

Watson and the Polarization of Interstellar Molecular Lines

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After moving on from his pioneering work in ion-molecule astrochemistry, Bill Watson worked on the theory of polarization of interstellar molecular lines, including masers. He was the world leader in this area. I will describe his work on the theory of linear polarization of quasi-thermally excited molecular lines from the general interstellar medium and how this work has been applied to improve our understanding of interstellar magnetic fields and their role in the evolution of molecular clouds and star formation. This is an area that will explode once CARMA and especially ALMA polarization mapping is possible. Bill also worked on the polarization of interstellar masers. I will briefly describe his contributions in three areas: limitations of the applicability of the classic Goldreich, Keeley, and Kwan solutions, inferring the strength of the magnetic field from the circular polarization when the Zeeman splitting is much less than the spectral bandwidth (such as in SiO masers), and the significance of the absence of components of the Zeeman triplet in the spectra of OH masers in regions of star formation.