RESEARCH HIGHLIGHTS

Selections from the scientific literature

PHOTONICS

Graphene sees the light

Three independent teams have boosted the performance of photodetectors that use graphene (atomically thick sheets of carbon) to convert light into electrical signals. This may enable fast optical communication within and between computer chips.

The latest devices boast data-transmission rates that rival those of conventional components and can sense a broader range of light wavelengths. Earlier graphene models produced weaker currents because most of the light failed to interact with their carbon layers. All three groups solved that problem by channelling light through silicon waveguides running along the graphene sheet.

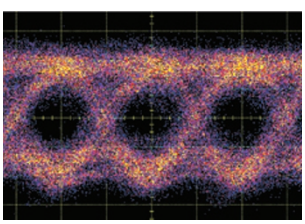
The device built by Thomas Mueller at the Vienna University of Technology and his team produces 50 milliamps of current per watt of infrared light — only ten times less than germanium photodetectors, the current standard.

Dirk Englund of the Massachusetts Institute of Technology in Cambridge and his co-workers made a similar detector that handles an impressive 12 gigabits of data per second, and produces a clean electrical signal (**pictured**).

Meanwhile, a device from the group of Xiaomu Wang, then at the Chinese University of Hong Kong, picks up mid-infrared light at room temperature, suggesting that graphene detectors could bypass the restrictive cooling requirements of other photodetector materials.

Nature Photon. **http://doi.org/ns8; http://doi.org/ns9; http://doi.org/ntb (2013)**

For a longer story on this research, see: go.nature.com/zoiolw



SOLVIN ZANKL, VISUALS UNLIMITED/SPL

ECOLOGY

Another killer fungus hits amphibians

The Netherlands' population of wild fire salamanders (*Salamandra salamandra*; pictured) declined by 96% in the past three years, but no known infectious agent was found on their bodies. Now An Martel at Ghent University in Merelbeke, Belgium, and her team identify the problem as a new species of chytrid fungus, *Batrachochytrium salamandrivorans*. Healthy salamanders that were experimentally infected with the fungus developed skin lesions and died.

Unlike the only other chytrid fungus known to cause deadly infections (*B. dendrobatidis*, which has ravaged global frog and toad populations), this new species does not affect midwife toads (*Alytes obstetricans*). It also grows at much lower temperatures, suggesting that the two chytrid species occupy different niches. The researchers developed a DNA-testing method to rapidly screen salamanders for the fungus, with the aim of tracking this latest threat to biodiversity.

Proc. Natl Acad. Sci. USA **http://doi.org/nrz (2013)**

NEUROSCIENCE

Different strains of Alzheimer's

Protein fibres that build up in the brains of people with Alzheimer's disease take on different structures in different patients.

Aggregates of the amyloid-β protein are a hallmark of Alzheimer's disease, but the molecular forms that they take in the brain have not been explored. Robert Tycko at the US National Institutes of Health in Bethesda, Maryland, and his team extracted amyloid-β from the brains of two patients who had died, and who had displayed different symptoms.

They used this amyloid-β to seed the growth of synthetic fibrils and analysed each sample with nuclear magnetic resonance and electron microscopy. Unexpectedly, all the fibrils from each brain had the same molecular structure, but the structures differed between brains.

The researchers say that imaging agents that distinguish between fibril structures might allow more-precise diagnoses of Alzheimer's disease.

Cell 154, **1257–1268 (2013)**

STRUCTURAL BIOLOGY

Rigid receptor denies HIV entry

The molecular structure of a protein commandeered by HIV to enter human cells reveals sites that could lead to