

World Congress on **QUANTUM PHYSICS CONFERENCE**

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Quantum research also needs PISQ-based activities**Koen Bertels**

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After spending 10 years in Quantum Computing and given the impending timeline of developing good quality quantum processing units, it is the moment to rethink the approach to advance quantum computing research. We evidently still have to wait for mature quantum hardware but we also have to start assessing in tandem the impact of the occurrence of quantum computing in various scientific fields. To this purpose, we need to use a complementary but quite different approach than proposed by the NISQ vision, which is heavily focused on and burdened by the engineering challenges. We propose and advocate the PISQ-approach: Perfect Intermediate-Scale Quantum computing based on the already known concept of perfect qubits. This will allow researchers to focus much more on the development of new applications by defining the algorithms in terms of perfect qubits and evaluate them on quantum computing simulators that are executed on supercomputers. The PISQ approach is even more urgent now that we getting really close to the end of the world-famous Moore's law: the end of producing even smaller and hopefully more performant transistor is closely arriving. So all sciences and industrial processes have to start moving towards quantum logic.

Biography

Koen Bertels was professor for about 20m years at TUDelft and started working on quantum computing almost 11 years ago. He was leading the quantum computer engineering section and was working on all computer engineering aspects relevant to build a quantum computer. Now, he has started a small company, QBee and is professor at the University of Porto and visiting professor at KULeuven.