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Sommario/riassunto	<p>While the universal quantum computer seems not in reach for the near future, this work focusses on analog quantum simulation of intriguing quantum models of light-matter interactions, with the goal of achieving a computational speed-up as compared to classical hardware. Existing building blocks of quantum hardware are used from superconducting circuits, that have proven to be a very suitable experimental platform for the implementation of model Hamiltonians at a high degree of controllability.</p>