Session: CT Stochastic processes 1
Date/time (Location): 9/9/2015, 2:30:00 PM–4:00:00 PM (TBC4)

Title: On a link between novel ensembles of random matrices and systems of self-driven particles

Author(s): Milan Krbalek (Czech Technical University)

Email: milan.krbalek@fjfi.cvut.cz

Abstract: Stochastic analysis of individual quantities measured in various systems of self-driven particles (agents: walkers, drivers, birds) reveals many common features. Indeed, statistical distributions of headways among succeeding agents as well as the statistical rigidity in those systems show significant mathematical similarities. Such a striking resemblance is not accidental, although each of those systems is ruled by a different level of mutual agent repulsions/attractions or a different level of stochasticity. Thus, to what extent are these distributions affected by the interaction rules? We will present (by means of novel classes of random matrices) a general scheme of agent dynamics producing the same statistical micro-distributions as those revealed in empirical data. Non-triviality of that correspondence will be confirmed by testing of associated statistical rigidities.