UNIVERSITY OF CAMBRIDGE

Institute of Continuing Education

From here to the edge of the observable Universe

Start date	15 April 2016	**End date**	17 April 2016
Venue	Madingley Hall Madingley Cambridge		
Tutor	Dr Robin Catchpole	**Course code**	1516NRX138

Director of Programmes	Emma Jennings
For further information on this course, please contact	Public Programme Co-ordinator, 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

Robin Catchpole, recent Senior Astronomer at the Royal Observatory Greenwich, currently works at the Institute of Astronomy in Cambridge. Born in 1943, he took a BSc at University College, London, before being posted to the Royal Observatory at the Cape of Good Hope. He received his doctorate from the University of Cape Town. In 1991 he returned to the Royal Greenwich Observatory, where he worked until it closed in 1998. He has authored and co-authored over 100 research papers and has used telescopes around the world including the Hubble Space Telescope. His research interests include the composition of stars, exploding stars, the structure of our Galaxy and galaxies with central black holes. He gives numerous popular lectures and radio and TV interviews.

Course programme

Friday

Please plan to arrive between 16:30 and 18:30. You can meet other course members in the bar which opens at 18:15. Tea and coffee making facilities are available in the study bedrooms.

19:00	Dinner
20:30 – 22:00	Session 1 Contents and Distance Scale of the Universe
22:00	Terrace bar open for informal discussion

Saturday

07:30	Breakfast
09:00 – 10:30	Session 2 Our Solar System from Fire to Ice
10:30	Coffee
11:00 – 12:30	Session 3 Asteroids and Impacts. Should we worry?
13:00	Lunch
14:00 – 16:00	Free
16:00	Tea
16:30 – 18:00	Session 4 The Evolution of the Stars and the Sun
18:00 – 18:30	Free
18:30	Dinner
19:45 – 22:00	Session 5 Visit the Institute of Astronomy to use telescope If cloudy; The Sun and Climate Change
From 21:30	Terrace bar open for informal discussion

Sunday

07:30	Breakfast
09:00 – 10:30	Session 6 Black Holes, Dark Matter and Vacuum Energy
10:30	Coffee
11:00 – 12:30	Session 7: Are We Alone?
12:45	Lunch

The course will disperse after lunch

Course syllabus

- To give participants a deeper understanding of the universe of which they are part.

- To give participants an ability to evaluate and put in a broader context, media reports on astronomy.

- To increase participants' awareness of the world around them, including the origin of everything, and in particular to no longer see the night sky a painted dome but as a dynamic ever changing place, a 3 dimensional entity.

Content:

The nature of stars, galaxies, black holes, dark-matter, vacuum-energy, the size of the universes, the evolution of stars and origins of elements created therein, the ultimate fate of our Sun and planets, the origin of our solar system and the variety of environments and landscapes within our solar system, the threats to life on Earth from cosmic impacts, evidence for past impacts and the probability of future impacts, the possibility of finding intelligent life elsewhere and why it seems to be silent out there, the structure of our Sun, its major cycles, the effects of magnetic fields on the solar atmosphere and how this effects our Earth, how the Earths climate has changed over the long and short timescales and what relevance the Sun might have to short term climate change on Earth.

Presentation of the course:

Teaching will be in the form of lectures followed by questions from students that will reveal what is difficult for them to understand.

The only topic suitable for a general class discussion is the question as to whether we are alone in the universe and I hope we can discuss this topic together.

I make no promise as it depends on the weather, but propose to make an evening visit to the Institute of Astronomy to use their 16 inch telescope to look at objects in the sky. Jupiter and the Moon will be well placed for observation.

Outcomes:

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

Have a deeper and better understanding of the night sky.

Have a deeper understanding of the origin of everything they see around them.

Have a broader perspective of ourselves and our civilisation and that of our Earth within the context of our Universe.

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
<u>Anything written by Lord Rees</u>		
Rees, Martin.	*Before the Beginning*.	Simon Schuster, 2002.
Rees, Martin.	*Just Six Numbers.*	Phoenix, Orion Pub Group, 2004.
Rees, Martin.	*Our Cosmic Habitat.*	Phoenix, Orion Pub Group, 2003.
Rees, Martin.	*Our Final Century?*	William Heinemann Ltd 2003
<u>General books on astronomy covering the same ground</u>		
Pasachoff, J M.	*Astronomy from the Earth to the Universe.*	Saunders College Publishing, 1995, 4th edition.
Shu, Frank T..	*The Physical Universe: An introduction to Astronomy*	University Science Books, 1982.
Freedman, R A, and Kaufmann, W J..	*Universe*	Freeman, 2007, 8th edition.

Website addresses

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: 01 April 2016