"Existence and uniqueness of solutions of the semiclassical Einstein equation in cosmology"

In this talk we consider a massive scalar quantum field with generic coupling to the scalar curvature on a cosmological background. The backreaction of the scalar field to the spacetime metric is described by the semiclassical Einstein equation and we discuss the existence and uniqueness of solutions of this system. We observe that a nonlocal term with higher order derivatives is present in the expectation value of the matter stress tensor which sources gravity. This term prevents a direct analysis of the system, we show how to deal with it in order to put the semiclassical equation in the form of a fixed point equation, which can then be treated with Banach fixed point theorem.