

CA24101

# Testing Fundamental physics with Seismology (FuSe)

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Funded by  
the European Union

# What is a COST action?

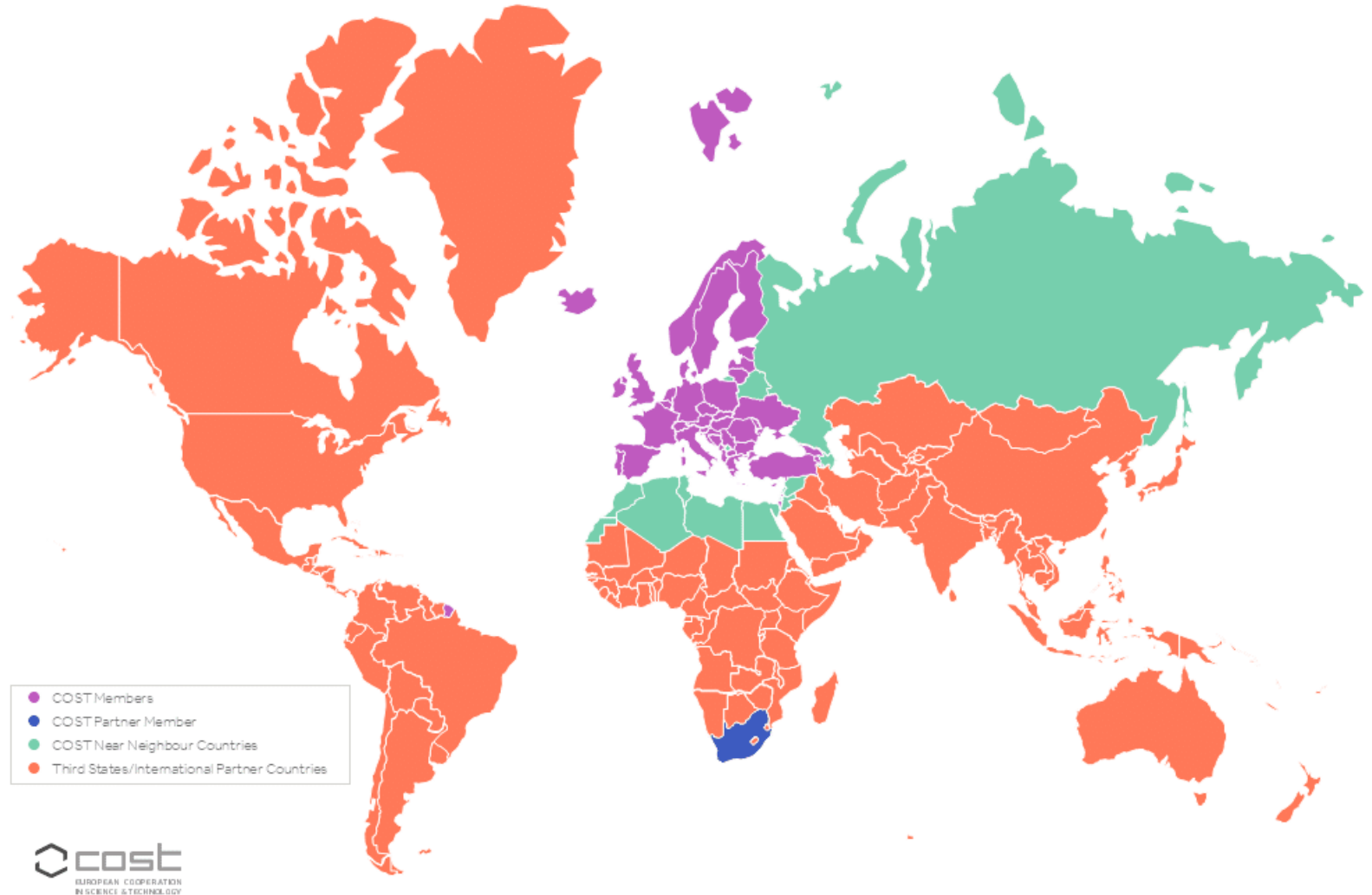
European **networking programme** connecting researchers and innovators across countries and disciplines, supporting collaboration, training, and knowledge.

- **Does not fund research, but networking activities:** meetings, workshops, missions, and training schools
- **Promotes interdisciplinarity, geographical balance, and gender equality:** increase research communities access to funding and infrastructures
- **Bottom-up structure:** topics are proposed by researchers themselves



# From proposal to open collaboration

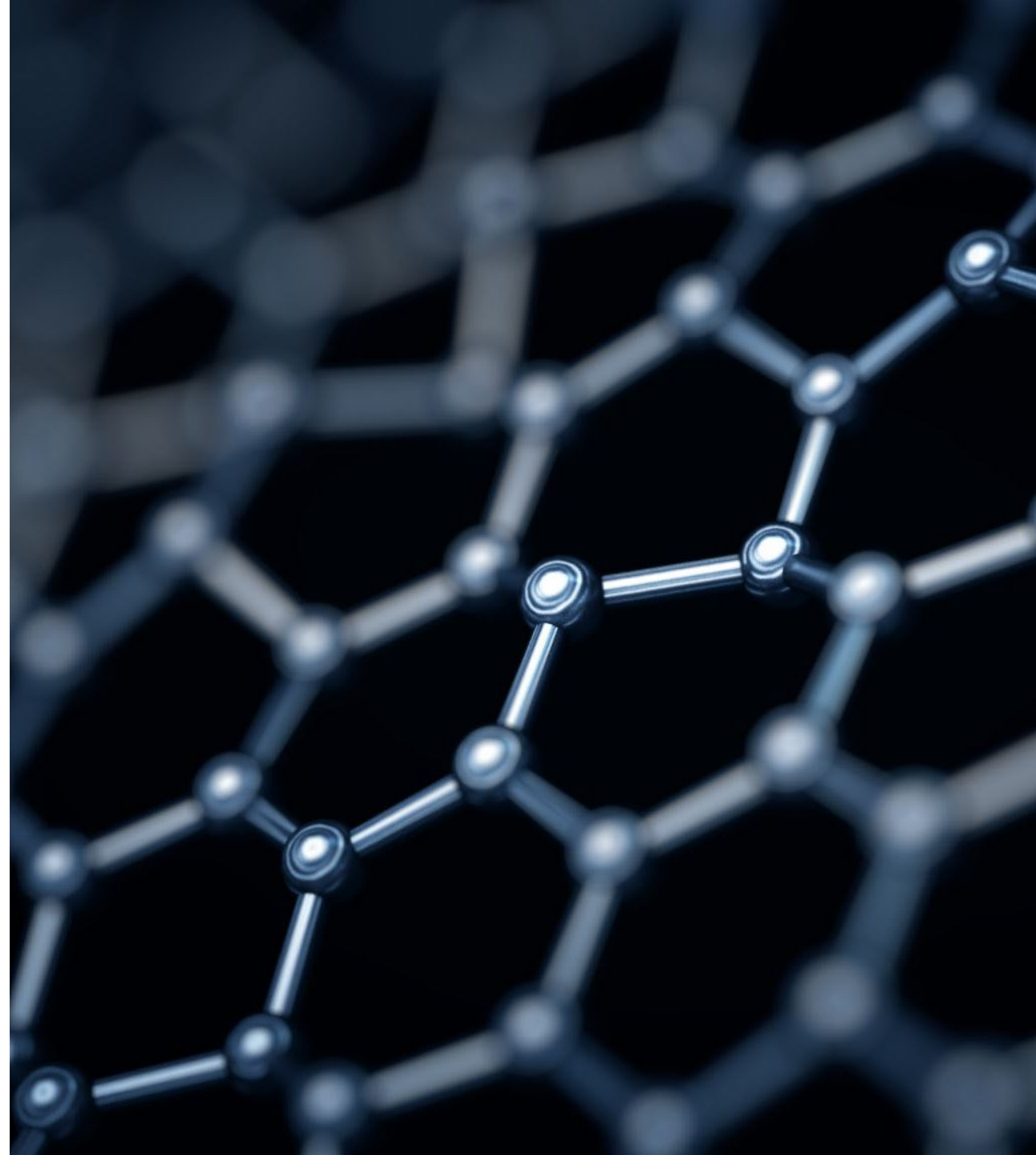
- A COST Action begins with a **proposal** submitted by a group of researchers (“proposers”) from at least seven COST member countries.
- Once the proposal is **approved and funded**, the Action becomes open: **any researcher, institution, or company** from COST member states (and beyond) can freely **join** and contribute to its activities during its four-year duration.



# Networking tools and opportunities

Each Action lasts 4 years MoU and involve participants from over 40 COST member countries and international partners

- **Scientific meetings and workshops:** meet, exchange ideas, and develop joint research strategies
- **Training schools** for early-career researchers and students
- **Short-Term Scientific Missions (STSMs)** to visit partner institutions abroad for short research stays
- **Dissemination and outreach events** to support the communication of scientific results to broader audiences



# What is FuSe?

Cost Action CA24101

Duration: 2025–2029

Kick-off: 13 October 2025

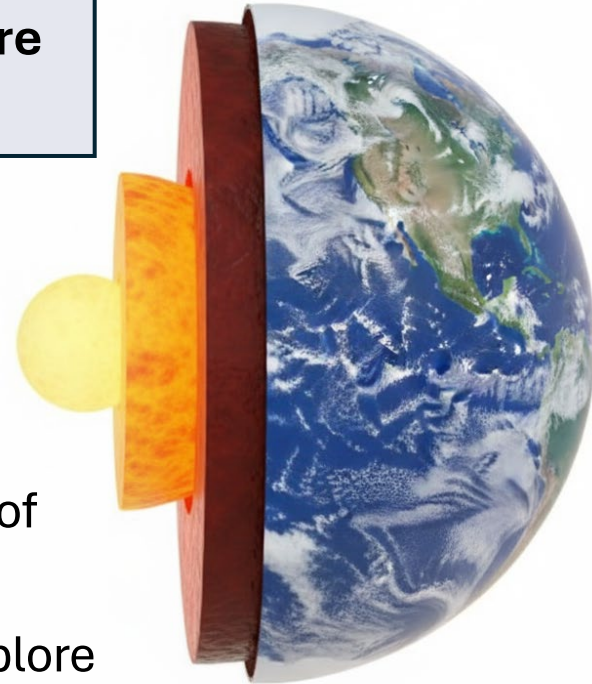


# Scientific playground

Seismic data to probe Fundamental Physics  
&

Fundamental Physics to probe the Earth's interior structure  
and other astrophysical objects

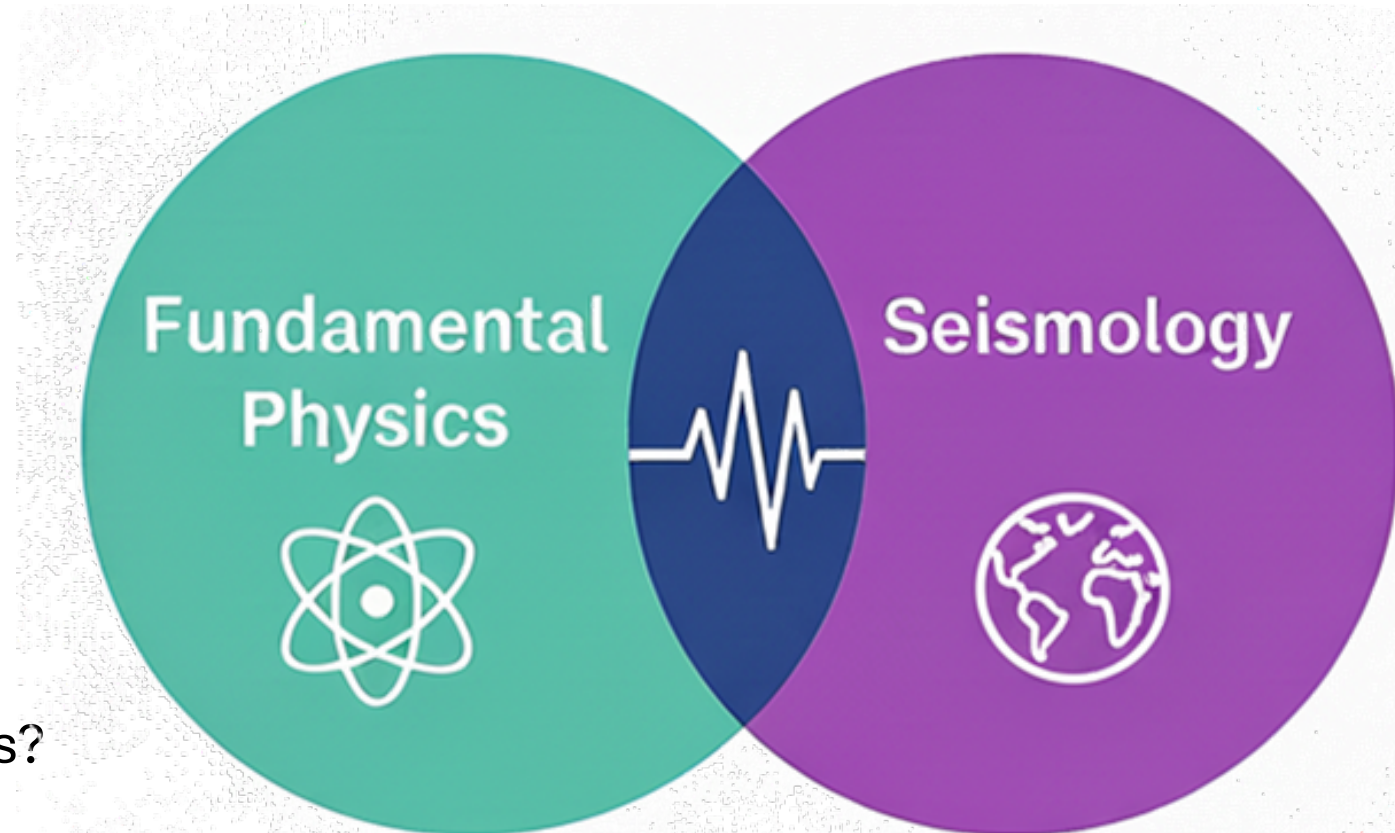
- **Fundamental physics aims to describe nature's laws across all scales:** dark matter, dark energy, and neutrinos play a critical role in particle physics and cosmology.
- The Earth, the Moon, and other astrophysical objects serve as **natural laboratories** for fundamental physics due to our knowledge of their internal structures
- **Seismology** and **asteroseismology** provides a powerful tool to explore the internal structure of the Earth stars and to uncover the fundamental physical processes, such as nuclear reactions, convection, and magnetism
- **Particle physics** provides remarkable insights into the Earth's depths: neutrinos, have become invaluable tools for studying our planet's interior



# The challenges

FuSe aims to **bridge** fundamental physics and geophysics by integrating experimental research with big data emerging tools, contributing to the cutting edge of scientific and **technological innovation**. Addressing these questions is crucial for progress in these areas:

- Can we obtain a better understanding of **fundamental physics models**, taking into account more realistic descriptions of the astrophysical bodies and the structure of materials they are made of?
- Can we improve the understanding of the **Earth** and other **astrophysical bodies' structure and composition** from fundamental physics?
- Can **Earth science** give us insights about fundamental physics, hinting at new physics?
- Can we improve **earthquake forecasting**?



# The aims of FuSe

## SME Collaboration

Partnering with SMEs to enhance sensor networks and AI.



## Key Questions

Identifying and investigating critical questions in physics and geophysics.



## Data Integration

Combining data from various sources for advanced research.



## Common Language

Building a shared understanding and methodology between disciplines.

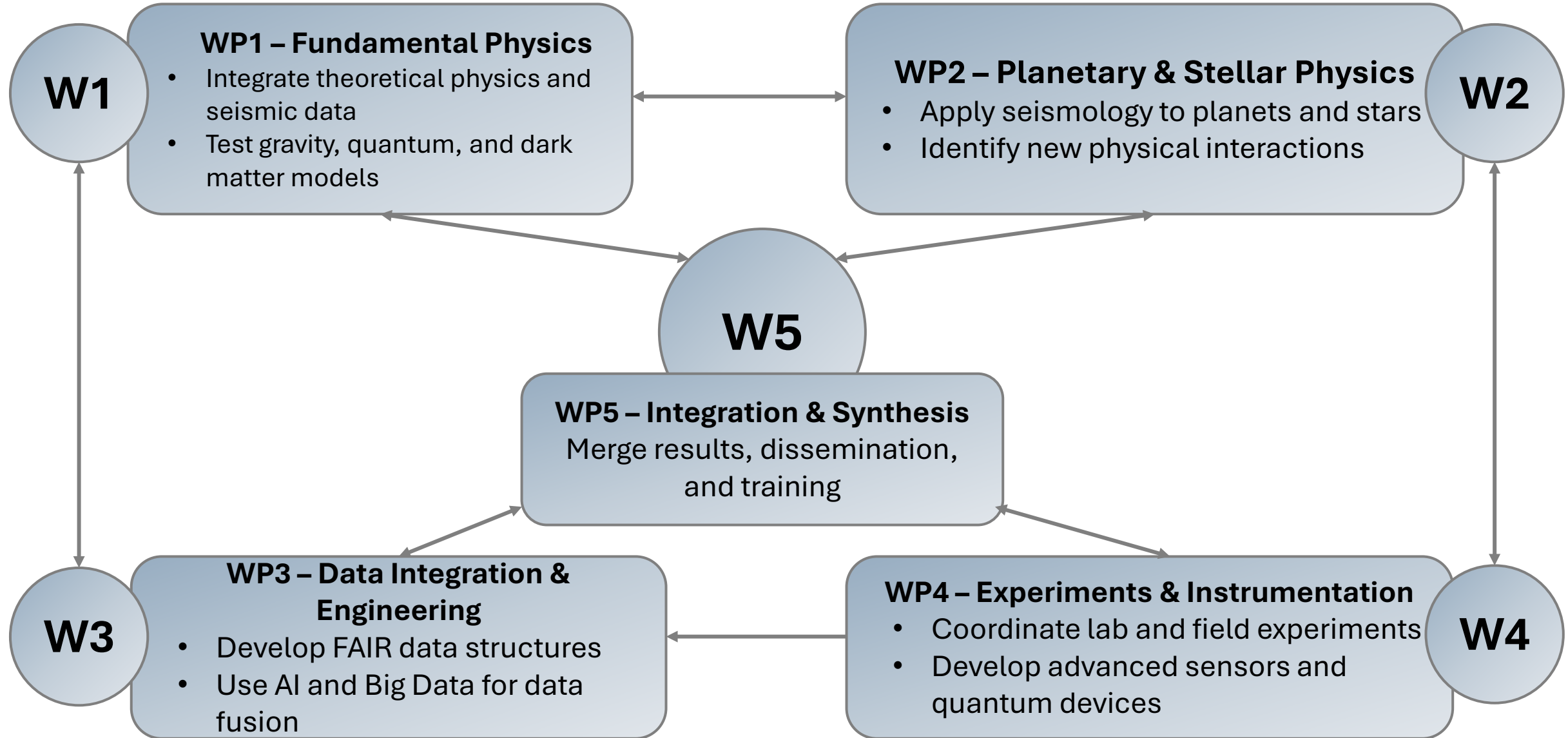


## Dynamic Research Groups

Creating diverse teams for idea exchange and innovation.



# FuSe Work Packages - Interactions and Objectives



# Contact persons

**Chair: *Aneta Wojnar (PL)***

**Vice-Chair: *Claudia Piromallo (IT)***

Science communication coordinator:

*Ludovic Ducobu (BE)*

Grant awarding coordinator:

*Mariam Tortóla (ES)*

Officer for gender balance and diversity:

*Marcin Bielewicz (PL)*

## **WG1: Fundamental physics**

Gergely Barnaoldi (HU) – Anna Pachol (NO)

## **WG2: Planetary and Stellar Physics**

Severine Rosat (FR) - Josipa Majsterovic (HR)

## **WG3: Data integration and engineering**

Elena Apostol (RO) - Eftim Zdravevski (MK)

## **WG4: experiments, observations and instrumentation**

*Juan Angel Sand (ES)*

## **WG5: integration and synthesis**

Virginia Strati (IT) – Susan Barbosa (PT)

# How to join/get involved

1. Create or update your **e-cost profile**  
**<https://e-services.cost.eu/user/login>**



## e-COST The online platform of COST Association

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Login

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2. Apply to a **working group** via the FuSe webpage

<https://www.cost.eu/actions/CA24101/>



# CA24101 - Testing Fundamental Physics with Seismology (FuSe)

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Description

Management Committee

Main Contacts and Leadership

Working Groups and Membership

## Description

The FuSe Action tackles challenges in fundamental physics by exploring seismic phenomena and earthquake precursors, providing new opportunities for testing. It aims to bridge the gap between fundamental physicists and Earth scientists, leveraging advanced technologies such as Big Data, machine learning, and AI, and working with small technological enterprises to translate theoretical insights into practical applications.

At the heart of FuSe is the belief that seismic phenomena could reveal new aspects of fundamental interactions and lead to the discovery of new physics. By analysing seismic data and studying the underlying physical principles, FuSe aims to explore imprints of unknown physics that may be embedded in these natural processes. On the other hand, the study of fundamental physics can also improve our knowledge of the Earth. This effort draws on interdisciplinary expertise, with a focus on how seismic events could deepen our understanding of the fundamental forces that govern the universe.

FuSe's innovative approach combines diverse scientific fields to pursue both theoretical and practical advancements. This synergy has the potential to transform our knowledge of both fundamental physics and seismic activity, contributing to a broader understanding of Earth's interior and the cosmos.

### Action keywords

Fundamental physics - Seismology - Geophysics - Material science - Big Data

### Action Details

- MoU - 010/25
- CSO Approval date - 19/05/2025
- Start date - 13/10/2025
- End date - 12/10/2029

### How can I participate?

- Read the Action Description [MoU](#)
- Inform the Main Proposer/Chair of your interest ([email](#))
- [Apply](#) to join your Working Groups of interest
- Please note, Management Committee nominations are carried out through the [COST National Coordinators](#)

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## Management Committee

Country	MC Member
Albania	Dr Klaudio PEQINI ▾
Armenia	Dr Hrachya KOCHARYAN ▾
Austria	Dr Sabri PLLANA ▾
Belgium	Dr Ludovic DUCOBU ▾
Croatia	Prof Fabio BONSIGNORIO ▾
Cyprus	Prof Sotirios CHATZIS ▾
Cyprus	Dr Christina OIKONOMOU ▾
Czech Republic	Dr Ippocratis SALTAS ▾
Estonia	Dr Tiina LIIMETS ▾
Estonia	Ms Sofia VIDAL ▾
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## Main Contacts

### Action Contacts



**Dr Aneta WOJNAR**

Action Chair

+48572110777

[aneta.wojnar@uwr.edu.pl](mailto:aneta.wojnar@uwr.edu.pl)



**Dr Claudia PIROMALLO**

Action Vice Chair


+390651956466


[claudia.piromallo@ingv.it](mailto:claudia.piromallo@ingv.it)



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Action Chair

+48572110777

[aneta.wojnar@uwr.edu.pl](mailto:aneta.wojnar@uwr.edu.pl)



**Dr Claudia PIROMALLO**

Action Vice Chair


+390651956466

[claudia.piromallo@ingv.it](mailto:claudia.piromallo@ingv.it)




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## Working Groups

Number	Title	Leader
1	Fundamental physics	Dr Gergely Gábor BARNAFÖLDI ▾
2	Planetary and stellar physics	Dr Severine ROSAT ▾
3	Data integration and engineering	Dr Elena Simona APOSTOL ▾
4	Experiments, observations and instrumentation	Prof Juan Angel SANS TRESSERRAS ▾
5	Integration of WGs 1-4	Dr Virginia STRATI ▾

Express your interest to join any of the working groups by applying below.

It is required to have an e-COST profile to submit your application. If needed, [create it first](#) and then click 'Apply'.

Apply

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**3. Participate** in meetings, STSM and training schools

**4. Contribute** scientifically (e.g. scientific papers), technically or organizationally

**STAY  
TUNED**

Coming soon...

- 1° Conference
- 1° Call for STSM
- 1° Training School



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# Thank you!

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