



Quantum Technologies Flagship

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Algo de historia



Future and Emerging Technologies

Quantum
Information
Processing and
Communication

Kick-off meeting

**Brussels 22-23
September 1999**





Possible Cluster Working Groups



- n **Cryptography and communication**
- n **Decoherence control**
- n **Qubit implementation, scalability**
- n **Quantum information processing theory**
- n **Roadmap**

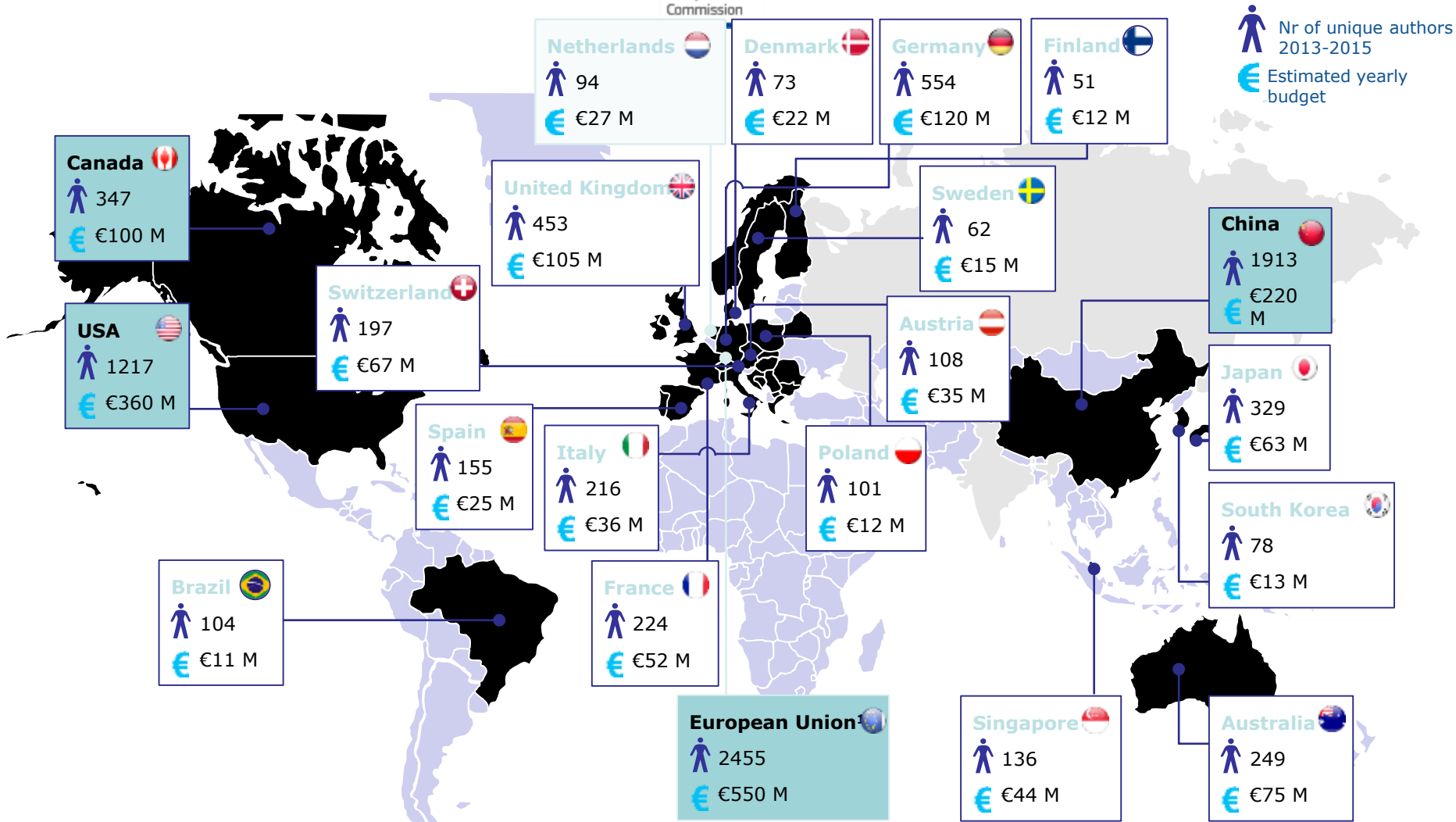


- >20 años de inversiones EU
 - **Sensores, comunicación/QKD, computación**
 - **Excelencia científica & técnica en EU**
 - **Premiados Nobel**
- Inversiones EU creciendo: ~550M€
 - **FET (~250M€), ERC (~100M€), MSCA (~125M€)**
 - **EMRP/EMPIR (metrology)**
 - **35 FP7 FET projects (+ FP5 + FP6 + H2020)**
- Varias iniciativas nacionales existentes o en preparación

~7000 investigadores 1.5 B€/y -> 5B€/y



European
Commission



1 Combined estimated budget of EU countries

SOURCE: Publication search, Mac Kinsey

Entorno político actual



Communication on European Cloud Initiative & Staff Working Document (SWD) on Quantum Technologies

"Exploiting the potential of quantum technologies:

The European Data Infrastructure should be complemented by an ambitious, long-term and large-scale flagship initiative to unlock the full potential of quantum technologies, accelerate their development and bring commercial products to public and private users."

"Action: The European Commission will start the preparatory steps for the flagship...with the aim to launch the ramp up phase in 2018."



"WELCOMES the discussion on the Commission's proposal to prepare for the launch of an ambitious flagship initiative in close cooperation with Member States and relevant stakeholders to unlock the full potential of quantum technologies and accelerate their development and take-up in commercial products."

Competitiveness council conclusions, 26/5/2016



Quantum Manifesto

A joint call for action endorsed by more than 3500 stakeholders from science and industry in EU and globally

1. Why Europe needs to act now
2. Call to launch an ambitious European programme
3. R&D goals for quantum technologies

<http://quope.eu/manifesto>

⇒ Handed over to Commissioner Oettinger at Quantum Europe conference

Porqué ahora?



- Mantener la supremacía científica EU
- Prepararse a la valorización I+D y el "take-up" industrial
- Apoyarse en los intereses nacionales
 - **ERANET Cofund =>24 MS**
 - **Iniciativas nacionales: NL, UK, DK, DE?, ES?, IT?, PT?**
- Interés creciente de la industria EU
 - **Bosch, Thales, ASML, Safran, Airbus, ATOS/Bull...**
 - **PYMEs : VLC Photonics, E2V, MuQuans, IDQuantique...**
- Competición global muy activa
 - **US, Canada, China, ...**

Qué es el Flagship?



Desafío Europeo: Convertir excelencia científica en excelencia industrial

- Mantener excelencia I+D EU
- Expandir a ingeniería
- Promover innovación
- Promover participación industrial

...antes que los competidores asiáticos o USA dominen el mercado

Timeline

2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027

HORIZON 2020

Next Framework Programme

HLG

call

**Ramp-up
phase**

Implementation phase

QuantERA

+ National/Regional programmes

Expert Group: composition



European
Commission

Chair

Prof. Dr. Jürgen Mlynek Humboldt University

Observer

(link with FET Flagship interim evaluation panel)

Prof. Maria Chiara Carrozza Sant'Anna School of Advanced Studies

Prof. Dr. Rainer Blatt	University of Innsbruck
Prof. Dr. Vladimir Bužek	Slovak Academy of Sciences
Prof. Dr. Tommaso Calarco	University of Ulm
Prof. Per Delsing	Chalmers University of Technology
Prof. Elisabeth Giacobino	CNRS, Laboratoire Kastler-Brossel
Prof. Dr hab. Marek Kuś	Polish Academy of Sciences - Center for Theoretical Physics
Prof. Eugene Simon Polzik	Niels Bohr Institute
Dr. Maria Luisa Rastello	National Institute of Metrological Research (INRIM)
Prof. Dr. ir. Wim Van Saarloos	The Netherlands Organisation for Scientific Research NWO - Foundation for Fundamental Research on Matter
Prof. Dr. Lluís Torner	ICFO - The Institute of Photonic Sciences
Prof. Ian Walmsley	University of Oxford - Department of Physics

Airbus Defense & Space	Mr. Paolo Bianco
ASML	Dr. Markus Matthes
Atos SE	Dr. Cyril Allouche
Ericsson	Dr. Fabio Cavaliere
ID Quantique	Dr. Grégoire Ribordy
KPN	Ms. Jaya Baloo
M2 Lasers	Dr Graeme Malcolm
Robert Bosch GmbH	Dr. Michael Bolle
Siemens AG	Dr. Norbert Lütke-Entrup
ST Microelectronics	Dr. Guido Chiaretti
Thales	Mr. Daniel Dolfi
VLC Photonics	Dr. Iñigo Artundo Martinez

Academic members

Industrial members

Timing



Expert Group actividades

Próxima reunión HLSG : 10 Noviembre 2016

Follow-up a medias de Enero-2017?

Presidencia Maltesa 16/17 Febrero 2017

Work Program

Expert Group SRA: Febrero 2017

Primer WP draft Q1 2017

WP adopción/publicación Julio 2017?

En resumen...

El flagship queda por definir
Están invitados a crear el flagship
QT=prioridad Europea & nacional
QT=prioridad económica
Gran apoyo político e industrial



Gracias por su atención