

The European Innovation Council

Alternative approaches to Quantum Information Processing, Communication, and Sensing

Samira Nik, Programme Manager
Quantum Tech and Electronics

European
Innovation
Council



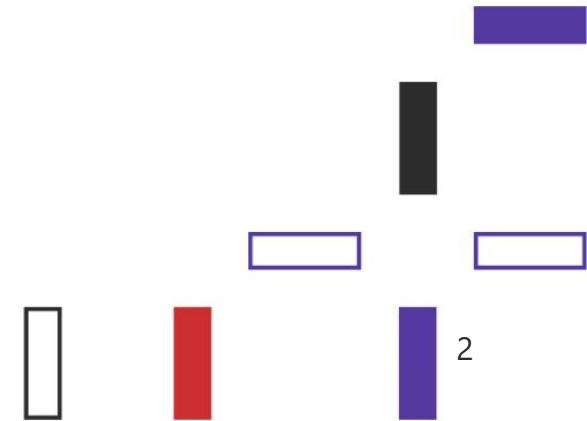
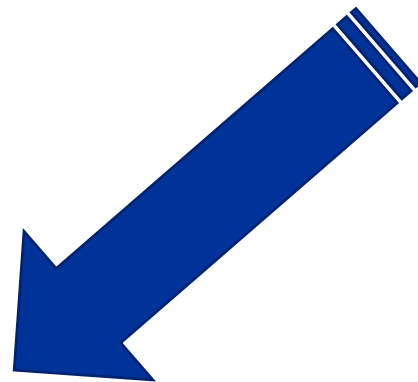
Send us your
questions by
Sli.Do!

Join at
slido.com
#EICPathfinder



- General Q&A
- Carbon dioxide and nitrogen...
- Cardiogenomics
- DNA-based digital data stor...
- Energy storage
- Towards the Healthcare Con...
- Quantum Information**

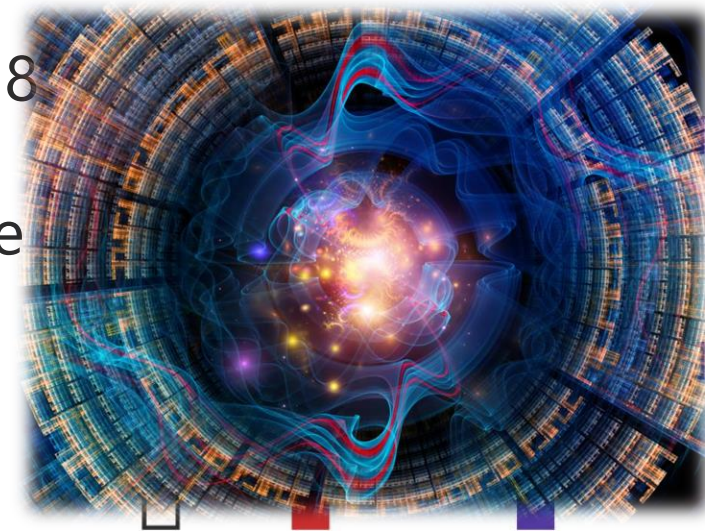
Join Sli.do #EICPathfinder and
select the **right Breakout session**





Set the scene

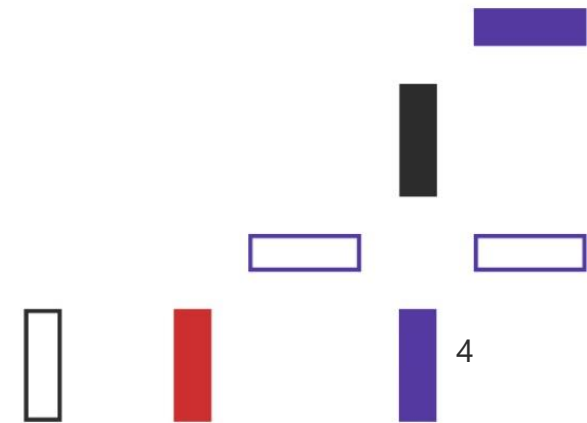
- Within the last two decades, quantum technologies (QT) have made tremendous progress, moving from fundamental blue-sky research into a cross-disciplinary field of applied research, technological development, and commercialization.
- Governments and companies worldwide are investing extensively to utilize the quantum technologies potential.
- Quantum race to lead in areas such as computing, communications, sensing, imaging, and simulation is ongoing.
- EUR 1 billion EC Quantum Technology Flagship, October 2018
a 10-year timescale:
Expanding European scientific leadership and excellence in this research area and to kick-start a competitive European industry in Quantum Technologies





Set the scene

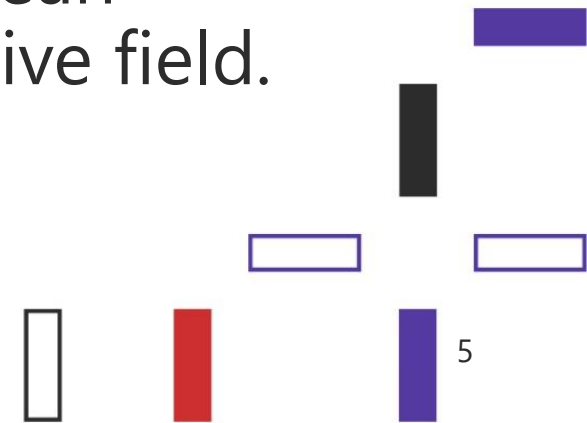
- QT Flagship aims to make Europe a dynamic and attractive region for innovative research, business, and investments in this field.
- The long-term horizon is a “Quantum Web”: Quantum computers, simulators and sensors interconnected via quantum networks distributing information and quantum resources, utilizing unique quantum phenomena such as coherence and entanglement.





Set the scene

- There is room for exploiting alternative implementations/platforms and (controllable) quantum principles that could become key elements in future quantum systems.
- Such new implementations and principles could lead to breakthrough innovations and enable new players to offer unique solutions for the architecture and critical building blocks of new quantum systems.
- This could represent a significant opportunity for European researchers, innovators, and companies in this competitive field.

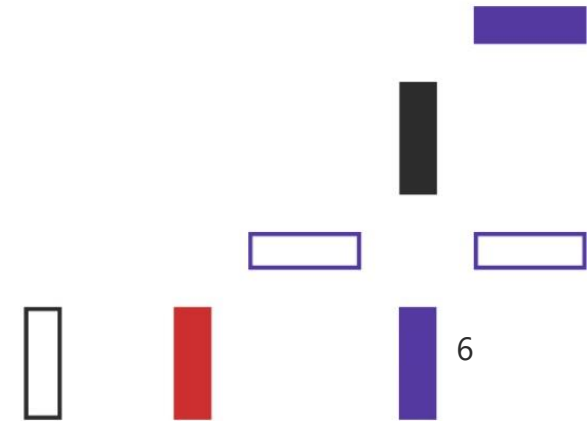




The Call in PW 2022

The proposals under this EIC Pathfinder Challenge:

- are expected to contribute to the development of information processing, communication or sensing components, for terrestrial or space applications, exhibiting similar advantages to the mainstream quantum technology approaches, in terms of sensitivity, accuracy, energy efficiency, etc;





The Call in PW 2022

The proposals under this EIC Pathfinder Challenge:

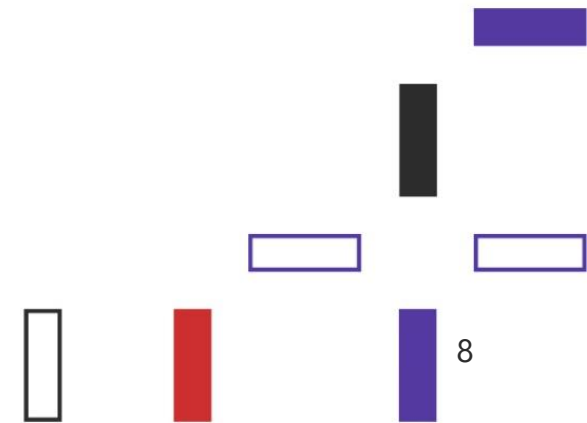
- should show how the foundations for novel approaches to encoding, manipulating, and storing information that could lead to practical applications
- should describe how the proposed information processing or communication system would be controlled, programmed, and measured and should address relevant interfacing aspects.





Evaluation steps

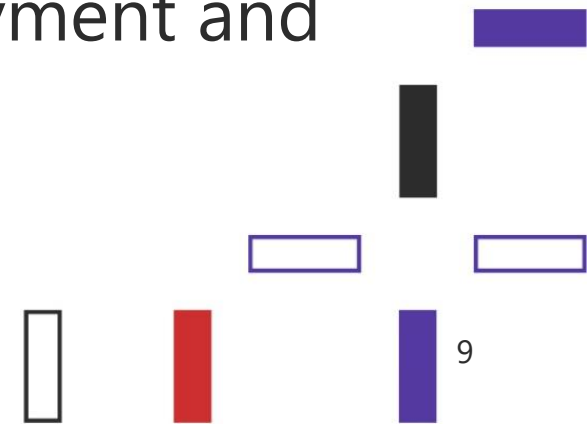
- In the first stage, all applications will be evaluated individually by external experts and scored against the evaluation criteria set out in the Work Programme.
- All applications that pass the defined thresholds against the criteria will be included in the second stage of the evaluation.





Evaluation steps

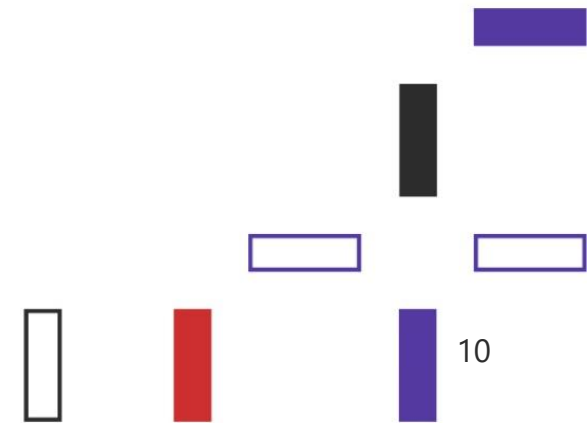
- In the second evaluation step, the evaluation committee, aims to build a consistent Challenge portfolio to advance Quantum information processing, Quantum communication, and Quantum sensing with the utilization of novel, non-mainstream implementation platforms, based on quantum phenomena. The proposals selected in the portfolio should be based on diverse novel approaches to data encoding and areas of deployment and application.





Categories

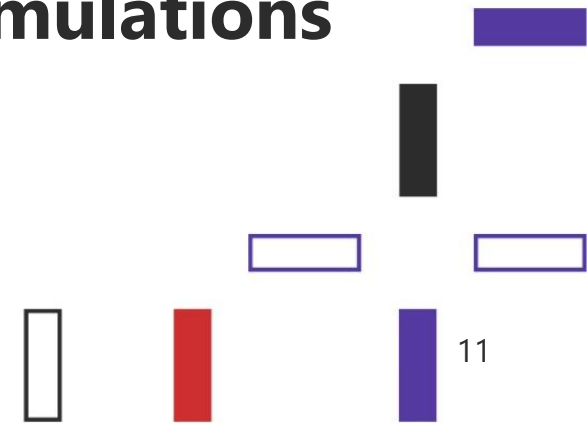
- In order to build the portfolio, the evaluation committee will map the proposals against a set of categories:
- I. **Implementation quantum platform/system (e.g., Superconducting qubits, Single photon sources, Trapped ions, Ultra-cold atoms in optical lattices, Topological nanowires, Nuclear magnetic resonance, etc.)**





Categories

- In order to build the portfolio, the evaluation committee will map the proposals against a set of categories:
- II. Quantum data encoding approach (Basic encoding, Angle encoding, QRAM encoding, Amplitude encoding, etc.)**
 - II. Applications of Quantum computing, Quantum simulations and Quantum sensing**





Portfolio considerations

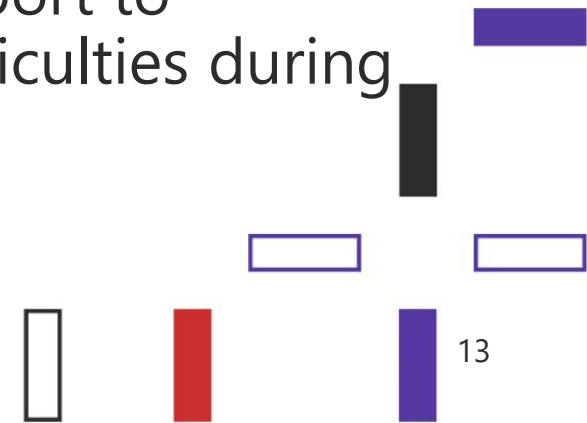
- For building the portfolio of projects to be funded, the evaluation committee will apply the following portfolio considerations:
 - The proposals selected in the portfolio should display diversity in the implementation quantum platform/ system.
 - The proposals in the portfolio should cover a variety of different data encoding or embedding approaches, and a variety of different applications in quantum computing, quantum simulation and quantum sensors, in order to assess the relative advantages of the approaches for different applications. Preference will be given to non-mainstream applications.





Challenge portfolio roadmap

- Following the selection of proposals to be funded under the Challenge, the Programme Manager will work together with the selected projects to develop a common roadmap for the Challenge.
- This roadmap will integrate the activities and milestones of the individual projects into a shared set of objectives and cross-project activities.
- The roadmap serves as a common basis for implementing the projects - including possible adjustments, reorientations or additional support to projects - and can be updated in light of emerging results or difficulties during the implementation.





Challenge portfolio roadmap

- The objectives can be revised, for instance based on projects' unexpected achievements, new technology trends, external inputs (other projects, new calls...).
- In particular, the Challenge roadmap will include activities on the transition to innovation and commercialisation, and to stimulate business opportunities. These activities may be supported and reinforced during the implementation with additional funding and expertise through proactive management.



Thank you!

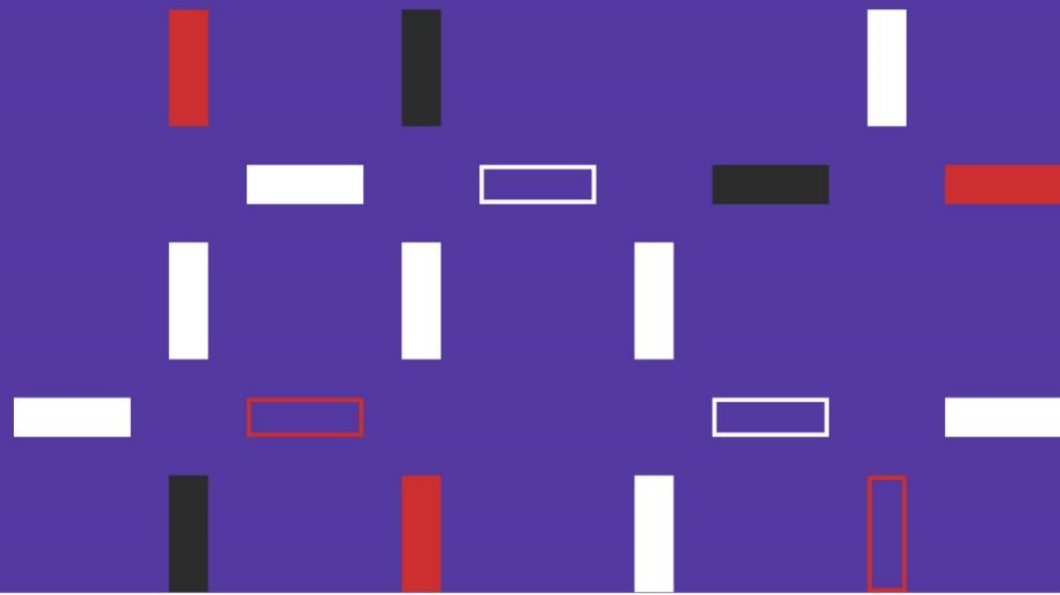
@EUeic

#Eueic

© European Union, 2021

Reuse of this document is allowed, provided appropriate credit is given and any changes are indicated (Creative Commons Attribution 4.0 International license). For any use or reproduction of elements that are not owned by the EU, permission may need to be sought directly from the respective right holders.

All images © European Union, unless otherwise stated. Image sources: ©Tom Merton/Caia Image, #315243588; ©REDPIXEL, #220695664; ©Halfpoint, #180578699; ©bnenin #213968072; ©MyMicrostock/Stocksy, #3094437622021. Source: Stock.Adobe.com. Icons © Flaticon – all rights reserved.



Send us your
questions by
Sli.Do!

Join at
slido.com
#EICPathfinder



- General Q&A
- Carbon dioxide and nitrogen...
- Cardiogenomics
- DNA-based digital data stor...
- Energy storage
- Towards the Healthcare Con...
- Quantum Information**

Join Sli.do #EICPathfinder and
select the **right Breakout session**

