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Statistical challenges of Big Data in astrophysics

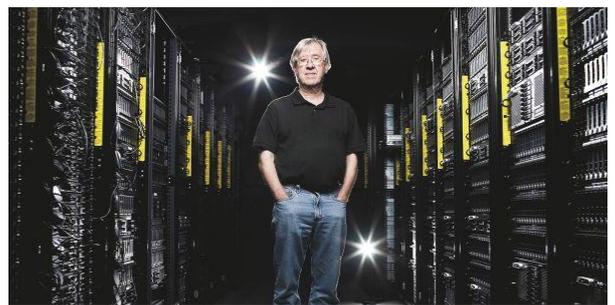


Prof. Alexander Szalay (The Johns Hopkins University)

Dr. Alexander Szalay is the Alumni Centennial Professor of Astronomy at the Johns Hopkins University. He is also a professor in the Department of Computer Science. A cosmologist, he works on the statistical measures of the spatial distribution of galaxies and galaxy formation. He was born and educated in Hungary, and he spent postdoctoral periods at UC Berkeley and the University of Chicago before accepting a faculty position at Johns Hopkins. Szalay was elected to the Hungarian Academy of Sciences as a corresponding member in 1990. He is the architect for the Science Archive of the Sloan Digital Sky Survey and project director of the NSF-funded National Virtual Observatory. He has written more than 340 papers that have appeared in various scientific journals, covering areas such as theoretical cosmology, observational astronomy, spatial statistics, and computer science. In 2003 he was elected as a Fellow of the American Academy of Arts and Sciences. He received an Alexander von Humboldt Prize in Physical Sciences in 2004 and a Microsoft Award for Technical Computing in 2008. He is a Corresponding Member of the Hungarian Academy of Sciences, and a Fellow of the American Academy of Arts and Sciences. In 2008 he became Doctor Honoris Clausa of the Eötvös University.

Abstract

Starting with the Sloan Digital Sky Survey, astronomy has started to collect very large data sets, covering a large part of the sky. Once these have been made publicly available, their analyses have created several nontrivial statistical and computational challenges. The talk will discuss various problems related to spatial statistics, to the analysis a hundreds of thousands of galaxy spectra and novel ways of measuring galaxy distances. In most of these problems scalability is a primary concern. Also, with the cardinality of the data sets the dominant source of uncertainties are shifted from statistical errors to systematic ones. Robust subspace projection can be used to minimize some of the underlying systematics.



All are welcome! Tea, coffee, biscuits will be served at 2:45 P.M.

You are welcome to nominate speakers to Shude Mao (shude.mao@gmail.com), Licai Deng (licai@bao.ac.cn), Xuelei Chen (xuelei@cosmology.bao.ac.cn).