



**UNIVERSITÄT
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Applications of Gaussian Process Emulators in the context of the RHIC BES program

In this talk, I will explore the applications of Gaussian Process (GP) emulators in the context of the RHIC Beam Energy Scan (BES) program. One key application is their use in combination with Bayes' theorem to extract Quark-Gluon Plasma (QGP) transport properties through high-fidelity model simulations within the iEBE-MUSIC framework. I will demonstrate how varying precision in GP emulators impacts the extracted posterior distributions, introducing additional sources of uncertainty in the determination of QGP transport properties.

Additionally, I will give an outlook on how GP emulators can eliminate the need for parametrizations when estimating QGP transport properties. Specifically, I will show how these emulators may be employed to derive the QCD equation of state using a data-driven approach, particularly in cases where first-principles guidance is lacking, such as at finite baryon chemical potential.

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14:15

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