

国台学术报告 NAOC COLLOQUIUM

2013 年 第 76 次 / Number 76 2013

TIME: Wednesday, 2:30 PM, Dec. 25 2013 **LOCATION: A135 NAOC**

An accurate and robust new approach for single-epoch black hole mass estimation in AGN



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Hua Feng's main interest is understanding the physics around accreting black holes. He conducts research in high energy astrophysics, mainly in X-ray astronomy and instrumentation. His recent major activity is to develop instruments capable of measuring X-ray polarization at a high sensitivity with various means. He is leading a group in the Department of Engineering Physics dedicated in the development of the photoelectric polarimeter based on gaseous detectors and a soft Bragg polarimeter based on multilayer mirrors. He is developing a short focal length soft X-ray polarimeter that could fit in a small scale satellite. He is also interested in X-ray and optical observations of accreting black holes, trying to identify a new population of black holes with masses intermediate between the stellar-mass and supermassive black holes.

Abstract

I will show preliminary results about a new method that we proposed for black hole mass estimation in AGN with a single-epoch spectrum. The new estimator consists of two luminosities directly extracted from the AGN spectra around the H β region using rectangle filters, and is calibrated against the reverberation-mapped masses with an intrinsic scatter of 0.28 dex. The two luminosities in fact extract virial information, the size and virial velocity of the broad line region, from the AGN spectrum. Compared with traditional single-epoch mass estimators that require broad line width measurements, a significant advantage of this new estimator is that it produces robust, unambiguous, and highly repeatable results even with low signal-to-noise spectra as spectral decomposition is no longer needed. This new method is developed based on an optimization technique, which may have potential applications in many other aspects of astrophysics.



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

You are welcome to nominate speakers to Weimin Yuan (wmy@nao.cas.cn), Mei Zhang (zhangmei@bao.ac.cn), Licai Deng (licai@bao.ac.cn), Xuelei Chen (xuelei@cosmology.bao.ac.cn), Shude Mao (smao@nao.cas.cn)