

CLIMATE MODELLING

A rainy signal from noise

A temperature increase of at least 1.4°C is needed before changes in regional precipitation can be distinguished from regular variability and attributed to global warming.

A team led by Irina Mahlstein of the National Oceanic and Atmospheric Administration in Boulder, Colorado, used a suite of general circulation models to analyse regional precipitation trends from 1900 to 2099. The analysis focused on wet seasons, for which models performed most accurately against historical trends.

By the end of this century, the study suggests, increases in wet-season precipitation will be apparent in many areas. However, the authors note that changes in extreme weather or annual precipitation might be detectable much earlier.

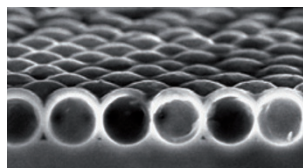
Geophys. Res. Lett. <http://dx.doi.org/10.1029/2011GL050738> (2012)

MATERIALS

Nanoscale shells trap light

Sheets of silicon nanoshells created by a team in California could lead to ultra-thin solar panels that are cheaper and easier to mass-produce than those currently available.

Conventional solar panels absorb light using relatively thick layers of nanocrystalline silicon that



can be time-consuming to manufacture. Yi Cui and his colleagues at Stanford University manufactured spherical, hollow silicon shells using standard chemical techniques and deposited them on a sheet (**pictured**). Light captured by the material was reflected many times inside the shells, increasing the amount of energy the sheet absorbed.

The team found that a 50-nanometre-thick layer of shells was as efficient as a 1-micrometre-thick sheet of conventional silicon.

Nature Commun. 3, 664 (2012)

BEHAVIOURAL SCIENCE

Sex is spread across the genes

Sex-specific behaviours in activities such as mating and parenting are controlled in a modular way by distinct sets of genes.

Nirao Shah at the University of California, San Francisco, and his colleagues screened the brains of male and female mice for differences in gene expression. They identified 16 genes differentially expressed in the hypothalamus

and amygdala, brain regions implicated in the control of sex-related behaviours. Sex hormones, which drive behavioural differences between the sexes, exert their effects by regulating the expression patterns of these genes.

Mice deficient in one of the genes demonstrated subtle differences in particular sex-specific behaviours, such as female acceptance of — or male interest in — penetration, without affecting other sex-typical behaviours. *Cell* 148, 596–607 (2012)



MICROBIOLOGY

Seal corpses shelter Antarctic microbes

Mummified seals scattered across the deserts of Antarctica's McMurdo Dry Valleys reveal that microbial communities in the region respond rapidly to environmental change.

The seal carcasses are naturally mummified by the extremely dry, cold conditions of one of the world's least hospitable climates. Craig Cary at the University of Waikato in Hamilton, New Zealand, and his colleagues found that undisturbed carcasses boost humidity, stabilize temperature and alter the microbial

communities in the soils beneath them.

The researchers assayed how quickly those communities changed by transplanting a 250-year-old seal carcass to a pristine location. Two summers later, the microbial composition of the soil beneath the transplanted seal resembled that of the seal's original location. This challenges the hypothesis that the region's soil ecology changes only over the course of centuries.

Nature Commun. 3, 660 (2012)