Electronic spectroscopy of molecules of astrophysical interest

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PROPOSITIONS
accompanying the thesis

Electronic Spectroscopy of Molecules of Astrophysical Interest

Towards improving our knowledge of the DIB carriers

1. Coupling a fast, wide-wavelength-coverage spectrometer to a high-resolution measurement scheme (and adding a mass detector) is a good way of efficiently surveying the vast search space of potential diffuse interstellar band (DIB) carriers.

   Chapter 2

2. In the context of DIB research, high-resolution electronic spectroscopy provides molecular parameters which can be used for simulating the spectra of molecules under interstellar conditions.

   Chapters 3 & 4

3. Previously reported cosmic ray ionization rates will need an update using improved OH^+ oscillator strengths and model parameters.

   Chapter 5

4. The claim of detecting the weaker interstellar C_{60}^+ DIBs using ground-based observations (Walker et al. 2016, ApJ 831:130) requires an independent validation, preferably through space telescopes (Cordiner et al. 2019, ApJL 875:L28).

5. Species involved in the formation and fragmentation of C_{60}^+ might well be the missing pieces of the DIB puzzle.

6. Experimentation will be the final arbiter in solving the DIB enigma.

7. Astronomy research begins with a spectroscope.

8. The available space between upper limits and wishful thinking has a clear upper limit.

9. It takes experience to know when something is good enough.

10. Scientists have the obligation of engaging the public who are fellow stakeholders of the natural world.

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