The infrared spectrum of massive protostars: circumstellar disks and high mass star formation

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Propositions accompanying the thesis

The Infrared Spectrum of Massive Protostars

Circumstellar Disks and High Mass Star Formation

1. Absorption lines at mid-infrared wavelengths of massive young stellar objects probe viscously heated circumstellar disks (Chapters 3, 4 and 5).

2. An ortho-to-para ratio less than three for C_2H_2 is an indication of probing a circumstellar disk atmosphere (Chapters 3 and 5).

3. A foreground origin for the absorbing gas of AFGL 2136 requires partial covering which varies with wavelength in such a way that HCN and C_2H_2 cover the background source more than H_2O (Chapters 4 and 5).

4. Full spectral surveys of star forming regions, in the 3-13 μm region at high spectral resolution, offer the possibility to detect hundreds of transitions of astrophysically interesting molecules (Chapters 3, 4 and 5).

5. High spectral resolution SOFIA/EXES observations will be very helpful in guiding upcoming studies with JWST.

6. The development of good atmospheric models, and the expansion of infrared molecular databases to more astrophysically relevant molecules, are essential to furthering ground-based astronomy at infrared wavelengths.

7. More appreciation should be given to how religious faith and science stimulate one another, rather than contradict or oppose one another.

8. Scientists will never answer all of the questions that are out there. Science will be a never ending quest.

9. Speaking the language of the country that you live in is very important for integrating well and feeling at home there.

10. PhD supervisors are happiest when they are in California.

Andrew G. Barr