

FM 45: Plenary Talk: Industry

Time: Wednesday 8:30–9:30

Location: Audi Max

Plenary Talk FM 45.1 Wed 8:30 Audi Max
Quantum Technologies - Challenges and Chances from an Industry Perspective — ●JÜRGEN GROSS — Robert Bosch GmbH, Renningen

Quantum Technologies, according to the European Quantum Flagship initiative, comprise the four technology areas Quantum Communication, Quantum Computation, Quantum Simulation, and Quantum Sensing & Metrology.

Our **motivation** as Bosch to engage in Quantum Technologies has the following aspects:

(1) Bosch is a leading supplier in miniaturized **sensor products**, both for automotive as for consumer sensors. This motivates continuous innovation and evaluation of new sensor concepts in our Corporate Research branch, now focusing especially also on quantum sensors.

(2) The **Internet of Things** transformation will rapidly change markets and ecosystems. Unprecedented numbers of sensors will create and transmit vast amounts of data, including sensitive person-related data. For safe and secure data transmission **quantum cryptography** and here especially **quantum random number generation** is expected to play an increasingly important role.

(3) Substantial progress in **quantum computing** is expected to

enable new computation principles that outperform “classical” high performance computers with certain tasks. We are actively exploring application spaces for quantum computers of the first and second generation, in particular in the fields of materials simulation and optimization

To build up necessary competencies in Quantum Technologies, close **cooperation** with leading academic experts is mandatory. Due to the early engagement of Bosch in the European Quantum Flagship initiative, Bosch is recognized as a competent and active collaboration partner within the quantum research programs on national and European level.

At Bosch, newly acquired expertise in quantum technologies will be combined with existing experience in design, fabrication, and setup of hardware and system prototypes to develop specific “quantum products”.

Bosch’s five major Quantum Technology projects are presented, the business context is given, and the technological principles are explained. The embedding of these projects in large public funded projects is shown. The presentation is concluded with an outlook on the success factors that we consider crucial for the economic success of Quantum Technology.