



Physics & Astronomy Colloquium

Fall 2010

Spinning Atoms with Light: a New Twist on Coherent deBroglie-wave Optics

Physicists have used light and its polarization to manipulate the internal state of atoms since the 19th century. Early in the 20th century, the momentum of light was used to manipulate the center-of-mass motion of atoms. Optical pumping, coherent laser excitation, and laser cooling provided additional tools to affect both the internal and external states of atoms. Bose-Einstein condensation created atomic samples having laser-like deBroglie wave coherence, and coherent atom optics provided mirrors and beamsplitters. Now, light beams with orbital angular momentum (angular momentum associated not with the optical polarization, but with the shape of the spatial mode), provide a new tool for coherent manipulation of atomic motion, creating coherent rotation of atom clouds, and persistent flow of atoms in toroidal traps.

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Nobel Laureate

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Thursday, November 4, 2010

4:00-5:20 PM - MND 1015

Open and free to all students, faculty, and public