

Quantum in Horizon Europe

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31 May 2022

**HORIZON
EUROPE**



THE EU RESEARCH & INNOVATION
PROGRAMME 2021 - 2027

#HorizonEU



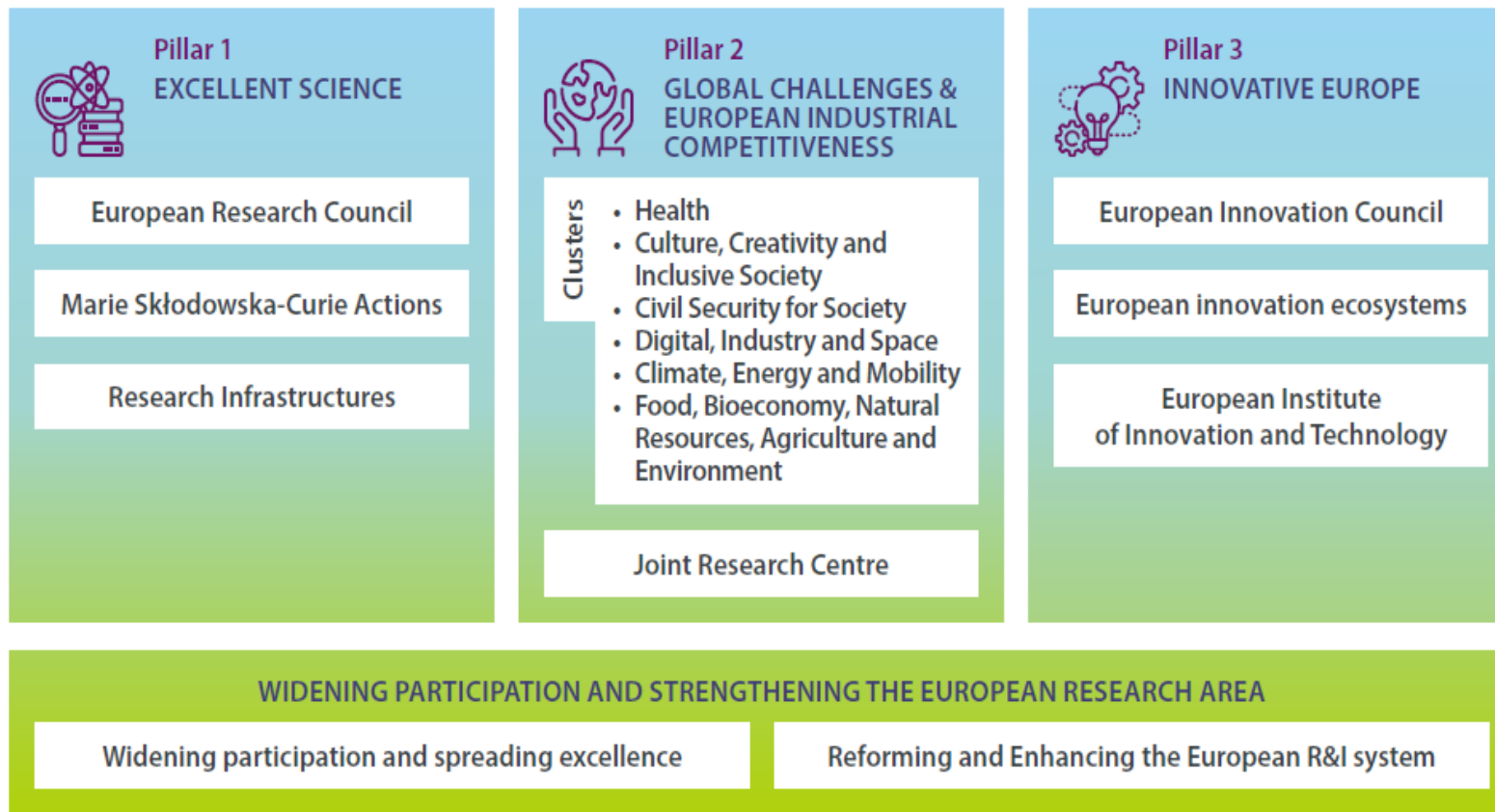
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Horizon Europe

Horizon Europe structure – EUR95bn

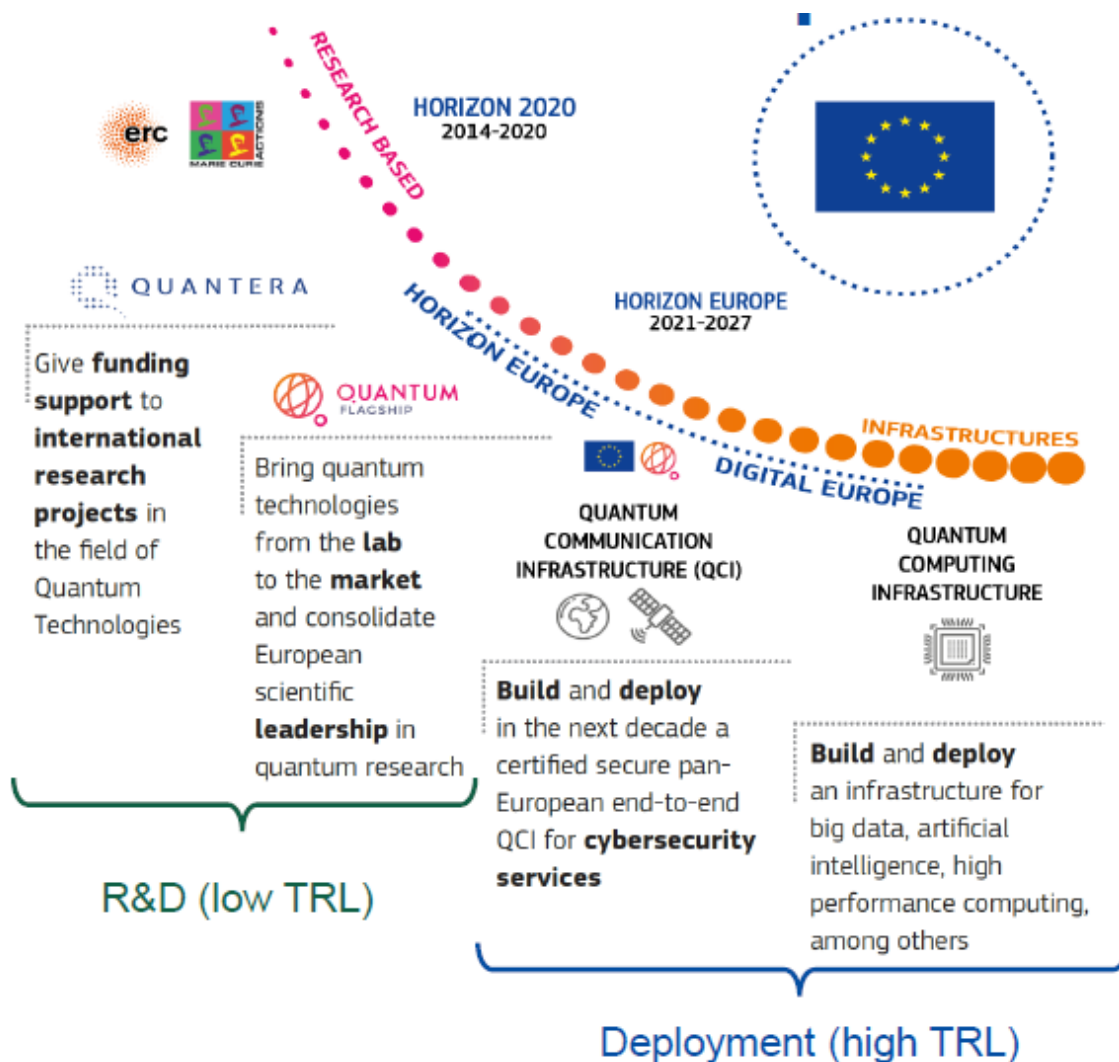




Quantum in the EU

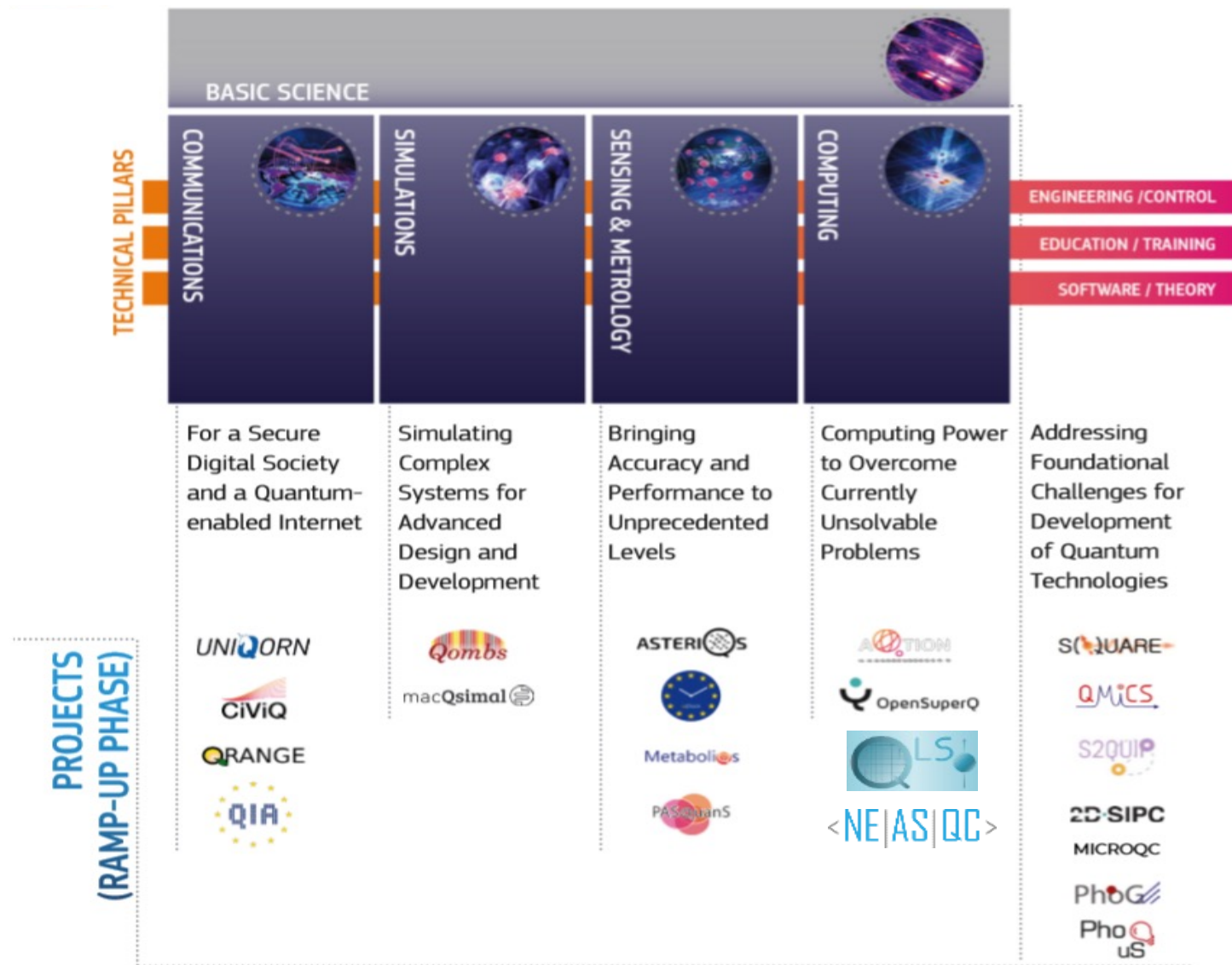
[\(42\) Quantum Technologies in a Digital Decade | Quantum Summit 2021 - YouTube](#)

[\(42\) Quantum in Horizon Europe- Israel Info Session – YouTube](#) 34 minutes





Projects from the Ramp-up phase (H2020)



<https://qt.eu/about-quantum-flagship/projects/>



Quantum deadline 21st October 2021

Digital and Emerging Technologies for Competitiveness and fit for the Green Deal				
Topic code	Title	Action Type	# proposals	# funded projects
HORIZON-CL4-DIGITAL-EMERGING-2021-01-21	Next generation quantum sensing technologies	RIA	8	2
HORIZON-CL4-DIGITAL-EMERGING-2021-01-23	International cooperation with Canada - Quantum	RIA	15	3
HORIZON-CL4-DIGITAL-EMERGING-2021-01-30	Investing in new emerging quantum computing technologies	RIA	5	2
HORIZON-CL4-DIGITAL-EMERGING-2021-01-32	Support and coordination of the Quantum Technologies Flagship Initiative (CSA)	CSA	1	1



Quantum deadline 27th January 2022

Framework Partnership Agreements (FPAs) are formalised long-term cooperation mechanisms involving several or recurring grants.

- based on jointly agreed action plans and agreements that set out the terms and conditions for receiving grants to implement
- set out the framework conditions governing potential grants to beneficiaries on the basis of an action plan
- have no budget
- selected following a call for proposals
- subsequently, beneficiaries may be invited to submit their proposals for an SGA
- SGAs can only be signed if the FPA has been signed



Quantum deadline 27th January 2022

Proposal statistics (currently going through grant preparation phase)

Flagship on Quantum Technologies: a Paradigm Shift				
Topic code	Title	Action Type TRL	# proposals submitted	# projects to be funded
HORIZON-CL4-DIGITAL-EMERGING-2021-02-15	Framework Partnership Agreement for developing the first large-scale quantum computers	FPA	2	2
HORIZON-CL4-DIGITAL-EMERGING-2021-02-17	Framework Partnership Agreement for developing large scale quantum simulation platform technologies	FPA	1	1
HORIZON-CL4-DIGITAL-EMERGING-2021-02-19	Framework Partnership Agreements in Quantum Communications	FPA	2	2
HORIZON-CL4-DIGITAL-EMERGING-2021-02-22	Framework Partnership Agreements for open testing and experimentation and for pilot production capabilities for quantum technologies	FPA	2	2
HORIZON-CL4-DIGITAL-EMERGING-2021-02-20	Quantum sensing technologies for market uptake	IA	4	3
HORIZON-CL4-DIGITAL-EMERGING-2021-02-10	Strengthening the quantum software ecosystem for quantum computing platforms (RIA)	RIA	9	2
HORIZON-CL4-DIGITAL-EMERGING-2021-02-16	Basic Science for Quantum Technologies (RIA)	RIA	31	7

3 Irish participations, 1 successful, no participation in FPAs



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Quantum deadline 27th January 2022

Successful FPAs to be invited to submit proposals for Strategic Grant Agreements

Flagship on Quantum Technologies: a Paradigm Shift					
Topic code	Title	Action Type TRL	Budget (M€)	Project size (M€)	# projects
HORIZON-CL4-QUANTUM-01-SGA	Developing the first large-scale quantum computers	SGA 4/5 → 6/7	40	18-20	2
HORIZON-CL4-QUANTUM-02-SGA	Developing large scale quantum simulation platform technologies	SGA 4/5 → 6/7	16	16	1
HORIZON-CL4-QUANTUM-03-SGA	Building the Quantum Internet	SGA 2/4 → 4/6	24	24	1
HORIZON-CL4-QUANTUM-04-SGA	Quantum encryption and future quantum network technologies	SGA 4/5 → 6/7	25	25	1
HORIZON-CL4-QUANTUM-05-SGA	Supporting open testing and experimentation for quantum technologies in Europe	SGA	19	19	1
HORIZON-CL4-QUANTUM-06-SGA	Supporting experimental production capabilities for quantum technologies in Europe	SGA	19	19	1



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Possible topics for 2023-2024 Work Programme

- HORIZON-CL4-2023-DIGITAL-EMERGING-01-41: Investing in alternative quantum computation and simulation platform technologies (RIA)
- HORIZON-CL4-2024-DIGITAL-EMERGING-01-42 Stimulating transnational research and development of next generation quantum technologies, including basic theories and components (Cascading grant with FSTP)
- HORIZON-CL4-2023-DIGITAL-EMERGING-01-43: Framework Partnership Agreement for developing large-scale quantum Computing platform technologies (FPA)
- HORIZON-CL4-2024-DIGITAL-EMERGING-01-44: Next generation quantum sensing and metrology technologies (RIA)
- HORIZON-CL4-2024-DIGITAL-EMERGING-01-45: Quantum sensing and metrology for market uptake (IA)
- HORIZON-CL4-2024-DIGITAL-EMERGING-01-46: Quantum communication components for space applications (RIA)
- HORIZON-CL4-2024-DIGITAL-EMERGING-01-47: Quantum Photonic Integrated Circuit technologies (RIA)



Strategic Autonomy (Article 22.5 - 1st part)

In order to achieve the expected outcomes, and safeguard the Union's strategic assets, interests, autonomy, and security, participation in this topic is limited to legal entities established in Member States, associated countries, OECD countries. Proposals including legal entities which are not established in these countries will be ineligible.....



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Strategic Autonomy (Article 22.5 - 2nd part)

In order to achieve the expected outcomes, and safeguard the Union's strategic assets, interests, autonomy, and security, it is important to avoid a situation of technological dependency on a non-EU source..... For this reason, participation is limited to legal entities established in Member States, Iceland and Norway.

For the duly justified and exceptional reasons listed in the paragraph above, in order to guarantee the protection of the strategic interests of the Union and its Member States, entities established in an eligible country listed above, but which are directly or indirectly controlled by a non-eligible country or by a non-eligible country entity, may not participate in the action unless it can be demonstrated, by means of guarantees provided by their eligible country of establishment, that their participation to the action would not negatively impact the Union's strategic, assets, interests, autonomy, or security.



Strategic Autonomy (Article 22.5 - 2nd part)

The guarantees shall in particular substantiate that, for the purpose of the action, measures are in place to ensure that:

- a) control over the applicant legal entity is not exercised in a manner that retrains or restricts its ability to carry out the action and to deliver results, that imposes restrictions concerning its infrastructure, facilities, assets, resources, intellectual property or know-how needed for the purpose of the action, or that undermines its capabilities and standards necessary to carry out the action;
- b) access by a non-eligible country or by a non-eligible country entity to sensitive information relating to the action is prevented; and the employees or other persons involved in the action have a national security clearance issued by an eligible country, where appropriate;
- c) ownership of the intellectual property arising from, and the results of, the action remain within the recipient during and after completion of the action, are not subject to control or restrictions by non-eligible countries or non-eligible country entity, and are not exported outside the eligible countries, nor is access to them from outside the eligible countries granted, without the approval of the eligible country in which the legal entity is established.



Other possible Quantum opportunities

Marie Skłodowska-Curie Actions (MSCA)

Excellent Science pillar of Horizon Europe, €6.4B budget

Intersectoral, interdisciplinary, international collaboration

Funds ALL areas of research (Bottom-up)

Career development and training projects

Companies with infrastructure and supervisory capacity can participate

<http://www.iua.ie/irish-marie-curie-office/introduction/>



Other possible Quantum opportunities

European Innovation Council

Support to innovations with breakthrough and disruptive nature and scale up potential that are too risky for private investors (**70% of the budget earmarked for SMEs**)

**European
Innovation Council**
– a one-stop-shop

Helping innovators **create markets** of the future, leverage private finance, **scale up** their companies, **Innovation centric**, risk taking & agile, pro-active management and follow up

Complementary instruments bridging the gap from idea to market

PATHFINDER

R&I grants

(from early technology to proof of concept)

TRANSITION

R&I grants

(proof of concept to pre-commercial)

ACCELERATOR

Grants & investment (via EIC Fund) for single SMEs & start-ups

(from pre-commercial to market & scale-up)



Travel Support for Academics

- To meet potential partners or attendance at EU information days/workshops relating to Horizon Europe
- Covers all Horizon Europe fields, except individual fellowships under MSCA
- Least-cost travel expenses and subsistence
- Visits will be typically up to three days duration
- Only one researcher will be supported to attend a meeting
- Applications must be submitted at least one month in advance

[Enterprise Ireland's Horizon Europe Funding Supports - Horizon Europe](#)



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Coordinator Support for Academics

The aim of this support scheme is to facilitate the preparatory work leading to a proposal for the coordination of a project under the Horizon Europe Programme.

- Coordinator (or internal approved staff) travel expenses/subsistence (**max €2k**)
- Costs of hosting meetings
- Employment of a researcher for short-term analysis (**max €8k/€850 per week**)
- Professional services (**max €4k ex VAT**)
- Replacement teaching (**max €8k**)

The maximum grant for academic coordinators under this support is €12,500 (inclusive of VAT).

***NOTE:**

- **Retrospective** expenditure not eligible
- **Deadline** : 10 weeks prior to call closing (submission) date.
- Proposal must be **submitted!**

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- Cluster 3 Civil Security for Society
- Cluster 4 Digital, Industry and Space
- Cluster 5 Climate, Energy and

Mobility

- Cluster 6 Food, Bioeconomy, Natural Resources, Agriculture and Environment

SUBMIT

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