Pressure Induced Quantum Critical Phenomena and Superconductivity

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This talk will discuss pressure induced superconductivity in vicinity of a Quantum Phase Transition. Quantum Phase Transitions are subtly different from the familiar classical phase transitions of which an example would be water becoming ice or steam as its temperature is varied. In such a transition, things move from becoming more or less ordered depending on whether their temperature is decreased or increased. However, if the temperature was hypothetically fixed to absolute zero and a parameter other than the temperature, for e.g., pressure, was varied and a phase transition was to occur, it would come without change in entropy, i.e., it would be an 'order to order' transition. In neighborhood of such a zero entropy phase transition we see emergence of superconductivity and other forms of novel quantum order.