

## CONDENSED MATTER THEORY SEMINAR

Subject: **Hidden Fermion Slater determinant wavefunctions for time evolution and SYK like models**

Speaker: **Björn Jakob Wurst (RWTH Aachen)**

Date & time: **April 5<sup>th</sup>, 2024 (Friday) @15:15**

Venue: **Phys 01.114**

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### Abstract:

The recent surge in interest in neural network quantum states (NQS) has led to great progress in the realm of variational ground state finding algorithms [1]. NQs have been demonstrated to capture ground states of some complex volume law scaling models, such as the Mott transition in a random hopping Hubbard model [2]. Still, time evolution remains a challenging task. In this talk we will first introduce the Hidden Fermion Slater determinant wavefunction ansatz [3] and explain how we can harness its expressive power for ground state search and time evolution. We then proceed by linking SYK like models to time evolution - highlighting that challenges for one transfer to the other. We introduce the entropy as adequate measure of how well we can represent ground states and time evolution. Further, we provide an understanding of why and when models become hard to solve for this type of approach.

[1] Matija Medvidović, Javier Robledo Moreno arXiv:2402.11014

[2] Chloé Gauvin-Ndiaye et. al arXiv:2311.05749

[3] Javier Robledo Moreno et. all arXiv:2111.10420v2