

Recent Progresses in quantum phase imaging

Marco Genovese

Inrim, strada delle Cacce 91, 10135 Turin, Italy

In the last years the specific properties of quantum states (as entanglement), for long time considered as peculiarities discussed by the restricted community of physicists interested in the foundations of quantum mechanics, became a fundamental resource for the development of new technologies (as quantum communication, computation and imaging), collectively dubbed “quantum technologies”.

In this talk, after a general presentation of quantum imaging [1] (from sub shot noise imaging to quantum illumination), I will present the most recent progress in quantum phase imaging, demonstrating as, in this case, the problem, typical of sub shot noise imaging [2, 3], related to the trade-off between resolution and noise suppression can be eliminated [3, 4], paving the way to practical applications of this technique.

References

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- [4] ”High-resolution quantum-enhanced phase imaging of cells”, A.Paniate; G.Ortolano; S.Soman; M.Genovese, I.Ruo-Berchera, Optica 13 (2026) 375