

Title: *On intrinsic differentiability in the Wasserstein space $\mathcal{P}_2(\mathbb{R}^d)$.*

Abstract: We elucidate the connection between different notions of differentiability in $\mathcal{P}_2(\mathbb{R}^d)$: some have been introduced intrinsically by Ambrosio–Gigli–Savaré, the other notion due to Lions, is extrinsic and arises from the identification of $\mathcal{P}_2(\mathbb{R}^d)$ with the Hilbert space of square-integrable random variables. We mention potential applications such as uniqueness of viscosity solutions for Hamilton-Jacobi equations in $\mathcal{P}_2(\mathbb{R}^d)$, the latter not known to satisfy the Radon–Nikodym property. (This talk is based on a work in progress with A Tudorascu).