

School of Physical Sciences Seminar

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Protoplanetary disks, the magnetorotational instability and multifluid magnetohydrodynamics

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Abstract:

The magnetorotational instability (MRI) is likely to play an important role in the evolution of protoplanetary disks through generating turbulence which, in turn, allows accretion through the disk to proceed. The inclusion of non-ideal, or multifluid, MHD effects has a significant impact on this process. I will discuss the recent results of global multifluid simulations of protoplanetary disks which examine, for the first time, the role of all three non-ideal effects (ambipolar diffusion, the Hall effect and parallel resistivity) on the non-linear evolution of the MRI in weakly ionised protoplanetary disks in the region where the Hall effect is believed to dominate.