Understanding gravity in the framework of quantum mechanics is one of the significant challenges in modern physics. Along this line, a primary question is whether gravity is a quantum entity subject to quantum mechanical rules. Despite the purported weakness of gravity, the phase evolution induced by the gravitational interaction of two-micron size test masses in adjacent matter-wave interferometers can detectably entangle them via the exchange of graviton mediation even when they are placed far enough apart to keep Casimir-Polder forces at bay. This prescription for witnessing entanglement certifies gravity as a coherent quantum mediator through simple correlation measurements between two spins: one embedded in each test mass known as a QGEM (quantum gravity induced entanglement of masses) protocol. This workshop will discuss various theoretical and experimental challenges to conceive the QGEM protocol in a lab that will require an unprecedented level of accuracy in witnessing the quantum nature of one of nature’s weakest interactions.

There is no registration fee.

Registration deadline: May 30, 2021

Online registration and more information: http://ictp-saifr.org/qgem2021/