PHYSICS AND ASTRONOMY
COLLOQUIUM

Dr. Gary Hinshaw

Department of Physics & Astronomy, University of British Columbia

"Taking the Measure of the Universe using Baryon Acoustic Oscillations"

Abstract

Cosmology is the study of the physical universe and the questions being addressed are profound: How old is the universe? How did it begin? How will it end? Is it finite or infinite? Remarkably, these questions are starting to be answered. Thanks to precise observations from an array of new instrumentation, we now know the age of the universe to better than 1%: 13.77 billion years. We know the contents of the universe are dominated by dark matter (24%) and dark energy (71%). Ordinary atomic matter makes up only 4.6% of the universe. To the best of our knowledge, the universe is infinite (or at least very large) and it will continue expanding forever, indeed at an ever faster rate. These conclusions are made possible by our ability to detect and characterize cosmic sound waves, called baryon acoustic oscillations (BAO), that long ago propagated the universe. The BAO place a distinctive imprint in both the cosmic microwave background radiation and in the distribution of galaxies we observe in the relatively nearby universe. I will describe several efforts to measure the BAO and describe what they might still be able to tell us about our universe in the years to com

Wednesday, January 13, 2016
3:00 p.m.
Bob Wright Centre
Room A104