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Quantum Phases of ^{4}He in Reduced Dimensions[1] THOMAS BADMAN[2], JEFFREY MCMAHON[3], Washington State University — When close to absolute zero, the large quantum motion of helium causes it to display exotic properties. Depending on the environment that the atoms are in, phases and transitions between them emerge in interesting ways. In this presentation, we present results from computer simulations of helium in reduced dimensions; in particular, when adsorbed to graphene and graphite. We use the numerically-exact diffusion Monte Carlo method, though address several contemporary issues regarding approximations and convergence. Interesting results include commensurate solid phases with stabilities that do not agree with previous work, the possibility of supersolidity, and anisotropic superfluidity that may be stabilized by straining the substrate.

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