

ATELIER « INFORMATION QUANTIQUE : CODES, GÉOMETRIE ET STRUCTURES ALÉATOIRES »
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WORKSHOP ON QUANTUM INFORMATION: CODES, GEOMETRY AND RANDOM STRUCTURES
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Almost Euclidean sections of L_1 and quantum uncertainty relations

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Uncertainty relations express the fundamental incompatibility of certain measurements in quantum mechanics. Far from just being puzzling constraints on our ability to know the state of a quantum system, uncertainty relations are arguably at the heart of why some classically impossible cryptographic primitives become possible when quantum communication is allowed. In this talk, I will describe a connection between low-distortion embeddings of L_2 into L_1 and quantum uncertainty relations. Then, I will explain how this connection leads to explicit bases that satisfy strong uncertainty relations. I also plan to show how these bases can be used for information locking and quantum identification.

This is joint work with Patrick Hayden and Pranab Sen available at [arXiv:1010.3007](https://arxiv.org/abs/1010.3007).

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