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Realisation of Hardy's Thought Experiment WILLIAM IRVINE, University of California at Santa Barbara and University of Oxford, JUAN HODELIN, University of California, Santa Barbara, CHRISTOPH SIMON, Laboratoire de Spectrometrie Physique, CNRS - Universite de Grenoble, France, DIRK BOUWMEESTER, University of California, Santa Barbara — We present an experimental realisation of Hardy's thought experiment [Phys. Rev. Lett. **68**, 2981 (1992)], using photons. The experiment consists of a pair of Mach-Zehnder interferometers that interact through photon bunching at a beam splitter. A striking contradiction is created between the predictions of quantum mechanics and local hidden variable based theories. The contradiction relies on non-maximally entangled position states of two particles.

Juan Hodelin
University of California, Santa Barbara

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