"Numerical Challenges in Lattice QCD 2022" – Welcome to Meinerzhagen!

A. Frommer, M. Günther, F. Knechtli, M. Peardon, S. Schaefer

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The Research Unit

- The framework is the Research Unit "Future methods for studying confined gluons in QCD" (FOR 5269) funded by the Deutsche Forschungsgemeinschaft (DFG)
- This workshop marks its official start!
- Web-page https://confluence.desy.de/display/for5269
- Four projects, principal investigators: Andreas Frommer (Applied Informatics, Wuppertal), Michael Günther (Applied Mathematics, Wuppertal), Francesco Knechtli (Theoretical Physics, Wuppertal), Stefan Schaefer (Theoretical Physics, DESY), cooperation partner: Mike Peardon (Mercator Fellow, Theoretical Physics, Dublin)
- Challenges:
 - high computational cost of the quark dynamics in the Monte Carlo sampling process of Lattice Quantum Chromodynamics (QCD)
 - severe statistical fluctuations in Monte Carlo estimates used to study confined gluons (charmonium, glueballs, ...)

¹²⁷ develop new techniques with a robust mathematical foundation

- Exchange of ideas and progress between mathematicians and physicists
- Topics:
 - Multi-level algorithms
 - Numerical solvers
 - Stochastic trace estimation
 - Numerical integration
 - Machine learning

and their interplay to solve challenges of physical problems in lattice QCD

- Format: 18 talks (mostly 30 minutes + 10 minutes discussion), podium discussion on Tuesday afternoon
- Thanks for coming and contributing to "look over the edge"!