

NONLINEAR LUTTINGER LIQUIDS

Abstract:

One-dimensional quantum fluids are usually described within the Luttinger liquid theory. This theory simplifies a real system by replacing the true spectrum of its particles with a linear one.

Abandoning the simplification has proven to be difficult. This talk describes a breakthrough which allows one to evaluate the dynamic responses of a non-linearized fluid. The hallmark of the new theory is a set of universal singularities of the dynamic response functions. It is applicable to a diverse group of systems, including, for example, electrons in quantum wires and cold atomic gases in one-dimensional traps.