Title: Introduction to Cosmology

Lecturer : Dr Subir Sarkar

Date and Times: 24th July at 11:15
25th July at 10:15
26th July at 11:15
27th July at 10:15
27th July at 11:15

Summary of the proposed talk:

Lecture 1: Seeing the edge of the universe: from speculation to science
Lecture 2: Constructing the Universe: relativistic world models
Lecture 3: The history of the Universe: decoupling of the relic radiation and synthesis of the light elements
Lecture 4: The content of the Universe: baryons, dark matter and dark energy
Lecture 5: Making sense of the Universe: fundamental physics and cosmology

Prerequisite knowledge and references:

A good background in basic undergraduate physics would be adequate.

Some excellent popular-level books are:

1) The First Three Minutes (2nd ed 1981) - Steven Weinberg
2) Darkness at Night: A Riddle of the Universe (1987) – Edward Harrison
3) Poetry of the Universe: A Mathematical Exloration of the Cosmos (1995) - Robert Osserman
4) The Little Book of the Big Bang: A Cosmic Primer (1998) – Craig Hogan
5) Quintessence: the Mystery of Missing Mass in the Universe (2000) – Lawrence Krauss

Recommended undergraduate texts are:

1) Introduction to cosmology (1995) – Jeremy Bernstein
2) Introduction to cosmology (2nd ed 1997) - Matts Roos
3) An Introduction to Modern Cosmology (2nd ed 2003) - Andrew Liddle
4) Introduction to Cosmology (2003) - Barbara Ryden

See also Ned Wright's superb cosmology tutorial on the web:
http://www.astro.ucla.edu/~wright/cosmolog.htm

Biography-

Brief CV:

Professor Subir Sarkar:

I was educated in India (BSc 1972, MSc 1974, Indian Institute of Technology, Kharagpur; PhD 1982, University of Bombay).

I was a Staff Researcher at the Tata Institute of Fundamental Research, Bombay (1979-84) and subsequently held a series of visiting positions (1984-85 CERN Geneva, 1985-87 University of Oxford, 1987-88, Rutherford Appleton Laboratory, Chilton).

During 1988-89 I left academia to work for an Indian non-Governmental Organisation (Eklavya, Bhopal) which specialises in science education and popularisation.

Since 1990 I have been at the University of Oxford where I was Research Fellow, Lecturer, Reader ... and am now Professor in Physics. I am also on the Adjunct Faculty at the Tata Institute of Fundamental Research, Mumbai.

My research interests are mainly at the interface between astrophysics/cosmology and fundamental physics. I work on theoretical aspects of baryo/leptogenesis, dark matter, cosmological phase transitions, inflation and large-scale structure, neutrino cosmology *et cetera*.

I also participate in two astroparticle experiments - the Pierre Auger Observatory in Argentina and IceCube at the South Pole – which are investigating very high energy cosmic rays and neutrinos.

Presently I am involved with both the European Astroparticle Physics Co-ordination (ApPEC) and the European Research Area network AstroNet, in drafting roadmaps for astroparticle physics and for cosmology. I am also Coordinator of an EU FP6 Marie Curie Research and Training network UniverseNet ("The Origin of the Universe: Seeking Links Between Fundamental Physics and Cosmology")