Abstract

In this talk, I will discuss SPDEs of fluid type featuring pseudo-differential noise (non-local in the spatial variable) and mean-field (non-local in the sample variable), respectively. In the case of pseudo-differential noise, we have uncovered certain cancellation properties inherent to pseudo-differential operators, which play pivotal roles in establishing the existence of solutions. Concerning mean-field dynamics, unlike classical SDEs/SPDEs, relying solely on stopping time techniques does not guarantee uniqueness. We have identified a new localized topology on measures that enables us to address this issue. Additionally, we have established abstract frameworks for each of these scenarios. To conclude, I will discuss some recent results and open problems in this field.