

Molecules and planets in the outer Galaxy: is there a boundary of the Galactic Habitable Zone?

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Galactic habitable zone from the perspective of phosphorous enrichment

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Phosphorus (P) is one of the vital elements for life. So, it is important to know how P abundance changes with place and time in the Galaxy for the discussion of habitability. So far, it was considered that core-collapse supernovae are the major production site of P.

However, the observed P abundances of Galactic stars have challenged this hypothesis. Recently, a new model for the chemical evolution of P is proposed and shows a good agreement with the observations. This new theory claims novae originated from massive white dwarfs, i.e., ONe novae, as the major P site, and predicts a high production of P in low-metallicity environments. Accordingly, the outer disk must possess the high fraction of P among metals, as implied from the recent observation of gaseous abundances, which might raise the potentiality of habitability there

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