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国台学术报告 NAOC COLLOQUIUM

2015 年 第 19 次 / No. 19 2015

Time: Wednesday 2:30 PM, Jun. 10th Location: A601 NAOC

Black Hole Spin and Relativistic Jets

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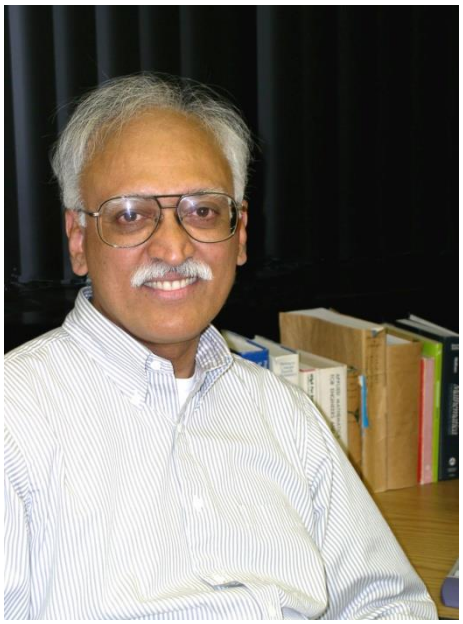

Professor Ramesh Narayan is the Thomas Dudley Cabot Professor of the Natural Sciences at Harvard University. Professor Narayan received a BSc in Physics from Madras University (1971), and an MSc (1973) and a PhD (1979) from Bangalore University. After a few years as a research scientist at the Raman Research Institute, Bangalore, he went in 1983 to Caltech, where he was a Senior Research Fellow. He joined the faculty at the University of Arizona in 1985, and moved to Harvard University in 1991. Professor Narayan has carried out research in a number of areas of theoretical astrophysics, including accretion disks, gravitational lensing, gamma-ray bursts, neutron stars and black holes. Professor Narayan is a Fellow of the Royal Society (London), a Fellow of the American Association for the Advancement of Science, and a Member of the US National Academy of Sciences.

Abstract

Black holes are very exotic objects. At the same time, they are also amazingly simple. An astrophysical black hole is believed to be fully described with just two parameters: mass and spin. A major goal of current research is to relate observational manifestations of black holes to these two intrinsic parameters. Relativistic jets, which are often associated with accreting black holes, e.g., in active galactic nuclei, black hole X-ray binaries, gamma-ray bursts and tidal disruption events, are particularly interesting in this context. Astrophysicists have for long speculated that black hole spin energy might be the energy source behind jets. Two recent advances have strengthened the case. First, numerical general relativistic magnetohydrodynamic simulations of accreting spinning black holes show relativistic jets forming spontaneously. In at least some cases, there is unambiguous evidence that much of the jet energy comes from the black hole, not the disk. Second, spin parameters of a number of accreting stellar-mass black holes have been measured. For ballistic jets from these systems, the radio luminosity of the jet appears to correlate with the spin of the black hole. Although the evidence is still marginal, if verified, it would strongly suggest a causal relationship between black hole spin and jet power.

All are welcome! Tea, coffee, biscuits will be served at 2:15 PM.