Spectropolarimetry: deciphering the magnetism of the Sun and stars

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It is well known to this audience that spectropolarimetry remains the only method capable of providing quantitative and reliable information about magnetic fields. For over a century, the analysis of the Sun's polarised spectrum has unveiled a wealth of physical mechanisms governing the interaction between solar plasma and magnetic fields. This includes the discovery of the magnetic nature of sunspots, the solar magnetic cycle and its polarity reversals, and the presence of small-scale, chaotic magnetic fields even in the quietest regions of the solar atmosphere. In this talk, I will present how spectropolarimetric observations have advanced our understanding of the Sun's magnetic field, with a particular focus on my research field. I will also highlight how this work helps bridge our solar knowledge to the study of magnetic fields in other stars.