

From neutron to quantum-gas interferometry  
- dedicated to Helmut Rauch, a pioneer of matter-wave interferometry

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Helmut Rauch pioneered diffraction of neutrons at crystals, in this way, established neutron interferometry and investigated the wave nature of matter. This inspired early experiments on atomic diffraction at crystals made of light. Compared to neutron diffraction, the atomic recoil velocity generated per scattered photon is small for most chemical elements. The energy scale accessible with Bose-Einstein condensates opens up efficient Bragg scattering for matter-wave interferometry. The talk, dedicated to Helmut Rauch, presents latest experiments to lower the expansion energies of atomic ensembles and new possibilities arising twin-lattice interferometry. They are fascinating tools for ground and space-borne interferometry.