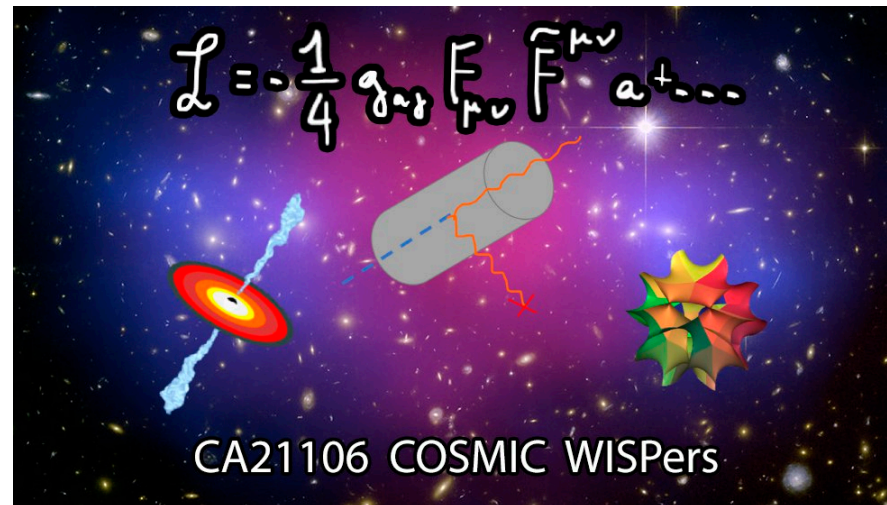
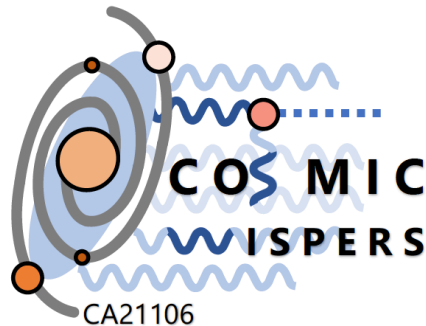


## COST ACTION CA21106

### COSMIC WISPers in the Dark Universe:

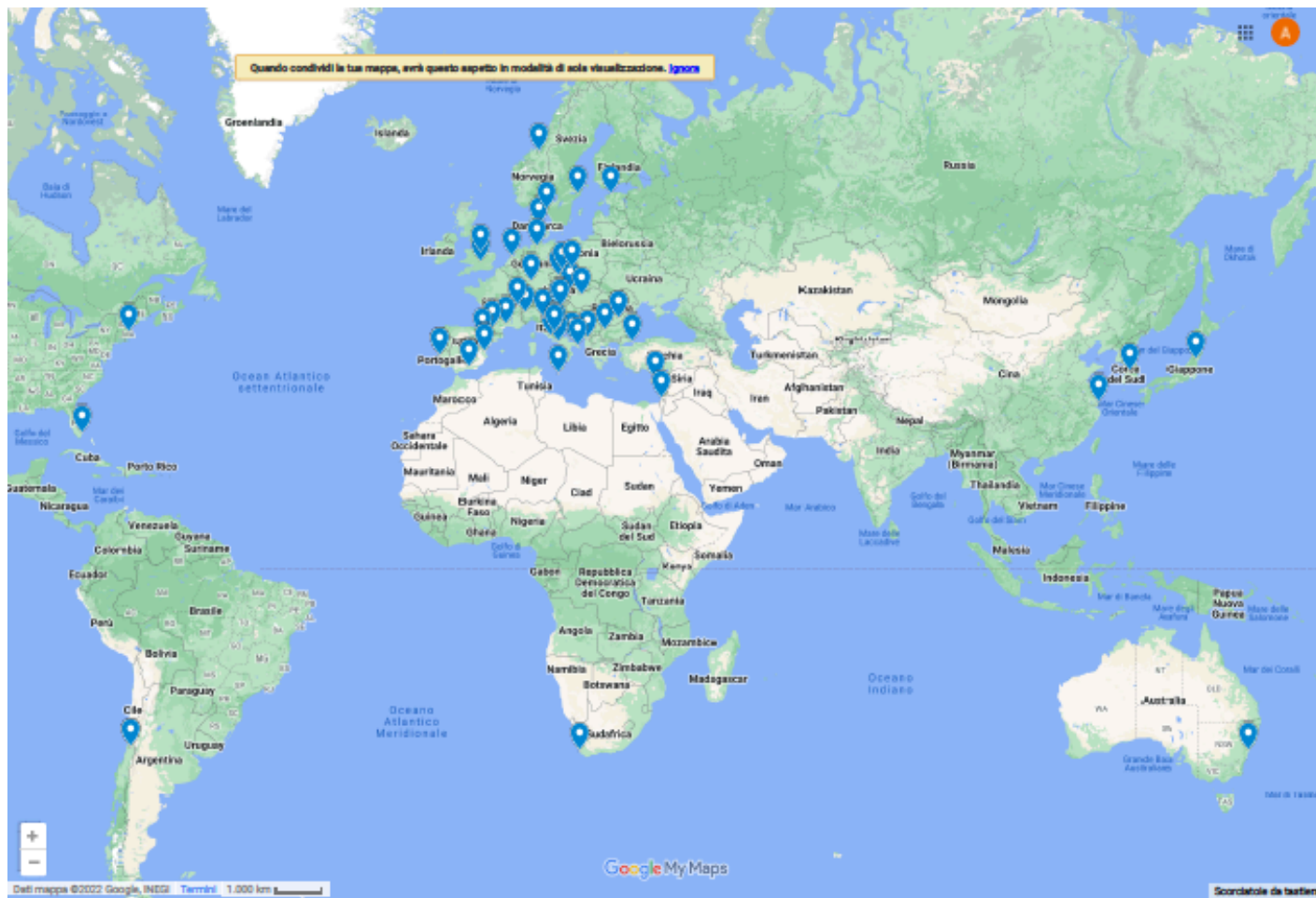
### Theory, astrophysics and experiments

Alessandro Mirizzi  
(Bari Univ. & INFN, Italy)



Funded by the  
European Union

# COSMIC WISPerS NETWORK



*~ 70 proposers*

**Currently > 250  
participants!**

**COST Country(25)** : Albania , Austria , Bulgaria , Croatia , Cyprus , Czech Republic , Denmark , Estonia , France , Germany , Hungary , Israel , Italy , Malta , Netherlands , Norway , Poland , Portugal , Romania , Slovenia , Spain , Sweden , Switzerland , Turkey , United Kingdom

**International Partner Country(7)** : Australia, Chile, China, Japan, South Africa, South Korea, United States



# 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

# 1° MANAGEMENT COMMITTEE MEETING

3-rd October 2022



Zoom Meeting

Original Sound for Musicians: Off COST Katchamon Nimprang is talking...

View

Participants (28)

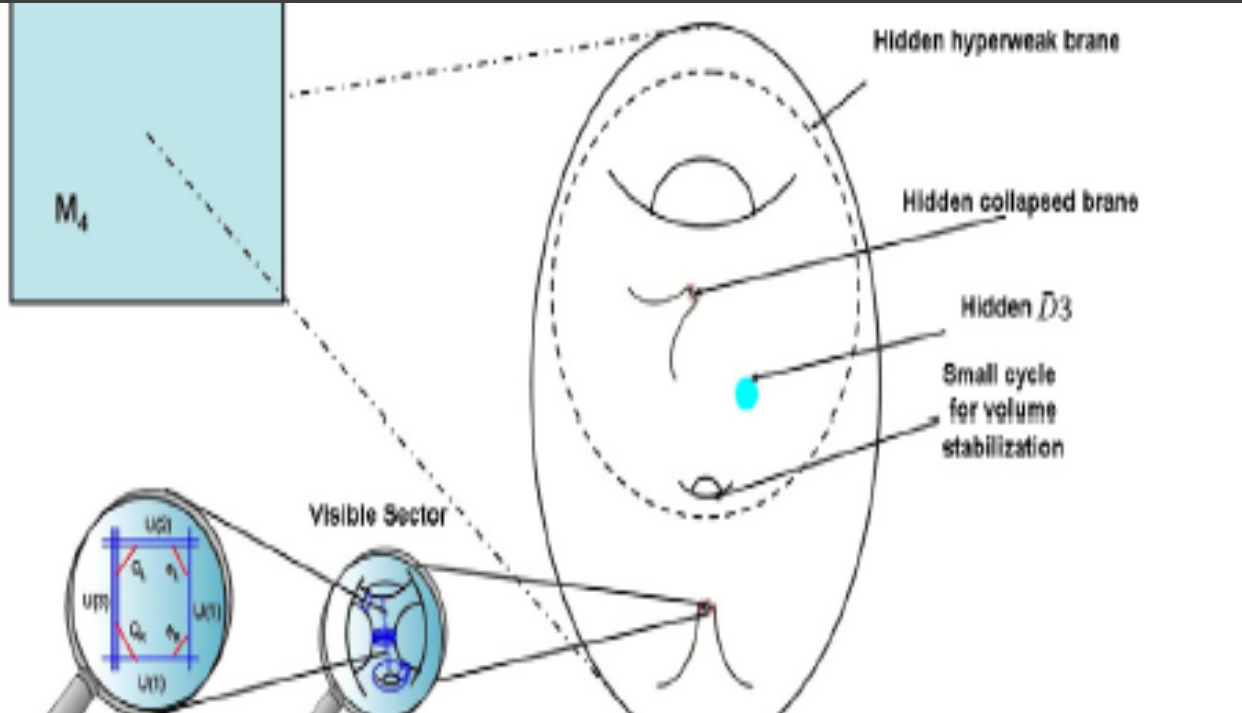
Find a participant

- EE Maria Benito Castaño
- EI ES Igor García Irastorza
- FP FR Pierre Pugat
- HM HR Marin Karuza
- A IT Alessandro Mirizzi
- IM IT Maria Paola Lombardo
- MC Michele Cicoli
- NW NL-Christoph Weniger
- M PT Michele Gallinaro
- RS Zoran D. Grujić
- SE - David Marsh
- SI Miha Nemevšek
- TR Serkant Çetin
- UJ UK Joseph Conlon
- WG- Andrea Caputo
- WI WG Inma Dominguez

Unmute Stop Video Security Share Screen Apps More Leave Invite Mute All

**Action Chair:** Alessandro Mirizzi  
(Bari Univ, IT)

**Action Vice-Chair:** Francesca  
Calore (LAPTh, Annecy, FR)



WG Leaders

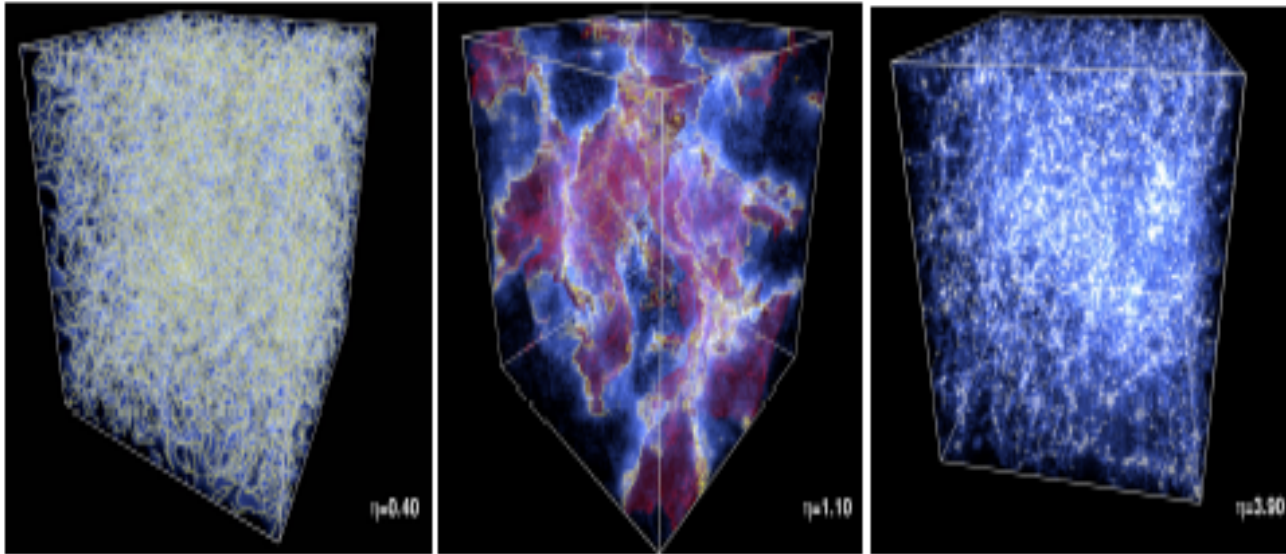
Michele Cicoli (Bologna Univ., IT)  
Ilaria Brivio (Bologna Univ., IT)

69 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 (Hebrew Univ. IS)  
Javier Redondo (Zaragoza Univ., ES)

148 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





# 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.

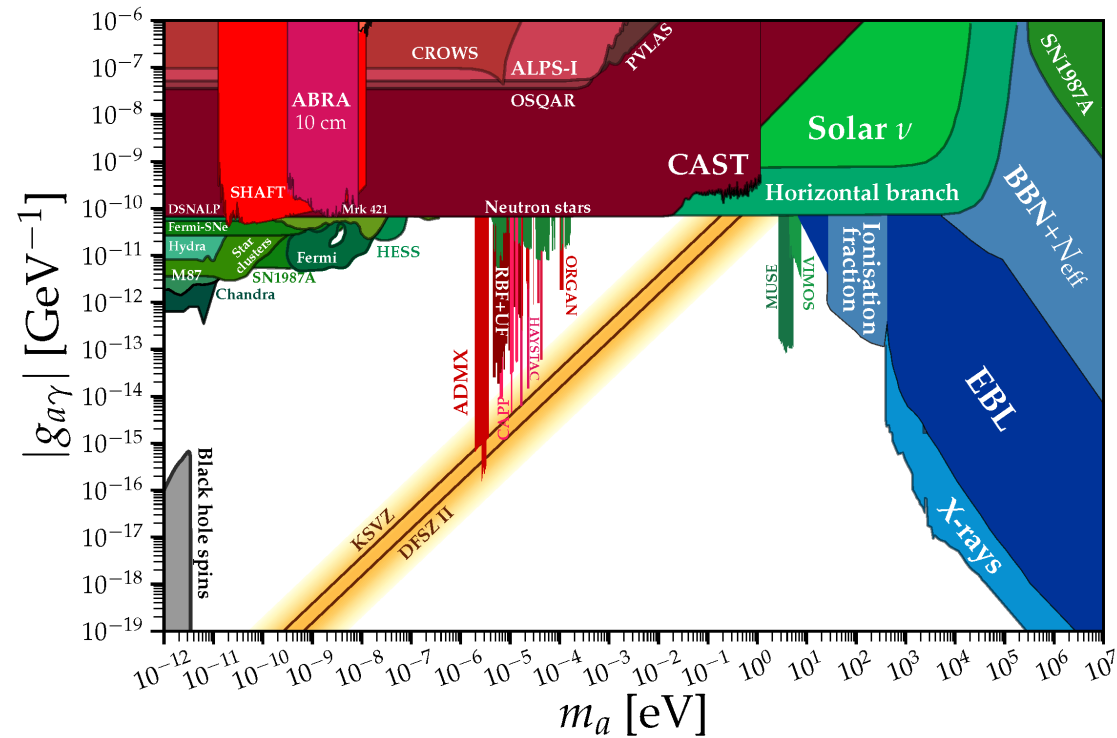
**WG Leaders**

Andrea Caputo (CERN, CH)  
Oscar Straniero (INAF, IT)

94 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)

88 participants

## WG5: DISSEMINATION AND OUTREACH

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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)*

63 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	4	12
	detection		
D4.2	Interim Report on direct	4	24
	detection		
D4.3	Final Report on direct	4	48
	detection		
D4.4	Report on Technologies	4	36
	Forums		
D5.1	Action webpage, twitter and	5	6
	repositories		
D5.2	Set Dissemination	5	6, 18,30
	and Communication Scheme		
D6.1	Lecture notes of the	1,2,3,4	12,24,32,48
	training schools		
D7.1	Final White Paper on	1,2,3,4	48
	the Physics case		



## 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:** **Pierluca Carenza** (Stockholm Univ., SW)



**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)

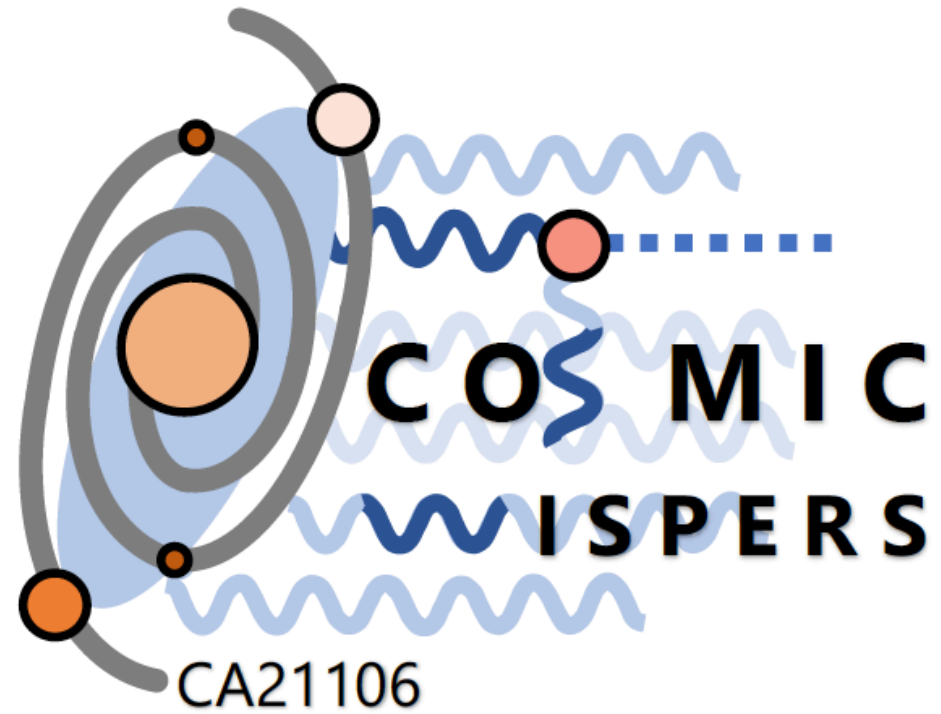
All events announced on the webpage [www.cosmicwispers.eu](http://www.cosmicwispers.eu)

## 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

## CA21106 LOGO



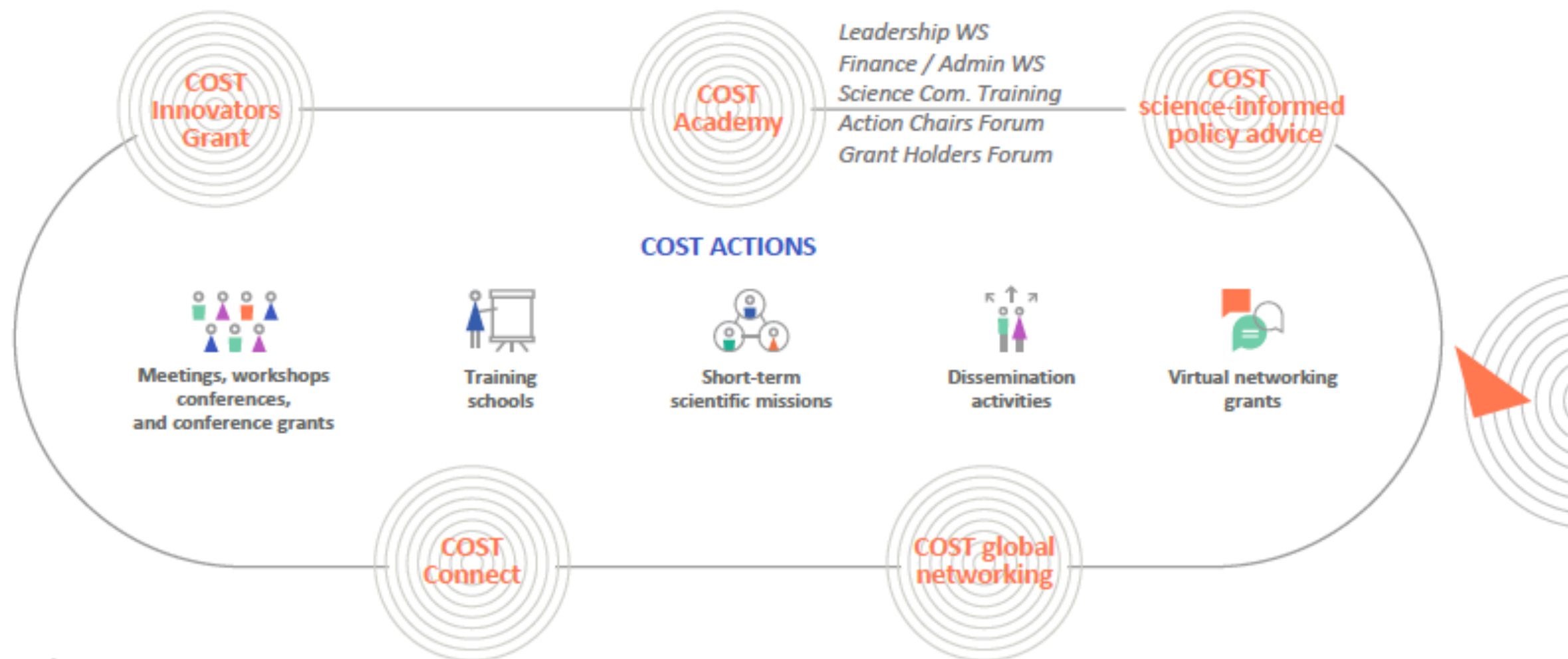
By Igor Irastorza

## WHAT YOU CAN DO FOR THE ACTION?

- Advertise the Action on social media and through press release
- Ask your colleagues and collaborators to register
- Post interesting events and papers on twitter and to the e-mail
- Put acknowledgements on your publication: "This article/publication is based upon work from COST Action COSMIC WISPerS CA 21106, supported by COST (European Cooperation in Science and Technology)"
- Use Action Logo and COST visual identity in your talks
- .....



# COST support beyond the COST Action



# 2023 EVENTS



22-23 Febr: Kick-off Meeting  
(Frascati, IT)



5-8 Sept: General Meeting  
+ MC Meeting  
(Bari, IT)



11-14 Sept: Training School  
(Lecce, IT)





## Kick-off meeting in Frascati





## General Meeting in Bari





WELCOME TO THE CA21106 TRAINING SCHOOL IN LECCE !

