Boltzmann collisions decrease Fisher information

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Sixty years after Henry McKean introduced Fisher information in kinetic theory of gases, we now know that the Boltzmann collision operator has a decreasing impact on the Fisher information, not just for some specific interactions, but for any realistic interaction and dimension. This allows to solve the longstanding problem of construction of classical smooth solutions of the spatially homogeneous Boltzmann with very singular collision kernels and opens the door to the completion of the century old program of the spatially homogeneous Boltzmann equation. A close relation to entropic bounds and logarithmic Sobolev inequalities is uncovered. This is joint work with Cyril Imbert and Luis Silvestre, building on the previous study of Guillin-Silvestre.



In honor of Claude Bardos's 85th birthday