

Contribution ID: 91

Type: Poster

The X-ray Absorption by the Interstellar Medium in Active Galaxies

Statistical X-ray AGN studies show that the fraction of obscured active galactic nuclei (AGN) increases towards the early universe, indicating that most of the supermassive black hole (SMBH) growth occurs behind large amounts of gas and dust. Models of AGN obscuration by a dusty torus cannot simply account for the increased fraction of absorbed sources, indicating additional obscuring structures surrounding the SMBH. Since galaxies in the early universe have a larger gas fraction and smaller size for the same stellar mass compared to the local universe, it suggests that the evolution of host galaxy interstellar medium (ISM) may be behind the increased fraction of obscured AGN. Since X-ray observations alone cannot distinguish between the gas associated with the AGN structure or the interstellar medium, we use sub-mm observations of the cold dust continuum to estimate the gas mass of more than 100 AGN host galaxies within the survey area of the COSMOS-Web survey. Thanks to the high angular resolution of JWST, we infer the spatial size of the gas mass based on the empirical relationship between sizes of gas and stellar distributions, allowing us to estimate the gas density and Hydrogen column density without relying on resolved CO observations. Here we present our preliminary results on the instance of absorption by the host galaxy ISM among the sample of X-ray detected AGN within the COSMOS-Web region.

Section

Galaxy/Extragalactic

Primary author: VIJARNWANNALUK, Bovornpratch (ASIAA)

Co-authors: CHEN, Chian-Chou (ASIAA); WANG, Wei-Hao (Institute of Astronomy and Astrophysics, Academia Sinica); GAO, Zhen-Kai (ASIAA)

Presenter: VIJARNWANNALUK, Bovornpratch (ASIAA)

Session Classification: Poster-EA