Quantera SAB

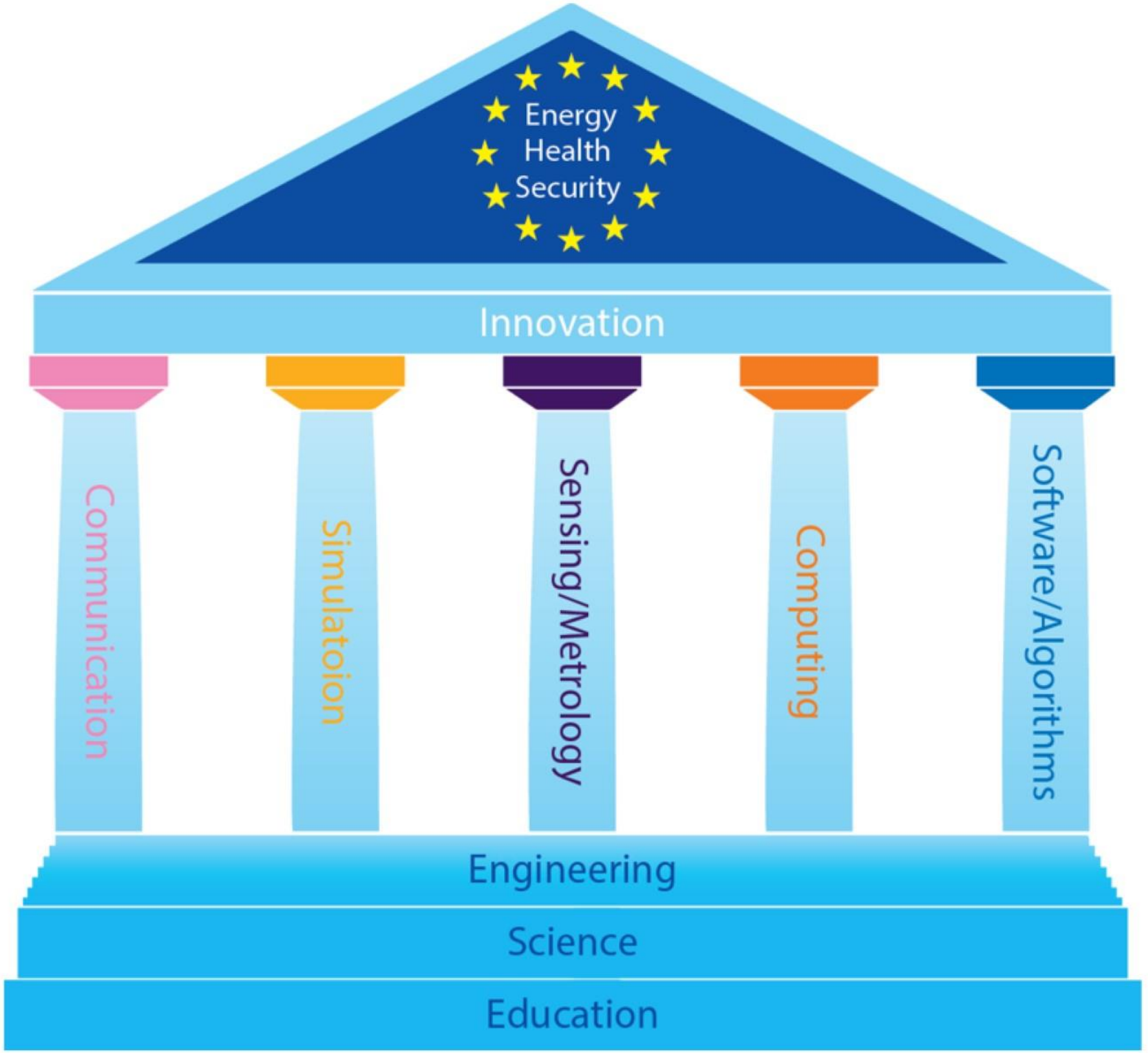
Sir Peter Knight, NPL, Chicheley & Imperial College London

QUANTERA
ERA-NET Cofund in Quantum Technologies

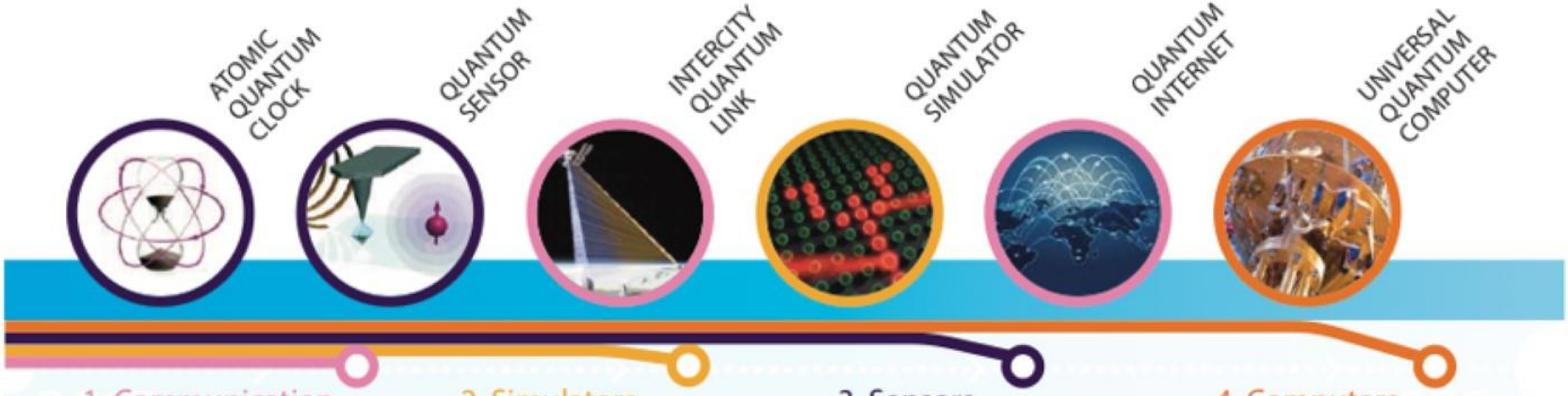
Call 2017 for Transnational Research Proposals

Supporting the topics of

Quantum Information and Communication Sciences and Technologies


Energy
Health
Security
Innovation
Communication
Simulatoion
Sensing/Metrology
Computing
Software/Algorithms
Engineering
Science
Education

Quantum Manifesto



	1. Communication	2. Simulators	3. Sensors	4. Computers
0 – 5 years	A Core technology of quantum repeaters B Secure point-to-point quantum links	A Simulator of motion of electrons in materials B New algorithms for quantum simulators and networks	A Quantum sensors for niche applications (incl. gravity and magnetic sensors for health care, geosurvey and security) B More precise atomic clocks for time stamping of high-frequency financial transactions	A Operation of a logical qubit protected by error correction or topologically B New algorithms for quantum computers C Small quantum processor executing technologically relevant algorithms
5 – 10 years	C Quantum networks between distant cities D Quantum credit cards	C Development and design of new complex materials D Versatile simulator of quantum magnetism and electricity	C Quantum sensors for larger volume applications including automotive, construction D Handheld quantum navigation devices	D Solving chemistry and materials science problems with special purpose quantum computer > 100 physical qubit
> 10 years	E Quantum repeaters with cryptography and eavesdropping detection F Secure Europe-wide internet merging quantum and classical communication	E Simulators of quantum dynamics and chemical reaction mechanisms to support drug design	E Gravity imaging devices based on gravity sensors F Integrate quantum sensors with consumer applications including mobile devices	E Integration of quantum circuit and cryogenic classical control hardware F General purpose quantum computers exceed computational power of classical computers

Why Quantum?

Expected impacts

Funded projects are expected to significantly advance the state-of-the-art of Quantum Sciences and Technologies by achieving one or more of the following targets:

1. Develop a deeper fundamental and practical understanding of systems and protocols for manipulating and exploiting quantum information;

2. Enhance the robustness and scalability of quantum information technologies in the presence of environmental decoherence, hence facilitating their real-world deployment;

3. Develop reliable technologies for the different components of quantum architectures;

4. Identify new opportunities and applications fostered through quantum technologies, and the possible ways to transfer these technologies from laboratories to industries,

5. Enhance interdisciplinarity in crossing traditional boundaries between disciplines in order to enlarge the community involved to tackle these new challenges.

The quantum alliance