

Sinergy of VUV and X-ray radiation

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Young stars are powerful emitters of VUV and X-ray radiation. The chemistry of inter- and circum-stellar ices has been extensively studied in the VUV regime, with less focus on X-ray radiation. This work investigates the combined effects of VUV and X-ray radiation on interstellar ices, particularly in terms of chemistry and photo-desorption.

To evaluate the synergy of both energy sources in a proto-planetary disk, we conducted single-source irradiation experiments using either VUV or X-ray radiation, as well as simultaneous VUV and X-ray irradiation. These experiments mimic the photon emission of a young star. We used a microwave-discharge hydrogen-flow lamp (MDHL) as VUV source and X-ray energies of 300, 550, and 900 eV. These experiments were performed at the national synchrotron radiation research center (NSRRC) in Taiwan.

The results obtained provide insights into the mechanisms and comparative effects of these distinct irradiation sources on circum-stellar ice analogues. They reveal how these sources influence the chemistry of the ice and the subsequent photo-desorption yields.