



QUANTUM  
FLAGSHIP

# Quantum Flagship

The Strategic Research Agenda Working Group (SRA-WG)  
Goals & Working Mode

1 9 A P R I L 2 0 1 8



Rob Thew  
University of Geneva

# European History

## QIPC: Quantum Information Processing & Communication

**1998:** The Pathfinder Project laid the foundation for the research field of QIPC at EU level

The EC has supported quantum technologies over the last 20 years with a cumulative investment reaching around €550M

**2004:** Special session  
Rome QIPC Conference

Discussion on actions to be taken with the aim to **promote QIPC research in Europe**, strengthen its image in a coherent way, **unify the research community** by elaborating a **common European strategy and goals**, and, especially, **provide the required input to the European Commission**, reaching in an appropriate way decision makers.

**2005:** QIPC Roadmap      2005 – 2013: 8 iterations

**2005-08:** Era-Pilot QIST

**2006-09:** QUROPE – Quantum Europe

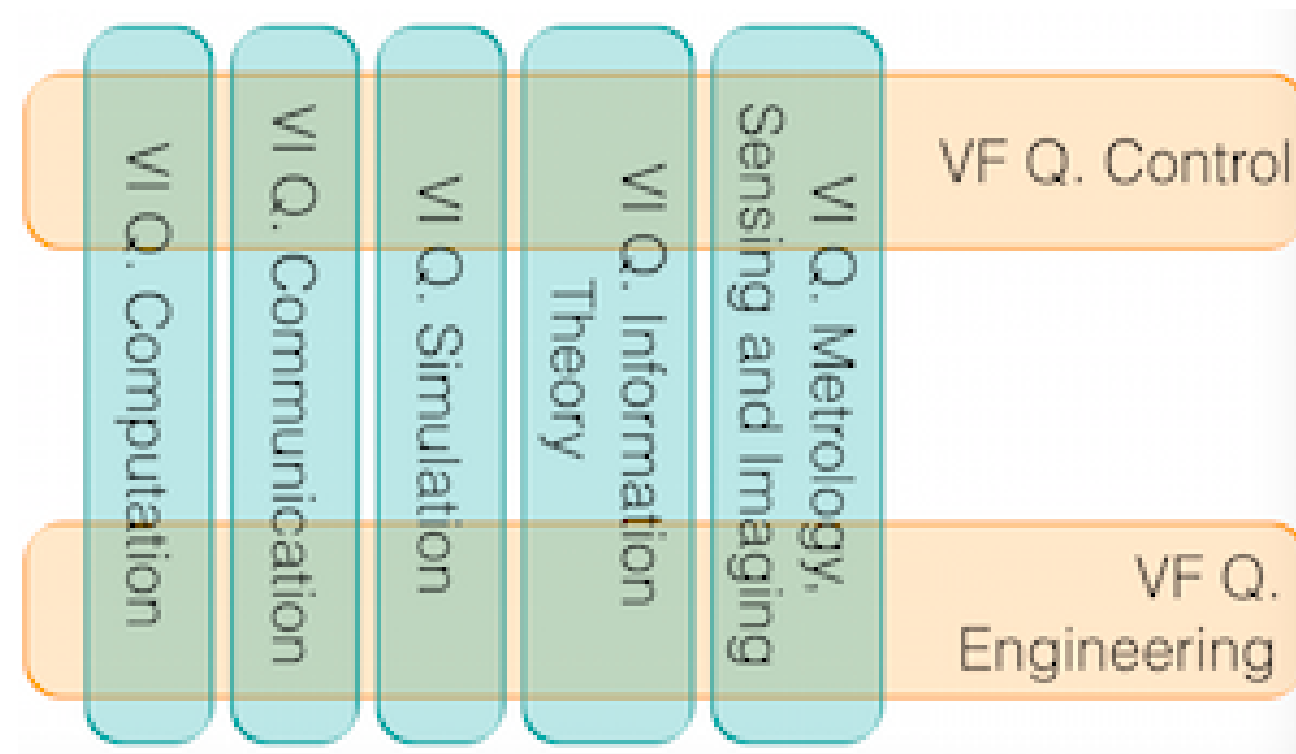
**2010-13:** QUIE<sup>2</sup>T - Quantum Information Entanglement-Enabled Technologies

**2013-16:** QUTE-Europe - Quantum Technologies for Europe

Coordination /  
Support Actions



# QUROPE: Virtual Institutes & Facilities



<b>Coordinator</b>	A. Acin				
<b>Virtual Institute</b>	<b>Computation</b>	<b>Simulation</b>	<b>Communication</b>	<b>Sensing</b>	<b>Theory</b>
<b>Director</b>	D. Esteve	I. Bloch	N. Gisin	I. Walmsley	I. Cirac
<b>Executive Secretary</b>	A. Wallraff	S. Kuhr	R. Thew	F. Jelezko	M. Wolf
<b>Members</b>	R. Blatt	J. Bloch	P. Grangier	M. Plenio	H. Buhrman
	D. DiVincenzo	J. Eisert	R. Renner	E. Polzik	M. Troyer
	D. Loss	M. Inguscio	G. Ribordy	J. Wrachtrup	S. Wehner
	P. Zoller	M. Lewenstein	A. Shields	K. Banaszek	R. Werner
		L. Vandersypen	R. Ursin		A. Winter
<b>Virtual Facility</b>	<b>Engineering</b>	<b>Control</b>			
<b>Director</b>	C. Marcus	S. Glaser			
<b>Executive Secretary</b>	J. Morton	F. Wilhelm			

## QIPC / QT Roadmap (2016)

# QT Roadmapping and the SRA

**Quantum Technologies Roadmap**

152 pages



A few pages



**Quantum Technologies Flagship Final Report**

High-Level Steering Committee  
28 June 2017



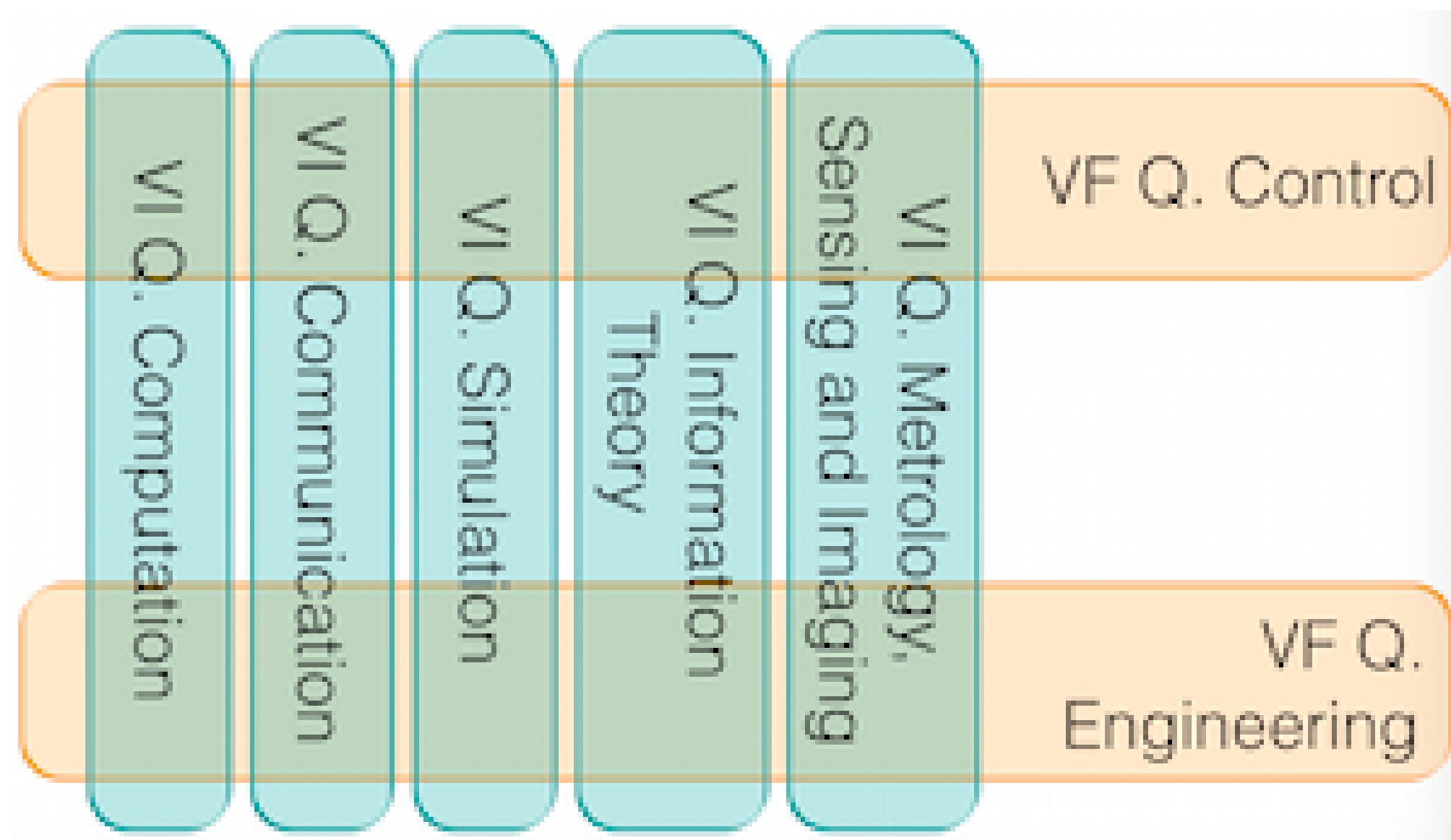
Contains the SRA ~8 pages

Update: QT Roadmap & SRA  
Initiate: Industrial Roadmap

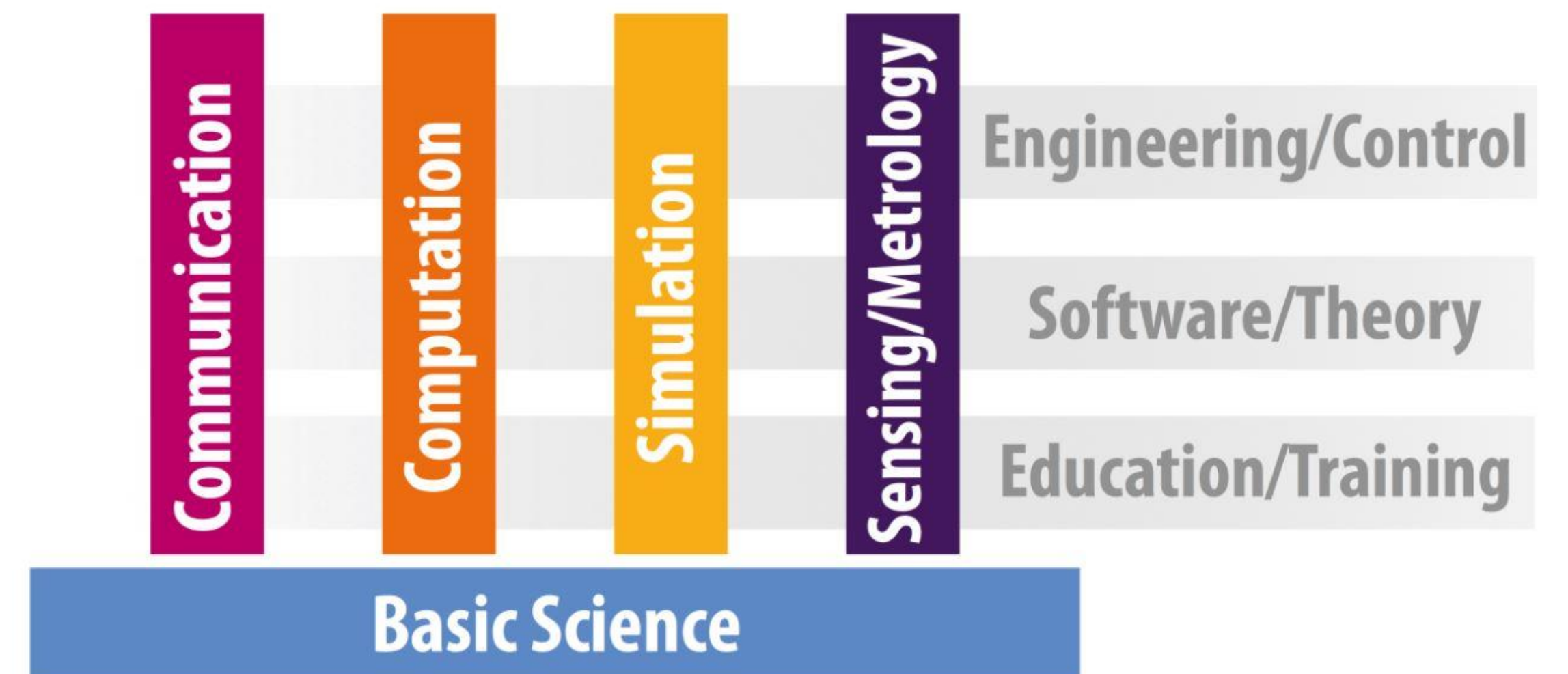
[www.qurope.eu](http://www.qurope.eu) → [www.qt.eu](http://www.qt.eu)

# A Virtual Quantum Evolution for a Quantum Revolution

## Virtual Institutes/Facilities



## Strategic Research Agenda – Working Group



# SRA Working Group Structure

<b>Communication</b>	<b>Computation</b>	<b>Simulation</b>	<b>Sensing &amp; Metrology</b>	
Engineering	Engineering	Engineering	Engineering	Engineering
Control	Control	Control	Control	Control
Software	Software	Software	Software	Software
Theory	Theory	Theory	Theory	Theory
Basic Science	Basic Science	Basic Science	Basic Science	Basic Science
Industry	Industry	Industry	Industry	~35-40
X	X	X	X	
X	X	X	X	

This will be made up of a combination of people from the previous VI/VFs + candidates proposed by the QCN

# Gender Equality

- Previously, the VI/VF had ~36 members  
... including 2 women...
- Our goal is to address this imbalance  
when forming the SRA-WG
- In the QSA we also have a task on  
Gender Equality Initiatives
- This will address all aspects of QT,  
not just the SRA-WG



- We are in the process of forming a working  
group to make sure that concrete  
objectives are defined and achieved.

- Chiara Macchiavello (IT),
  - Lydia Sanmarti (ES),
  - Ruth Oulton (UK),
  - Irene D'Amico (UK),
  - Christiane Koch (DE),
  - Iuliana Radu (BE),
  - Geraldine Haack (CH)
- } QFlag

If you're interested in assisting, let me know



The Flagship will evolve & the QT community will have a say in that

## SRA-WG: Goals

- Develop a well thought-through, ambitious, but achievable, long-term Strategic Research Agenda (SRA), which takes into account scientific, technological and market developments.
- Formulate and update relevant technology roadmaps and the strategic agenda as well as policy proposals, discussion papers for related or future initiatives (e.g. FP9).
- Defining, developing and monitoring TRL & KPI.
- Assist in preparing and coordinating input of technical content for the web portal. [www.qt.eu](http://www.qt.eu)

Inclusive & complete Roadmaps depend on the whole community & good communication

## **SRA-WG: Working Mode**

Concerning the QT Roadmap & SRA

Events like today represent a perfect opportunity to discuss the state of the art and where we, as a community, think we should be heading.

There will be another community consultation event in Vienna on the 29-30<sup>th</sup> October

There will be THE Quantum Technologies Conference

In February– March 2019

**As we've previously done, consultation opportunities will be announced so everyone can contribute.**

Concerning Policy Input

This will follow a similar approach.

Sometimes the SRA-WG will have to respond executively in the case of short time constraints

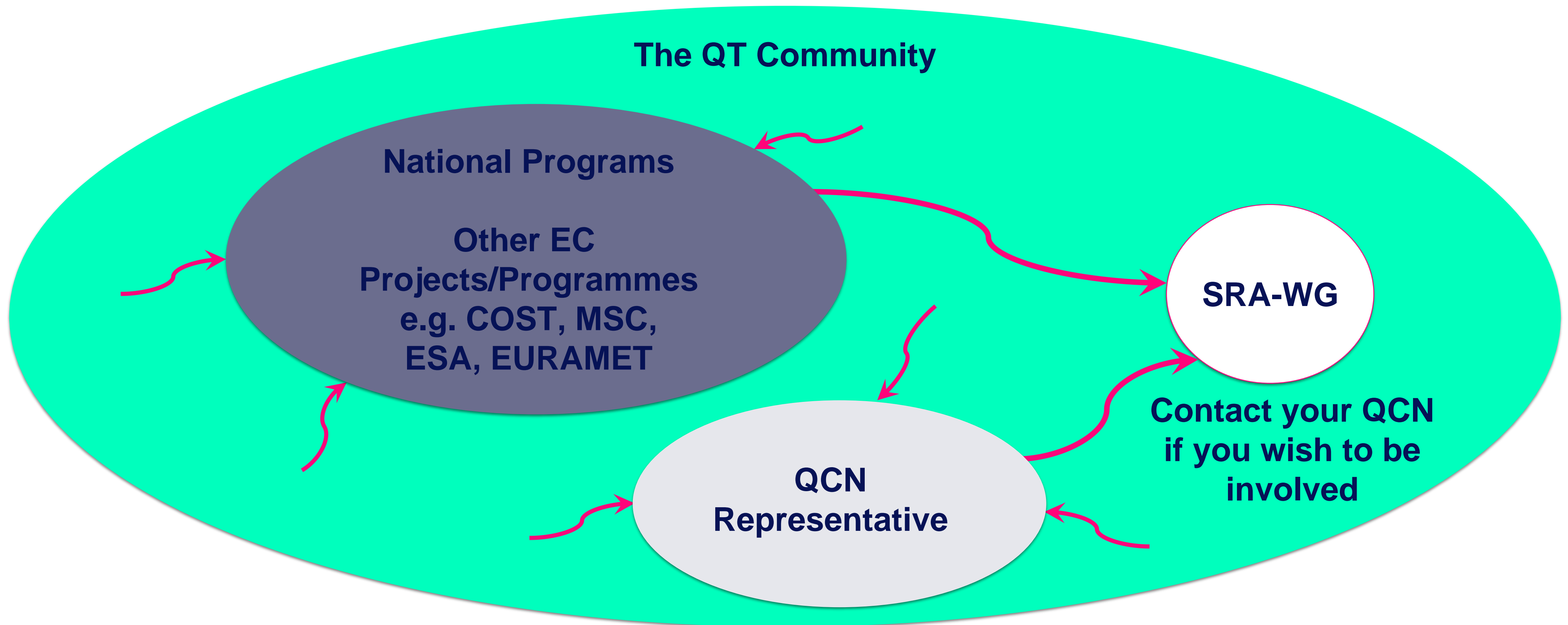
Flagship Project  
Meetings/Conferences

Domain Specific  
Workshops/Conferences

Inclusive & complete Roadmaps depend on the whole community & good communication

## SRA-WG: This is a Lot of Work

The SRA-WG can be seen, in part, as an editorial body



# SRA Breakout Sessions

Start with a short presentation on status of the Roadmap and SRA.

Followed by discussion on several points:

1. What are we missing in terms of big picture visions for these areas?
2. What are we missing in terms of emerging technologies and concepts?
3. How to define an Industrial Roadmap?
4. What are the challenges for the community to realise the ambitions of the Flagship and beyond?
5. What is missing from this discussion?

Communication	Tessar	Nicolas Gisin & Andrew Shields
Computation	Abbe	Walter Riess & Ferdinand Schmidt-Kaler
Simulation	OPM1	Jens Eisert & Michael Marthaler
Sensing and Metrology	Zeiss	Bruno Desruelle & Piet Schmidt

Engineering & Control	Schott	Kai Bongs & Christiane Koch
Software & Theory	Dialyt	Anouk de Hoogh & Toni Acin
Basic Science	Prismo	Tilman Pfau & Alain Aspect