Quantum Optics Laboratory

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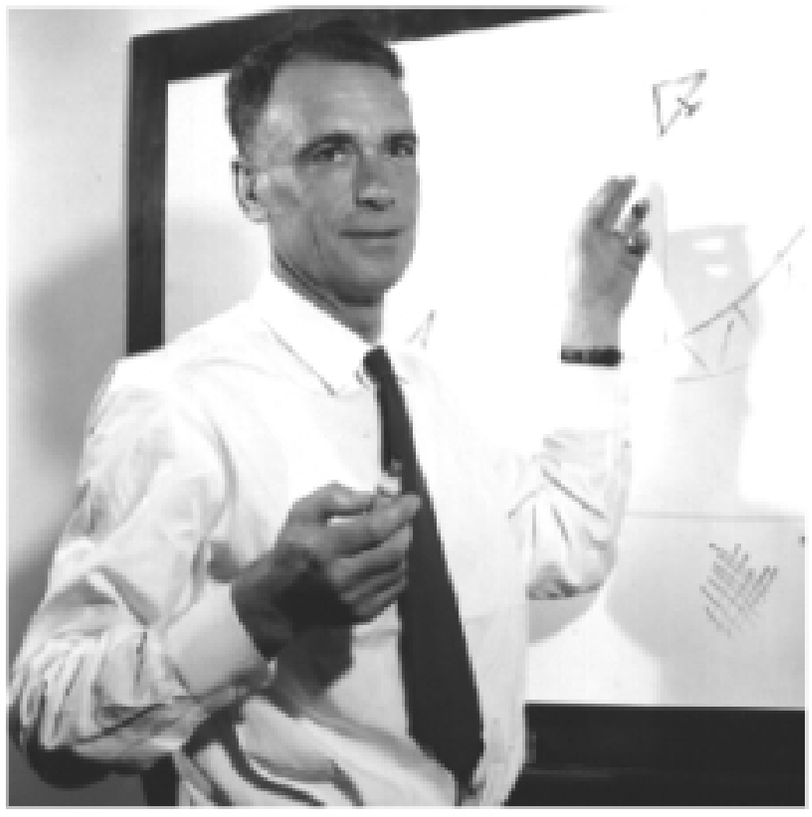
Outline

To study four important experiments the quantum theory of light:

- Entanglement and Bell's Inequalities (Lab. 1).
- Single Photon Interference (Lab. 2).
- Confocal Microscope Imaging of Single Emitter Fluorescence and Observing Photon Antibunching Using Hanbury Brown and Twiss Setup (Lab. 3 and 4).

Photon Antibunching: Introduction, Background and Theory

- In 1956, Hanbury Brown and Twiss observed the existence of correlation between the outputs of two photoelectric detectors illuminated by partially correlated light waves.



(a) R. Hanbury Brown

(b) Hanbury Brown-Twiss set-up (taken from [1], p. 409)