UNIVERSITY OF CAMBRIDGE

Institute of Continuing Education

Astronomy day: the life and death of stars

Date	26 June 2016	**Time**	10:00am – 16:45pm
Venue	Madingley Hall Madingley Cambridge		
Academic Director	Dr Judith Croston	**Course code**	1516NDX039

Director of Programmes	Emma Jennings
For further information on this course, please contact	Clare Kerr, Public Programmes Coordinator 01223 746237 clare.kerr@ice.cam.ac.uk

To book See: www.ice.cam.ac.uk or telephone 01223 746262

Tutor biographies

Dr Judith Croston is ICE Teaching Officer and Academic Director for Physical Sciences, and also holds a part-time position as Principal Research Fellow in the astronomy group at the University of Southampton. She obtained her MSci in Physics with Astrophysics from the University of Bristol, followed by her PhD in the area of extragalactic astrophysics from Bristol in 2004. She has previously worked as a postdoctoral researcher in the Service d'Astrophysique, Commission d'Energie Atomique, Saclay, as an Associate Lecturer with the Open University, and as a Research Fellow at the University of Hertfordshire. She currently leads several international research projects investigating jets from supermassive black holes using ground and space-based astronomical observatories, and is involved in planning for next-generation instruments and observatories.

Dr Helen Mason is a solar physicist at DAMTP, the University of Cambridge. She is head of the Atomic Astrophysics group and has worked on many solar space projects in the UV and X-ray wavelength ranges (most recently: SoHO, Hinode, SDO and IRIS). She has also developed an atomic database, CHIANTI, now used worldwide for analyses of solar spectra. In 2014, Helen was awarded an OBE for her services to Higher Education and to Women in Science, Engineering and Technology. She has participated in many outreach projects and given science presentations to audiences at many venues, including the Royal Institution. She has participated in several TV programs, most recently BBC4's 'Seven Ages of Starlight'. She leads the Sun|trek project (www.suntrek.org) which explores the Sun and its effects on the Earth. Most recently she has been working with schools on science projects linked to Tim Peake's flight on the ISS.

Day school content:

Why do we expect the Sun to keep shining for the next few billion years? What will happen after that? Are we really made of stardust?

This course will explore the science of stars, how they form, why they live for so long, and what happens after they die. We will begin by discussing what a star is, what types of measurements astronomers can make to try to understand how they work, and how our understanding of stars has evolved and improved over the last century. The second session will focus on our nearest star, the Sun, exploring its dynamic nature and the wealth of information we can obtain from modern solar observatories. We will then move on to consider the life cycle of stars: how they are born in cold dark clouds of gas, and how their lives subsequently depend on their mass. We will conclude by discussing some of the most exotic stars: the white dwarfs, neutron stars and black holes that form the endpoints of a star's life, exploring how such exotic objects can be identified in our Galaxy and beyond. Finally we will consider how stars explode in supernovae, and how dying stars help to create the conditions for future generations of stars and planetary systems to be born.

Programme:

09:30	Terrace bar open for pre-course tea/ coffee
10:00 – 11:15	Exploring stars – how do we know how stars work?
11:15	Coffee
11:45 – 13:00	Our dynamic Sun
13:00	Lunch
14:00 – 15:15	The birth and life cycle of stars
15:15	Tea
15:30 – 16:45	Stellar death and reincarnation
16:45	Day school ends

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
K. J. H. Phillips	*Guide to the Sun*	Cambridge University Press 2008
Lucie Green	*15 Million Degrees: a journey to the centre of the Sun*	Viking 2016
Andrew King	*Stars: a very short introduction*	Oxford University Press 2012
Kenneth R. Lang	*The life and death of stars*	Cambridge University Press 2013
J. Craig Wheeler	*Cosmic catastrophes: exploding stars, black holes and mapping the Universe*	Cambridge University Press 2014

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 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: 09 June 2016