CNR NANOTEC INSTITUTE OF NANOTECHNOLOGY

Seminars @ NANOTEC

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Wave and vortex turbulence in nonlinear optics and Bose-Einstein condensates

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Light in nonlinear optics systems and Bose-Einstein condensates (BEC) share a common nonlinear model: Nonlinear Schrodinger equation (NLSE). It describes motions very similar to the dynamics of fluids, but with certain important differences arising from the quantised character of vortices and dispersive effects. I will overview the results on the wave and vortex turbulence described by the NLSE obtained within the wave turbulence theory and by numerical simulations.
I will discuss forward and inverse turbulent cascades and ideas how to implement them in the optical and BEC systems.

Short Bio: Sergey Nazarenko obtained his PhD in theoretical and mathematical physics from Landau Institute for Theoretical Physics, Moscow, in 1991. He worked as a researcher at the Landau institute from 1991 to 2005, visiting assistant professor at the Mathematics Department at the University of Arizona in 1992-1996, as a research fellow and later reader and full professor at the Mathematics Institute, University of Warwick in 1996-2018. Since 2018, Sergey Nazarenko is working as a Research Director of Premiere Classe at the National Center for Scientific Research (CNRS) , France, with a base at the Institute of Physics of Nice. His research interests are in the theory of turbulence in various physical applications, from quantum to cosmological scales.

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