

## MP 15: Quantum Field Theory: Renormalization

Time: Thursday 14:00–14:50

Location: H6

MP 15.1 Thu 14:00 H6

**A Rigorous Derivation of the Functional Renormalisation Group Equation** — ●JOBST ZIEBELL — TPI, Jena, Deutschland

The functional renormalisation group equation is derived in a mathematically rigorous fashion in a framework suitable for the Osterwalder-Schrader formulation of quantum field theory. To this end, we devise a very general regularisation scheme and give precise conditions for the involved regulators guaranteeing physical boundary conditions. Furthermore, it is shown how the classical limit is altered by the regularisation process leading to an inevitable breaking of translation invariance. We also give precise conditions for the convergence of the obtained theories upon removal of the regularisation.

MP 15.2 Thu 14:25 H6

**Perturbative Renormalization in Combinatorially Non-local Field Theory** — ●JOHANNES THÜRIGEN — WWU Münster

Renormalization in local quantum field theory relies on the possibility to subtract all subdivergences in a Feynman diagram as described for example by Zimmermann's forest formula or the Connes-Kreimer Hopf algebra. Here we show how this can be generalized to field theories with combinatorially non-local interactions such as matrix or tensor field theories. In particular, this gives a general recipe for renormalization of various field-theory approaches to quantum gravity.