



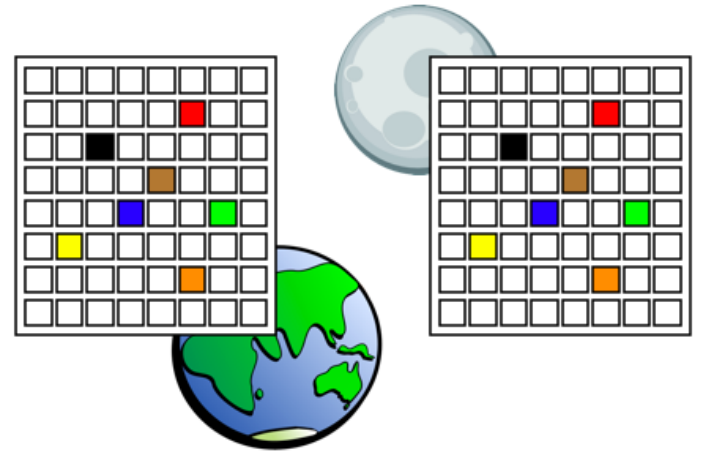
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## The information content of biphoton images



Dr. Curtis Broadbent

The wave-particle duality of light has startling implications when images are measured on a single-photon level. When measured in a pixel-basis, photons with an extended transverse spatial profile collapse, registering detection of the photon on a single pixel. When two photons which are entangled in the transverse spatial degrees of freedom are measured, that collapse can occur in a correlated way so that distant observers always measure the photon to have registered in the same pixel. When these so-called biphoton images are measured in the far field, pixel registrations always occur at inverse locations relative to the optical axis. That images can be correlated in both the near- and far-field can be used, for example, to perform imaging with bucket detectors, detectors with zero spatial resolution. I'll describe the results of research which uses the tools of information theory to characterize and quantify the information which may be shared between distant parties using biphoton images, both with and without entanglement.

**4PM, WEDNESDAY, MAY 14, 2014**

**Carlson Auditorium, Center for Imaging Science (Bldg. 76)**