

UNIVERSITY OF TEXAS AT DALLAS - DEPARTMENT OF PHYSICS

PHYSICS COLLOQUIUM

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Wednesday, February 22, 2006; 4:00-5:00 PM
Kusch Auditorium, FN 2.102

Cosmology and the Accelerating Expansion of the Universe

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I will start by a short review of what we have learned from theory and from astronomical observations about the standard cosmological model including the surprising discovery that the expansion of the universe has entered a phase of acceleration. The cosmic acceleration and the physics questions related to it constitute one of the most challenging and important problems in many fields of physics. I will report the progress made on this problem from several recent research studies. A paramount question is to determine if the cosmic acceleration is due to an energy component (dark energy) in the universe or if it is due to a modification in the gravity sector. I will report results on a procedure that we proposed recently and that will answer this question in the near future. This procedure goes one important step further than the previous work and uses a consistency check based on Einstein's General Relativity. I will discuss how we implemented and tested the new procedure using different combinations of simulated data from the Cosmic Microwave Background Radiation, Weak Gravitational Lensing, and Supernova data.

About the speaker: Mustapha Ishak-Boushaki completed his graduate work in 2002 in cosmology and general relativity at Queen's University in Canada. He then worked as a research associate at Princeton University until 2005. He then joined UTD last year where he is building a dynamic group in astrophysics, cosmology and relativity. He received an NSERC research fellowship and served on a National Science Foundation panel. He has worked on several research problems in cosmology and general relativity and has published more than 15 articles in prestigious research journals.