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# Toward Neutral Atom Array Quantum Processors in Singapore

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he development of 200 qubits or more quantum processors is divided into subtasks running in parallel to tackle the various technical and conceptual challenges. On the technical side, we are developing a compact 2D MOT, a science chamber for the 3D MOT with an ultrahigh vacuum environment, and a 2D tweezer array of neutral atoms. The 2D MOT segment improves the atom flux and segregates the vacuum for the 3D MOT thanks to a differential tube. The atoms are cooled down to the microKelvin range in the 3D MOT and loaded in the tweezer array. On the conceptual side, we are evaluating key atomic transitions for the realization of quantum computing operations. We are also working on developing static tweezer arrays using spatial light modulators to trap the atoms. Subsequently, we will be developing mobile tweezers for the rearrangement of the atoms during the later stages of the project.

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