Thesis Proposal for the Master's Degree in Physics

Title: Characterization of kinetic properties of the plasma around interplanetary shock waves

Abstract (max 10 lines): Interplanetary shocks propagating in the heliosphere are one of the major sources of energetic particles. They compress the plasma and locally modify the turbulent properties of both magnetic and velocity fields. While the large scale properties of such structures have extensively been studied, how shocks influences the dynamics at the scale of the gyromotion of thermal ions is still under debate. In particular, such small scales are typical of the shock transition layer size, whose internal structure cannot be trated as a thin discontinuity at the scales of thermal ions. We propose to investigate, by means of Solar Orbiterand MMS observations, the characteristic of the distribution functions of ions in the environment close to interplanetary shock waves.

Supervisor(s): Silvia Perri, Denise Perrone

E-mail(s): silvia.perri@fis.unical.it

Laboratory where the thesis is carried out: AstroPlasmiLab

Any participating external structures: Italian Space Agency (ASI)

Type of thesis: research (data analysis)