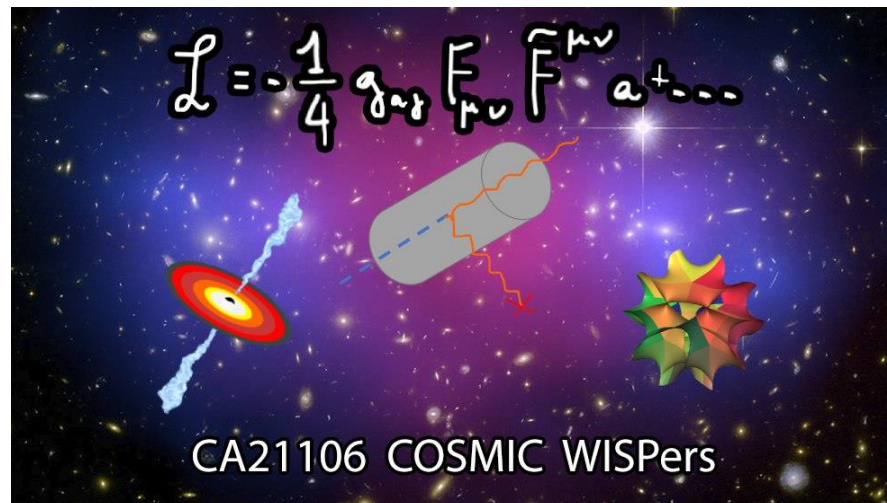
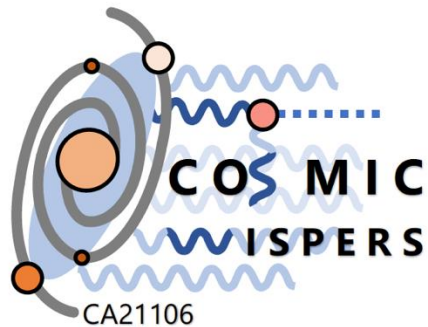


COST ACTION CA21106

COSMIC WISPErs in the Dark Universe:

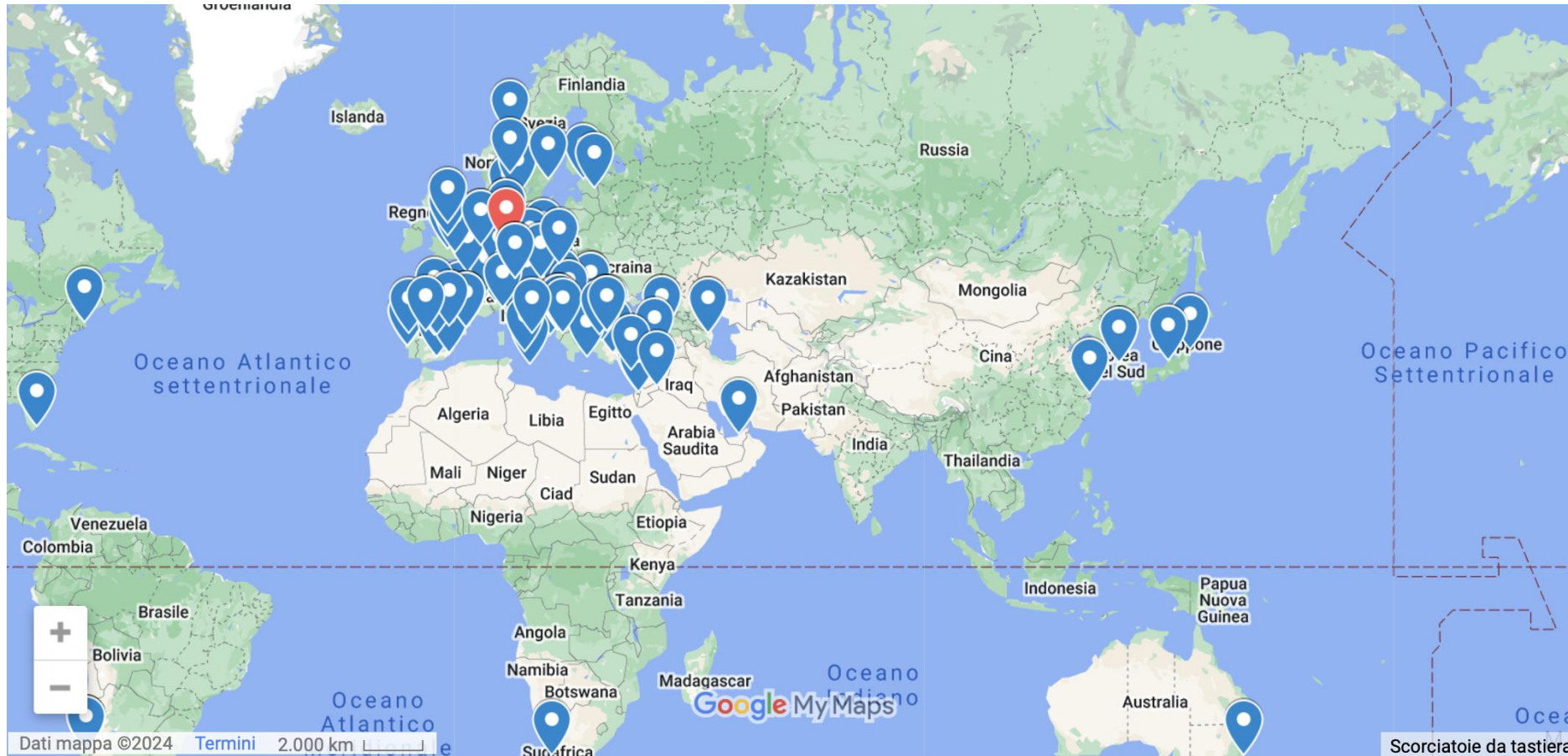
Theory, astrophysics and experiments

Alessandro Mirizzi
(Bari Univ. & INFN, Italy)



Funded by the
European Union

COSMIC WISPerS NETWORK



~ 70 proposers

Currently > 370 participants!

WISPs

WISPs are very Weakly Interacting Slim ($m < \text{GeV}$) Particles which emerge in several extensions of the Standard Model of Particle Physics.

CHALLENGE

The aim of this Action is an exhaustive study of these WISPs, notably axions, axion-like particles (ALPs) and dark photons, ranging from their theoretical underpinning, over their indirect observational consequences in astrophysics, to their search at colliders and beam-dump and their direct detection in laboratory experiments.

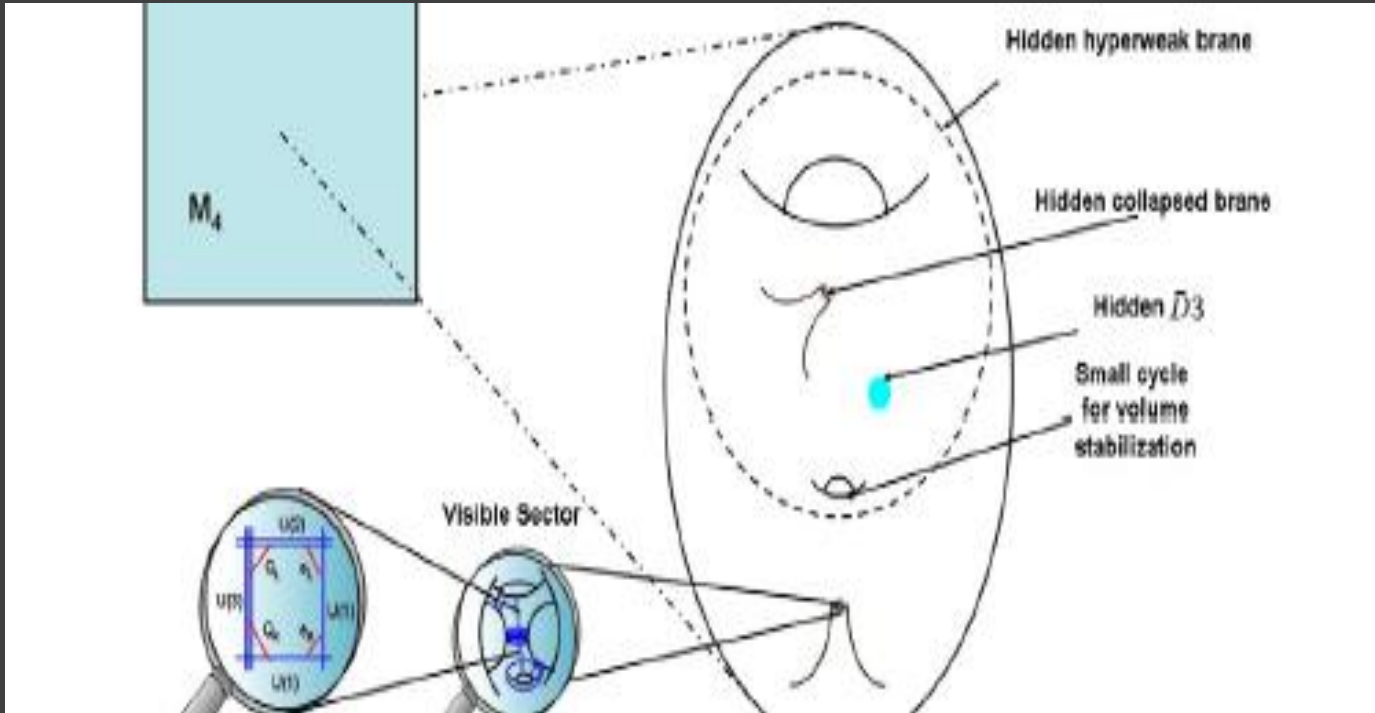


OBJECTIVES (from MoU)

- ✓ Provide a discussion forum for **European coordination** of WISPs Physics activities
- ✓ Develop a **Roadmap** for WISPs Physics in Europe
- ✓ Coordinate and support in a **synergic** way WISPs searches
- ✓ Compare WISPs **theoretical** models and assess performance of different **experimental** techniques
- ✓ Provide input to **Small and Medium Size Enterprises** (SMEs)
- ✓ **Disseminate** the research results
- ✓ Provide **cross community discussions** to enable new experiments
- ✓ Stimulate **transfer of knowledge** among established leading groups on the field and emerging excellent scientists in ITC
- ✓ Promote **gender balance**
- ✓ Involve **new research groups** from ITC
- ✓ Attract **young talented researchers**

STRATEGIES

- Common platform to connect WISP research activities in different areas. Collaborations in a structured way through Working Groups, Workshops and Short-Term Missions
- Organize much of the scientific foundation for present and next generation WISPs experiments. Develop a European roadmap for experiments. Interplay between theorists, experimentalists and representatives of SMEs
- Training activities to offer inter-disciplinary research competences which are difficult to obtain locally
- Offer to ECI the opportunity to develop management skills sharing responsibility in the management of the Action. Particular emphasis on the gender balance
- Promote the visibility of researchers from ITC connecting them with leading scientists in EU countries
- Outreach activities. Improve the communication skills of the young participants



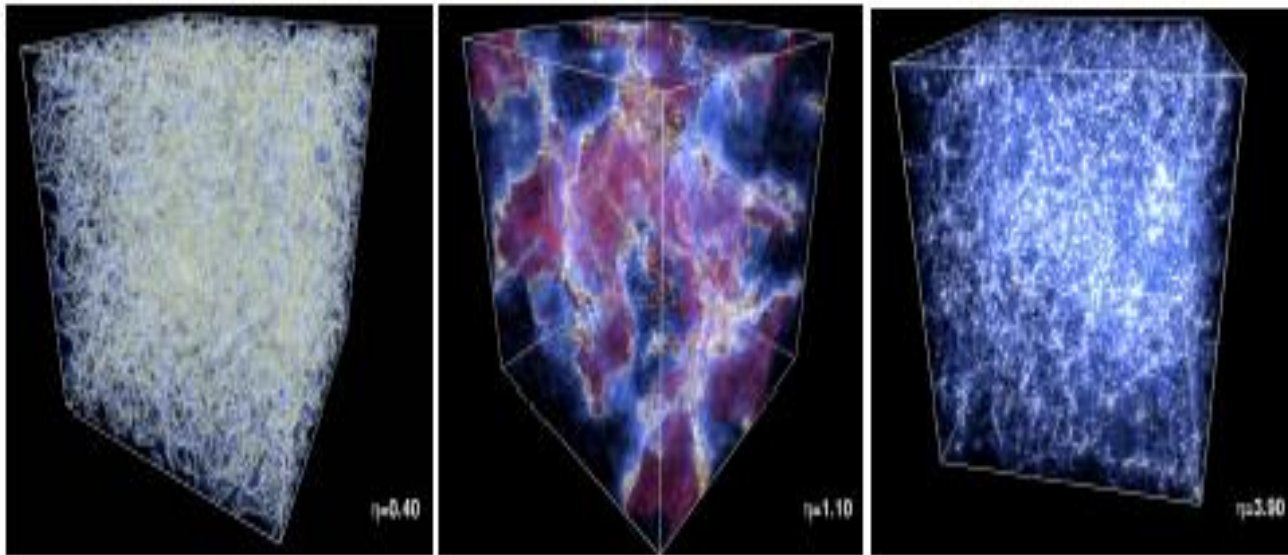
WG Leaders

Michele Cicoli (Bologna Univ., IT)
 Sophie Renner (Glasgow Univ., UK)

102 participants

WG1: THEORY AND MODEL BUILDING

Determine the nature, number, masses and couplings of WISPs that arise in well-motivated theories of fundamental physics, and in particular within string compactifications that join moduli stabilisation with (semi)-realistic matter sectors



WG Leaders

Edoardo Vitagliano (Padua Univ., IT)
Marco Gorghetto (DESY, DE)

211 participants

WG2: DARK
MATTER AND
COSMOLOGY

Obtain precise predictions of axion and WISP DM relic abundance and identify distinguishing features of WISP DM in Large Scale Structure data

A satellite with two large solar panel arrays is shown in space. The Earth's horizon is visible at the bottom, and a bright, fiery celestial object is in the top left corner. The background is filled with stars.

WG3: WISPs IN ASTROPHYSICS

Deepen the studies of the signatures of WISPs in astroparticle physics. These include WISP oscillations into photons, WISP-induced energy loss in stellar systems and signatures from gravitational waves and from primordial black-hole superradiance.

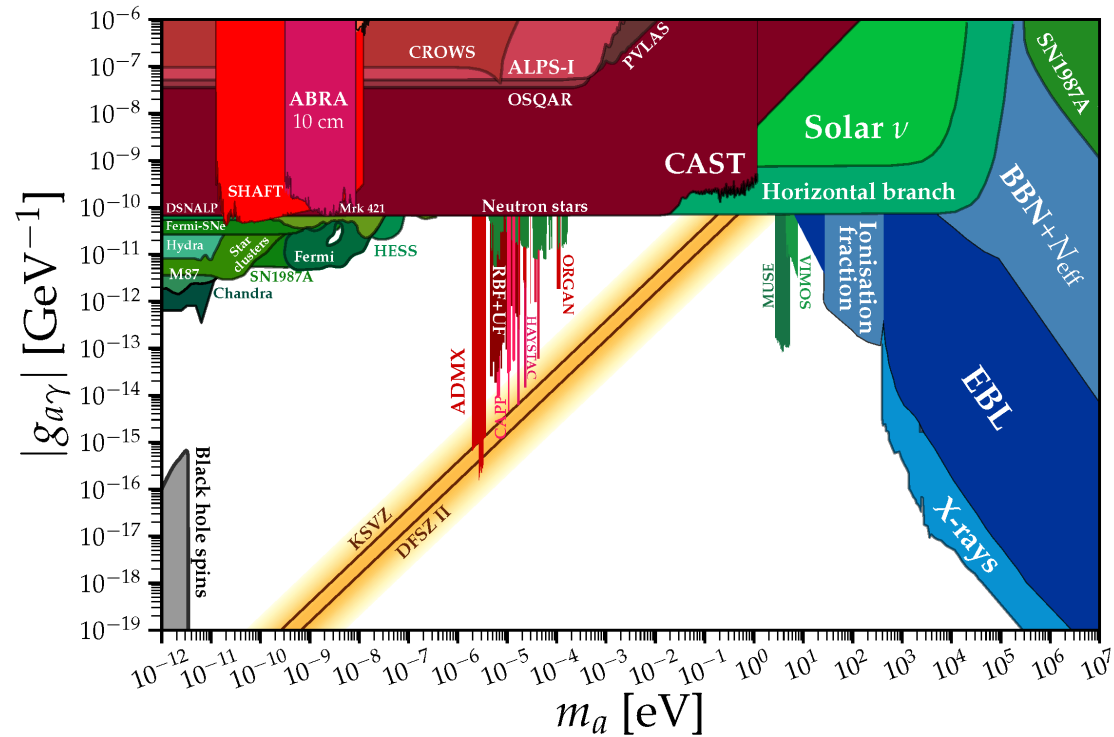
WG Leaders

Maurizio Giannotti (Zaragoza U., ES)
Oscar Straniero (INAF, IT)

130 participants

WG4: DIRECT WISPs SEARCHES

Produce a complete, updated and revised summary of the status of WISP searches, highlighting parts of the parameter space, models or couplings that are not under test by present or future searches. Outline a roadmap to WISP discovery and a way to disentangle among different WISP models



WG Leaders

Claudio Gatti (LNF, IT)
Marin Karuza (Rijeka Univ. , HR)

135 participants

WG5: DISSEMINATION AND OUTREACH

Enhance the dissemination and communication of the results, and to structure outreach activities to attract public awareness to the challenges and achievements in astro-particle physics.



WG Leaders

Olga Mena (IFIC, ES)

Science Communication Coordinator

Loredana Gastaldo (Heidelberg Univ , DE)

77 participants

DELIVERABLES (from MoU)

Deliverable number	Deliverable title	WG number	Deliverable date (months)
D1.1	Draft Report on theory and pheno	1	12
D1.2	Interim Report on theory and pheno	1	24
D1.3	Final Report on theory and pheno	1	48
D2.1	Draft Report on DM and cosmology	2	12
D2.2	Interim Report on DM and cosmology	2	24
D2.3	Final Report on DM and cosmology	2	48
D2.4	Public code to simulate axion effects on LSS	2	40
D3.1	Draft Report on astroph.	3	12
D3.2	Interim Report on astroph.	3	24
D3.3	Final Report on astroph.	3	48
D4.1	Draft Report on direct detection	4	12
D4.2	Interim Report on direct detection	4	24
D4.3	Final Report on direct detection	4	48
D4.4	Report on Technologies Forums	4	36
D5.1	Action webpage, twitter and repositories	5	6
D5.2	Set Dissemination and Communication Scheme	5	6, 18,30
D6.1	Lecture notes of the training schools	1,2,3,4	12,24,32,48
D7.1	Final White Paper on the Physics case	1,2,3,4	48

HORIZONTAL COMMITTEES



Grant Evaluation Committee: provides to the Action MC a proposal of selected grants and amounts for their approval

Grant Awarding Coordinator: **Venelin Kozhuharov** (Sofia Univ., BG)



Young Researchers and Innovators Representative Council: involve the ECI in the management of the Action and in organization of the Activities

Coordinator: **Arturo de Giorgi** (Madrid Univ., ES)



Gender and Diversity Advisor: monitor the gender balance and provide a plan to implement gender balance

Deniz Sunar Cerci (Adiyaman Univ., TR)

- **Journal Club Organizers:** Maria Benito Castano (Tartu Obs., EE), Michele Tammaro (Jozef Stefan Inst., SI)
- **Colloquium Organizers:** Arturo de Giorgi (Inst. De Fis. Teor, ES), Giuseppe Lucente (Bari Univ., IT) , Hugo Tercas (Ist. de Plasma, Lisboa, PT)
- **Newsletter Editors:** Damiano Fiorillo (NBI, Copenhagen, DE), Giovanni Grilli de Cortona (INFN, IT), Alessandro Lella (Bari Univ. IT)

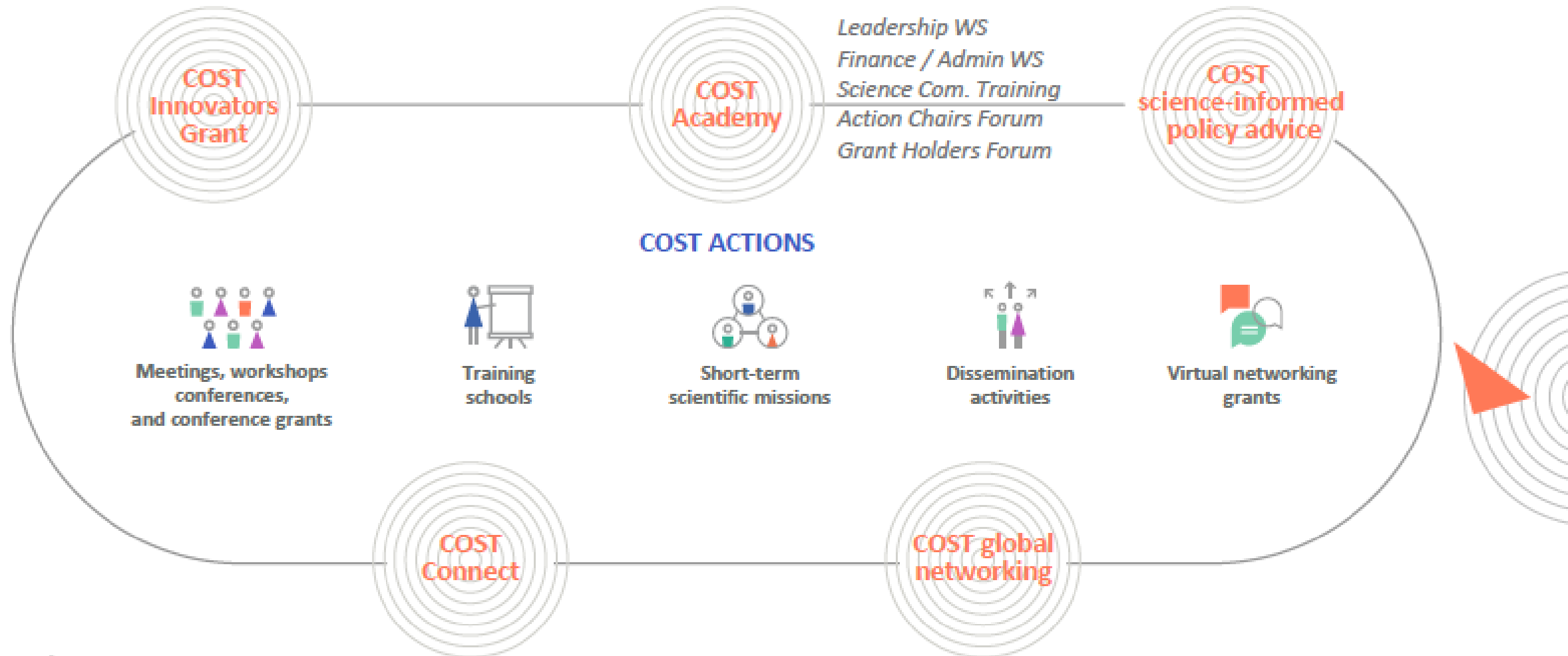
All events announced on the webpage www.cosmicwispers.eu

CORE GROUP

The Action MC decided to delegate part of their power to a **Core Group** that may carry-on day by day management and urgency cases

The **Core Group** is constituted by Chair, Vice-Chair, WG Leaders, Grant Holder Scientific Repr., Science Comm. Coordinator, Grant Award. Coord., Young Researc. Council Repres., Gender Advisor

COST support beyond the COST Action



2024 EVENTS



1-2 Febr: Working Group Meeting
(DESY Hamburg, DE)



11-14 June: Training School
(Ljubljana, SL)

A quick look to the CA21106 General Meeting program

There will be plenary sessions and 4 parallel sessions corresponding to the different Working Groups:

- **WG1:** Theory and Model Building [Convenors: **Michele Cicoli**, **Sophier Renner**]
- **WG2:** Dark Matter and Cosmology [Convenors: **Edoardo Vitagliano**, **Marco Gorghetto**]
- **WG3:** Astrophysics [Convenors: **Maurizio Giannotti**, **Oscar Staniero**]
- **WG4:** Direct Searches [Convenors: **Claudio Gatti**, **Marin Karuza**]
- There will be also review on the WG activities by WG Leaders and round tables.
- On Thursday afternoon after the session there will be an **outreach talk** (in Turkish) by **Serkant Cetin**

All the contributions will be published on Proceedings of Science (PoS) edited by SISSA

PLEASE SIGN EVERY MORNING THE ATTENDANCE LIST

WELCOME IN ISTANBUL!

