

SEMINAR NOTICE

TUESDAY 12 DICEMBRE 2023

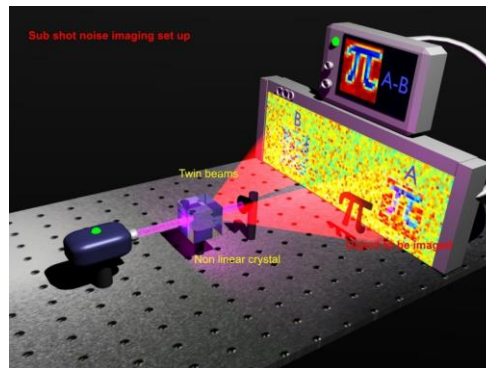
Università degli Studi di Bari, Physics Department, first floor,
Aula multimediale at 15.30

Dott. Marco Genovese, Istituto Nazionale di Ricerca Metrologica (INRiM) Torino, will hold a seminar entitled:

Quantum Imaging

Abstract

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, I will introduce the new possibilities in imaging offered by quantum measurements [1] and, in particular, of photon number correlated states. Then, I will discuss in more detail some of these new protocols, in particular exploiting quantum photon number correlations, as quantum lithography [2], ghost and sub shot noise imaging (both in absorption and phase [3]) and quantum illumination [4], the contribution of INRiM having been particularly significant for the last two. In particular, I will discuss practical applications. For instance, these range, for ghost imaging, to imaging in turbulent or diffusive media to imaging in cryogenic situations, while for sub shot noise imaging (and other techniques) can be relevant for biological (/medical applications (e.g. retinography).



Sub-shot-noise imaging scheme.

Teaching staff, young researchers, doctoral students, research fellows and students are invited (*no registration is required*)

[1] M. Genovese, Journal of Optics, 18 (2016) 073002.

[2] M. D'Angelo, M.V. Chekhova, and Y. Shih Phys. Rev. Lett. **87**, 013602 (2001)

[3] G. Brida, M. Genovese, I. Ruo Berchera, Nature Photonics 4, 227 (2010). G. Ortolano, A.

Paniate, P. Boucher, C. Napoli, S. Soman, S. F. Pereira, I. Ruo-Berchera, M. Genovese,
Light: Science & Applications 12, 171 (2023)
[4] E. Lopaeva, I. Ruo Berchera, I. Degiovanni, S. Olivares, G. Brida, M. Genovese, Phys. Rev. Lett. 110,
153603 (2013)

Remote link: https://teams.microsoft.com/l/meetup-join/19%3aUdTD3sW_RVSeM9cNJOimR4djrXQPUKq6xYYrCuxBkog1%40thread.tacv2/1702302840744?context=%7b%22Tid%22%3a%22c6328dc3-afdf-40ce-846d-326ead86d49%22%2c%22Oid%22%3a%22e7e9303-6c2a-4b4a-be85-b2723e6ef851%22%7d