

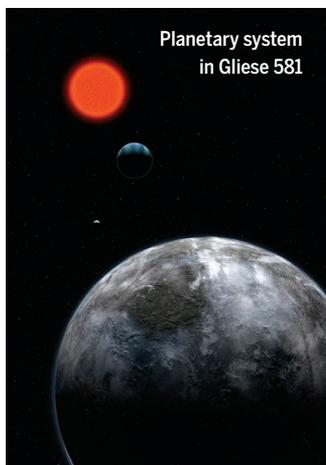
cells were exposed to TGF- $\beta$ . The protein changes correlated with changes in cell behavior. The authors modeled the network of interacting proteins affected by TGF- $\beta$ , creating a road map that can explain how TGF- $\beta$  influences cell behavior. — JDB

*Sci. Signal.* **7**, rs5 (2014).

## QUANTUM METROLOGY Subtle entanglement in an atomic cloud

In the quantum world, atoms can be correlated with each other—"entangled"—which reduces the uncertainty in the knowledge of some of their properties. Physicists then use this reduced uncertainty to perform precision measurements. Strobel *et al.* made an unusual type of entangled state consisting of hundreds of ultracold Rb atoms. These methods may in the future be able to generate states that will be more useful in precision measurement. — JS

*Science*, this issue p. 424



Planetary system  
in Gliese 581

## EXOPLANET DETECTION Tricky star plays sleight-of-light

Two signatures in starlight thought to be written by extrasolar planets may turn out to be forgeries. Astronomers often attribute periodic shifts in a star's apparent motion toward and away from us to the tug of orbiting planets. Robertson *et al.* studied archival spectra of the star Gliese 581 to assess

another potential cause: magnetic activity on the star's surface. The signals once attributed to two planet candidates instead resulted from the combined effect of starspots and stellar rotation. Planet hunters be warned—correct for stellar activity in your data analyses. — MMM

*Science*, this issue p. 440

## INDUCED EARTHQUAKES Wastewater disposal linked to earthquakes

The number of earthquakes is increasing in regions with active unconventional oil and gas wells, where water pumped at high pressure breaks open rock containing natural gas, leaving behind wastewater in need of disposing. Keranen *et al.* show that the steep rise in earthquakes in Oklahoma, USA, is likely caused by fluid migration from wastewater disposal wells. Twenty percent of the earthquakes in the central United States could be attributed to just four of the wells. Injected fluids in high-volume wells triggered earthquakes over 30 km away. — NW

*Science*, this issue p. 448

## CLATHRIN ADAPTORS A membrane-activated switch to bind clathrin

Clathrin-mediated endocytosis—the process by which cells take up nutrients and signals within clathrin-coated vesicles—is very well understood. Kelly *et al.* reveal an unanticipated layer of regulation in this process. The proteins AP2 and clathrin are the major constituents of endocytic clathrin-coated vesicles. AP2 and clathrin stick together through a clathrin-binding motif in AP2. The authors now show that AP2's clathrin-binding motif is normally buried within the core of the AP2 protein. AP2 only ejects its clathrin-binding motif and recruits clathrin if it is associated with the correct cell membrane and an endocytic cargo. — SMH

*Science*, this issue p. 459

## IN OTHER JOURNALS

Edited by **Kristen Mueller**  
and **Jesse Smith**



The common  
marmoset has  
a sequenced  
genome

### GENOMICS

## Marmoset DNA shows why it's small

**A** New World monkey joins a growing list of primate species with sequenced genomes, improving genomicists' ability to tell what genes make primates—and humans—unique. Brazil's common marmoset is unusual among primates: It is tiny—the size of a guinea pig—and always produces twins. During development, the twins share placental blood supply; after birth, each carries stem cells from the other that produce foreign blood cells with no ill effect. The Marmoset Genome Sequencing and Analysis Consortium found five genes likely involved in making the monkey small and eight genes that may help it adjust its metabolism and temperature control to deal with being tiny. — EP

*Nat. Genet.* **10.1038/ng.3042** (2014).

### OPTICAL IMAGING

## Stealthy spying on a moving target

Ghost imaging can create an image of a moving target without the target ever knowing that it is being watched. The traditional way to observe an object, either stationary or in motion, is to illuminate it and use the light that it reflects or scatters to create an image on a detector such as a camera. However, the observation of the object can itself be detected, which compromises the stealth of the process. Ghost imaging, a technique that forms an image with photons that have never even come into contact with the object, has been used to

detect objects at rest, and now Li *et al.* show that it also can be used to reconstruct the image of moving targets, such as the small wafer that they use in their demonstration. — ISO

*Appl. Phys. Lett.* **104**, 251120 (2014).

### TRANSCRIPTION

## TRF2 gets transcription started, too

Transcribing DNA into RNA involves an intricate dance of proteins and nucleic acids. Transcription starts at specific promoter sequences near genes, including one called the TATA box. For most genes, a protein called TBP binds to the

TATA box and attracts other proteins required for transcription. Wang *et al.* studied fruit flies, hoping to learn whether the transcription of genes that encode ribosomal proteins (proteins that help translate RNA to protein), which contain a different promoter (a TCT motif), work in the same way. They found that the TBP-related factor TRF2, rather than TBP, bound to TCT motifs near the transcription start site, and the cell needed TRF2 to transcribe ribosomal proteins. — BAP

*Genes Dev.* 10.1101/gad.245662.114 (2014).

## METABOLIC DISEASE

### A vitamin's dark side in liver disease

Too much of a good thing can be bad for the liver. Chen *et al.* find that mice with high levels of thiamine (vitamin B<sub>1</sub>) in their livers develop fatty liver disease, a metabolic disorder that affects one-third of adults in the United States. A protein called organic cation transporter 1 (OCT1) carries dietary thiamine into the liver. When the researchers deleted the *Oct1* gene in mice or fed mice a diet low in thiamine, the mice did not develop the disease. OCT1 also carries the diabetes drug metformin into the liver, which might explain why metformin decreases symptoms of fatty liver disease: By competing with thiamine for OCT1, metformin reduces the amount of dietary thiamine that reaches the liver. — PAK

*Proc. Natl. Acad. Sci. U.S.A.* 10.1073/pnas.1314939111 (2014).

## NANOWIRE GROWTH

### Avoiding instabilities while creating wires

A template is a great tool for making an object of a particular size and shape, but it works only if the template fills completely. Shin *et al.* show that ions race to fill the pores in the template during template-assisted electrodeposition of nanowires. When fast-growing wires fill the template, however,

neighboring wires stop growing, creating instabilities in the wire growth. The authors show that they can overcome this problem of “diffusion-limited” deposition by making the template hotter at one end and colder at the other. — MSL

*Nano Lett.* 10.1021/nl501324t (2014).

## RANGE SHIFTS

### Warming waters create new bedfellows

Climate change alters the geographical range of species. Such shifts can affect species in major ways, such as changing their abundance or bringing adjacent, closely related species into contact. Potts *et al.* found that rapidly warming waters in the Angola-Benguela Frontal Zone

over the last three decades caused the African kob fish *Argyrosomus coronus* to move southward, where they now live—and spawn—in some of the same places as a related species. Species often overlap at range boundaries, but climate-driven overlap makes it harder for people to manage economically important species and changes the way species fit into their ecosystems. — SNV

*Glob. Change Biol.* 10.1111/gcb.12612 (2014).

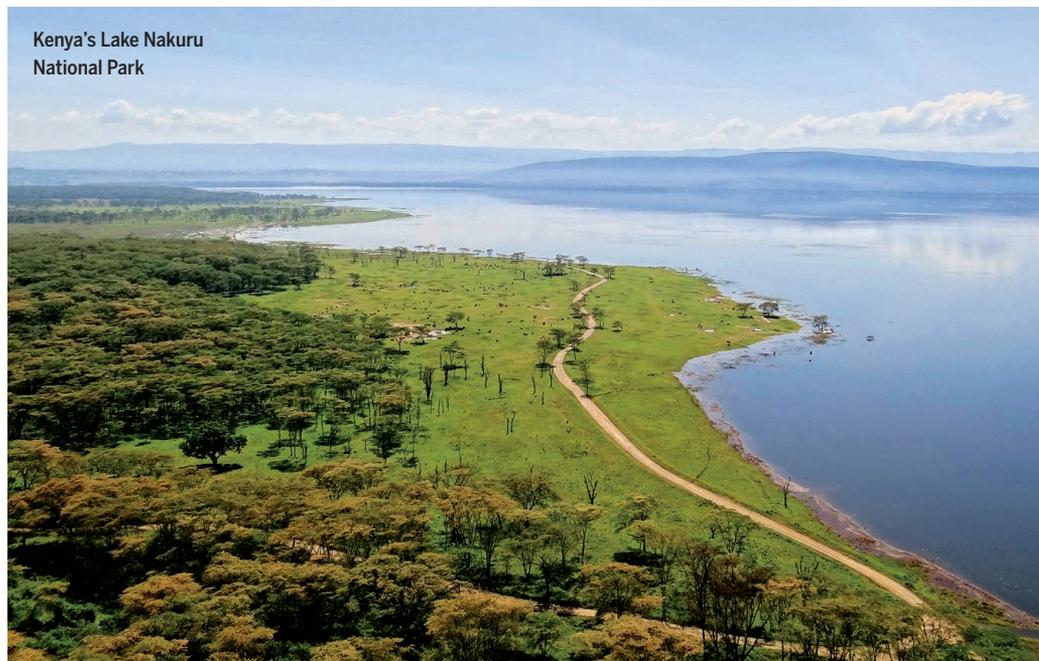
## PLANETARY TOPOGRAPHY

### Springtime sighting at Titan's coastline

Seasonal warming on Saturn's largest moon, Titan, is changing the shoreline of one of its

methane seas. Titan hosts an active methane cycle like the water cycle on Earth, and a local year lasts 30 Earth years. Titan's northern summer solstice will occur in May 2017, and although seasonal shoreline changes have been seen in the south, they have not yet been observed in the north. Hofgartner *et al.* describe Cassini RADAR images that reveal a ~20-km feature coming and going in Titan's northern sea Ligeia Mare in July 2013. They interpret this signal as a change in the position of the boundary between the frozen shoreline and the liquid sea during the thaw after the winter's freeze. — MMM

*Nat. Geosci.* 10.1038/ngeo2190 (2014).



## CONSERVATION

### Making protection of biodiversity count

Global protected areas aim to protect biodiversity, but they do not currently protect threatened species very well. Venter *et al.* report that 85% of threatened vertebrates need greater protection. Governments plan to increase protected areas from 13 to 17% of the land surface by 2020. But if governments continue to select cheap, marginal lands to protect, the protected species will increase only marginally. The authors suggest that choosing to protect areas where threatened species live would lead to a fivefold improvement in threatened species protection for only 1.5 times the cost of purchasing and protecting the cheapest land. — AMS

*PLOS Biol.* 10.1371/journal.pbio.1001891 (2014).

# Science

## TRF2 gets transcription started, too

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