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**The 2D Bose gas: observation of the BKT transition and the intermediate regime between thermal and superfluid.<sup>1</sup>**

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I will present experimental results on a Bose gas in a quasi-2D geometry, near the Berezinskii, Kosterlitz and Thouless (BKT) transition temperature. By measuring the 2D density profile and the coherence length of the gas, we identify different states of the gas. In particular, we observe that the gas exhibits a bimodal distribution without long range order. In this state, the gas is not superfluid, but presents a longer coherence length than the thermal cloud. Experimental evidence seems to indicate that we are observing the transition from this regime towards superfluidity (BKT transition).

<sup>1</sup>Work completed by P. Cladé, C. Ryu, A. Ramanathan, K. Helmerson and W.D. Phillips