Cosmic Magnetic Field

Hyunjin Cho[1], Dongsu Ryu[1], Ji-hoon Ha[1], Hyesung Kang[2]
[1]*Ulsan National Institute of Science and Technology (UNIST), Korea*
[2]*Pusan National University, Korea*

The Faraday rotation measure (RM) of extragalactic radio sources is one of tools that can explore the magnetic field in the cosmic web. We have investigated the statistical properties of the RM using the data of simulations for the large-scale structure formation of the universe. Various modelings for the cosmic magnetic field including the redshift dependence, and the intrinsic RM of radio sources have been considered. We here present the structure functions (SFs) of simulated RMs for small angular separations, and compare the SFs with observations, specifically those from the NRAO VLA Sky Survey (NVSS) and LOFAR Two-Metre Sky Survey (LoTSS). We then discuss the implications of our work.

[박 GC-03] Radiative Transfer in Highly Thick Media through Rayleigh and Raman Scattering with Atomic Hydrogen

Seok-Jun Chang
Sejong University

Hydrogen is the most abundant element in the universe, which is, in the cosmological context, attributed to its simplest structure consisting of a proton and an electron. Hydrogen interacts with an electromagnetic wave in astrophysical environments. Rayleigh scattering refers to elastic scattering, where the frequencies of the incident and scattered photons are the same. Rayleigh and resonance scattering is a critical role study Lyman Alpha objects in the early universe. The scattering causes the frequency and spatial diffusion of Lyα. In the case of Raman scattering, the energies of the incident and scattered photons are different. The photons near Lyβ convert to the optical photons near Hα through Raman scattering. The photon scattered by atomic hydrogen can carry both of the properties of the H I region and the emission region. I adopt a Monte Carlo approach to investigate the formation of the various spectral line features through Rayleigh and Raman scattering in highly thick media of atomic hydrogen. In this thesis, I present my works on radiative transfer involving the scattering processes between far UV photon and atomic hydrogen. I introduce scattering processes with atomic hydrogen and the spectral, spatial, and polarized information originating from the scattering.

[구 GC-04] Testing delayed AGN feedback using star formation rate measurements by SED fitting with JCMT/SCUBA-2 data

Changseok Kim[1], Yashashree Jadhav[1], Jong-Hak Woo[1,2], Aeree Chung[3], Junhyun Baek[3], Jeong Ae Lee[1], Jaejin Shin[1, 4], Ho Seong Hwang[1,2], Rongxin Luo[1], Donghoon Son[1], Hyungi Kim[1], Hyuk Woo[1]
[1]*Astronomy Program, Department of physics and Astronomy, Seoul National University*
[2]*SNU Astronomy Research Center, Seoul National University*
[3]*Department of Astronomy, Yonsei University*
[4]*Department of Astronomy and Atmospheric Sciences, Kyungpook National University*

The impact of AGN on star formation is one of the main questions in AGN-galaxy coevolution studies. However, direct evidence of AGN feedback is still rare. One of the main obstacles is that various star formation rate (SFR) indicators are contaminated by AGN contribution. We present IR-based SFR measurements of a sample of 52 local ($z<0.3$) AGNs, which were selected based on kinematical properties of ionized gas outflows, using SED analysis with JCMT/SCUBA-2 data. First, we will compare IR-based SFR with other SFR indicators to check the reliability of the SFR indicators. Second, we will discuss the contribution of Mid-IR emission from hot dust of AGN torus by comparing SED fitting results with and without including AGN dust component. Finally, we will report the correlation between specific SFR (sSFR) and AGN activity (e.g., outflow strength or Eddington ratio) as evidence of no instantaneous feedback and discuss the implications of these results

[구 GC-05] Preparing for low-surface-brightness science with the Rubin Observatory: characterisation of LSB tidal features from mock images

Garreth W. Martin[1,2]
[1]*KASI,* [2]*University of Arizona*

Minor mergers leave behind long lived, but extremely faint and extended tidal features including tails, streams, loops and plumes. These act as a fossil record for the host galaxy's past interactions, allowing us to infer recent accretion histories and place constraints on the properties and nature of a galaxy's dark matter halo. However, shallow imaging or small homogeneous samples of past surveys have resulted in weak