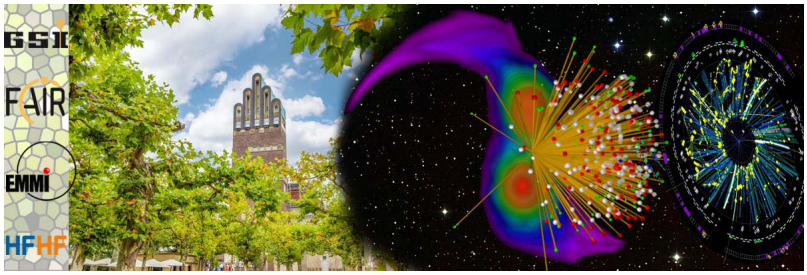

Contribution ID: **62** Type: **Oral**

Nuclear EOS for arbitrary proton fraction and temperature based on chiral EFT and a Gaussian Process Emulator

Thursday, 21 September 2023 08:30 (30 minutes)

We present results for the equation of state of asymmetric nuclear matter at finite temperature based on chiral effective field theory interactions to next-to-next-to-next-to-leading order. Our results assess the theoretical uncertainties from the many-body calculation and the chiral expansion. Using a Gaussian process emulator for the free energy, we derive the thermodynamic properties of matter through consistent derivatives and use the Gaussian process to access arbitrary proton fraction and temperature. This enables a first nonparametric calculation of the equation of state in beta equilibrium, and of the speed of sound and the symmetry energy at finite temperature. Moreover, our results show that the thermal part of the pressure decreases with increasing densities.

Primary authors: KELLER, Jonas (TU Darmstadt); Prof. SCHWENK, Achim (TU Darmstadt); HEBELER, Kai (TU Darmstadt)

Presenter: HEBELER, Kai (TU Darmstadt)

Session Classification: Microscopic calculations of neutron-rich, dense nuclear matter

Track Classification: Microscopic calculations of neutron-rich, dense nuclear matter