



Dr. Iuliana Radu

Title: Technology challenges towards building a viable quantum computer

Iuliana Radu, imec
Kappeldreef 75, Leuven, B-3001 Belgium
radu@imec.be

Quantum computing is fundamentally different than classical computing but many of the technology challenges are similar to those for building classical systems. Building the first viable quantum computers comes with many challenges, some conceptual, yet many technological. In this talk, we outline how learning and practices from standard CMOS technology development can be used to enable quantum computing. We will discuss how materials and process development can improve device performance. We explain how standard modeling can be extended to describe accurately enough qubits.

While qubits are the central part of the quantum computer, the control circuitry plays as large a role in upscaling quantum computers. We expect that standard or lightly modified CMOS can do the job. Standard CMOS transistors at cryo-temperature behave as much as transistors at room temperature although with some changes. We will outline here some of these differences and the gaps in understanding.