



## **Gyrokinetic theory and simulations of the turbulence in the solar wind**

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I will outline gyrokinetics and argue that it is both the most promising and physically appropriate theoretical framework for studying the magnetised plasma turbulence in the solar wind - both in the inertial and dissipation ranges. I will introduce the concept of kinetic cascade and show how the more familiar cascades of Alfvén waves, density fluctuations, kinetic Alfvén waves etc. fit into the correct unified theoretical description. I will also present preliminary results of gyrokinetic and hybrid fluid-kinetic simulations of the turbulence in the solar wind. They are successful in capturing the main observed features: the Kolmogorov scaling in the inertial range, the spectral break around the ion gyroscale, the secondary cascade in the dissipation range, etc.