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Mott transition, magnetism and d-wave superconductivity on lattices with frustration[1] A.-M.S. TREMBLAY, BUMSOO KYUNG, Universite de Sherbrooke — By tuning band parameters and choosing appropriate lattices, it is possible to frustrate antiferromagnetism to reveal the competing d-wave superconducting (d-SC) phase, the normal phase and the Mott insulating phase. We study the nature of the competition between these phases by using Cellular Dynamical Mean-Field Theory for the Hubbard model on the anisotropic triangular lattice and on the square lattice with second-neighbor hopping. The phase diagram in the $T = 0$ plane is drawn as a function of interaction strength U/t and frustration t'/t. The critical interaction strength for the Mott transition is found as a function of frustration. At half-filling and for intermediate coupling we find that outside the Mott insulating phases, d-SC appears at an optimal level of frustration. We also identify spin fluctuations as the source of pair formation. We find that components of the spin susceptibility involved in binding are mostly centered in the quarter of the Brillouin zone closest to (π, π). We conclude that retarded short-range spin fluctuations are crucial for d-SC even in the presence of frustration and that there are optimal values of frustration that favor d-SC.

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