

Ices in star-forming regions: the role of metallicity

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Understanding properties of interstellar medium in diverse metallicity environments are crucial to reveal the formation and evolution history of cosmic materials from the past metal-poor galaxies to the present metal-rich galaxies. In dense and cold molecular clouds where stars are formed, the formation of ices on dust surfaces plays a central role for physical and chemical evolution of interstellar medium. To elucidate a possible link between properties of dense molecular clouds and the cosmic time evolution, it is necessary to understand characteristics of ice chemistry as a function of galactic metallicity and related environmental factors. In this talk, I will review recent observational and theoretical studies of ices in various metallicity environments ranging from the Galactic center to nearby low-metallicity dwarf galaxies (the Large and Small Magellanic Clouds), and discuss the role of galactic metallicity on physical and chemical processing of ices in star-forming regions.