UNIVERSITY OF CAMBRIDGE

Institute of Continuing Education

Understanding climate variability

Start date	26 February 2017	**Time**	10:00 – 16:45
Venue	Madingley Hall Madingley Cambridge		
Tutor	Dr Michael Davey	**Course code**	1617NDX034

Director of Programmes	Emma Jennings
For further information on this course, please contact	Public Programme Coordinator, Clare Kerr clare.kerr@ice.cam.ac.uk or 01223 746237
To book	See: www.ice.cam.ac.uk or telephone 01223 746262

Tutor biography

Dr Michael Davey is a research scientist at the Centre for Mathematical Sciences, University of Cambridge, in the atmosphere-ocean dynamics group. He also has a part-time position with the Met Office, in the monthly-to-decadal variability and prediction team. He has led and participated in multi-national projects relating to climate modelling and long-range forecasting, and has served on several working groups and comittees for the World Meteorological Organization. In 2015 he gave a public lecture at the Cambridge Science Festival entitled ‘El Niño: what on Earth will happen next?’

Course programme

09:30	Terrace bar open for pre-course tea/coffee
10:00 – 11:15	**Session 1:** observed climate variability and climate models
11:15	Coffee
11:45 – 13:00	**Session 2:** El Niño and other climate phenomena
13:00	Lunch
14:00 – 15:15	**Session 3:** impacts
15:15	Tea
15:30 – 16:45	**Session 4:** long-range prediction
16:45	Day-school ends

Course syllabus

Aims:

Participants will learn about some major features of the climate system that influence variability from year-to-year, and their impacts. They will gain an understanding of the underlying physical processes, and find out how useful predictions can be made for seasons ahead.

Content:

Why do weather and climate vary such a lot from year to year? How can events in the equatorial Pacific affect the whole world? What can be predicted months in advance?

The course will start with the definition of climate and descriptions of major features of world climate, followed by examples of climate variability on various timescales. Our understanding of how the climate works is greatly enhanced by the use of climate models, and a descriptive introduction to 'dynamical' climate modelling will be provided.

The most important source of year-to-year change is the cycle of 'El Niño Southern Oscillation' events, and this naturally-occurring phenomenon will be a particular focus. We will look into the essential role of interactions between the atmosphere and ocean in creating, sustaining and ending such events, and find out about the worldwide impacts that result. The climate system contains several other such 'modes' of variability, and some of these will also be explored.

Although the weather on a specific day cannot be predicted months ahead, it is possible in many regions to make useful long-range forecasts of, say, rainfall averaged over a season. We will find out how this is possible, see some practical examples, and discuss what use can be made of such outlooks.

Presentation of the course:

Presentations by the tutor, class discussion, exercises

As a result of the course, within the constraints of the time available, students should be able to:

define climate variability;

describe the El Niño Southern Oscillation phenomenon and explain the cause;

describe an example of a long-range forecast and discuss its usefulness and limitations

Reading and resources list

Listed below are a number of texts that might be of interest for future reference, but do not need to be bought (or consulted) for the course.

Author	Title	Publisher and date
Ross Couper-Johnston	El Niño – the weather phenomenon that changed the world	Hodder&Stoughton 2000
Michael Glantz	Impacts of El Niño and La Niña on climate and society	CUP 2000
Roger Barry	Essentials of the Earth's climate system	CUP 2014

Website addresses

www.metoffice.gov.uk/research/climate

Additional information

Venue

Details of how to find Madingley Hall can be found on our website:
http://www.ice.cam.ac.uk/who-we-are/how-to-find-the-institute*

Refreshments

Tea and coffee and a packed lunch will be provided. If you have any specific dietary requirements or allergies and have not already advised us, please inform our Admissions Team on ice.admissions@ice.cam.ac.uk or +44 (0)1223 746262.

Note Students of the Institute of Continuing Education are entitled to 20% discount on books published by Cambridge University Press (CUP) which are purchased at the Press bookshop, 1 Trinity Street, Cambridge (Mon-Sat 9am – 5:30pm, Sun 11am – 5pm). A letter or email confirming acceptance on to a current Institute course should be taken as evidence of enrolment.

Information correct as of: 10 November 2016