Superconducting supercomputers and quantum computing

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Information technologies have been developing at a formidable pace. While miniaturization has been the driver for this in the past decades (Moore's law), the attention is now focusing to the energy consumption. Already a considerable fraction of the worlds' energy use is in information technologies. Also, the on-chip energy dissipation and concomittant high temperatures form a bottleneck in further speeding up processors. For these reasons a great interest exist in the exploration of new computing paradigms.

In my presentation, I will introduce two of such paradigms and discuss their current progress and prospects, namely superconducting 'RSQF' circuitry and quantum-computation. Both technologies require (ultra)-low temperatures, providing interesting challenges for cryogenic engineering.