"European Innovation Council - EIC: Lo strumento EIC Pathfinder"

18 febbraio 2025

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SAPIENZA Università di Roma





European Innovation Council (EIC) established by the European Commission, under the Horizon Europe programme (2021-27)





## Outline

- Topic
- The long-term vision
- The path toward the proposal
- Proposal preparation
- The team





### VAn der WaaLs matERials for Integrated nAnophotonics VALERIA







### VAn der WaaLs matERials for Integrated nAnophotonics VALERIA

#### Nanophotonics



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#### **Preliminary results do matter**





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#### **Quantum technologies**







### The long-term vision

### VAn der WaaLs matERials for Integrated nAnophotonics VALERIA

- **Two-dimensional materials**
- Nanophotonics
- **Quantum technologies**

The long-term vision of VALERIA is the achievement of a **single-material photonic platform** exploiting the nanostructurisation of van der Waals crystals





Enabling QUAntum Information by Scalability of Engineered quantum materials









Quantum technologies, Materials Science







Strained 2D-material/micro-LED heterostructures for large-scale quantum technologies

2023

HORIZON-CL4-2023-DIGITAL-EMERGING-01-33: 2D materials of tomorrow (RIA)



Italy (2), Germany (1), Poland (2)



**3** Universities, **2** Research Institutes





Quantum Technologies, Materials Science, Chemistry, Quantum Optics, Device fabrication





2023

Grande Rilevanza

-	

Svezia Tecnologie dell'Informazione e Comunicazione

Identificativo	PGR12485	
Elementi generali		
Area di ricerca	Tecnologie dell'Informazione e Comunicazione	
Titolo (in Italiano)	Tutto in uno: Una singola piattaforma di materiali van der Waals per fotonica quantistica integrata	
Titolo (in altra lingua)	All-in-one: A single van der Waals material platform for on-chip quantum photonics	
Parola chiave #1	two-dimensional materials	
Parola chiave #2	quantum technologies	
Parola chiave #3	solid state physics	

# CBG 200 nm





#### Italy (1), Sweden (1)

#### 2 Universities

#### Quantum Technologies, Quantum Optics, Device fabrication

May 2021 Start: May 2022 May 2023 Oct 2023 End: May 2025





#### Call: HORIZON-EIC-2024-PATHFINDEROPEN-01

(EIC Pathfinder Open 2024)



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VAn der WaaLs matERials for Integrated nAnophotonics VALERIA





funded

laboratory

## **Proposal preparation**

- First idea in 2023 within the Bilateral project Italy-Sweden
- January 2024, the PI arranged first bilateral meetings and contacted the partners and formed the Consortium







## **Proposal preparation**

- First idea in 2023 within the Bilateral project Italy-Sweden
- January 2024, the PI arranged first bilateral meetings and contacted the partners and formed the Consortium
- February 2024, one or two general meetings: assignment of tasks
   One partner devoted to month-person effort and budget formation
   Designation of work-package (WP) leaders in charge of WP writing
   Proposal writing, redaction, and figures by the PI's group
   Impact section required the largest effort
   Every single aspect matters: science, data management, dissemination
   Feedback from all partners and strong and centralised PI coordination
   Read, read and read ... Ask for external opinion

**Continuous and reliable support from the Sapienza grant office** 

• 7 March 2024, submission





## Proposal strengths/weaknesses

#### • *Simple and understandable idea*: one material system → many functionalities

The long-term vision of the proposal is very clear: the achievement of an integrated quantum photonics platform based on a single kind of material

The long-term impact of the research is potentially transformative owing to the new opportunities that it presents in the development of quantum photonic based systems that overcome some of the limitations of existing approaches.

The allocation of person month resources between the partners is appropriate. However, the balance of effort between the WPs is not sufficiently justified in terms of the level of activity in the work packages and the corresponding number of milestones and deliverables

The societal benefits lack sufficient detail in the proposal, however, it is expected that benefits would include new employment opportunities.

The environmental impacts lack sufficient discussion in the proposal. It is noted that the materials to be used have low impact on the environment although this is insufficiently justified in the proposal

Composition of Consortium essential: Combine diverse expertise from world leaders Gender balance may matter (2/7 units lead by female researchers)



