migrated close to the tumour cells.

The authors suppressed the tumours' growth with the c-kit-inhibiting drug imatinib mesylate (Gleevec). Imatinib was then given to a child with a life-threatening *NF1*-dependent tumour, which subsequently shrank by about 70%.

CHEMICAL BIOLOGY

Clotting by quorum

Nature Chem. Biol. doi:10.1038/nchembio.124 (2008)

In some invertebrates, such as horseshoe crabs, the presence of bacteria can directly trigger blood clotting, which stops infection from spreading. But the initiation of vertebrate blood clotting was thought to require a more complex system of biochemical signalling.

Rustem Ismagilov of the University of Chicago in Illinois and his co-workers suggest otherwise. The team found that clusters of *Bacillus anthracis*, which causes anthrax, and *Bacillus cereus* initiated coagulation in mouse and human blood within minutes, yet dispersed bacteria of the same species did not. The bacteria directly reacted with clotting enzymes called coagulation factors and the blood clotted only when these factors reached a critical density — which happened when the bacteria formed clusters.

QUANTUM PHYSICS

Entangled accuracy

Nature Phys. doi:10.1038/nphys1112 (2008)

Quantum information is usually sent by light that is 'entangled'. This means that properties of photons sent between the two parties are quantum mechanically linked, and that the information changes when it is 'read', thus providing theoretically perfect data security. But entanglement is delicate and can easily be disrupted by factors such as atmospheric turbulence — so the receiver cannot tell whether a message was intercepted, or if the weather got in the way.

Ulrik Andersen of the Technical University of Denmark and his co-workers think that they can. They sent entangled light pulses through a simulated atmosphere, finding that when the pulse's amplitude fell within a certain range, it remained entangled.

The authors hope that the technology will help to improve the long-distance transfer of quantum information.

MOLECULAR BIOLOGY

Chewing the fat

Science **322**, 957–960 (2008)

Certain stem cells may link ageing and obesity, according to Gary Ruvkun and his colleagues at the Massachusetts General Hospital in Boston. When they halted the development of germline stem cells — those that make reproductive cells — from the worm *Caenorhabditis elegans*, the animals suddenly began storing less fat.

The authors pinpointed a gene, *K04A8.5*, that encodes a fat-burning enzyme, and showed that this gene's expression is boosted in fat storage tissues in worms that lack germline stem cells. Elevating the expression of *K04A8.5* decreased fat storage in worms carrying mutations that conferred increased longevity, whereas reducing it using a technique called RNA interference shortened their lifespans.

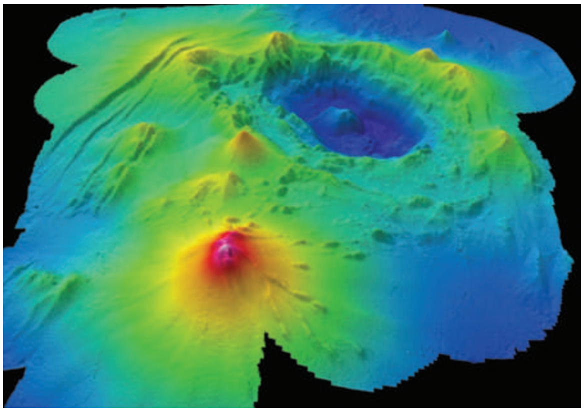
GEOSCIENCES

Submarine slippage

Geochem. Geophys. Geosys. doi:10.1029/2008GC002113 (2008)

Monowai Cone (pictured below) is an undersea volcano north of New Zealand. It is probably the world's most active, making it a good model system for studying how submarine eruptions cause landslides, and how both of these can trigger tsunamis. Bill Chadwick at Oregon State University in Newport and his colleagues have measured Monowai Cone's topology in 1998, 2004 and 2007 and have compared the timing of its build-up and collapse with data from the Polynesian Seismic Network.

Between 1998 and 2004 there were nine swarms of '*T* waves' — indicators of explosive eruptive activity — of which the biggest was linked to a collapse. But another large collapse occurred between 2004 and 2007 when no anomalous *T*-waves were recorded — possibly owing to limitations of the monitoring network. The authors say that this is the first study of its type and that more effort should be spent monitoring undersea volcanoes.



JOURNAL CLUB

Douglas Natelson
Rice University, Houston, Texas

A physicist foresees a new era in electronics.

A material's electronic properties depend largely on its density of mobile charge carriers (electrons and holes). The most common way of tuning that density is 'doping'. This involves carefully adding atoms or molecules that donate or take up electrons from the surrounding material. But doping comes with a downside: these added impurities themselves become charged, so they scatter mobile charge carriers and muddy the predictability of the material's electronic properties.

How to avoid doping? Look to Julius Edgar Lilienfeld. In 1925, he proposed what is now called the 'field effect', in which the material of interest functions as one electrode of a capacitor. When a voltage is applied to the other electrode, equal and opposite charge densities accumulate on the sample material. The density of charge carriers can be varied as it is in doping, but not to the same extent. Nonetheless, the field effect has an everyday role in transistors — which are the fundamental parts of consumer electronics.

Another of Lilienfeld's inventions, the electrolytic capacitor, holds the key to much higher field-effect charge densities, which could have dramatic consequences. Researchers at Tohoku University in Sendai, Japan, recently used a polymer electrolyte to achieve sufficiently large charge densities at a strontium titanate surface to generate superconductivity (K. Ueno *et al. Nature Mater.* **7**, 856–858; 2008). This has been seen before in doped strontium titanate, but the electrolytic capacitor approach avoids the disorder inherent in doping.

By using mobile ions in an electrolyte to attract charges in the sample, this quirky capacitor can build up charge densities approaching those of chemically doped electronic materials such as high-temperature superconductors. This opens up the possibility of transistor-like devices that can work with very low voltages.

Discuss this paper at **http://blogs.nature.com/nature/journalclub**