-intrinsic requirement of Dscaml isoform diversity for axon collateral formation *H. He* et al.

#### DEPARTMENTS

## 1065 EDITORIAL

Science diplomacy with Cuba By Gerald R. Fink et al.



## 1194 WORKING LIFE

On the road again
By Jacopo Marino

Science Staff	1063
New Products	1187
Science Careers	1188

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 © 2014 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Demestic individual membership and subscription (5) issues). \$1282. 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.

Change of address: Allow 4 weeks, giving old and new addresses and 8 digit account number. Postmaster: Send change of address to AAAS, P.O. Box 96178. Washington, DC 20009-6178. Single-copy sales: \$10.00 current issue, \$15.00 back issue prepared includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not failing within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Tragsactional Reporting Service, provided that \$30.00 per article is paid directly to CCC, 222 Reservood Drive, Danvers, MA 01923. The identification code for Science is 0036-8075. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized Indexes.

Neuron remodeling during sleep helps learning

6 JUNE 2014 • VOLUME 344 • ISSUE 6188

#### IN BRIEF

1066 Roundup of the week's news

#### IN DEPTH

#### 1069 KICKOFF LOOMS FOR DEMO OF **BRAIN-CONTROLLED MACHINE**

Brazilian neuroscientist Miguel Nicolelis defends his plans to show off a thought-directed exoskeleton at the World Cup By K. Servick

#### 1070 A BOLD BABY STEP ON EMISSIONS

But U.S. curbs alone won't slow warming By E. Kintisch

#### **1072 LENGTHY RNAS EARN RESPECT AS CELLULAR PLAYERS**

A few of these molecules are clearly important, but just how many? By E. Pennisi

#### 1073 GEARING UP FOR A CLOSER LOOK AT THE HUMAN PLACENTA

Workshop participants build an agenda for research on this oft-ignored bridge between mother and fetus By J. Kaiser

#### 1075 SOLAR FURNACE RISES FROM THE **SOVIET ASHES IN CENTRAL ASIA**

Lasers, superconductors, and gamma rays now fill the time of extraordinary facility By R. Stone

#### FEATURES

#### **1076 MINORITY VOICE**

Richard Tapia has prepared generations of minority students for academic jobs, but he says they still aren't welcome By J. Mervis



# SPECIAL SECTION

# The global supply chain

1100 Rethinking the global supply chain

1104 The information highway gets physical By J. Mervis

1108 The whole chain By K. J. Dooley

1109 Emerging approaches, challenges and opportunities in life cycle assessment S. Hellweg and L. Milà i Canals

1114 Humanity's unsustainable environmental footprint A. Y. Hoekstra and T. O. Wiedmann

1118 Slowing Amazon deforestation through public policy and interventions in beef and soy supply chains D. Nepstad et al.

1124 The science of sustainable supply chains D. O'Rourke

#### SEE ALSO

- ► PODCAST
- ▶ WWW.SCIENCEMAG.ORG/SPECIAL/SUPPLY



Hong Kong staging dock Photo: @ Victor Fraile/Corbis

#### **1080 THE KILLING GROUND**

Clues from a German coal mine show how early hunters lived, 300,000 years ago, and how their prey died By M. Balter

#### PERSPECTIVES

#### 1084 CHANGE IS COMING TO THE **NORTHERN OCEANS**

Cod and pollock respond to changing climate and ocean conditions By A. B. Hollowed and S. Sundby

#### **1086 SPEED METAL**

Planetary core formation is a relatively fast process By T. Elliott ► REPORT P. 1150

#### 1087 MEMORIES-GETTING WIRED **DURING SLEEP**

Sleep gives dendritic spines staying power By D. R. Euston and H. W. Steenland

#### 1089 JUST ADD AEROSOLS

Only a little aerosol is needed to change cloudiness By L. A. Remer ► REPORT P. 1143

#### 1090 EU AGRICULTURAL REFORM **FAILS ON BIODIVERSITY**

Extra steps by Member States are needed to protect ecosystems By G. Pe'er et al.

#### 1092 ENERGY AT LIFE'S ORIGIN

Analysis of primitive organisms suggests life began at hydrothermal vents By W. F. Martin et al.

#### 1094 DISRUPTING DISSOLVING IONS AT SURFACES WITH FLUID FLOW

Solvent flow can dramatically change surface reactions By G. A. Waychunas ▶ REPORT P. 1138

## 1095 BEST PRACTICES FOR BIOFUELS

Data-based standards should guide biofuel production By H. Youngs and C. Somerville