

Dust in the Local Interstellar Medium

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Interstellar dust has been observed in the low density partially ionized very local interstellar medium (ISM), and inside of the heliosphere. The grains flowing into the heliosphere provide a unique glimpse of the size distribution of the dust. The existence of large interstellar grains inside of the heliosphere, radii $\sim 1 \mu\text{m}$, suggests that the Local Interstellar Cloud (LIC) was once much denser, perhaps part of a molecular cloud ¹. Comparisons between the solar composition and the inferred gas-phase abundances of Fe, Mg and Si in the LIC provide insights into the composition of the grains and the gas-to-dust mass ratio in the cloud. The depletion pattern in the LIC is consistent with grains that are olivines. Discrepancies between the apparent total gas plus dust abundances and solar abundances lead us to speculate that the local population has been enriched by larger grains with a history that may be independent of that of the smaller grains ^{3,2}. Dust grains in the local ISM are magnetically aligned, giving a separate diagnostic of both the local magnetic field and grain properties.

References

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