

Physics Seminar: Ioanna Kourkoulou
Wednesday, September 25 · 2:00 – 3:00pm
Location: 313

Title: S-matrix positivity without Lorentz invariance: a case study

Abstract: In this work we attempt to understand the analytic structure of amplitudes in theories with broken Lorentz invariance. To this end, we use as an example a UV complete model for relativistic superfluids - a complex scalar theory with quartic interactions at finite density. With a focus on $2 \rightarrow 2$ processes in center-of-mass configurations we find a few interesting properties, including a new branch cut as a result of the theory's non-analytic dispersion relations. While our results are model-dependent, we hope to understand which of our findings are related to basic physical properties, and how they may be relevant to other Lorentz-breaking systems.