



**UNIVERSITÄT
BIELEFELD**



Faculty of Physics



Faculty of Mathematics

Colloquium Mathematical Physics

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Universität Regensburg

Causal Fermion Systems and Unitary Group Integrals

The theory of causal fermion systems is an approach to describe fundamental physics. It gives quantum mechanics, general relativity and quantum field theory as limiting cases and is therefore a candidate for a unified physical theory. Moreover, causal fermion systems provide a general framework for modelling and analyzing non-smooth spacetime structures. The dynamics of a causal fermion system is described by a nonlinear variational principle, the causal action principle.

In the talk I will give a non-technical introduction. Then I will define the quantum state of a causal fermion system. Its computation involves unitary group integrals. I will show the different integrals and explain the scaling limit which we are interested in. I am reporting on joint work with Niky Kamran and Moritz Reintjes.

Friday, January 13, 2023 16:15 hrs

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