**Observable signatures of plasmoid-dominated magnetic reconnection in relativistic astrophysical plasmas**

Benoît Cerutti (IPAG)

Reconnection is a fundamental plasma physics process during which the magnetic field topology changes rapidly. This process provokes an efficient conversion of magnetic energy into heat and non-thermal particle acceleration within thin current sheets. It is generally accepted that magnetic reconnection is fast thanks to the fragmentation of current sheets by the tearing mode. This instability leads to the formation of multiple reconnection sites and a broad range of plasmoid size, ranging from microscopic kinetic scales up to macroscopic system-size scales. Using particle-in-cell simulations and a hierarchical merging model for the plasmoid growth, I will show that the largest plasmoids could have very concrete observable signatures in relativistic plasmas surrounding neutrons stars and black holes: from subpulse emission in pulsar lightcurves, to bright knots in pulsar wind nebulae, and hot spots in horizon-scale images of black hole magnetospheres.