P146a MAGellanic Outflow and chemistry Survey (MAGOS): the Power of LMC Protostellar Outflows

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Star-forming environments have changed dramatically throughout cosmic history, and it is a fundamental question to understand whether or not star formation processes are universal or diverse in such varied environments. In particular, metallicity is an essential environmental difference between the early universe and the present-day Milky Way. However, so far, observational studies of individual star formation in sub-pc scales are primarily limited in the solar-metallicity Milky Way's disk. In order to investigate the dynamics and chemistry in low-metallicity star formation, we started a new project called "MAGellanic Outflow and chemistry Survey (MAGOS)." In this talk, we will present the scope of the MAGOS project and the first science results on LMC protostellar outflows. We target 40 massive protostars (> $10^4 L_{\odot}$) in the low-metallicity nearby dwarf galaxies, the Large and Small Magellanic Clouds (LMC and SMC), with the 0.1-pc resolution observations by ALMA Band 7. We analyze the outflow properties (mass, momentum, and energy) of the first obtained 30 LMC protostars using the CO (3–2) line. The LMC outflow properties are statistically consistent with the Milky Way ones, suggesting the universality of star-formation dynamics in those two metallicity environments with $\sim 0.5 Z_{\odot}$ and $\sim 1 Z_{\odot}$.