

## 27th Rencontres ITZYKSON : Fluctuations far from Equilibrium



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### Gianni JONA-LASINIO - On the origin of the macroscopic fluctuation theory and some perspectives

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The macroscopic fluctuation theory (MFT) is a consistent and self-contained description of macroscopic fluctuations using only transport coefficients. In the formulation of the Rome group an important motivation was the discovery that we could reproduce by a purely macroscopic calculation the result of Derrida, Lebowitz and Speer obtained solving the microscopic symmetric simple exclusion process. Then the MFT developed in several directions allowing a unified treatment of different physical problems where a separation of scales is possible. Directions for future research include: i) extension of the MFT to the quantum case; ii) the possible use of an additional Hamiltonian structure discovered on the way; iii) a formula which recalls Clausius view of entropy; iv) developing the recent work on the integrability of the time dependent MFT. Time permitting I will discuss some perspectives.

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