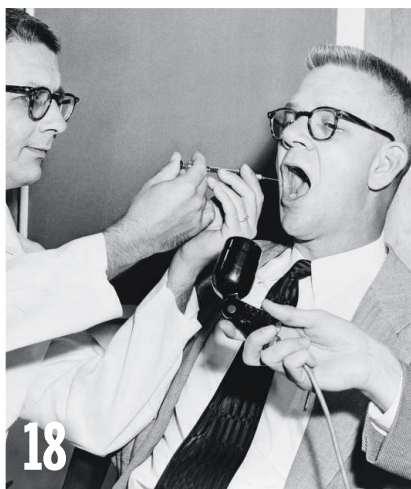




CONTENTS

4 JULY 2014 • VOLUME 345 • ISSUE 6192

NEWS



IN BRIEF

10 Roundup of the week's news

IN DEPTH

13 INJECTION WELLS BLAMED IN OKLAHOMA EARTHQUAKES

State regulators start to take action to reduce risks of induced tremors
By E. Hand

► SCIENCE EXPRESS REPORT
BY K. M. KERANEN ET AL.

14 BIOTECH FEELS A CHILL FROM CHANGING U.S. PATENT RULES

Supreme Court decisions hobble efforts to protect inventions involving natural products
By K. Servick

15 PLAN TO GRADE INSTITUTES RATTLES RUSSIAN ACADEMY

Researchers fear reforms mark path to institute closures
By V. Pokrovsky

16 A CHALLENGE TO PSEUDOSCIENCE

Expat dismisses claims that devices noninvasively detect viruses in blood and treat infections
By J. Bohannon

17 FAULTY DRUG TRIALS TARNISH JAPAN'S CLINICAL RESEARCH

Spate of scandals shows need to reform clinical research regulations and practices
By D. Normile

FEATURES

18 HIGH HOPES

Psychedelic drugs fell from grace in the 1960s. Now, scientists are rediscovering them
By K. Kupferschmidt

22 Can ecstasy treat the agony of PTSD?

Party drug inches toward phase III study
By K. Kupferschmidt

► PODCAST

INSIGHTS

LETTERS

24 NEXTGEN VOICES

PERSPECTIVES

28 A CROWNING ACHIEVEMENT FOR DECIPHERING CORONARY ORIGINS

Postnatal maturation of the heart spurs coronary vessel development from an unanticipated source
By C. G. Burns and C. E. Burns

► REPORT P. 90

29 THE BIRTH OF COOPERATION

Mutualistic symbiosis can arise without prior coevolution
By D. K. Aanen and T. Bisseling

► REPORT P. 94

31 EMERGENT COMPLEX STATES IN BILAYER GRAPHENE

Experiments probe a wealth of exotic electronic behavior
By B. J. LeRoy and M. Yankowitz

► REPORTS PP. 55, 58, & 61

32 FOLLOWING THE SAME NERVE TRACK TOWARD DIFFERENT CELL FATES

Schwann cell precursors can become either neurons or glia
By C. Kalcheim and H. Rohrer

► REPORTS PP. 82 & 87



34 IPCC LESSONS FROM BERLIN

Did the "Summary for Policymakers" become a summary by policy-makers?
By B. Wible

34 Getting serious about categorizing countries

By D. G. Victor et al.

36 Political implications of data presentation

By N. K. Dubash et al.

37 Mapmakers and navigators, facts and values

By O. Edenhofer and J. Minx

39 SHAKING UP VOLCANOES

Data from a Japanese seismic network elucidate how large earthquakes may disrupt volcanic systems
By S. G. Prejean and M. M. Haney

► REPORT P. 80



BOOKS ET AL.

40 THE OPEN MIND

By J. Cohen-Cole, reviewed by J. Isaacs

41 ENLIGHTENING SYMBOLS

By J. Mazur, reviewed by G. Donati

DEPARTMENTS

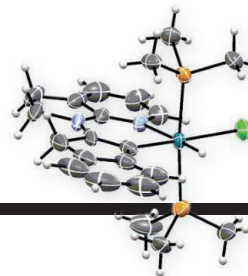
9 EDITORIAL

Raising the bar
By Marcia McNutt

110 WORKING LIFE

A giant leap
By John N. (Jack) Kittinger

Science Staff	8
New Products	102
Science Careers	103



RESEARCH

IN BRIEF

42 From *Science* and other journals

REVIEW

45 HUMAN EVOLUTION

Evolution of early *Homo*: An integrated biological perspective *S. C. Antón et al.*

REVIEW SUMMARY; FOR FULL TEXT:

[HTTP://DX.DOI.ORG/10.1126/SCIENCE.1236828](http://dx.doi.org/10.1126/SCIENCE.1236828)

RESEARCH ARTICLES

46 EXOPLANET DETECTION

A terrestrial planet in a ~1-AU orbit around one member of a ~15-AU binary *A. Gould et al.*

50 MOLECULAR KINETICS

Ras activation by SOS: Allosteric regulation by altered fluctuation dynamics *L. Iversen et al.*

REPORTS

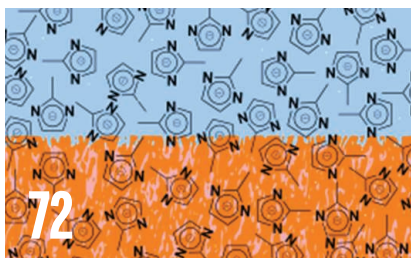
BILAYER GRAPHENE

55 Electron-hole asymmetric integer and fractional quantum Hall effect in bilayer graphene *A. Kou et al.*

58 Chemical potential and quantum Hall ferromagnetism in bilayer graphene *K. Lee et al.*

61 Tunable fractional quantum Hall phases in bilayer graphene *P. Maher et al.*

► PERSPECTIVE P. 31



64 ACTIVE GALAXIES

A fast and long-lived outflow from the supermassive black hole in NGC 5548 *J. S. Kaastra et al.*

68 C-H BOND ACTIVATION

Regioselective ketone α -alkylation with simple olefins via dual activation *F. Mo and G. Dong*

72 SEPARATION MEMBRANES

Interfacial microfluidic processing of metal-organic framework hollow fiber membranes *A. J. Brown et al.*

75 SOCIAL PSYCHOLOGY

Just think: The challenges of the disengaged mind *T. D. Wilson et al.*

77 CLIMATE CHANGE

Climate change and wind intensification in coastal upwelling ecosystems *W. J. Sydeman et al.*

80 EARTHQUAKE DYNAMICS

Mapping pressurized volcanic fluids from induced crustal seismic velocity drops *F. Brenguier et al.*

► PERSPECTIVE P. 39

NEURODEVELOPMENT

82 Parasympathetic neurons originate from nerve-associated peripheral glial progenitors *V. Dyachuk et al.*

87 Parasympathetic ganglia derive from Schwann cell precursors *I. Espinosa-Medina et al.*

► PERSPECTIVE P. 32

90 VESSEL FORMATION

De novo formation of a distinct coronary vascular population in neonatal heart *X. Tian et al.*

► PERSPECTIVE P. 28

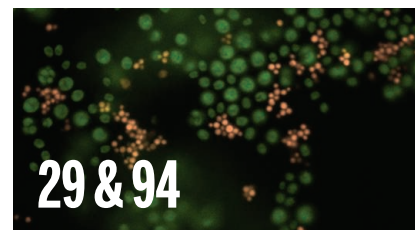
94 PLANT-FUNGAL ECOLOGY

Niche engineering demonstrates a latent capacity for fungal-algal mutualism *E. F. Y. Hom and A. W. Murray*

► PERSPECTIVE P. 29

98 CELL DEATH

Opposing unfolded-protein-response signals converge on death receptor 5 to control apoptosis *M. Lu et al.*



ON THE COVER



Artist's view of a bilayer of graphene, in which two hexagonal carbon lattices are stacked on top of each other. The unusual band structure of bilayer graphene, coupled with external

fields and interactions between electrons, leads to exotic quantum effects. See pages 31, 55, 58, and 61. *Image: C. Bickel/Science*

Science

345 (6192)

Science **345** (6192), 9-110.

ARTICLE TOOLS

<http://science.sciencemag.org/content/345/6192>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.