

## MP 12: Tensor Networks I

Time: Wednesday 15:40–16:00

Location: H-HS I

MP 12.1 Wed 15:40 H-HS I

**Algebraic structure of renormalization in tensorial field theories** — •JOHANNES THÜRIGEN — Mathematisches Institut der Westfälischen Wilhelms-Universität Münster

Quantum field theories on non-commutative geometry have recently been found to be solvable non-perturbatively in a matrix-theory representation. Tensorial field theories are a generalization of such matrix field theory to higher rank and specific models are candidates for a quantum theory of gravity. It is therefore an important question to

what extent non-perturbative solutions can be obtained in such field theories as well. I address this challenge making use of the algebraic structure of renormalization. I will derive the Hopf algebra of Feynman diagrams for such non-local field theories giving rise to Dyson-Schwinger equations. This is the first step towards identifying the conditions for solving tensorial field theories non-perturbatively. Control over the non-perturbative regime is an open issue of huge physical interest since the limit to continuum space-time coincides with the limit to critical loci in such approaches to quantum gravity.