

Gas flow patterns in barred galaxies and a potential mechanism to seed massive black holes

沈俊太 研究员 (Shanghai Astronomical Observatory)

2018/05/08, 4pm, the Observatory Hall



Nuclear rings are common features in the inner region of barred galaxies, with their shapes and properties linked to the physical parameters of the galaxies. We use high-resolution hydrodynamical simulations to study gas inflow patterns in barred galaxies, with special attention to the nuclear rings. The location and thickness of nuclear rings are tightly correlated with galactic properties, such as the bar pattern speed and bulge central density. We elaborate the formation mechanism of nuclear rings, and propose a new simple method to estimate the bar pattern speed for barred galaxies possessing such a ring. We also attempt to reproduce and understand the gas features present in the barred Milky Way. In addition, we demonstrate that a bar may provide a self-limiting rapid growth mechanism of massive black holes. The result may have important implications on the seeding of massive black holes in the very high-redshift quasars, and forming massive black holes in disk galaxies without a significant classical bulge.

沈俊太个人简介：中科院上海天文台研究员，国家基金委优秀青年基金获得者，英国皇家学会牛顿高级学者，中科院优秀导师奖获得者。2005 年在美国罗格斯大学获得天体物理博士学位，其博士论文荣获2006年度罗格斯大学Plano博士论文奖。2005年起作为独立博士后（Harlan J. Smith Postdoctoral Fellow）在德克萨斯大学奥斯汀分校进行研究工作。2009年回国工作并入选中科院“百人计划”，并且在百人计划终期评估中被评为优秀。主要研究方向为星系动力学和星系结构，包括银河系、旋涡星系、椭圆星系、超大质量黑洞、暗物质晕的结构演化及相互作用。