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"Nano-electronics: Shaping Our Future"

This presentation will start with a look into the future where new semiconductor-based solutions will be needed both in the ICT and energy worlds to solve the grand challenges of the 21st century.

To create a sustainable earth, there is an urgent need for renewable energy sources, for low energy consumption, smart mobility and communication, and affordable healthcare services. Solar energy will play a major role in this. Communication is evolving towards cheap-person centric nomadic communication which will ultimately enable that virtual communities will be experienced as real life.

The globalization of unhealthy lifestyles, rapid unplanned urbanization, and the ageing of populations contribute to a rise in chronic diseases. The merging of nano, bio and ICT will play an important role to tackle these challenges and the related rising healthcare costs by developing remote health monitoring systems, improved diagnostics and personalized medicines.

All these fantastic applications will certainly need chips with teraflop and terabit compute and storage capabilities. Further scaling will be indispensable to realize this. However, today, as we are reaching atomic granularity, physical limitations start to disturb the expected transistor behavior. Further scaling is only possible by innovative use of new materials, transistor architectures and lithographic techniques.

It will be discussed how all of this will require "More Moore (scaling)" but also a plethora of new multi-disciplinary micro- and nano-system technologies also called "More than Moore (MTM)" technologies. All of this will require strong research partnerships in an open innovation mode.