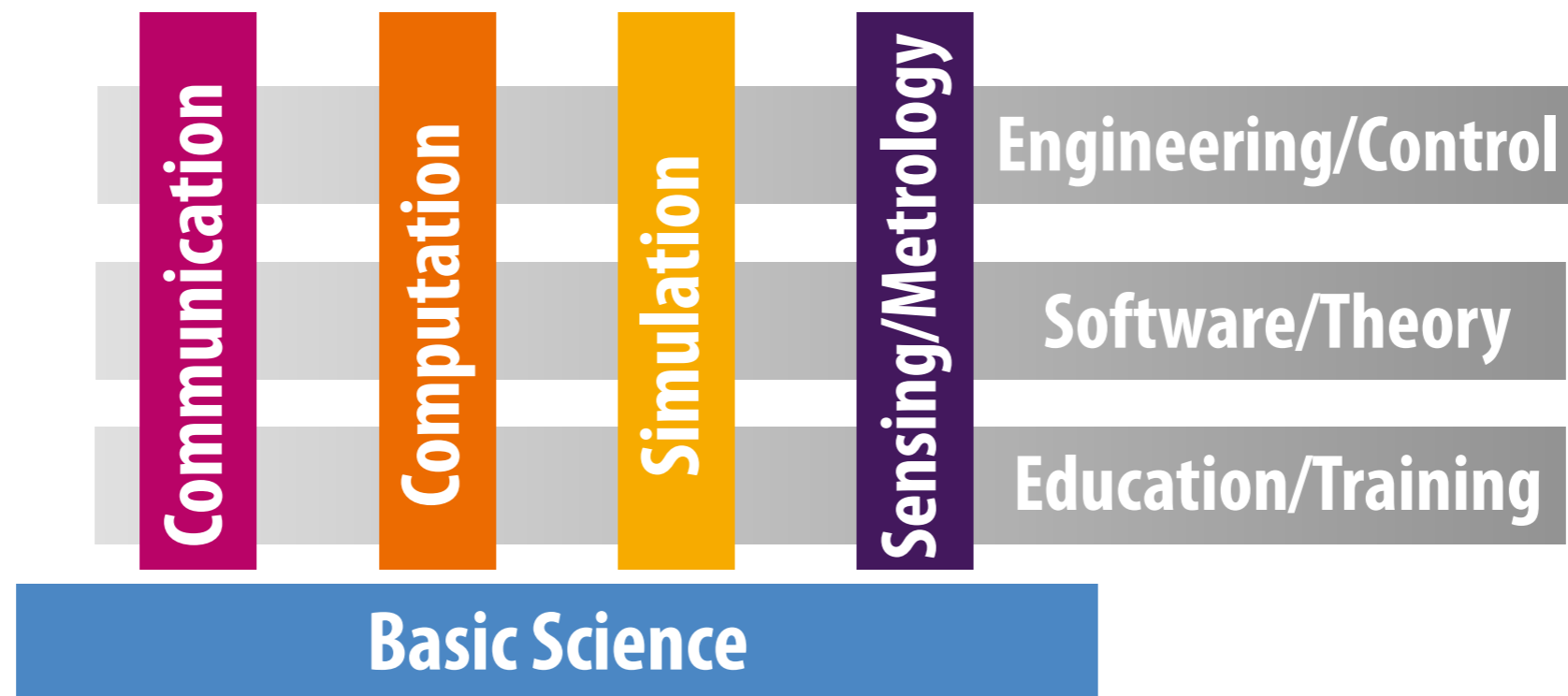


Quantum mission structure

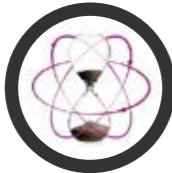
- Four mission driven R&I domains built on top of Basic Science



- First call published in October 2017

Quantum mission timeline

**APPLICATION
EXAMPLES**



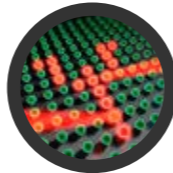
- ▶ Diagnosing diseases by quantum-enhanced imaging
- ▶ Resilient communication and energy networks thanks to atomic clocks



- ▶ Quantum secure links between data centres / banks / government offices become standard
- ▶ Real-time traffic optimization on quantum simulators



- ▶ Underground imaging using quantum gravity sensors
- ▶ Satellite-independent navigation
- ▶ Design of novel materials / chemicals / drugs exploiting quantum simulators



- ▶ Quantum sensors in mobile devices
- ▶ Next-generation digital assistants based on quantum machine learning
- ▶ Quantum Internet with e.g. quantum secure online banking



**TECHNICAL
MILESTONES**

- ▶ Fault tolerant route for >50 qubits processor
- ▶ Quantum Simulators with >500 individual coupled elements
- ▶ Quantum Random Number Generator and Key Distribution devices
- ▶ Quantum sensors outperform classical counterparts

- ▶ Quantum processor fitted with quantum error correction
- ▶ Demonstration of quantum optimisation
- ▶ Quantum repeaters and memory prototypes
- ▶ Entanglement enhanced sensors

- ▶ Quantum Computers outperforming classical computers
- ▶ Quantum simulators solving problems beyond supercomputer capability
- ▶ Long distance (>1000km) entanglement based networks and protocols

- ▶ Transition from prototypes and niche markets to mass markets
- ▶ European leadership in production and application of quantum technologies