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Cosmic Information: IT from BIT, from BITS in IT

Prof J. Richard Bond, Canadian Institute for Theoretical Astrophysics, University of Toronto

Date 16 Jan 2012 (Monday)
Time 3:30- 5:00pm
Venue Room 5583 (5/F via Lifts 27-30), HKUST

Abstract:

We consider the Universe to be fundamentally quantum and statistical, the many-paths/many-worlds story. Cosmic Information Theory and Analysis, CITA, is a unifying theme underlying the vast sweep of our current ideas of the Universe and the experiments we use to probe them, ranging from the ultra-early beginnings to our far-future fate. The speaker will describe the intimate entanglement of theory with precision "first-light" and other cosmic data, in particular from the cosmic microwave background satellite Planck and the Andes-based Atacama Cosmology Telescope. Such data are the BITS in IT informing us of the physics that defines the BIT of the Universe accessible to us from which we hope to learn of that vast IT which encodes all Cosmic Information. The mysterious dark energy that drives the cosmic acceleration we observe happening now and its early universe counterpart, inflation, will be a focus.

About the speaker:

J. Richard Bond received his PhD in theoretical physics from the California Institute of Technology in 1979. He then held postdoctoral fellowships at the University of California at Berkeley and Cambridge University. He became an Assistant Professor at Stanford University in 1981. From 1985-1987, he held the position of Associate Professor at both Stanford and the Canadian Institute for Theoretical Astrophysics (CITA) at the University of Toronto. He became a full-time Professor at CITA and the University of Toronto's Physics and Astronomy Departments in 1987. In 2000, he was given the title of University Professor. He served two five-year terms as Director of CITA, from July 1996 to June 2006.

Prof Bond has played a leading role in the Canadian cosmology community over the past two decades. His research contributions have been recognized on numerous occasions and he has been the recipient of many honors and awards, which include: a Sloan Research Fellowship (1985); the E.W.R. Steacie Memorial Fellowship (1988); the Steacie Prize for Natural Sciences (1989); the Carlyle S. Beals Prize from the Canadian Astronomical Society (1995); the Canadian Association of Physicists (CAP)/ Centre de recherches mathématiques (CRM) Prize in Theoretical and Mathematical Physics (1998); the Dannie Heineman Prize for Astrophysics (2002), a joint prize of the American Institute of Physics and the American Astronomical Society; the NSERC Award of Excellence (2003 & 2005); the Gerhard Herzberg Canada Gold Medal for Science and Engineering (2006); an Alexander von Humboldt Research Award (2007); the Killam Prize for the Natural Sciences (2007); and the Gruber Cosmology Prize from the International Astronomical Union (2008). He is also a Fellow of the Royal Society of Canada (1996), the American Physical Society (1998) and the Royal Society of London (2001); an Elected Foreign Honorary Member of the American Academy of Arts and Sciences (2003); and an Officer of the Order of Canada (2005).

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