

IMS Public Lecture

The Scientific Basis of Climate Change

Speaker: Emily Shuckburgh
British Antarctic Survey, UK

Date: Thursday, 23 April 2009

Time: 6:30pm – 7:30pm

Venue: Lecture Theatre 33
Block S17, Level 2, Faculty of Science
National University of Singapore
Singapore 119260

FREE ADMISSION

Abstract

There is much discussion of the dangers of climate change, but what is the scientific basis for the predictions? This talk will review the science behind the headlines.

Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years. The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land-use change, while those of methane and nitrous oxide are primarily due to agriculture.

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. Data on past climate indicates that the warmth of the last half century is unusual in at least the previous 1,300 years. The last time the polar regions were significantly warmer than present for an extended period (about 125,000 years ago), reductions in polar ice volume led to 4 to 6 metres of sea level rise.

The scientific community now believes that it is very likely that most of the observed increase in globally averaged temperatures since the mid-20th century is due to the observed increase in man-made greenhouse gas concentrations. Continued greenhouse gas emissions at or above current rates will cause further warming and induce many changes in the global climate system during the 21st century. The latest predictions of these changes have recently been published by the Intergovernmental Panel on Climate Change and will be reviewed in this talk.

About the Speaker

Dr Emily Shuckburgh is a UK Natural Environment Research Council fellow based at the British Antarctic Survey and a Fellow of Darwin College, University of Cambridge. She is a climate science expert who has worked at École Normale Supérieure in Paris and at the Massachusetts Institute of Technology, as well as at the University of Cambridge. She is a Fellow of the Royal Meteorological Society and a Fellow of the Royal Society of Arts. Dr Shuckburgh's research aims to improve our understanding of the physics of the circulation of the atmosphere and oceans. She has recently spent time taking climate measurements in Antarctica. Dr Shuckburgh is editor of a book published by Cambridge University Press in 2008 entitled 'Survival: The Survival of the Human Race', which considers many of the challenges to human survival, now and in the past, including the threat to human societies posed by climate change.

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