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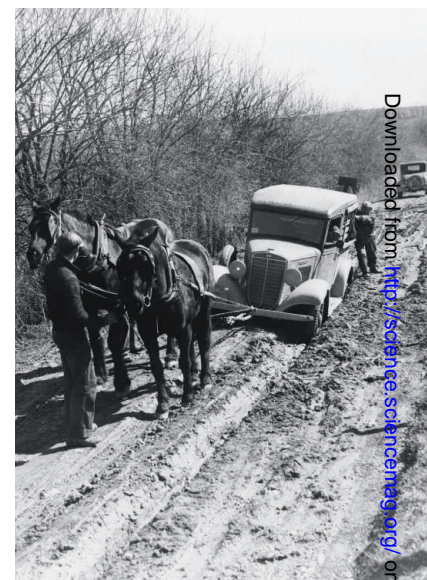
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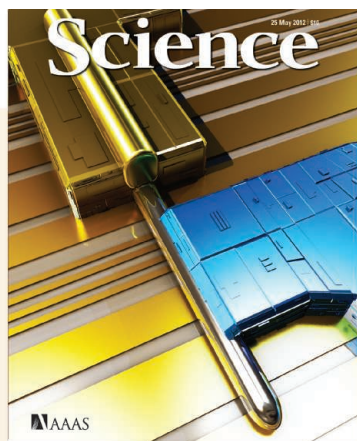


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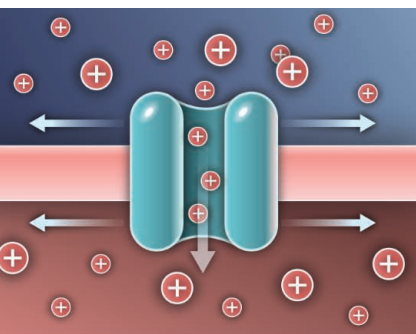
## COVER

Artist's rendering of an electronic device hosting Majorana fermions. The semiconducting nanowire (cylindrical structure) has a diameter of 100 nanometers and lies atop a gate structure consisting of many metallic stripes. The nanowire is contacted at the top with a gold electrode and at the bottom with a superconducting electrode (shown in blue). See page 1003.

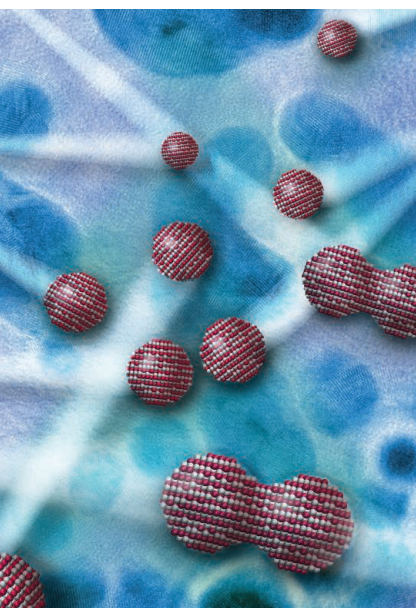
*Image: V. Mourik, K. Zuo, S. M. Frolov, S. R. Plissard, E. P. A. M. Bakkers, L. P. Kouwenhoven, with assistance from www.avalondesigns.nl*

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 A Bayesian inference model predicts how listeners decode communications.  
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- 999 **Growing Microtubules Push the Oocyte Nucleus to Polarize the *Drosophila* Dorsal-Ventral Axis**  
*T. Zhao et al.*  
 The addition of tubulin monomers to microtubules provides the force to relocate the oocyte nucleus.  
 >> *Perspective p. 984*

## REPORTS

- 1003 **Signatures of Majorana Fermions in Hybrid Superconductor-Semiconductor Nanowire Devices**  
*V. Mourik et al.*  
 Theoretically predicted particles that double as their own antiparticles emerge in a superconductor-coupled indium antimonide nanowire.  
 >> *Perspective p. 989*
- 1007 **Unidirectional Growth of Microbumps on (111)-Oriented and Nanotwinned Copper**  
*H.-Y. Hsiao et al.*  
 Oriented copper grains grown using direct-current electroplating serve as a template for intermetallic microbumps.
- 1011 **Real-Time Imaging of Pt<sub>3</sub>Fe Nanorod Growth in Solution**  
*H.-G. Liao et al.*  
 An in situ liquid stage is used to study the formation of nanowires from solution in a transmission electron microscope.
- 1014 **Direction-Specific Interactions Control Crystal Growth by Oriented Attachment**  
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 Iron oxyhydroxide nanoparticles rotate until finding a perfect lattice match with a neighboring particle to grow.
- 1018 **Large-Pore Apertures in a Series of Metal-Organic Frameworks**  
*H. Deng et al.*  
 Metal-organic frameworks with hexagonal channel pores up to almost 100 angstroms in diameter have been synthesized.
- 1023 **Linking Petrology and Seismology at an Active Volcano**  
*K. Saunders et al.*  
 Volcanic minerals from a Mount St. Helens eruption reveal a causal relationship between magma processes and seismicity.
- 1028 **Temperature-Dependent Alterations in Host Use Drive Rapid Range Expansion in a Butterfly**  
*R. M. Pateman et al.*  
 A warmer UK has enabled the brown argus butterfly to expand its range by feasting on the geranium.
- 1030 **Linking Crystallographic Model and Data Quality**  
*P. A. Karplus and K. Diederichs*  
 A statistical method places model and data quality on the same scale and indicates how far one can model.
- 1032 **Structures from Anomalous Diffraction of Native Biological Macromolecules**  
*Q. Liu*  
 Don't get MAD or be SAD; try lower energy.  
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- 1036 **The Crystal Structure of Human Argonaute2**  
*N. T. Schirle and I. J. MacRae*  
 The structure of the core protein of the human RNA interference machinery is determined at high resolution.  
 >> *Perspective p. 985*
- 1040 **Metabolite Profiling Identifies a Key Role for Glycine in Rapid Cancer Cell Proliferation**  
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 Rapidly growing cancer cells rely on the amino acid glycine to make nucleotides.  
 >> *Perspective p. 990*
- 1045 **FKF1 Conveys Timing Information for CONSTANS Stabilization in Photoperiodic Flowering**  
*Y. H. Song et al.*  
 A plant protein sensitive to blue light links longer afternoons to more flowering.
- 1049 **Kinship Categories Across Languages Reflect General Communicative Principles**  
*C. Kemp and T. Regier*  
 The systems of terms used in different languages to describe kin are optimized for simplicity and informativeness.  
 >> *Perspective p. 988; Brevia p. 998; Science Podcast*
- 1054 **Neural Correlates of a Magnetic Sense**  
*L.-Q. Wu and J. D. Dickman*  
 Neurons in a pigeon's brain encode the direction and intensity of the geomagnetic field.  
 >> *Perspective p. 991*

## SCIENCEONLINE

## SCIENCEEXPRESS

[www.sciencexpress.org](http://www.sciencexpress.org)

**A Mitochondrial Pyruvate Carrier Required for Pyruvate Uptake in Yeast, *Drosophila*, and Humans**  
*D. K. Bricker et al.*

The genes encoding two components of the pyruvate transporter in mitochondria have been identified.  
10.1126/science.1218099

**Identification and Functional Expression of the Mitochondrial Pyruvate Carrier**  
*S. Herzig et al.*

Two components of the mitochondrial pyruvate transporter confer transport activity when expressed in bacteria.  
10.1126/science.1218530

**Recurrent Hemizygous Deletions in Cancers May Optimize Proliferative Potential**  
*N. L. Solimini et al.*

The genomes of cancer cells have preferentially lost genes that inhibit cell growth.  
10.1126/science.1219580

**The Structures of COPI-Coated Vesicles Reveal Alternate Coatome Conformations and Interactions**

*M. Faini et al.*

The flexible coatome complex makes contact with a variable number of neighbors and coats vesicles of variable size.  
10.1126/science.1221443

**Structural Basis for Preceptor Modulation of Plant Hormones by GH3 Proteins**  
*C. S. Westfall et al.*

Crystal structures of plant GH3 proteins reveal how these enzymes accommodate jasmonates, auxins, and benzoates.  
10.1126/science.1221863

**A Reduced Organic Carbon Component in Martian Basalts**

*A. Steele et al.*

Analysis of 11 martian meteorites reveals complex hydrocarbons associated with magmatic minerals in 10 of them.  
10.1126/science.1220715

>> *News story p. 970*

**Hesperian Age for Western Medusae Fossae Formation, Mars**

*J. R. Zimbelman and S. P. Scheidt*

Counts of impact craters provide age for a region on Mars close to the landing site of rover Curiosity.  
10.1126/science.1221094

## SCIENCENOW

[www.sciencenow.org](http://www.sciencenow.org)

Highlights From Our Daily News Coverage

**Life at the Top Can Be Good for Your Health**

A study suggests that high-ranking baboons have stronger immune systems.

[http://scim.ag/Immune\\_Systems](http://scim.ag/Immune_Systems)

**Just a Spoonful of Castor Oil**

A study reveals the molecular mechanism of castor oil.

[http://scim.ag/Castor\\_Oil](http://scim.ag/Castor_Oil)

**Barely Breathing Microbes Still Living in 86-Million-Year-Old Clay**

Organisms deep beneath the sea floor survive on minuscule amounts of oxygen.

<http://scim.ag/Microbes-Oxygen>

## SCIENCE SIGNALING

[www.sciencesignaling.org](http://www.sciencesignaling.org)

The Signal Transduction Knowledge Environment

**22 May issue: <http://scim.ag/ss052212>**

**RESEARCH ARTICLE: Interferon- $\beta$  Therapy Against EAE Is Effective Only When Development of the Disease Depends on the NLRP3 Inflammasome**

*M. Inoue et al.*

## PODCAST

*M. L. Shinohara and A. M. VanHook*

Characterization of an animal model may explain why not all patients with multiple sclerosis respond to interferon- $\beta$ .

**PERSPECTIVE: Structure of the First Sphingosine 1-Phosphate Receptor**

*A. L. Parrill et al.*

The lipid sphingosine 1-phosphate may laterally diffuse through the membrane to bind a receptor.

**PERSPECTIVE: Revisiting Channel Allostery—A Coherent Mechanism in IP<sub>3</sub> and Ryanodine Receptors**

*K. Hamada and K. Mikoshiba*

Structural analyses suggest a similar gating mechanism in the IP<sub>3</sub> and ryanodine receptors.

## SCIENCE TRANSLATIONAL MEDICINE

[www.sciencetranslationalmedicine.org](http://www.sciencetranslationalmedicine.org)

Integrating Medicine and Science

**23 May issue: <http://scim.ag/stm052312>**

**FOCUS: Clinician-Investigators as Translational Bioscientists—Shaping a Seamless Identity**

*E. R. Edelman and K. LaMarco*

**COMMENTARY: Risk and Return for the Clinician-Investigator**

*S. Henrickson and D. Altshuler*

## PODCAST

*E. R. Edelman and K. LaMarco*

In this first of a series, senior scientists counsel early-career clinician-investigators on molding a successful research career.

**RESEARCH ARTICLE: Effective Adjunctive Therapy by an Innate Defense Regulatory Peptide in a Preclinical Model of Severe Malaria**

*A. H. Achtman et al.*

Anti-inflammatory drugs based on host defense peptides ameliorate malaria in mice.

**RESEARCH ARTICLE: Adenosine A<sub>2A</sub> Receptor Activation Prevents Wear Particle-Induced Osteolysis**

*A. Mediero et al.*

Bone damage caused by particles from orthopedic implants is prevented by an adenosine receptor agonist in mice.

**RESEARCH ARTICLE: PTH/PTHrP and Vitamin D Control Antimicrobial Peptide Expression and Susceptibility to Bacterial Skin Infection**

*B. Muehleisen et al.*

Vitamin D and parathyroid hormone work together to maximize innate immune resistance to skin infections.

**RESEARCH ARTICLE: Modeling the Dynamic Relationship Between HIV and the Risk of Drug-Resistant Tuberculosis**

*R. Sergeev et al.*

**FOCUS: TB and HIV—Deadly Liaison or Manageable Threat?**

*B. G. Williams*

HIV-coinfected TB patients are less likely to be affected by drug-resistant TB.

**LETTERS: Comments and Response on “The Predictive Capacity of Personal Genome Sequencing”**

*Comments: C. B. Begg and M. C. Pike;*

*D. Golan and S. Rosset; E. J. Topol*

*Response: B. Vogelstein et al.*

## SCIENCE CAREERS

[www.sciencereers.org/career\\_magazine](http://www.sciencereers.org/career_magazine)

Free Career Resources for Scientists

**Experimental Error: The Unwritten Rules of Journalism**

*A. Ruben*

The key to understanding the way the media covers science is to know the rules to which science journalists adhere.

[http://scim.ag/EE\\_SciWriters](http://scim.ag/EE_SciWriters)

**Working for a Contract Research Organization**

*N. Lubick*

Scientists interested in any phase of drug research and development can find opportunities within CROs.

[http://scim.ag/CRO\\_Work](http://scim.ag/CRO_Work)

**Content Collection: Lab Management**

*E. Pain*

New group leaders need to learn how to manage people, projects, finances, and more.

[http://scim.ag/CC\\_LabManagement](http://scim.ag/CC_LabManagement)

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On the 25 May *Science* Podcast: classifying cousins, the evolution of bad teeth, where science and comedy meet, and more.

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