



Mathematics and CS Seminar

Failure of Ornstein-Zernike asymptotics for models with exponentially decaying interactions

Sébastien Ott (University of Geneva)

Host: M. Beiglböck, N. Berestycki, L. Erdős, J. Maas, F. Toninelli

In 1914 and 1916, Ornstein and Zernike published a celebrated heuristic predicting the sharp asymptotic behaviour of density-density correlations in high temperature/low density gases. This theory has since then become a classical topic in the statistical theory of fluids. The (non-rigorous) derivation of their asymptotics relies on a certain "mass gap condition", which was believed to hold at least in very high temperature/very low density regimes as soon as the potential is "short range" (exponentially decaying). In a recent joint work with Y. Aoun, D. Ioffe, and Y. Velenik, we proved that this condition can fail precisely in these regimes, when the interaction decays exactly like $\psi(r) e^{-r}$. The failure/success of the condition (and of the OZ asymptotics) is then closely related to the pre-factor ψ . In this talk, I will present the mechanism behind this failure, which can be seen as a condensation transition for a suitable model. To keep things elementary, I will mostly restrict to the case of the Ising model.

Tuesday, June 15, 2021 05:30pm - 06:15pm

IST Austria Campus Online via Zoom



This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage: <https://ist.ac.at/en/campus/how-to-get-here/> The IST Shuttle bus is marked IST Shuttle (#142) and has the Institute Logo printed on the side.