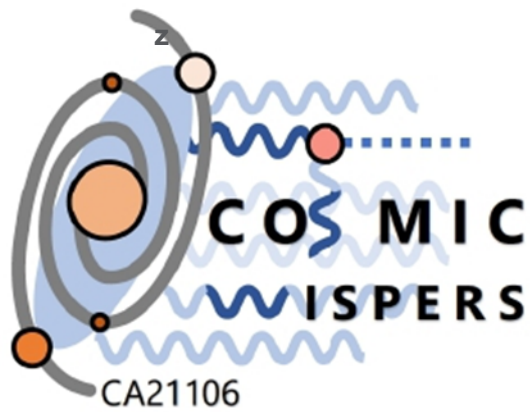




# Science Communication Plan

## COST Action CA21106

Version 01



## VERSIONS AND HISTORY OF CHANGES

Version	Date of adoption by MC	Notes (e.g. changes from previous versions)	Lead author(s)*
SCP_01		First version of the SCP	Olga Mena, Loredana Gastaldo, Alessandro Mirizzi

This document is based upon work from COST Action [COSMIC WISPerS, CA21106](#), supported by COST (European Cooperation in Science and Technology).

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## 1. SUMMARY

Recent years have seen a renewed interest towards very weakly interacting particles (WISPs), like axions and dark photons, with impressive developments on both theoretical and experimental side. Searches for WISPs are strongly motivated by the attempts to understand the nature of the dark matter and puzzling astrophysical and particle physics observations.

**The aim of the COSMIC WISPerS Action is to organize the scientific foundation for the next generation of WISPs experiments and searches, and to promote a roadmap for the researchers, research sponsors and the broader scientific community.**

In order to fulfil this ambitious goal, it is crucial a promotion of the Action and of its results, in order to raise awareness about the exciting WISP physics and about the possible related game-changing discoveries.

### 1.1 Dissemination Strategy

The Action dissemination strategy will be based on publication of Action results on:

- top-class **high impact** peer reviewed scientific journals and on online repositories
- talks at major **international conferences**
- **organization** of workshops and webinars to attract the scientific community and the stakeholders towards the topics of the Action.

Furthermore, our workshops plus the participation in the major international conferences and in specialized workshops will be a fundamental dissemination tool via talks and posters delivered by senior and junior members. The project will prioritize to make publications available via Open Access, thanks to the posting of articles first on the arXiv and institutional repositories, when available, and then choosing journals for publication which allow Open Access via the gold or green routes, whenever possible. Also, much attention will be dedicated to ensure that all publications and presentations acknowledge properly the EC support.

### 1.2 Communication Strategy

The communication goal of the Action is to share the motivations and the achievements of this project with policy makers and the public at a level that can be understood by non-experts.

Such a task can be accomplished by a wide initiative to distribute the acquired knowledge among the largest possible audience:

- A **webpage** will be settled, containing relevant information about the Action and the related activities, as well as an outreach section. The outreach section includes popularization of recent scientific major results from inside and outside the COSMIC WISPerS action, a question and answer section, a news of the month for the general public, quizzes, games and links to other scientific outreach sites.
- A **Twitter account** will be created to quickly disseminate information related to the Action to general public.
- **Public talks** for a large audience will be offered in junction with the events organized by the Action.
- **Participation to outreach activities** like Open Days, Science Weeks and the Night of Researchers to spread the topic related to the Action.

### 1.3 Valorization Strategy

In order to make a concrete use of Action results for research and knowledge transfer it is also crucial to attract **Small and Medium Size Enterprises (SMEs)** as well as **funding agencies**. For this purpose, the Action valorisation strategy will involve

- the organization of Action **Technology Forums** to strengthen the cooperation among stakeholders from industry and WISPs physics projects.
- Transmission of the **main reports of the Action** to the appropriate funding agencies and policy makers for their evaluation.

### 1.4 Implementation Strategy

The dissemination, communication and valorisation plans will be implemented through a specific **Working Group (WG 5)**, led by the Science Communication Coordinator and by a co-leader. The Science Communication Coordinator, the co-leader and the WG5 members, will be in charge of setting, coordinating and monitoring the communication and dissemination strategy. A contact person for science communication will be nominated in each Country which will be in charge for coordinating communication measures.

COUNTRY	NAME	INSTITUTE	E-MAIL ADDRESS
Albania			
Austria			
Bulgaria			
Croatia			
Cyprus			
Czech Republic			
Denmark			
Estonia			
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Germany	Loredana Gastaldo	Kirchhoff Institute for Physics, Heidelberg University	Loredana.Gastaldo@kip.uni-heidelberg.de
Hungary			
Israel			
Italy			
Malta			
Netherlands			
Norway			
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Portugal			
Romania			
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Spain	Olga Mena	Instituto de Física Corpuscular, IFIC (CSIC -UV), Valencia	omena@ific.uv.es
Sweden			
Switzerland			
Turkey			
United Kingdom			

	COMMUNICATION	DISSEMINATION	VALORIZATION
<b>Objectives</b>	<p>Raising public awareness towards WISP physics case</p> <p>Attract people (devoting a special effort to minorities) towards the exciting world of fundamental physics.</p> <p>Engaging general public in outreach activities of the network</p> <p>Promote and communicate via social media the Action initiatives and developments</p>	<p>Maximise the impact of Action activities and scientific research outcomes via a large number of channels</p> <p>Attract researchers to work on WISPs, with special emphasis on young scientists and under-represented groups</p>	<p>Motivate SMEs to invest in technology development to perform new experiments.</p> <p>Convince the funding agencies to promote WISPs large-scale experiments.</p> <p>Make concrete use of results for research, knowledge transfer or commercial use.</p>
<b>Expected Impact</b>	<p>Visibility of WISP community towards general public.</p> <p>Success of the research collaborations among different European countries</p> <p>Show that investments in science imply technological innovations and benefit for all the society (MRI magnets)</p> <p>Engagement of young women and less represented groups to pursue scientific careers and become field leaders</p>	<p>Establish a shared platform that links together various research efforts and lays the groundwork for current and future WISP experiments.</p> <p>Allow the community to go a step forward with respect to current status based on the Action feedback</p> <p>Maximize interdisciplinarity in the field.</p>	<p>Organize the scientific foundation for the next generation of WISPs experiments and searches.</p> <p>Motivate the benefit for industry, technology and society in general from the development of new techniques used in particle physics.</p>
<b>Audiences</b>	<p>General people interested in science focusing on talented young people and minorities</p>	<p>Researchers, industry, stakeholders</p>	<p>SMEs and policy makers</p>
<b>Languages</b>	<p>Adapt communication skills to special audience (schools, public talks)</p>	<p>Scientific and specialist language</p>	<p>Combines general and technical language to present reports, results.</p>
<b>Channels &amp; Tools</b>	<p>Website, twitter account</p> <p>Special didactical material for high school students (gamification, quizzes, ...)</p> <p>Masterclasses (axion searches)</p> <p>Posters, brochures, videos.</p> <p>Public talks and webinars</p>	<p>Peer-review journals, scientific or stakeholder conferences, online repository of results.</p> <p>Lecture notes of Training Schools of the Action</p> <p>Recorded talks and seminars of Action workshops</p> <p>Posters, brochures, videos</p> <p>Webinars</p> <p>EU related platforms and services such as Open Research Europe, European Open Science Cloud.</p>	<p>Technology Forums and relative reports</p> <p>Reports of WG activities</p> <p>EU related platforms and services such as CORDIS, Horizon Results Booster, Innovation Radar, Horizon Results platform,</p> <p>European Patent Office.</p>

## 2. GENERAL AIM AND TARGET AUDIENCES

A global perspective is an increasingly essential ingredient of human enterprise. Science should not and cannot escape this planetary trend. Therefore, the aim of the COSMIC WISPerS Action is to establish a shared platform that links together various research efforts and lays the groundwork for current and future WISP experiments. In order to allow the community to go a step forward with respect to current status and **to maximise the impact of Action activities**, a broad and visible dissemination of the research results is a key issue of the COSMIC WISPerS Action. This task will allow researchers, SMEs and policy makers to identify the Action as a reference for the state-of-the-art of the field.

**The key message to convey to these target audiences is the existence of an intriguing physics case, the WISP paradigm, with high potential to lead to game-changing discoveries in the next decade solving long-standing open questions of fundamental physics (e.g. the nature of Dark Matter).**

### 2.1 Dissemination

Dissemination of outstanding results will

- attract more researchers to work on WISPerS
- motivate SMEs to invest in technology development to perform new experiments
- convince the funding agencies to promote WISPerS large-scale experiments.

In order to achieve these goals, Action results will be published on top-class journals and on online repositories. Dissemination talks will also be delivered at major international conferences. The Action will also organize in person and hybrid workshops to attract the scientific community and stakeholders towards WISPerS physics.

### 2.2 Communication

The public engagement will also focus on the **societal impact of research**, showing that investments in science imply technological innovations which are essential not only for science but also for the benefit of society at large. Therefore, **raising public awareness to science via communication** has become a standard professional responsibility of research institutions and active scientists alike. The topics of this Action, at the interface of particle physics, astrophysics and cosmology, are particularly suitable for this task. In relation to this challenge, the key message to communicate to the general public is the role of WISPerS in relation to the Dark Universe. The most important questions to convey to a broad audience are:

- why it is interesting to study WISPerS and how they can help to answer to long-standing open questions in (astro)-particle physics,
- how to search WISPerS,
- which are the most promising approved or planned experimental programs,
- how indirect signatures from astrophysical observations may lead to a WISP discovery complementary to laboratory searches.

The **main targets** for these communication objectives are talented young people and in general people interested in science, in order to attract them towards the fabulous world of fundamental physics. Action Communication strategy will be based on the Action webpage and on social media. Action participants will also be involved in outreach activities at local level (e.g. public talks).

Concerning **gender issues and to less represented groups**, notice that in science and in physics in particular women represent a small fraction of researchers and moreover that fraction decreases with the seniority, with only few women at the professor level in Europe and worldwide. In order to help with this long-standing issue, the Action will provide key scientific and complementary skills and international visibility, independence, and collaborative links, together with self-confidence. The project is optimally gender-balanced, with a strong female participation, key for encouraging young women to pursue scientific careers and become field leaders. In this regard, the Action shall focus on **high school students** by means of visits and talks, in order to promote STEM education. Special attention will be devoted to fostering a stronger participation in science also of less-represented groups. The outreach activities planned will strengthen this aspect by making sure that women and less represented groups in the specific environment are involved in the activities and have high visibility. This will be particularly important in relation to schools and activities aimed at young people and those done in the developing countries.

## 2.3 Valorization

The specific targets for valorisation of Action results **are SMEs and policy makers**. At this regard, the Action will organize **Technology Forums** to create a strong network of laboratories and industrial partners to promote a better knowledge of the existing facilities for industrial users and wider markets for technology transfer possibilities. Funding agencies and policy makers will also be **informed about the key results** of the Action sending them the reports and the final Physics paper, addressing recommendations on scientific and technological issues. By acting coherently on these recommendations, funding agencies will be able to exploit fully the tantalizing potential for WISP discoveries.



### 3. PLAN FOR THE COMMUNICATION OF ACTION RESULTS

The communication task of COSMIC WISPerS Action can be accomplished by a wide range of initiative to distribute the acquired knowledge among the largest possible audience. In order to achieve this goal, the Action Communication Plan will be developed as follows:

- the Action will settle a **website** to explain the physics case and the activities. The webpage will clearly show an Action **logo** and make reference to the COST visual identity. On the webpage will be also uploaded videos and material to popularise the different activities of the Action.
- **Videos** will be provided also in **different languages** in order to promote WISPerS towards people not familiar with English. During the Kick-off meeting in Frascati (IT) (Feb. 2023) will be developed a video to introduce to general public the topics of the Action.
- A **Twitter account** will be created to quickly communicate information related to the Action to general public. Important events and results related to the Action activities will be also communicated through press releases.
- **Posters and brochures** for different audiences and scientific levels describing the COSMIC WISPerS Action will also be available on the webpage and will be distributed in the events in which the Action will be involved. Poster and Brochure will be available in **different languages**.
- On a **local level**, members of the Action will be encouraged to participate to activities like Open Days, Science Weeks and the Night of Researchers.
- **Public talks and games** will be organised, including science quizzes. During the Kick-off meeting in Frascati (IT) (Feb. 2023) will be organized the first public talk on topics related to the Action. Particular attention will be devoted to create connections with secondary schools and organise in place outreach events for students. Dedicated space will be devoted to outreach activities also on the Action webpage.
- **Masterclasses** to allow high school students to experience the WISPerS search.
- **Didactical material** for high schools, primary schools and museums, adapting the format to the audience science level. The description of the material will be translated in different languages

Planned Activities Number	Planned Activities Title	Planned Activities date (months)
SC1	Setting on the webpage and a repository concerning the Action activities	6 + periodic updates
SC2	Video to introduce to general public the topics of the Action translated in different languages	12 months + updates
SC3	Twitter account to quickly communicate information related to the Action to general public	6 months + maintenance
SC4	Poster and brochure translated in different languages	6 months + update
SC5	Outreach events at local level (Open Days, Science Weeks and the Night of Researchers)	minimum of twice per year
SC6	Public talk in universities, research and cultural centres	each three months
SC7	games	twice per year
SC8	Masterclasses for high school students	18 months + updates
SC9	Didactic material translated in different languages addressed to school of different levels	12 months

## 4. PLAN FOR THE DISSEMINATION OF ACTION RESULTS

The dissemination plan of the Action results and achievements towards researchers and stakeholders is based on the following strategy:

- The Action will develop a **common database** on WISPs theoretical models (**WG1**), on cosmological (**WG2**), astrophysical (**WG3**) and experimental (**WG4**) bounds in order to settle the state-of-the-art of the field.
- The research papers resulting from the Action activities will be published in **top-class scientific journals** (e.g., Journal of High Energy Physics – JHEP -, Journal of Cosmology and Astro-particle Physics – JCAP -, Physical Letter B, European Physics Journal C, Nuclear Physics B, Physical Review, Astronomy & Astrophysics, ...) with an established peer-review system. The support by COST will be acknowledged. The relevant journals are all electronically available. Preference will be given to publication which allow **Open Access via the gold or green routes**, whenever possible.
- Extensive use will be made of the **e-print server** arXiv.org (<http://arXiv.org>), which is the primary channel for scientific information exchange in the fields of particle physics and astrophysics. This will guarantee **open access** to all publications of the Action.
- The journal version of the most relevant publications will also be accessible on a **repository on the Action webpage**.
- **The final Physics Paper on the WISP Physics Case**, summarising the output of the Action activities and shaping the European roadmap for WISP searches, will be available on the Action Webpage and will also be published on a European Open Access top-class journal (e.g. JHEP, JCAP).
- **Lectures Notes** of the Action **Training Schools** will also be published in open-access series, like Proceedings of Science (PoS) from SISSA.
- The COSMIC WISPs results will be presented **at major international conferences**, such as European Physical Society Conference, Identification for Dark Matter (IDM), Patras, Topics on Astroparticle and Underground Physics (TAUP), International Conference in High Energy Physics (ICHEP), International Symposium on Particles, Strings and Cosmology (PASCOS), Planck, String Pheno.
- Results will be disseminated also at **workshops** as well as in **seminars and colloquia** at academic institutions and research centres. All presentations will be clearly recognizable through reference to the visual identity and Action logo.
- **Events** open to all interested scientists will also be organised by the Action: **Workshops, Conferences, Training Schools**. These events will be advertised through the Action webpage and through specialized servers like InSpire-hep. This will give a large boost in dissemination of scientific results. The COSMIC WISPs Action will also organize **online webinars and journal clubs** open to all the community. A monthly **newsletter** on Action activities and on relevant papers and events will be maintained. The coordination of webinars, journal clubs and newsletters will be assigned to Early Career Investigators (ECI) members.
- The COSMIC WISPs Action aims at providing input to SMEs identifying progresses needed in key technologies for present and future experiments. For these purpose, **reports** on technological challenges prepared by WG4 along with **Technology Forums** will be delivered to stakeholders from industry and WISPs physics projects. These reports will also be visible on the Action webpage.

**Timeline.** The database on WISPs models and bounds will be accessible on the Action webpage within 24 months from the start of the activities. Research papers and contributions to conferences are expected to appear throughout all the duration of the Action **by the participants of all the different WGs**, starting from Summer 2023. Webinars, journal clubs and newsletters are expected to occur monthly starting from January 2023. The kick-off workshop will take place in February 2023. The first General Conference and the Training Schools will occur in September 2023.

Deliverable Number	Deliverable title	Deliverable date (months)
D1	Setting on the webpage and a repository concerning the Action activities	6
D3-4-5-6	Draft reports on the activities of WG1-2-3-4	12
D12	Report on Technologies Forums	40
D17	Lecture notes of the Training School	12

## 5. PLAN FOR THE VALORISATION OF ACTION RESULTS

The aim of the COSMIC WISPer Action is to organize the scientific foundation for the next generation of WISPs experiments and searches. Therefore, the specific target audience for **valorisation** of the Action results are policy makers and SMEs. During the development of the Action a constant interaction with these stakeholders is expected. Specifically:

- The **Reports and the final Physics Paper** resulting from Action activities will be delivered to the appropriate funding agencies and policy makers (ApPEC, international laboratories like CERN, DESY, LFN and national agencies) for their evaluation. After appropriate reviews and consultancy, the respective organizations are expected to make decisions to realise the considered experiments. These Reports should contain **necessary technical information** required for the decisions, to be combined with the **scientific priorities** of the decision time.
- In order to **create connections with industrial partners**, representatives of SMEs developing the key technologies used in WISP experiments will be invited to participate to this Action (in the WG 4). In particular, dedicated **Technology Forums** are foreseen with a focus on specific technologies where leading scientists and entrepreneurs will be invited to show the latest achievements in the sector. These will be a unique opportunity to generate new cooperation contacts and contracts. The goal of the Forums is to create a strong network of laboratories and industrial partners to promote a better knowledge of the existing facilities for industrial users and wider markets for technology transfer possibilities. The role of the SME in the Technology Forums will be fundamental to shape the strategy for WISP searches to be proposed in the roadmap. Furthermore, the Technology Forums involving SMEs would motivate the upgrade or the development of new technologies used in particle physics. In this sense, the researches pursued in the framework of the Action may have a direct impact on triggering technological development. The Technology Forums would provide a **discussion platform** for companies and project scientists to define the future ways of boosting cooperation to the benefit of all stakeholders.
- Contact with **ECFA** and **PBC** to validate the interdisciplinary spirit of the Action

Deliverable Number	Deliverable title	Deliverable date (months)
D3-4-5-6	Draft reports on the activities of WG1-2-3-4	12
D12	Report on Technologies Forums	40

SME	Contact person	e-mail address

Scientific Network/ International Lab	Contact person	E-mail address
Physics Beyond Collider		
ECFA		
CERN		
DESY		