You are welcome to nominate speakers to colloquium@nao.cas.cn. The video and slides of previous colloquia and more information can be found at http://colloquium.bao.ac.cn/.

国台学术报告 NAOC COLLOQUIUM

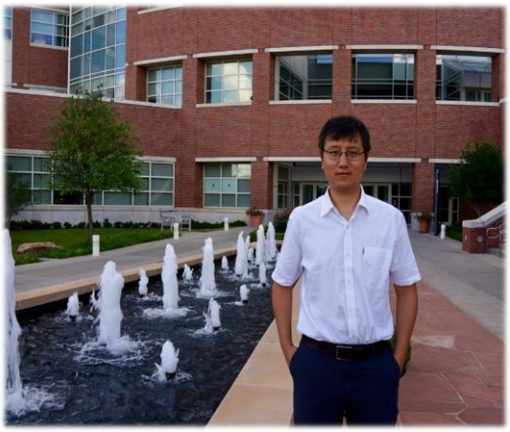
2018 年 第 22 次 / No. 22 2018

Time: Wednesday 2:30 PM, Jun.27th Location: A601, NAOC

Constraining Planet Mass-Scale Objects in Extragalactic Galaxies and Immediate Environment around Supermassive Black Holes with Quasar Microlensing

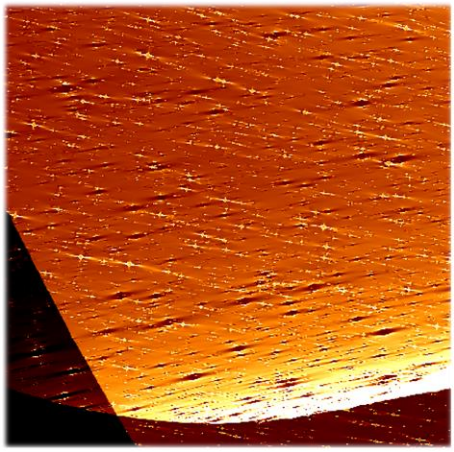
Prof. Xinyu Dai

University of Oklahoma



Prof. Xinyu Dai is a Tenured Associate Professor of University of Oklahoma. He received his BS from Peking University in 1998 and his PhD from the Penn. State University in 2004. He was a Post-doc at the Ohio State University from 2004 to 2008 and University of Michigan from 2008 to 2009. He joined the University of Oklahoma as a Research Scientist in 2009 and then promoted to an Assistant Professor on 2011. His main research interests include extragalactic astronomy, gravitational lensing, microlensing, active galactic nuclei and galaxy clusters.

Abstract



Gravitational microlensing provides a unique probe to study the population of lens objects and the emission region of the innermost parts of quasar accretion disks. We show that the current X-ray observations of microlensing signatures of emission close to the innermost stable orbit are able to constrain the population of lens objects down to planet mass scales. In particular, we found a planet mass fraction to be larger than 0.0001 of the halo mass, which is equivalent to 2,000 unbound objects ranging from Moon to Jupiter mass, free floating between stars, per main sequence star in the lens galaxy of RXJ1131-1231. In addition, two microlensing effects can be used to constrain black hole spins and X-ray reflection regions for high redshift quasars. The first effect is the excess iron line equivalent widths of lensed quasars compared to normal AGN, and the second is the distribution of iron line peak energies of lensed quasars. A microlensing analysis of the iron line equivalent widths prefers high spin values and very steep iron line emissivity profiles for quasars at z~2. I will also discuss the prospect of these sciences in the era of the next generation of X-ray telescopes.

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