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PAHs trace the molecular gas in star-forming galaxies

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We present new CO(1-0) line observations of 34 infrared-selected PAH emitters at intermediate redshift ($0.01 \leq z \leq 0.3$) to investigate the connection among the PAH emission, the total gas content, and the star formation rate in normal and starbursting galaxies. Combined with observations from the literature at low and high redshift, our analysis reveals a universal, tight, and linear PAH-CO relation independent of redshift and star formation efficiency, suggesting that the emission from PAHs is strongly correlated with the cold diffuse gas. We also find a strong correlation between the PAHs and the cold dust emission, which is another reliable gas tracer independent of CO. Based on our results, we propose the use of PAHs as a proxy for the molecular gas content in star-forming galaxies at all redshifts. As PAHs will be routinely detected with the upcoming launch of JWST, they will serve as a useful tool to investigate the cold gas properties of high-z galaxies up to $z \sim 3$.

Consider for a poster?

Yes

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Session Classification: Poster Presentations

Track Classification: Dust as a tool