

# Beam shaping and control with optical feedback

**Nir Davidson**

*Dept. of Physics of Complex Systems, Weizmann Institute of Science, Rehovot, Israel*

We demonstrate how the intensity, phase and coherence function of optical beams can be rapidly shaped and controlled by all optical in a modified degenerate cavity laser. The desired beam properties are designed to have minimal loss and are hence rapidly obtained as the lasing solution via mode competition inside the laser cavity. We demonstrate the ability of our system to solve related problems such as phase retrieval, focusing and imaging through scattering medium, simulating spin Hamiltonians and more.