Geoengineering: expensive, inefficient, uncertain – and inevitable?

The Royal Society has released the results of its survey of geoengineering solutions to the problems posed by climate change – and it’s a gloomy prospect, but unavoidable unless we make sizeable cuts in greenhouse gas emissions as soon as possible.

Geoengineering is a term for technological means of modifying Earth systems, generally applied to the problems of climate change. The study was led by Prof. John Shepherd, who identified two types of geoengineering: those that remove carbon dioxide and other greenhouse gases from the atmosphere, and those that reduce the amount of solar radiation reaching Earth.

The latter work quickly, but do not lower greenhouse gas levels, nor do they address associated problems of climate change such as changes in ocean chemistry. The former methods tackle the fundamental problem, but cannot do so quickly, nor have any yet been demonstrated to be effective, let alone cost-effective.

Any technological solution also has to work reliably for very long periods of time, without damaging side effects, and at reasonable cost. At present, reducing emissions is the best option – we do not have safe effective geoengineering methods.

“None of the geoengineering technologies so far suggested is a magic bullet, and all have risks and uncertainties associated with them,” said Shepherd. “It is essential that we strive to cut emissions now, but we must also face the very real possibility that we will fail. Used irresponsibly or without regard for possible side effects, geoengineering could have catastrophic consequences similar to those of climate change itself. We must ensure that a governance framework is in place to prevent this.”

http://royalsociety.org/document.asp?id=8729

Amateur spots impact on Jupiter

An Australian amateur astronomer spotted something odd on Jupiter in July, and thought it might be the effects of an impact. Follow-up observations by major observatories confirmed this and tracked the evolution of the scar in Jupiter’s turbulent atmosphere.

On 19 July, Anthony Wesley, an amateur observer from Canberra, found a new dark spot in the southern hemisphere of Jupiter, looking very like the marks left by the impact of comet Shoemaker-Levy 9 in 1994. Data from observatories including the HST (which interrupted recalibration work to take a picture) showed that the spot was expanding and changing shape daily.

Infrared observations, such as those made at 24 hours notice by the Gemini North telescope on Mauna Kea, Hawaii, showed that the dark patch is hotter than its surroundings, and further observations with the MICHELLE spectrograph/imager should allow discrimination of ammonia abundance and atmospheric aerosols from temperature effects, to track the evolution of the site. Already, their image shows an arc-like structure in the debris.

Comparisons with the Shoemaker-Levy impact in 1994 suggest that the impacting object was around a few hundred metres across, but it is not yet clear whether it was a comet or an asteroid.

Putting a stamp on Britain

A new set of stamps on the theme of “Eminent Britons” will include an image of Sir Martin Ryle in front of his radio telescopes, also recognizing the International Year of Astronomy.

The Royal Mail will issue the new set of 10 first-class stamps on 8 October this year. Each one celebrates an eminent Briton with a connection to 2009. Sir Martin Ryle takes his place alongside Fred Perry, born in 1909, Mary Wollstonecraft, born 1759, and Donald Campbell, who broke the Water Speed Record on Coniston Water in 1959.

Sir Martin’s inclusion marks the 1959 publication of the landmark map of stellar sources. The 2009 connection also celebrates International Year of Astronomy 2009.