

# Matter wave optics and interferometry : from concepts to applications

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Cooled close to absolute zero, atoms move at velocities of or below a few centimeters per second and no longer behave as particles, but as de Broglie waves whose propagation can lead to interference phenomena. This presentation will describe how to observe matter-wave interferences, to reproduce, for example, phenomena found in the propagation of electrons in semiconductors. It will also introduce how to use the interferences to build highly accurate measuring devices and use them for guidance and navigation, or perform accurate test of fundamental physics.