

HKU project funded under the NSFC/RGC Joint Research Scheme

Investigating the Properties and Impacts of the Wind Launched from Black Hole Super-Eddington Accretion Flow

Principal Investigator (Hong Kong):

Professor Lixin Dai, Associate Professor, Department of Physics, Faculty of Science

Project Summary:

Recent observations reveal that in the centre of every big galaxy, there is a massive black hole. While these black holes grow via consuming gaseous materials, they also produce bright emissions and powerful outflows. This project will focus on studying how massive black holes produce winds when they consume gas at extremely high rates and how such winds shape the co-evolution of massive black holes and their host galaxies. The collaborative study will be conducted jointly with collaborators at Shanghai Astronomical Observatory (PI: Feng Yuan).

The researchers will conduct a series of advanced general relativistic simulations of black hole accretion and galaxy evolution simulations. Thanks to advanced telescopes such as the James Webb Space Telescope, astronomers can finally start to observe massive black holes in the early universe, which makes this study very timely.

港大「聯合科研資助基金計劃」項目

超愛丁頓黑洞吸積流中的風及其在活動星系核回饋研究中的應用

首席研究員（香港）：

理學院物理學系副教授戴麗心教授

項目簡介：

每個大星系的中心都有一個大質量的黑洞。這些黑洞通過吸積氣態物質而生長，並同時產生明亮的輻射和強大的外流。這個研究計畫將重點研究大質量黑洞如何在以極高的速率吸積氣體時產生風，以及這種風如何影響大質量黑洞及其宿主星系的共同演化。這項合作研究由香港大學的研究小組和上海天文台的合作者（由袁峰領導）共同進行。

研究人員將進行一系列先進的關於黑洞吸積過程的廣義相對論模擬以及星系演化過程的模擬。現在天文學家終於可以使用詹姆斯韋太空望遠鏡等先進望遠鏡來觀測早期宇宙的大質量黑洞，這使得這項研究非常及時。