

Transformation and sublimation of interstellar ices: insights from laboratory experiments and astronomical observations

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 www.youtube.com/AstronomicalAGUSP/live



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Abstract

To date, over 320 molecules have been detected in the interstellar medium, the majority of which are organic in nature. Many of these species either form or condense on dust grains, creating icy coatings that harbor a rich chemical inventory; from simple diatomic molecules to complex prebiotic organics. As clouds evolve into disks, these ices undergo various transformations that shape what molecules are available for incorporation into planetary bodies. This raises two fundamental questions: which ingredients survive this interstellar journey? and in what state are they available for forming planets and planetesimals? The answers rely on understanding the physicochemical processes that govern ice evolution,

achievable only by combining astronomical observations, which constrain the molecular history of interstellar space, with laboratory experiments that elucidate the mechanisms behind these observations. In this talk, I will highlight how vacuum cryogenic experiments on interstellar ice analogues work in synergy with observations from state-of-the-art telescopes such as ALMA and JWST to advance our understanding of the chemical evolution of volatiles in star- and planet-forming regions.