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# **COST Action**

***Pan-Eurasian EXperiment – Europe – Near Europe***

***Neighbourhood countries***

***Earth System Research Network***

**PEEX-EU-NEN-ReN**

**Hanna Lappalainen & Alexander Mahura, University of Helsinki (UHEL)  
& the PEEX COST Action partners/ teams**

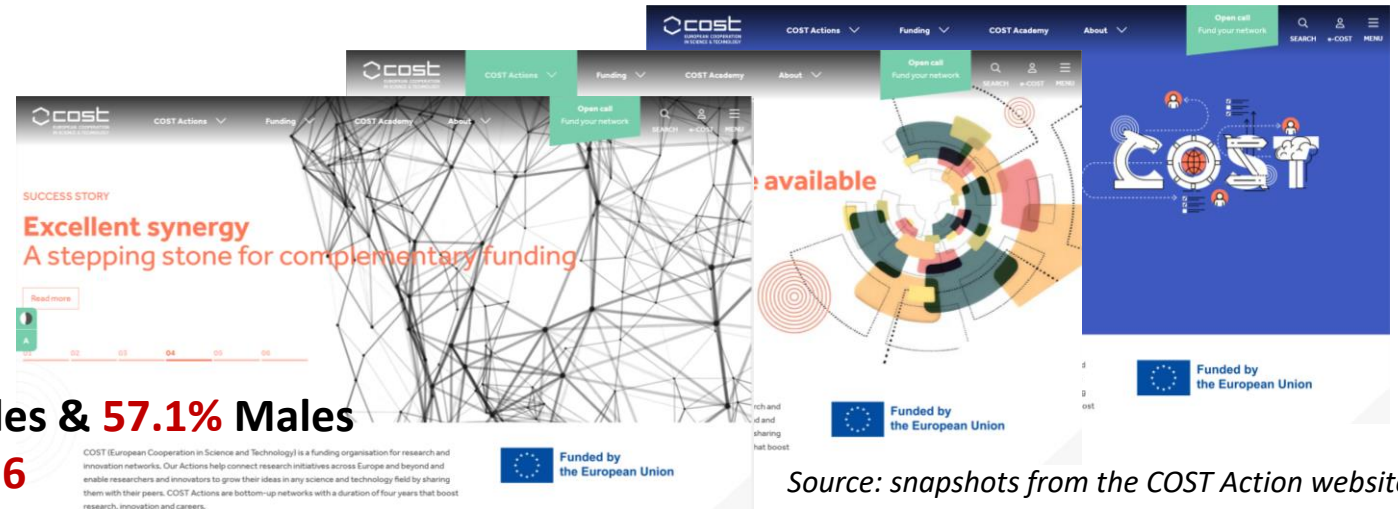
***PEEX Seminar (hybrid), 22 April 2025***

# COST Action **PEEX-EU-NEN-ReN**

## *Pan-Eurasian EXperiment – Europe – Near Europe Neighbourhood countries Earth System Research Network*

COST Action proposal subm. **23 Oct 2024**  
Decision to be announced: **Spring 2025**

- Number of Proposers: **35**
- Gender Distribution of Proposers: **40.0% Females & 57.1% Males**
- Number of Young Researchers and Innovators: **6**
- Core Expertise of Proposers: Distribution by Sub-Field of Science:
  - 71.4%** - Earth and related Environmental sciences
  - 28.6%** - Agriculture, Forestry, Fishery, Chemistry sciences, economics, business, others
- Institutional distribution of Network of Proposers:
  - 80.0%** - Higher education, research-performing & associated organizations (**28**)
  - 20.0%** - Governmental organizations or agencies, non-for-profit organizations or associations, SMEs (**7**)
- COST Full Member (**15**): **Armenia, Bulgaria, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Iceland, Italy, Latvia, Norway, Romania, Switzerland, Ukraine** + Other countries (**2**): Jordan, Kazakhstan
- COST Inclusiveness Target Countries (ITC): **53.33 %**



# Overall Research Coordination Objective

## COST Action

- To establish COST Action as a multidisciplinary research network to answer PEEEX large-scale science questions, which are supporting the development of regional strategies for climate change adaptation and mitigation, air quality, impacts on the environment and population, their living conditions and health and ecosystem services.

## Specified Scientific & Operational Objective

- COST Action Working Groups (WGs) and their specified scientific and operational objectives to be implemented through WGs meetings, online seminars/ webinars, annual sci. conferences, e-platforms, mobilities/ STSMs, YSSs, trainings, policy briefs.

## Capacity-Building Objectives

- (1) New knowledge sharing; (2) Training of young scientists; (3) Transfer of knowledge; (4) Disseminating research results; and (5) International networking.

- To open new opportunities for research collaboration in atmospheric, Earth's and environmental sciences & to carry out joint research collaboration through mobilities of PhD students between COST Action Partners
- To assess the current environmental observations between the COST Action Partners & to define actions towards harmonisation based on the Global-SMEAR concept
- To access knowledge gap for needs of modelling & to improve integrated multi-scales and -processes simulations and modelled data analyses
- To educate new generation of young researchers & to introduce novel e-learning assets between involved COST Action Partners

- New potential research and educational initiatives for PhD students' and young researchers' projects
- Completed short-term scientific missions between COST Action Partners, and young scientist schools which support the completion of the PhD studies
- Established research and innovation network between COST Action Partners, and expanded by inviting new interested universities and organisations
- Organised webinars/ workshops/ conferences on research, observations / data harmonization and educational topics based on PEEEX and ACCC agendas and interactions between the COST Action Partners
- Widely disseminated (during and beyond) COST Action activities and results to science community, stakeholders e.g., NGOs, SMEs, and general public



PEEX (Pan-Eurasian Experiment program;

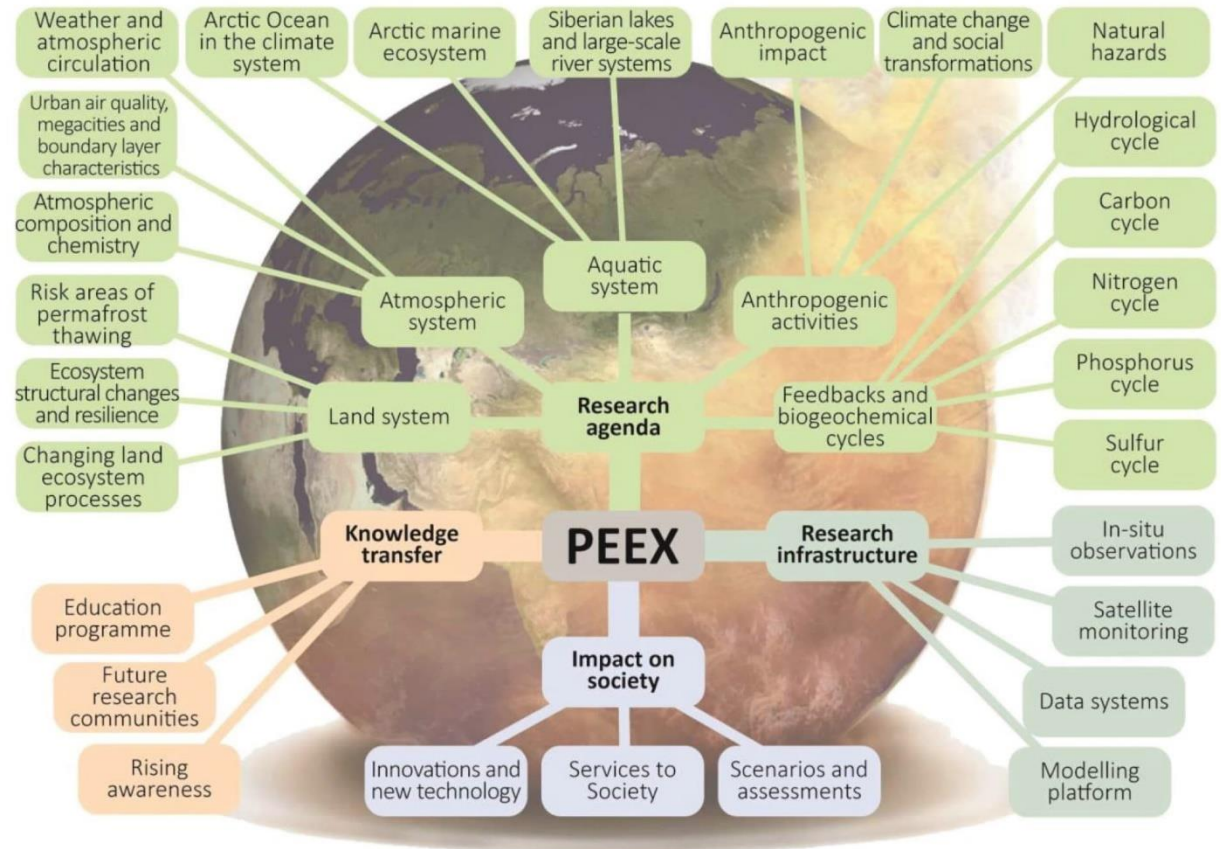
<https://www.atm.helsinki.fi/peex>)

research agenda is focused  
on understanding the complex interlinked  
**land–atmosphere–ocean–society system**  
in the EU-NEN region context  
&

introduces **large-scale research questions**  
(15 in total)

&  
**key topics** summarised for

**Land system**  
**Atmospheric system**  
**Aquatic system**  
**Anthropogenic activities**  
**Feedbacks – interactions**



**PEEX framework for research agenda, research infrastructures,  
impact on society and knowledge transfer**

ACCC (Atmosphere and Climate Competence Center; <https://www.acccflagship.fi>)

## Impact Programs (IP):

**IP1-IP2:** Carbon sinks of the agricultural and forested lands

**IP3:** Climate neutrality of the companies

**IP4:** Climate neutral cities and health

**IP5-IP6:** Novel carbon and atmospheric observation techniques

**IP7:** Air pollution cocktail in megacities

**IP8:** Climate analytic solutions

**IP9:** New collaboration via the climate change – air quality forum re-named as supporting policies and practices

**IP10:** Operational phase of PEEX Program

**IP11:** Global-SMEAR for the Earth Observatory

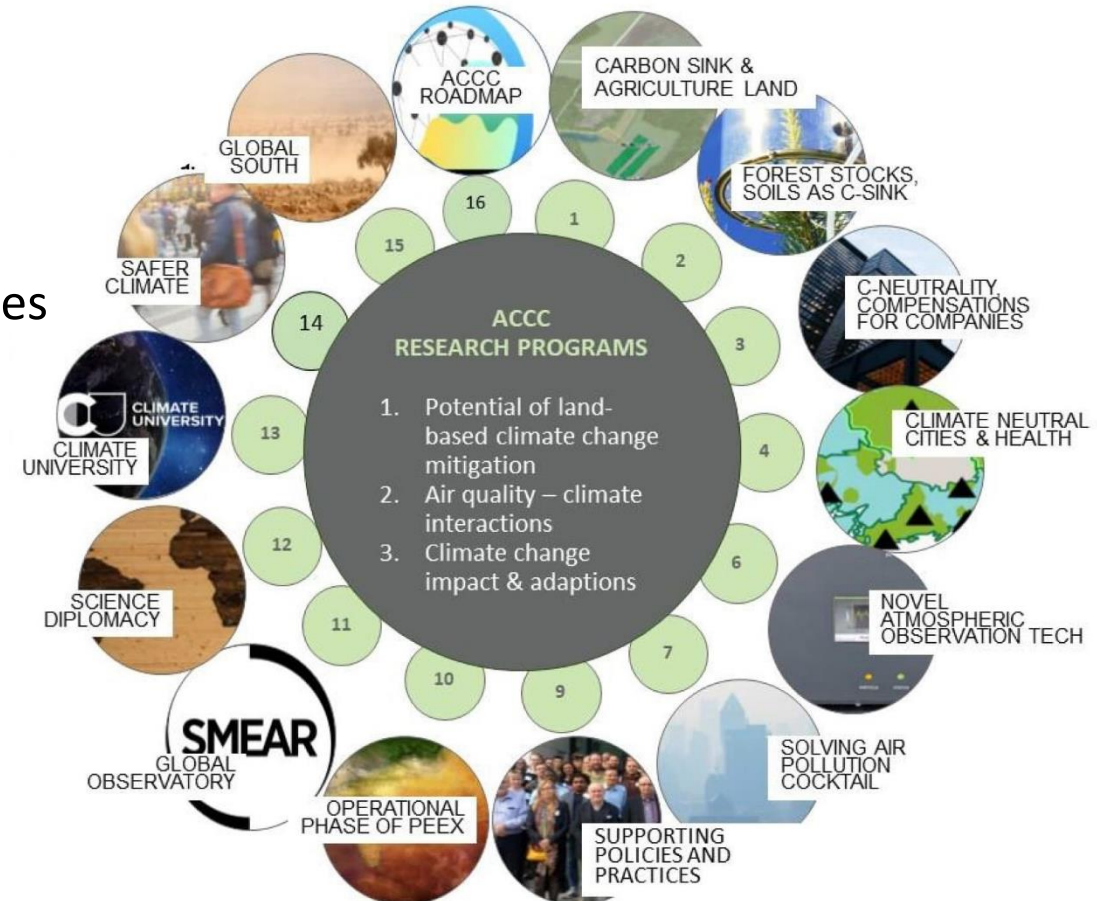
**IP12:** Science diplomacy

**IP13:** Climate University with massive online education

**IP14:** Safer Climate Initiative

**IP15:** Global South

**IP16:** ACCC Roadmap



- **WG-1: Research**
- **WG-2: Observations & Data**
- **WG-3: Integrated Modelling**
- **WG-4: Knowledge Transfer**



## OBJECTIVES:

- **O1.1:** To better understand the Earth system and the influence of environmental changes in pristine and industrialized Pan-Eurasian environments
- **O1.2:** To better understand the processes relevant to climate change and air quality in the European / Eastern Europe geographical domain

## TASKS:

- **T1.1.** List of ongoing research activities and critical overview of the current knowledge on information from the COST Action members studies in the Europe and Near East European region
- **T1.2.** Recommendations for future studies

## DELIVERABLES:

- **D1.1.** Report for the ongoing activities and integrated research (M24, R, PU)
- **D1.2.** Report for the recommendations and their distribution to stakeholders: status of current knowledge and approaches for future studies (M42, R, PU)

## MILESTONES:

- **M1.1.** Consensus on research disciplines involved (verification: e-form opened for access; M09)
- **M1.2.** 1st annual science conference (verification: conference organised and carried out; M12)
- **M1.3.** 1st iteration critical overview report and recommendations (verification: draft prepared; M30)

## OBJECTIVES:

- O2.1. To promote development of coordinated and comprehensive in-situ observation
- O2.2. To collect information of the current observations (metadata), used standards of the COST Action Partners

## TASKS:

- T2.1. Knowledge gap analysis
- T2.2. Recommendations from science to service applications based on observations

## DELIVERABLES:

- D2.1. Gap analysis results (M18, R, PU)
- D2.2. Recommendations to service applications (M36, R, PU)

## MILESTONES:

- M2.1. Established e-form for collecting info. on current observations (verification: e-form opened; M09)
- M2.2. Recommendations communicated with stakeholders (verification: materials collected; M24)

### OBJECTIVES:

- **O3.1.** To implement the validated and harmonised data products in models of appropriate spatial and temporal scales and topical focus
- **O3.2.** To collect info on existing and newly developed modelled-based datasets and archives with continuous comprehensive dataflows

### TASKS:

- **T3.1.** Knowledge gap analysis to identify the needs for modelling
- **T3.2.** Hemispheric-regional-subregional-urban-local scales modelling
- **T3.3.** Analyses of performed multi-disciplinary modelling studies on multi-scales for policy applications

### DELIVERABLES:

- **D3.1.** Summary of knowledge gaps and concept for seamless/ integrated modelling (M24, R, PU)
- **D3.2.** Summary of modelling applications for Pan-Eurasian region (M42, R, PU)
- **D3.3.** Recommendations from science to service applications based on modelling (M45, R, PU)

### MILESTONES:

- **M3.1.** Assessment of stakeholders' needs in modelling (verification: e-form opened; M18)
- **M3.2.** Assessment of modelling applications (verification: information collected/ ready for analysis; M33)
- **M3.3.** First version of recommendations drafted (verification: draft is publicly available; M42)

## OBJECTIVES:

- **O4.1. To educate next generation of multidisciplinary experts and scientists capable of finding tools for solving grand challenges (capacity building)**

## TASKS:

- **T4.1. Overview of ongoing PhD student projects at the COST Action Partners' institutions**
- **T4.2. Organization of Short-term Scientific Missions, STSMs**
- **T4.3. Young Scientist Schools, YSSs**

## DELIVERABLES:

- **D4.2.1. Annual summary reports on completed STSMs (M12, M24, M36, M48)**
- **D4.3.1. YSS on Atmospheric Observations of Aerosols, Clouds and Trace Gases (M18)**
- **D4.3.2. YSS on Advanced Analysis of Atmosphere-Surface Interactions and Feedbacks (M30)**
- **D4.3.3. YSS on Multi-Scales and -Processes Integrated Modelling, Obser. and Assessment for Environ. Applic. (M42)**

## MILESTONES:

- **M4.1. Current state of ongoing PhD projects overviewed (verification: information collected; M06)**
- **M4.2. First year STSMs completed (verification: summary report is publicly available; M13)**
- **M4.3. YSS completed (verification: all materials are publicly available; M19)**

# National & International Collaboration

*will be promoted on 3 levels between:*

**COST Action**

- **Research fields**  
*(ecology – physics – technology – chemistry – meteorology – geography – social sciences)*  
**(WG-1)**
  
- **Research methodologies**  
*(theory – modelling – experiments – observations, in-situ observations, remote sensing observations; qualitative and quantitative research)*  
**(WGs 2,3)**
  
- **Universities, research institutes, companies and bodies at different policy- and decision-making levels**  
**(WG-4)**



- Phases
- Timeline
- Management

Phase-I (year 1) : **Inventory**

Phase-II (year 2-3) : **Development, Assessment & Applications**

Phase-III (year 4) : **Synthesis and Dissemination of Action results**

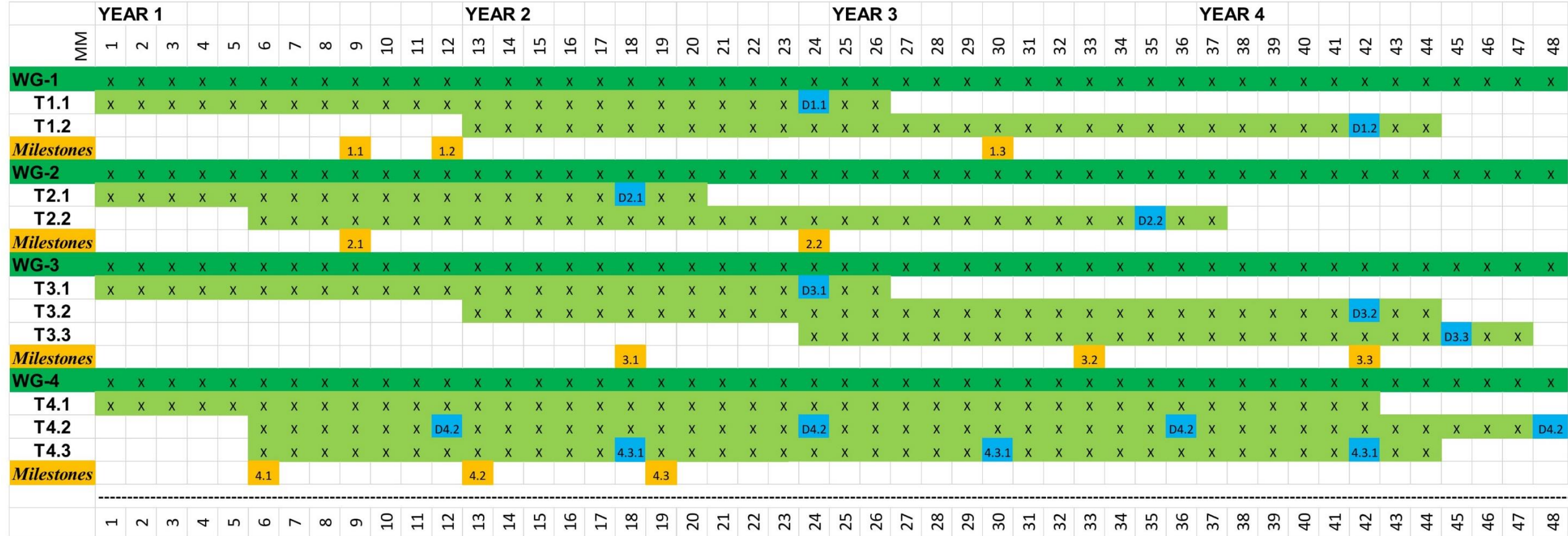
Years	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
Quarters	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
Phases	I	I	I	I		II	II	II	II		II	II	II	II		III	III	III	III
MC-Meetings		X		X			X		X			X		X			X		X
WG-Meetings				X			X		X			X		X			X		X
Workshops/ Conferences			X					X					X					X	
Schools								X					X					X	
Short-Term Science Missions			X	X		X	X	X	X		X	X	X	X		X	X		
WG reports/ papers				P			R		P			R		P			R		P
Annual Reports to COST				X					X					X					X
Final Report to COST																			X
Public Website	X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X

**COST Action Phases (by years and quarters) with activities:**

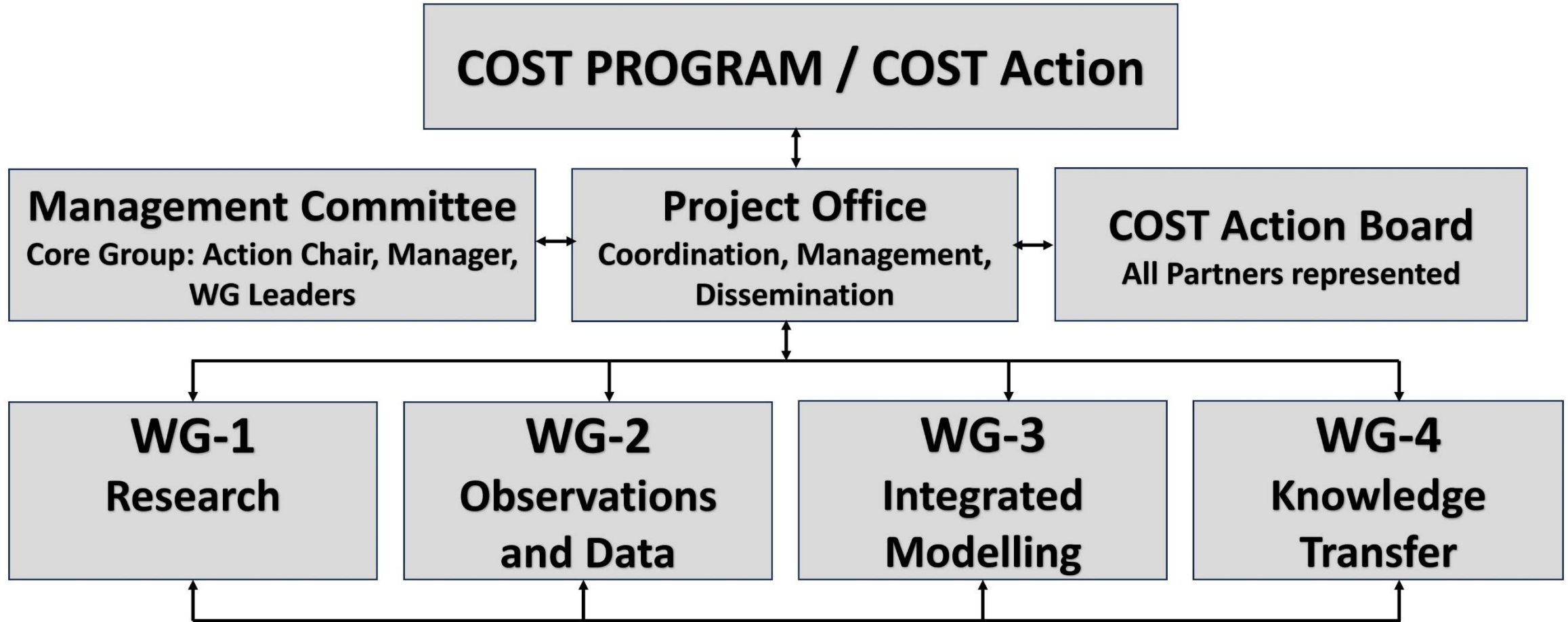
**MC & WG meetings, annual conferences/ workshops, YSSs, STSMs, WGs reportings, annual reports to COST, & website.**

# Gantt Diagram/ Timeline

## COST Action



Detailed timeline for 4-year period (from month (MM) 1 until month 48)  
for 4 WGs' **tasks** (T#.#), **deliverables** (De#.#) and **milestones** (M#.#)



COST Action workflow between:  
COST Program, Project Office, Management Committee, Board, and Working Groups (WGs).



Pan-Eurasian Experiment

**PEEX**

## CONTACT

Dr. Hanna K. Lappalainen

[hanna.k.lappalainen@helsinki.fi](mailto:hanna.k.lappalainen@helsinki.fi)

&

Dr. Alexander Mahura

[alexander.mahura@helsinki.fi](mailto:alexander.mahura@helsinki.fi)



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