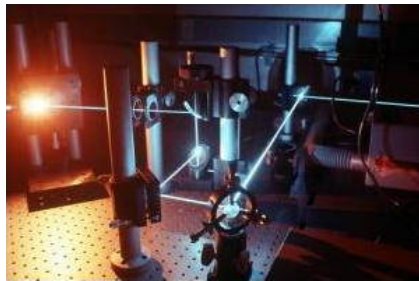
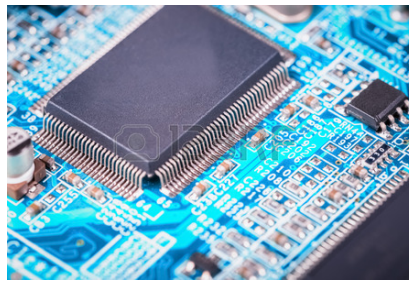


Towards the Quantum Technology Flagship: Quantum Revolutions

1st quantum revolution: quantum mechanics explains the structure and the interactions of atoms, light and matter.



lasers

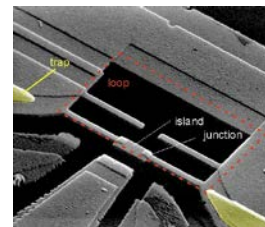
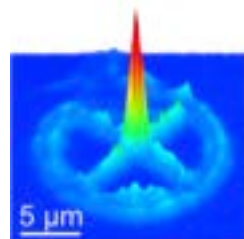


micro electronics

2nd quantum revolution: when reaching the level of individual quantum objects, the most surprising and far-reaching quantum properties (such as superpositions, entanglement) become experimental evidences.

These quantum properties open the way to revolutionary methods to process, communicate, and manipulate information carried by such objects.

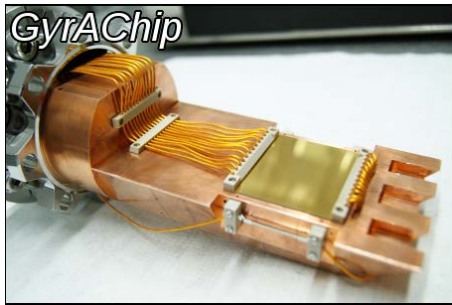
source of individual photons



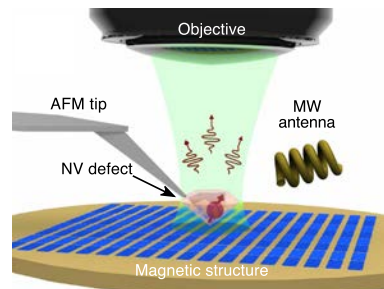
Quantum bit (qubit)
in superconductors

Quantum Technologies

1. Quantum sensors and metrology: *the ultimate physical precision*

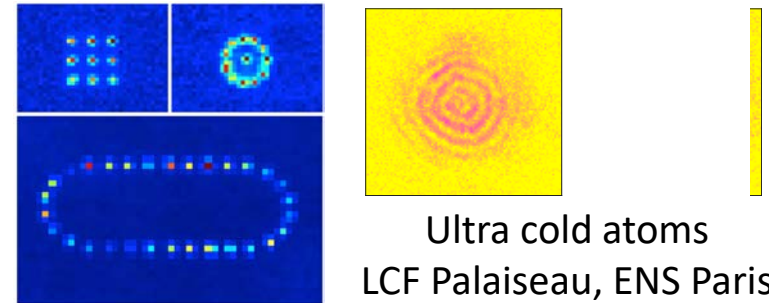


Gyrometer « on a chip »
SYRTE, Obs. Paris, Thales



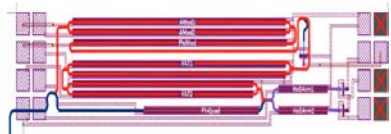
Micro-magnetometer
LAC Orsay, Thales

2. Quantum simulations: *beyond the computable.*

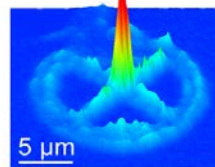
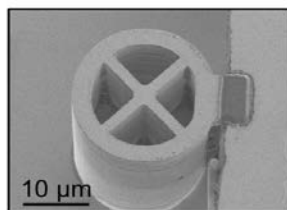
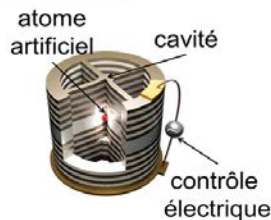


Ultra cold atoms
LCF Palaiseau, ENS Paris

3. Quantum communications: *security of data transfer.*

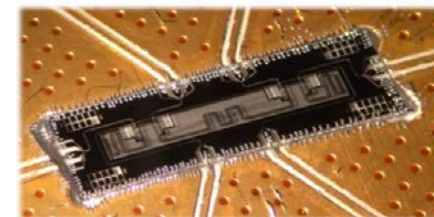
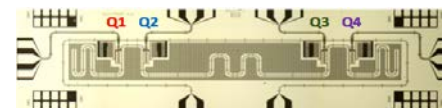


Integrated quantum cryptography
LIP6 Paris, LCF Palaiseau



Artificial atoms and micro-cavities - C2N Palaiseau

4. Quantum computing: *an algorithmic revolution.*



Quantum circuits
with 4
superconducting
qubits
SPEC / CEA
Saclay

Disruptive Technologies

Investments at the international level:

- * Public : Canada, USA, Australia, UK, Germany, NL, China...
- * Private : IBM, Intel, Google, Microsoft, Toshiba, D-Wave...
 - in Europe : Bosch, Siemens, IMEC, Nokia, Airbus, IDQ...
 - in France : Thales, ATOS, SODERN... + PME : μ Quans...



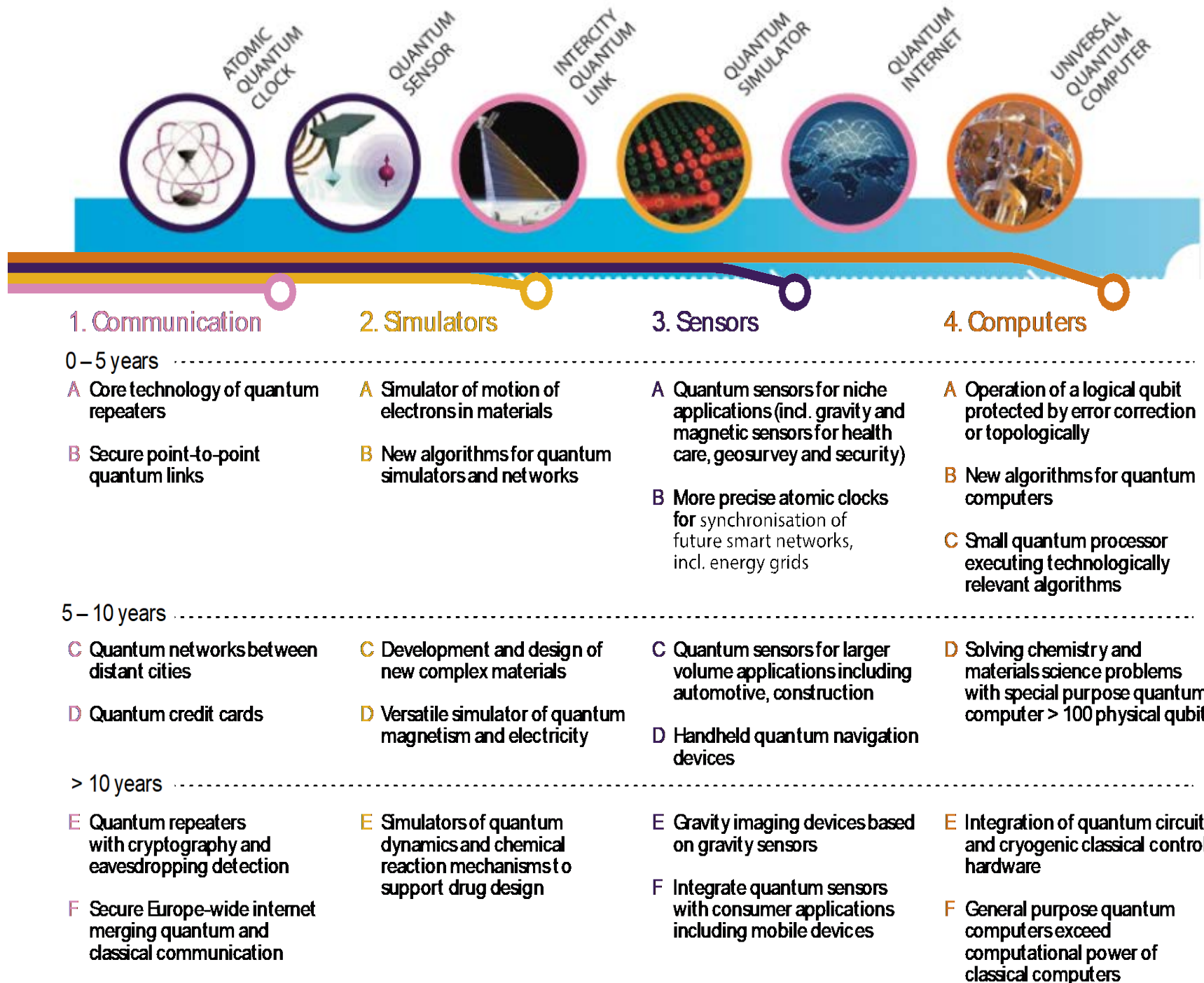
Toy quantum computer
IBM (5 =>16 qubits)

QuantumManifesto
A New Era of Technology Draft - March 2016

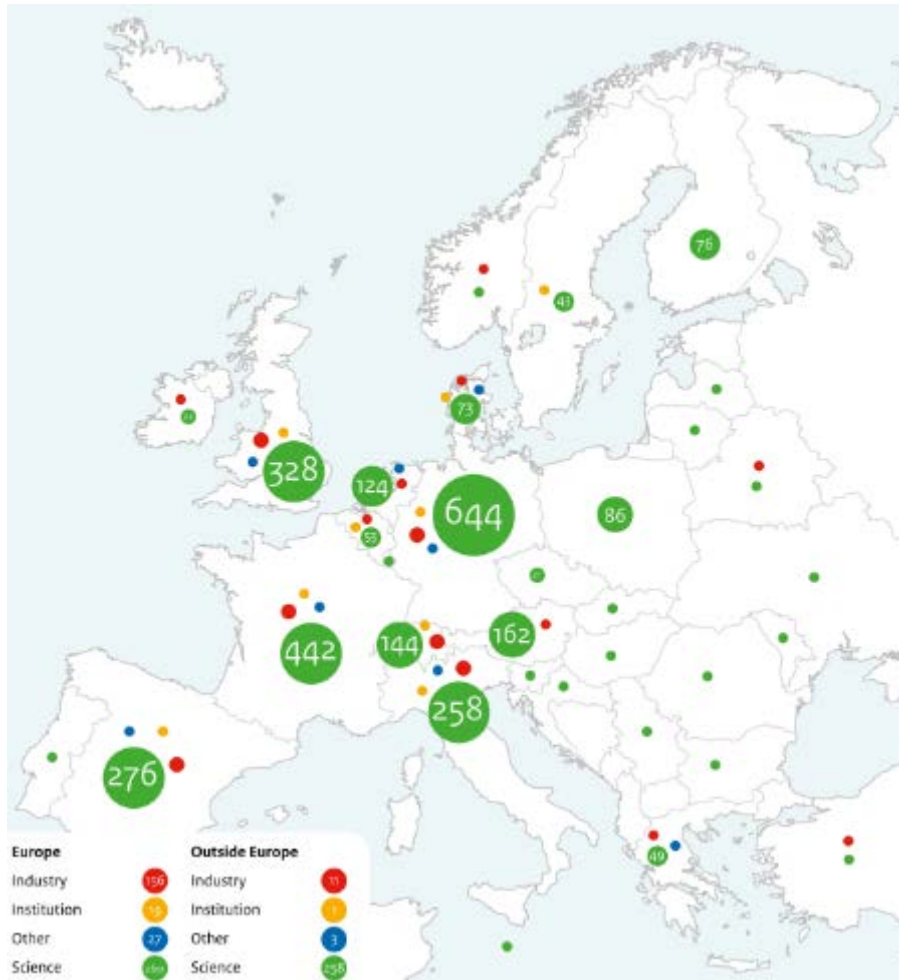
European effort: "Quantum Technologies Flagship"

- * D. Estève (CEA), P. Grangier (CNRS), T. Debuisschert (Thales) in the academic and industrial working group
- * E. Giacobino (CNRS), D. Dolfi (Thales), C. Allouche (ATOS) in the High Level Steering Committee (HLSC) for defining the « ramp-up phase » starting in 2018.

Quantum Manifesto

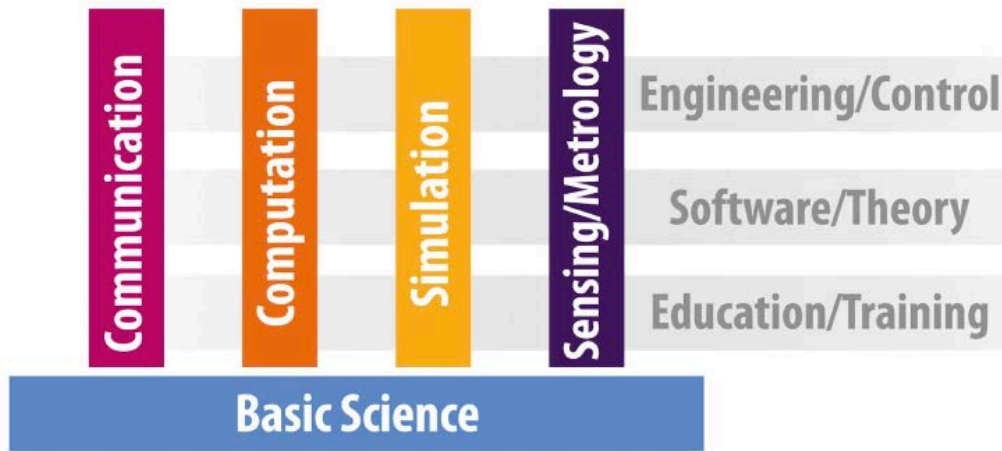


More than 3600 supporters from academia and industry

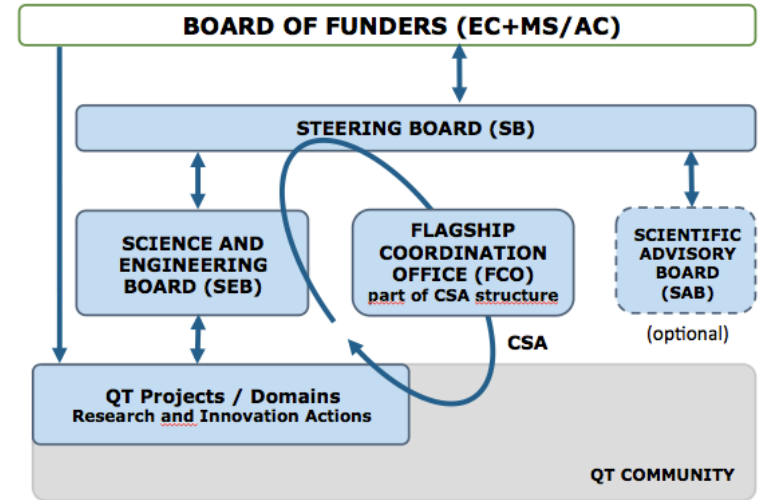


QT Flagship:

Input from the High Level Steering Committee



Strategic Research Agenda (SRA)
Implemented in the call



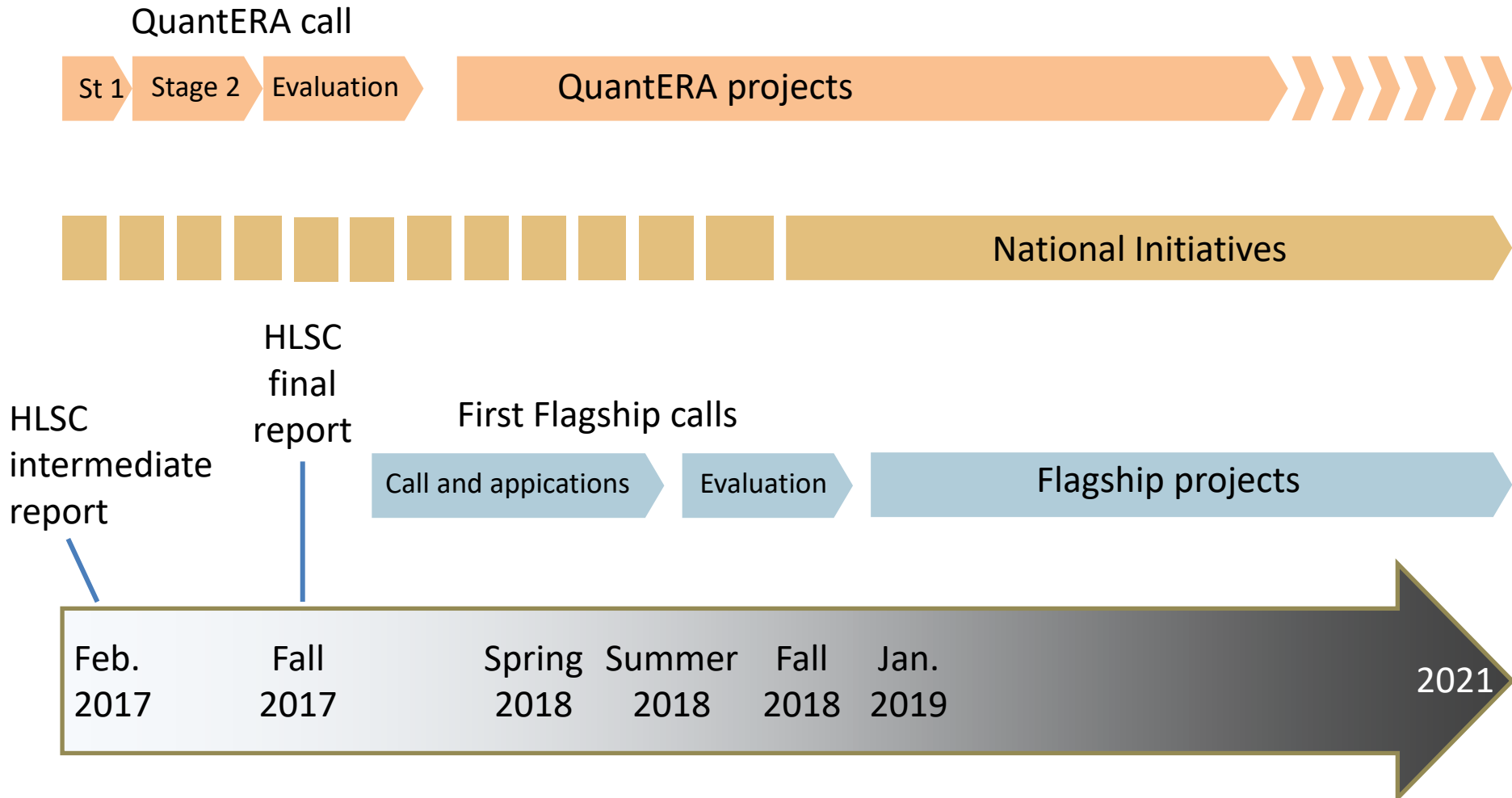
Governance
Still under discussion

Quantum
Technologies Flagship
Intermediate Report

High-Level
Steering
Committee
16 February 2017

Timeline : QT Flagship Call

Opening : 31 Oct 2017, Deadline : 20 Feb 2018



QT Flagship Call: funding

Conditions for the Call - FET FLAGSHIPS – Tackling grand interdisciplinary science and technology challenges

Opening date(s), deadline(s), indicative budget(s):²⁸

Topics (Type of Action)	Budgets (EUR million)	Deadlines
	2018	
FETFLAG-03-2018 (RIA)	130.00	20 Feb 2018
Overall indicative budget	148.00	

The indicative funding budget for area e. – Fundamental Science – under FETFLAG-03-2018 (RIA) is up to EUR 20 million.