MP 7: Quantum Field Theory II

Zeit: Dienstag 14:55–15:55 Raum: 30.45: 201

MP 7.1 Di 14:55 30.45: 201

The BV formalism applied to classical gravity — •Katarzyna Rejzner — 2. Institut für Theoretische Physik, Hamburg, Deutschland

I will give an interpretation of the BV operator which is based on infinite dimensional differential geometry. Using this mathematically precise formulation one can apply the BV method in the functional approach to classical and quantum field theory. As an example I will discuss general relativity in the framework of locally covariant field theory.

MP 7.2 Di 15:15 30.45: 201

Defektformierung in der Quantenfeldtheorie — Jürgen Berges und •Stefan Roth — TU Darmstadt, Deutschland

Abstract: We propose a quantum approach to nonequilibrium dynamics which combines the successful aspects of classical-statistical simulations on a lattice with the ability to take into account quantum corrections. It is based on the 2PI effective action for inhomogeneous fields and a volume average. This procedure does not involve any double counting which could appear in sampling prescriptions for inhomogeneous quantum evolutions. As an example, we study nonequilibrium dynamics of defect formation in $1 + 1$ dimensional relativistic scalar field theory and compare to insufficient descriptions based on homogeneous quantum fields. (arXiv:hep-ph/1012.1212)

MP 7.3 Di 15:35 30.45: 201

Renormalization with Flow Equations and the ABJ anomaly — •Benjamin Leveque and Christoph Kopper — Centre de Physique theorique, Ecole Polytechnique

We study the renormalizability of axial abelian gauge theory within the flow equation framework in which the theory is regularized in a way which does not respect gauge-invariance but permits to rigorously apply Euclidean path integral methods.

On the one hand we prove renormalizability in the weak sense of power counting; on the other hand we analyse the Slavnov- Taylor-identities of the theory to show that these cannot be restored after taking away the regulators as has been proven in the case of non-anomalous theories like QED. We insist on the relation between the anomaly and the infrared problem for theories with massless particles. We have no evidence that the anomaly is related to the transformation properties of the integration measure in the path integral as is sometimes asserted in the literature but rather to the properties of triangular diagramme analysed by Adler and followers.