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A New Dawn : Mathematical Modelling of the Sun's atmosphere

Dr James McLaughlin

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Abstract:

Magnetohydrodynamics (MHD) unites two disciplines: electromagnetism and fluid dynamics. The Sun acts as a unique laboratory for illustrating astrophysical magnetohydrodynamics, and I am interested in applying the MHD equations to various problems in solar and astrophysical plasmas. I have a particular interest in MHD wave behaviour in inhomogeneous media. My current research involves numerical modelling of MHD wave activity in solar active regions and solar plumes, along with their comparison to satellite data. This talk will cover the fundamental equations of magnetohydrodynamics, illustrate their surprisingly rich structure, and demonstrate mathematical modelling of solar phenomenon.