

# **THE OPTICS OF THE SCALAR SPATIAL COHERENCE WAVELETS**

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## **GENERAL DESCRIPTION**

This is a course on the fundamentals and principles of the optical spatial coherence, in the modern framework named the phase-space representations of optical fields or Wigner optics. The properties of the main quantities (i.e. the spatial coherence wavelets, the marginal power spectrum and the structured coherence support) are discussed in detail. The phase-space diagrams are also interpreted as a maps of interfering rays, which allows implementing numerical algorithms to simulate (or to calculate) the behaviour of optical fields in any state of spatial coherence under specific conditions. Thereafter, applications in interference, diffraction, holography, imaging and field modulation are described.