

Support of the emerging quantum technology industry by metrology – examples at PTB

Quantum Technology Competence Center

Transfer of quantum technology from basic research into application

- Est. 2019, located at PTB, the German National Metrology Institute
- Combines PTB's internationally recognized competence in metrology, sensing and quantum technologies
- Support for the emerging quantum industry, with a focus on start-ups and on small and medium-sized enterprises (SMEs)

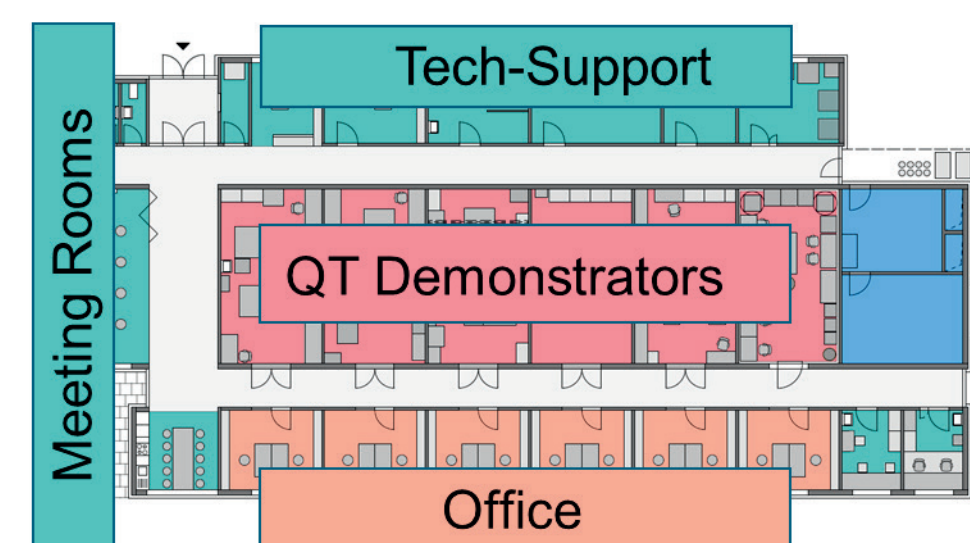


www.qtz.ptb.de

Lummer-Pringsheim building at PTB Braunschweig



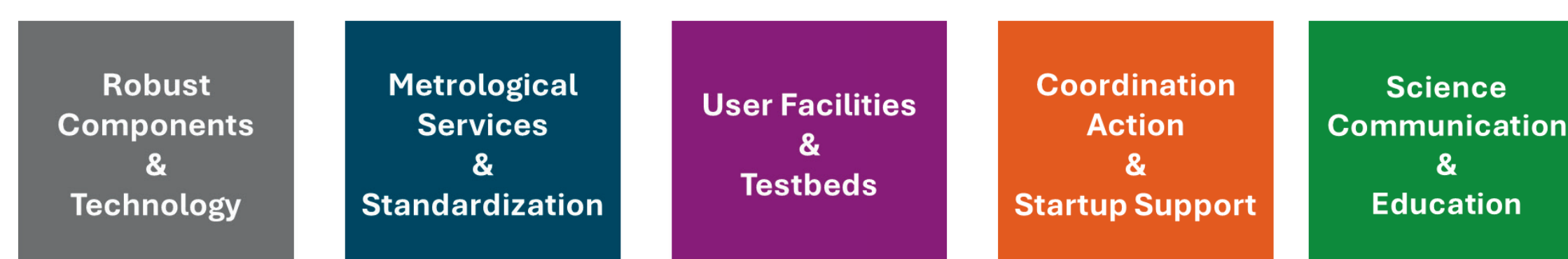
- 240 m² high-tech labs + office space
- User platforms and demonstrators, shared with industry partners
- Historic reference: Otto Lummer and Ernst Pringsheim



Fields of Activity of QTZ

- Comprehensive concept, covering many aspects of metrology, science, components development, standardization and more for a sustainable tech-transfer in industry
- PTB's central hub for cooperation and access to QT expertise and infrastructure

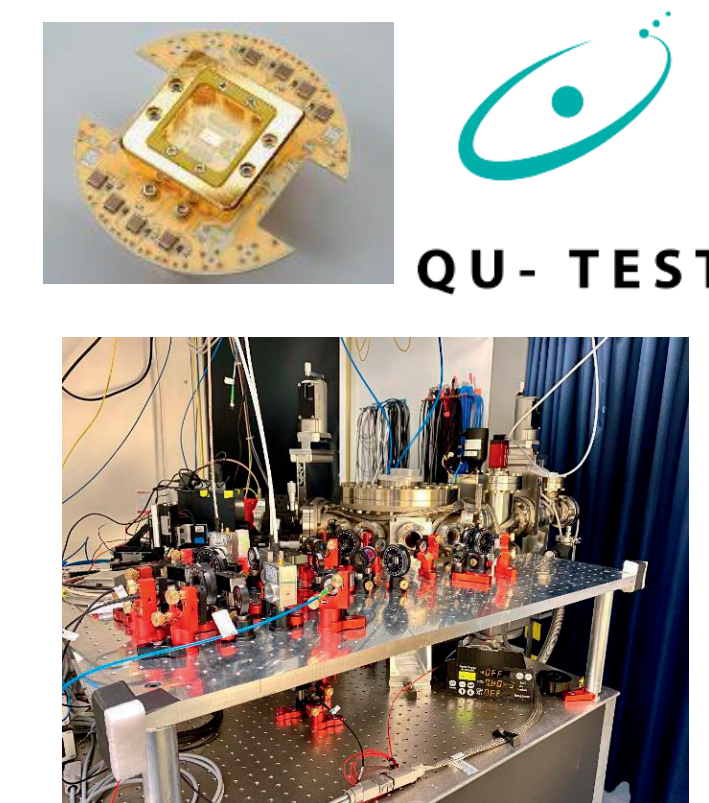
Transfer of QT into Application



Ion Traps

User facility Ion Traps

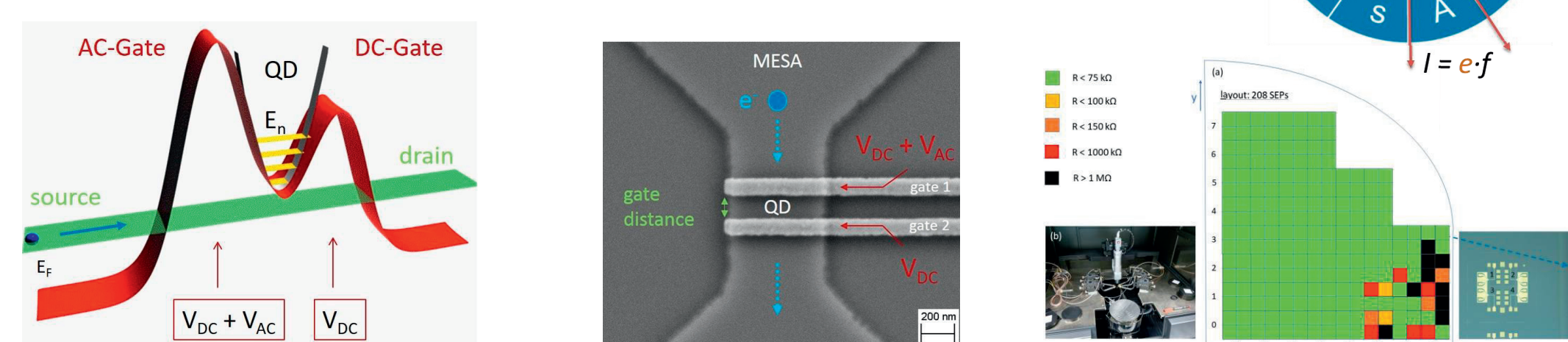
- Standardized tests of ion traps (2D surface + 3D)
- Robust, fair and reproducible
- Automated measurement routines, intuitive usability for external users
- First characterization of an industrially fabricated ion trap recently started



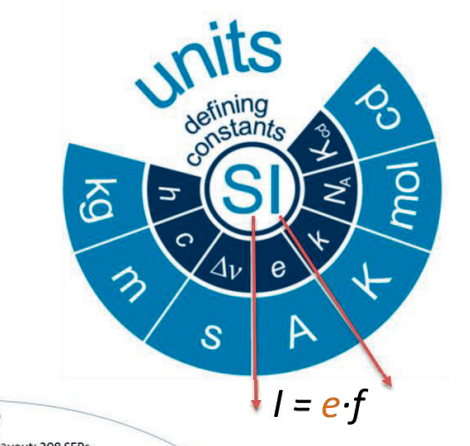
Single-electron Sources

Robust and reproducible single-electron pumps (SEP)

- Development of semiconductor based SEPs
- Scaling & testing of devices in a small-series production



Revised SI-System (2019):

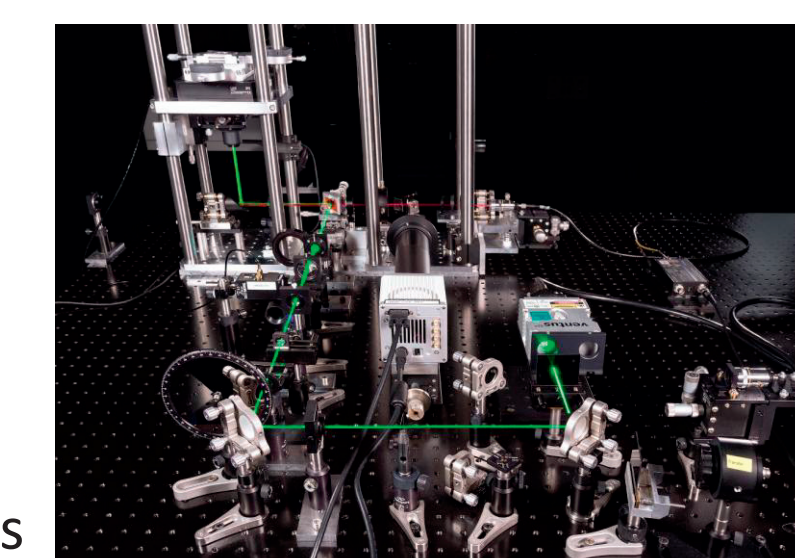


Various Examples

Quantum Networks

Quantum radiometry & networks

- Single-photon sources & detectors
- QKD component characterization (DV, CV, entanglement)
- Fiber testbeds for QKD tests and developments



QVLS-HTI

High-tech Incubator for deep-tech start-ups

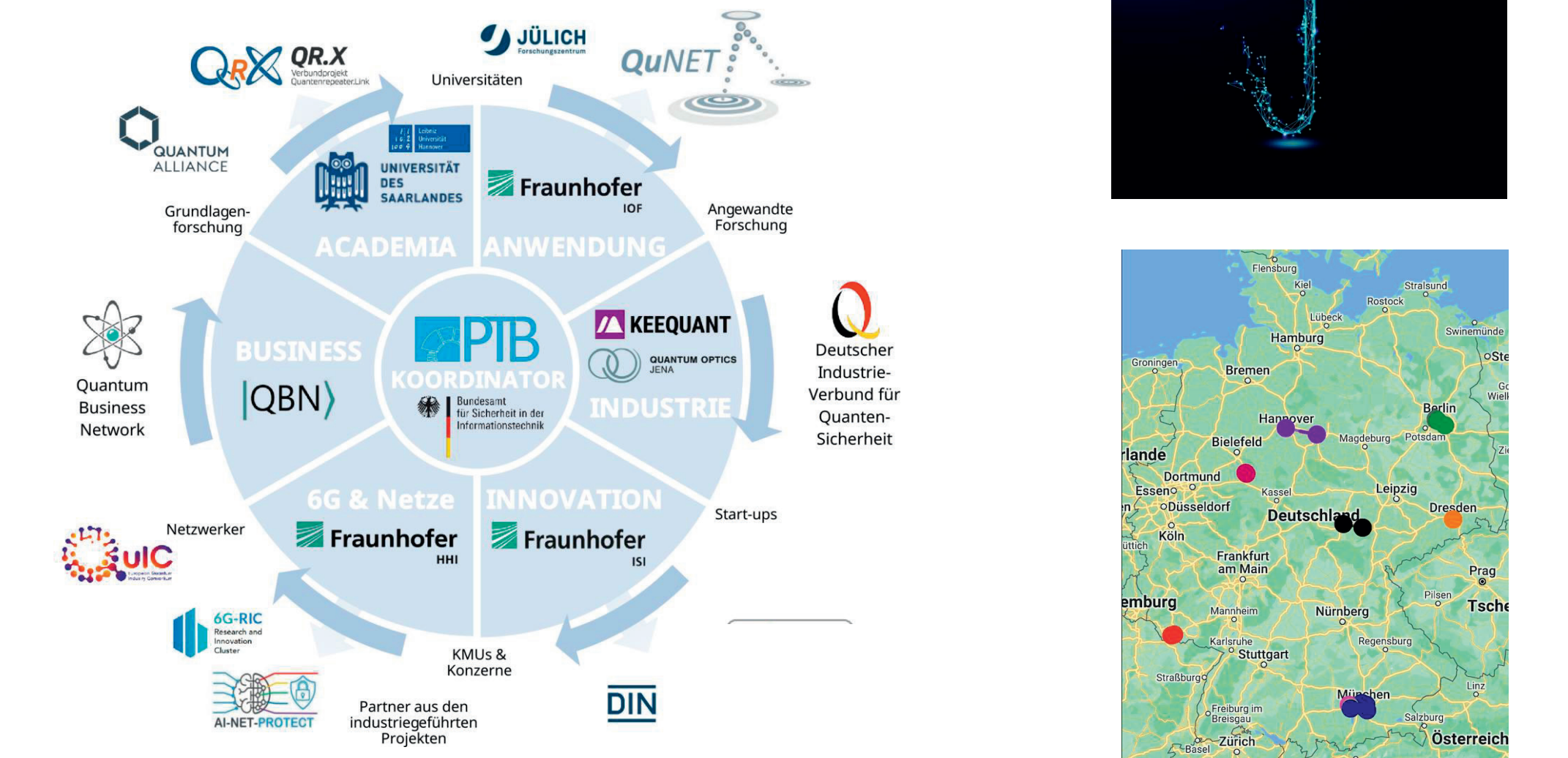
- 11 QT start-ups funded for 30 month in 1st call
- External 380 m² lab and office space at Rollei-Werke in Braunschweig
- 4.2 Mio. € investment to build up a sustainable, local ecosystem



SQuaD

Quantum Communication Germany

- Umbrella project, coordinated by QTZ
- Sustainable transfer of technology

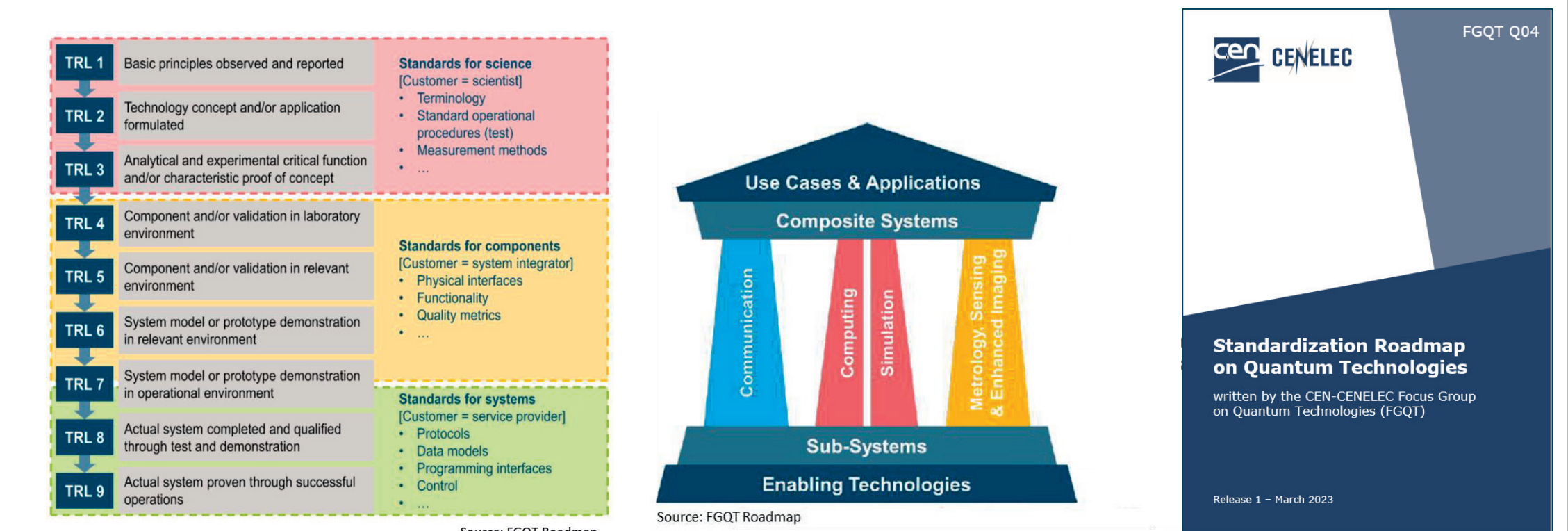


Standardization

"Scientific revolutions don't require standards; industrial revolutions do"

Committees & collaborative initiatives

- CEN/CENELEC JTC22 & WG1 "Strategy"
- IEC/ISO JTC3
- NMI-Q: Accelerating the Adoption of Quantum Technologies through Measurements and Standards



Training & Outreach

Knowledge transfer and education

- Virtual user facilities, hands on training
- Workshops, courses for industry, ...
- European framework for education and training on QT

