Quantum Optical Networks based on Exciton-polaritons

Fact Sheet

Project Information

Q-ONE

Grant agreement ID: 101115575

DOI
10.3030/101115575

EC signature date
31 July 2023

Start date
1 September 2023

End date
31 August 2027

Funded under
The European Innovation Council (EIC)

Total cost
€ 3 980 960,00

EU contribution
€ 3 980 960,00

Investment in EU policy priorities

Digital agenda	●	Clean air	○
Artificial Intelligence	○	Climate action	○
Biodiversity	○		

Coordinated by
CONSIGLIO NAZIONALE DELLE RICERCHE
Italy

Project description

A universal quantum platform harnessing exciton polaritons and neuromorphic computing

The ability to generate and control reconfigurable quantum states of matter underlies a plethora of potential applications in quantum optics and quantum information

technologies. The EIC-funded Q-ONE project plans to enable this in an integrated photonics device at the intersection of quantum physics and AI, leveraging quantum neural networks that can sense and generate reversible quantum states of light without requiring extreme single-particle interaction strengths. The project will use strongly interacting photons (exciton polaritons) and principles of neuromorphic computing to recognise quantum photon states, including entangled pairs, without correlation measurements. This is a key challenge in quantum mechanics.

Fields of science (EuroSciVoc)

natural sciences > physical sciences > **condensed matter physics**

natural sciences > physical sciences > quantum physics > **quantum optics**

natural sciences > physical sciences > optics > **nonlinear optics**

Keywords

Optics | Light matter interaction | Exciton-Polariton | Neuromorphic Computing | Semiconductors

Programme(s)

HORIZON.3.1 - The European Innovation Council (EIC) MAIN PROGRAMME

Topic(s)

HORIZON-EIC-2022-PATHFINDERCHALLENGES-01-06 - EIC Pathfinder Challenge: Alternative approaches to Quantum Information Processing, Communication, and Sensing

Call for proposal

HORIZON-EIC-2022-PATHFINDERCHALLENGES-01

See other projects for this call

Funding Scheme

HORIZON-EIC - HORIZON EIC Grants

Coordinator

CONSIGLIO NAZIONALE DELLE RICERCHE

Net EU contribution

€ 650 125,00

Total cost

€ 650 125,00

Address

PIAZZALE ALDO MORO 7
00185 Roma
Italy

Region

Centro (IT) > Lazio > Roma

Activity type

Research Organisations

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Participants (6)

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS

France

Net EU contribution

€ 492 750,00

Address

RUE MICHEL ANGE 3
75794 Paris

Region

Ile-de-France > Ile-de-France > Hauts-de-Seine

Activity type

Research Organisations

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

€ 492 750,00

UNIWERSYTET WARSZAWSKI

Poland

Net EU contribution

€ 635 966,25

Address

KRAKOWSKIE PRZEDMIESCIE 26/28
00-927 Warszawa

Region

Makroregion województwo mazowieckie > Warszawski stołeczny > Miasto Warszawa

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

€ 635 966,25

HEWLETT PACKARD ENTERPRISE BELGIUM

Belgium

Net EU contribution

€ 450 000,00

Address

HERMESLAAN 1A
1831 Diegem

Region

Vlaams Gewest > Prov. Vlaams-Brabant > Arr. Halle-Vilvoorde

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

€ 450 000,00

CENTRUM FIZYKI TEORETYCZNEJ POLSKIEJ AKADEMII NAUK

Poland

Net EU contribution

€ 412 500,00

Address

AL LOTNIKOW 32 46
02 668 WARSZAWA

Region

Makroregion województwo mazowieckie > Warszawski stołeczny > Miasto Warszawa

Activity type

Research Organisations

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

€ 412 500,00

SORBONNE UNIVERSITE

France

Net EU contribution

€ 640 780,00

Address

21 RUE DE L'ECOLE DE MEDECINE
75006 Paris

Region

Ile-de-France > Ile-de-France > Paris

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

€ 640 780,00

UNIVERSITAT LINZ

Austria

Net EU contribution

€ 698 838,75

Address

ALTENBERGER STRASSE 69
4040 Linz

Region

Westösterreich > Oberösterreich > Linz-Wels

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

€ 698 838,75

Partners (1)

PARTNER

NANYANG TECHNOLOGICAL UNIVERSITY

Singapore

Net EU contribution

€ 0,00

Address

NANYANG AVENUE 50
639798 Singapore

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

No data

Last update: 2 May 2025

Permalink: https://cordis.europa.eu/project/id/101115575

European Union, 2025