R02a **Physical conditions in the nuclear region of NGC 1614 revealed with ALMA**

安藤未彩希 (総研大/国立天文台), 伊王野大介 (総研大/国立天文台), 斉藤俊貴 (東大), 植田準子 (CfA), 道山知成 (総研大/国立天文台)

The interaction between gas-rich galaxies plays a fundamental role in the evolution of galaxies. This process triggers starburst and merging galaxies often become bright in IR luminosities. Since the role of the molecular gas in this mechanism is crucial, quantifying the physical condition of ISM is important for understanding mergers and galaxy evolution. Here we present high resolution ($\sim$ 1": $\sim$310 pc) Atacama Large Millimeter/submillimeter Array (ALMA) line data of ^{12}CO(J=1-0, 2-1) and ^{13}CO(J=1-0, 2-1) in NGC 1614, which is a local luminous infrared galaxy and thought to be a late-stage merger. The differences in the distribution of these lines come from the differences in the excitation conditions and/or relative abundance ratio. By solving radiative transfer equation under the assumption of large velocity dispersion condition, we estimate the physical condition, such as kinetic temperature, H_2 number density and column density of each molecule, at several regions within the galaxy. We find that the molecular gas is cold ($\sim$ 40 K) and dense ($> 10^3$ cm^{-3}) around the starburst ring, and becomes more diffuse at the outer regions. In addition, it is known that the ratio of low-J ^{12}CO/^{13}CO lines in luminous mergers is higher than normal spiral galaxies. We show the ^{12}CO/^{13}CO(J=1-0, 2-1) ratio maps and suggest an interpretation of their relation to interaction events.