

Extra-Galactic Diffuse Interstellar Bands

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Abstract. Diffuse Interstellar Bands (DIBs) have been observed ubiquitously along many sight-lines probing the interstellar medium of the Milky Way. Despite extensive efforts, their carrier(s) have not yet been identified, although they are very likely of a carbonaceous nature and reside in the gas phase. Possible candidates include, but are not limited to, polycyclic aromatic hydrocarbons (PAHs), fullerenes and carbon chains.

To advance our understanding of DIB behaviour and thus DIB carrier properties we need to study environments inherently different from those observed in the Milky Way. Only recent advances in instrumentation and telescope capabilities are providing us with new exciting possibilities for extra-galactic DIB research.

We present here a selection of our recent observational results for (extra)-galactic DIBs in the Local Group and beyond. In particular, DIBs in the Magellanic Clouds and in the spiral galaxy NGC 1448. These first results show surprising similarities between certain DIB profiles as well as differences in DIB behaviour.

Understanding diffuse cloud chemistry, in particular with respect to complex (carbonaceous) molecules, is crucial to any DIB carrier identification. In this respect, external galaxies offer a unique window as they exhibit local interstellar conditions (such as metallicity, UV-field and gas-to-dust ratio) very different from those observed in the Milky Way. We discuss briefly the effect of metallicity and the gas-to-dust ratio on the physico-chemical properties of diffuse clouds and the subsequent effects on the PAH charge state distribution and the DIB carriers.

Keywords. Astrochemistry – Extra-Galactic ISM: clouds – ISM: molecules – ISM: lines and bands – ISM: molecular processes

References

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