Quantum black holes, holography and the graviton mass

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Ever since Hawking's discovery that quantum black holes radiate, a microscopic understanding of this phenomenon has been a litmus test for a consistent theory of quantum gravity. An idea that has transformed the field, and occupied center stage during the past two decades, is to consider the black hole horizon as a holographic screen on which the black hole interior is recorded.

In its precise formulation, known as AdS/CFT correspondence, the book-keeping device is a local quantum field theory similar in nature to the familiar quantum electrodynamics. In the first part of the talk I will describe these far-reaching ideas. As an application, I will then explain how AdS/CFT correspondence might help answer a long-standing theoretical question: can there exist more than one gravitons?