Minutes of the 2st Management Committee Meeting of the COST Action

# CA21106 – COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments (CosmicWISPers)

**Hybrid, Bari, Italy**

**Centro Polifunzionale Studenti (ex Palazzo delle Poste e Telegrafi), Bari, Italy**

*08/09/2023*

## 1) Agenda

1. Welcome to participants, verification of the quorum and adoption of agenda
2. Information to the MC
   a) Recap of the minutes of the last meeting, e-votes and matters arising since the last meeting
   b) Core Croup: report from the Core Group, including delegated decisions
   c) Action Membership: New Specific Organisations and COST Members represented in the MC
   d) Action Participation: WG membership and applications, New MC members/Observers and provisional substitution.
   e) Budget status: summary from the Grant Holder.
   f) Update from the COST Association (if representative is present)
3. Follow up and discussion on the
   a) Action management: structure, leadership positions and other supporting roles. Mandates to the Core Group (if applicable)
   b) Implementation of the COST Excellence and Inclusiveness Policy
   c) Grant Awarding by the Action
   d) Progress of each working group
   e) Science Communication Plan
   f) Progress on MoU Objectives, WG tasks, deliverables, and Goals for the current GP.
4. Planning
   a) Revision of Work and Budget Plan of the current GP (if applicable)
   b) Draft plans for the following GP(s).
   c) Upcoming activities
5. Monitoring and Reporting to the COST Association
6. AOB
7. Summary of MC decisions
8. Closing

The meeting slides are provided in Annex 1.

## 2) Hosting Team and Participants

- Action Chair: Alessandro Mirizzi

Participants in the attendance list here attached (Annex 2).

## 3) COST Action discussions

There was a wide discussion on Progress on MoU Objectives, WG tasks and Management topics introduced by the following talks:

1. WG1 – WISPs Model Building [talk by co-leader Ilaria Brivio]
2. WG2 – WISPs Dark Matter and Cosmology [talk by leader Edoardo Vitagliano]
3. WG3 – WISPs in Astrophysics [talk by leader Andrea Caputo]
4. WG4 – Direct WISPs searches [talk by co-leader Marin Karuza]
5. WG5 – Dissemination and Outreach [talk by co-leader Loredana Gastaldo]
6. Grant awarding – implementing STSMs, VMs and ITC Conference Grants [talk by Grand Awarding Coordinator Venelin Kozhuharov
7. Report by Gender and Diversity Advisor [talk by Deniz Sunar Cerci]
8. Report by Leader of ECI Council [talk by Pierluca Carenza]
9. Organising Training Schools,
10. Action criteria for fair & transparent reimbursement
11. Awarding WG membership

## 4) Pre-requisites for the decision making

21 out of 25 COST Full or Cooperating Member countries having nominated at least one MC member were represented in the meeting. Therefore, the minimum of 2/3 of the parties present (17) to reach the quorum was achieved allowing the Management Committee to take formal votes in accordance with the Annotated Rules.

## 5) Decisions by the Management Committee

### Discussion on Work and Budget Plan

The Working Group Structure and the leadership positions were confirmed. Only co-leader of WG1 Ilaria Brivio will be substituted by Sophie Renner (Glasgow Univ.) since Ilaria Brivio will become the Chair of COST Action CA22130 COMETHA. The deliverables for the 2 GP were confirmed as expressed in MoU. In order to fulfill the goals of the 2 GP, presented in the W&B plan, there were proposed the following activities

a) Meetings
   a. Working Group Meeting [2 days beginning of 2024]: 26,650 euros [location: DESY tbc]
   b. General Meeting [4 days, September 2024]: 71,000 euros [location: Istanbul or Belgrade tbd]

b) Training School: [4 days, June 2024]: 30,000 euros [location: Lubjiana or Sofia, tbd]

c) STSMs grants: 13,000 euros

d) ITC Conference Grants: 2,000 euros

e) Dissemination Grants: 1,000 euros

f) Scientific publications in Open Access: 2200 euros

g) Action website maintenance: 600 euros

h) Bank charges: 900 euros

The MC agreed on deciding the locations for a) and b) by an electronic vote.

The draft of W&B plan  is provided in Annex 3.

## a. Next MC meeting and AOB

The MC agreed to meet next September during the General Meeting

**Minutes prepared by:**

- *Action Chair* Alessandro Mirizzi

# *ANNEX 1*

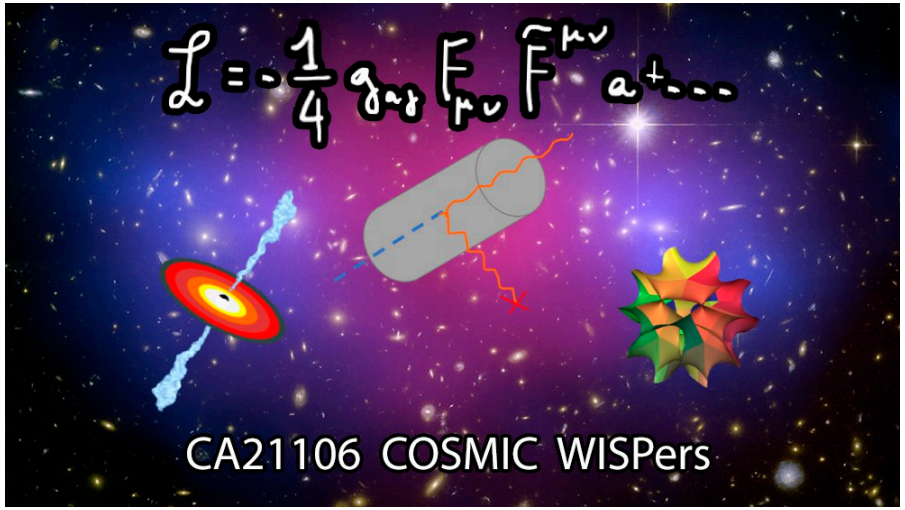
2nd CA21106 Management Committee Meeting, Bari, 8 September 2023

# COST ACTION CA21106

## COSMIC WISPers in the Dark Universe:

## Theory, astrophysics and experiments

Alessandro Mirizzi
(Bari Univ. & INFN, Italy)




Funded by the European Union

**COST Action CA21106: "COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments"**
**Management Committee Meeting**
**Draft Agenda**
**From 05/09/2023 at 09:00:00 to 08/09/2023 at 18:00:00**
**Hybrid, Bari, Italy**
**Centro Polifunzionale Studenti (ex Palazzo delle Poste e Telegrafi), Bari, Italy**

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# 1. WELCOME TO PARTICIPANTS, VERIFICATION OF THE QUORUM AND ADOPTION OF AGENDA

QUORUM

•At Action MC meetings if a quorum of 2/3 of COST Full and Cooperating Members is present (including virtually) or represented

25 COST Full or Cooperating Members . 2/3 → 17 Countries

# 2. a) Recap of minutes of 1 st MC Meeting 03/10/2022 and e-votes

## 5) Decisions by the Management Committee

### a. Election of the Chair and Vice-chair and selection of the Grant Holder (Scientific Representative)

Prof Alessandro Mirizzi (Italy) was elected Chair.
Dr Francesca Calore (France) was elected Vice Chair.
The MC selected Universita' degli Studi di Bari (Italy) as Grant Holder Institution, represented at the MC by Prof Alessandro Mirizzi.

### b. Agreement on the Action Structure

The MC decided that the Action structure shall be as followed:

- WG1 – WISPs Model Building
- WG2 – WISPs Dark Matter and Cosmology
- WG3 – WISPs in Astrophysics
- WG4 – Direct WISPs searches
- WG5 – Dissemination and Outreach

Further to the mandatory leadership position the Action agreed on the following leadership positions or committees:

- Equity and Inclusiveness Advisor → Deniz Sunar Cerci (TR)
- Young Researchers and Innovators Representative → Pierluca Carenza (SW)
- Grant Evaluation Committee → Venelin Kozhuharov (BL)
- Working Group leaders will be supported by co-leads.

## c. Election of other mandatory leadership positions

The following participants were elected for mandatory leadership positions:

| Position | Name | Country | YRI | Gender |
|---|---|---|---|---|
| Grant Awarding Coordinator | Venelin Kozhuharov | BG | N | M |
| Science Communication Coordinator | Olga Mena | ES | N | F |
| WG1 Lead | Michele Cicoli | IT | N | M |
| | Ilaria Brivio | DE | Y | F |
| WG2 Lead | Nick Rodd | CH | Y | M |
| | Javier Redondo | ES | N | M |
| WG3 Lead | Inma Dominguez | ES | N | F |
| | Andrea Caputo | IL | Y | M |
| WG4 Lead | Claudio Gatti | IT | N | M |
| | Marin Karuza | HR | N | M |

Edoardo Vitagliano (IL, Y, M)

Oscar Straniero (IT, N, M)

| | | | | |
|---|---|---|---|---|
| WG5 Lead | Olga Mena | ES | N | F |
| | Loredana Gastaldo | DE | N | F |

Science Communication Leader

# 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)

## d. Core Group and mandates

A Core Group was established. It is constituted by Chair, Vice-Chair, WG Leaders, Grant Holder Scientific Representative, Science Communication Coordinator, Grant Awardarding Coordinator, Young Researchers Council Represresentative, Gender Advisor. The Management Committee gives a mandate to the Core Group to relocate budget up to EUR 7500, which was not used for already implemented activities, to any other upcoming activity foreseen in the Grant Period or to any new activity deemed in line with the Goals of the current Grant Agreement Period. The MC also gives mandate to the Core Group for the acceptance of WG membership.

The MC gives mandate for the Grant Holder: "Upon receipt of the official e-COST invitation to an Action activity the recipient shall respond within two weeks, either accepting or declining their participation. The GH is mandated upon Core Group approval to withdraw the entitlement for reimbursement of an invitee, when they do not have accepted the invitation via the e-COST platform within this deadline, even when they later participate in the respective activity. This applies also to invitees being Management Committee Members or their substitutes. The invitee shall be duly informed about the withdrawal.»

## e. Discussion on Work and Budget Plan

During the first Grant Period it was planned to carry on the following activities:

- ✓ Development of the webpage of the Action
- ✓ Present a Science Communication plan withing 6 months
- ✓ Organize online Monthly Webinars about the physics case of the Action
- ✓ Organize WG Online Meetings.
- ✓ Organize a Hybrid Kick-off Meeting (2 days) to plan WG activities (National INFN Laboratory, Frascati, IT, Febr. 2023)
- ✓ Organize a General Conference (Bari, IT, Sept. 2023, 4-5 days)
- ✓ Organize a Training School 4-5 days (Lecce, IT, Sept. 2023, 4-5 days)
- ✓ Support STSM

The tentative proposed budget plan is the following:

- Meetings. Hybrid Kick-off meeting Frascati (10.5 kE), General Conference+MC Bari: 37.5 kE (37.5 kE)
- Training School. Lecce (20 kE)
- Mobility of researchers and innovators (28 kE)
- Presentations at Conferences organized by Third Parties (3 kE)
- Dissemination and Communication products. Webpage, brochure, poster, online proceedings (5 kE)
- Other expenses Related to Scientific Activities. E.g. zoom licences (2 kE)
- **Total Science Expediture:** 106.25 kE
- Financial and Scientific Administration (max 15 % of B): 18.75 kE

- Total budget: 125 kE → 153,582.50 EUR

# MC Decisions

Please carefully read the e-Vote Guide before using this tool

Filter by status:

Select one or more status

| Title / Initiator | Type | Status | Result | Dates | | |
|---|---|---|---|---|---|---|
| Search a vote ... | | | | | | Export |
| **Budget reallocation**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 16/07/2023<br>23/07/2023 | View vote | Options |
| **Leadership position WG2**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 11/05/2023<br>18/05/2023 | View vote | Options |
| **Guiding principles for the procedure and application for grants and schools**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 19/04/2023<br>26/04/2023 | View vote | Options |
| **Science Communication Plan**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 13/03/2023<br>20/03/2023 | View vote | Options |
| **Rules for Applications to ITC Conference, STSMs, Dissemination Conferences GRANTS**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 10/03/2023<br>17/03/2023 | View vote | Options |
| **Leadership positions in WG3**<br>Alessandro Mirizzi | MC-Voting | Closed | Approved | 05/01/2023<br>13/01/2023 | View vote | Options |
| **Rules for Approvals of WG Applications**<br>Alessandro Mirizzi | MC-Voting | Closed | Approved | 24/10/2022<br>31/10/2022 | View vote | Options |

Showing 7 total votes

# 2. b) Core Group

Meeting on monthly basis. Strong input in organizing all events (workshop, training schools), setting rules for participations to WGs and for STSMs and in budget re-modulation

# 2. c) Action Memberships

Beginning of Action

**Participation in the Action:**

| Number of | COST Full or Cooperating Members | | COST Partner Members | Specific Organisations | Near Neighbour Countries | Third States | Total |
|---|---|---|---|---|---|---|---|
| **Countries** | | | | | | | |
| COST Members / Specific Organisations represented in the MC | 25 | | 0 | 0 | n.a. | n.a. | 25 |
| | ITC | 56% | | | | | |
| | Non-ITC | 44% | | | | | |
| Countries represented in the Working Groups | 26 | | 0 | 0 | 0 | 7 | 33 |
| | ITC | 50% | | | | | |
| | Non-ITC | 50% | | | | | |
| **Individuals** | | | | | | | |
| Nominated MC Members / MC Observers | 35 | | 0 | 0 | n.a. | n.a. | 35 |
| | ITC | 51% | | | | | |
| | Non-ITC | 49% | | | | | |
| Approved Working Group members | 109 | | 0 | 0 | 0 | 13 | 122 |
| | ITC | 32% | | | | | |
| | Non-ITC | 68% | | | | | |

Sept. 2023

## Action Profile

### Action General Information

| | | | |
|---|---|---|---|
| Action Code | CA21106 | MC Chair | Prof Alessandro Mirizzi |
| Action Title | CA21106 - COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments | | |
| MOU | 020/22 | Draft MOU | OC-2021-1-25120 |
| CSO Approval Date | 2022-05-27 | | |
| Action Start Date | 03/10/2022 | Action End Date | 02/10/2026 |
| Science Officer | Dr Ralph Stuebner | Administrative Officer | Ms Rose Cruz Santos |

**Participation in the Action:**

| Number of | COST Full or Cooperating Members | | COST Partner Members | Specific Organisations | Near Neighbour Countries | Third States | Total |
|---|---|---|---|---|---|---|---|
| **Countries** | | | | | | | |
| COST Members / Specific Organisations represented in the MC | 25 | | 0 | 0 | n.a. | n.a. | 25 |
| | ITC | 52% | | | | | |
| | Non-ITC | 48% | | | | | |
| Countries represented in the Working Groups | 30 | | 0 | 0 | 1 | 9 | 40 |
| | ITC | 53% | | | | | |
| | Non-ITC | 47% | | | | | |
| **Individuals** | | | | | | | |
| Nominated MC Members / MC Observers | 38 | | 0 | 0 | n.a. | n.a. | 38 |
| | ITC | 47% | | | | | |
| | Non-ITC | 53% | | | | | |
| Approved Working Group members | 229 | | 0 | 0 | 2 | 20 | 251 |
| | ITC | 29% | | | | | |
| | Non-ITC | 71% | | | | | |

# 2.d) Action WG Participations

Beginning of Action

**Working Groups**

| | WG Title | WG Leader | Number of WG members |
|---|---|---|---|
| WG1 | WG1: WISPs Model Building | Prof Michele Cicoli | 37 |
| WG2 | WG 2: WISPs Dark Matter and Cosmology | Prof Nicholas Rodd | 74 |
| WG3 | WG 3: WISPs in Astrophysics. | Prof María Inmaculada Domínguez Aguilera | 58 |
| WG4 | WG4: Direct WISPs searches. | Dr Claudio Gatti | 49 |
| WG5 | WG 5: Dissemination and Outreach | Dr Olga Mena | 38 |

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**Working Groups**

| | WG Title | WG Leader | Number of WG members |
|---|---|---|---|
| WG1 | WG1: WISPs Model Building | Prof Michele Cicoli | 69 |
| WG2 | WG 2: WISPs Dark Matter and Cosmology | Dr Edoardo VITAGLIANO | 148 |
| WG3 | WG 3: WISPs in Astrophysics. | Dr Andrea Caputo | 94 |
| WG4 | WG4: Direct WISPs searches. | Dr Claudio Gatti | 88 |
| WG5 | WG 5: Dissemination and Outreach | Dr Olga Mena | 63 |

# 2.e) Budget status

COST Action CA21106 Annex A of the Grant Agreement (not editable) from 2022-11-01 to 2023-10-31

| Networking Tools | Quantity | Budget |
|---|---|---|
| Meetings | 2 | EUR 64 840.12 |
| Training Schools | 1 | EUR 37 500.00 |
| Mobility of Researchers and Innovators | tbd. | EUR 22 300.00 |
| Presentation at Conferences organised by Third Parties | tbd. | EUR 3 250.00 |
| Dissemination and Communication Products | 3 | EUR 4 150.00 |
| Other Expenses Related to Scientific Activities (OERSA) | 2 | EUR 1 400.00 |
| **Total Science Expenditure** | | **EUR 133 440.12** |
| Financial and Scientific Administration and Coordination (FSAC) - MAX. 15% | 15 % | EUR 20 016.02 |
| **Total Grant** | | **EUR 153 456.14** |

**Funds available to spend globally:** EUR 11 950.00

| Total | Grant budget (a) | Expenditure | | | | | Delta (g=f-a) |
|---|---|---|---|---|---|---|---|
| | | Actuals (b) | Accruals (c) | Total (d=b+c) | Forecast (e) | Total (f=d+e) | |
| Meeting | 64 840.12 | 0.00 | 11 340.12 | 11 340.12 | 53 500.00 | 64 840.12 | 0.00 |
| Training School | 37 500.00 | 0.00 | 0.00 | 0.00 | 37 500.00 | 37 500.00 | 0.00 |
| Short-Term Scientific Mission Grant | 22 300.00 | 0.00 | 11 500.00 | 11 500.00 | 0.00 | 11 500.00 | -10 800.00 |
| Virtual Mobility Grant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Inclusiveness Target Countries Conference Grant | 2 000.00 | 0.00 | 850.00 | 850.00 | 0.00 | 850.00 | -1 150.00 |
| Dissemination Conference Grant | 1 250.00 | 0.00 | 1 250.00 | 1 250.00 | 0.00 | 1 250.00 | 0.00 |
| Dissemination and Communication Products | 4 150.00 | 0.00 | 1 600.00 | 1 600.00 | 2 550.00 | 4 150.00 | 0.00 |
| Other Expenses Related to Scientific Activities (OERSA) | 1 400.00 | 0.00 | 0.00 | 0.00 | 1 400.00 | 1 400.00 | 0.00 |
| Virtual Networking Support Grant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Networking expenditure** | **133 440.12** | **0.00** | **26 540.12** | **26 540.12** | **94 950.00** | **121 490.12** | **-11 950.00** |
| | | | | | | | |
| Eligible Networking expenditure | 133 440.12 | 0.00 | 26 540.12 | 26 540.12 | 94 950.00 | 121 490.12 | -11 950.00 |
| FSAC 15% of Eligible Networking expenditure | 20 016.02 | 0.00 | 3 981.02 | 3 981.02 | 14 242.50 | 18 223.52 | -1 792.50 |
| **Eligible Costs** | **153 456.14** | **0.00** | **30 521.14** | **30 521.14** | **109 192.50** | **139 713.64** | **-13 742.50** |

# 2.f) Update from COST Association

# 3.a) Follow-up discussion on Action Management

- Need to replace WG1 co-leader Ilaria Brivio. She is chair of new COST Action CA22130 COMETHA (Comprhensive Multi-boson Experiment-Theory Action).
Congratulations to Ilaria for this great achievement !!

- Find a new ECI Council Coordinator

14 Leadership positions: 3 from ITC countries, 4 ECI, 5 F

Proposal: increase Leadership positions from ITC and/or F, e.g. co-leaders?

# 3.b) Implementation of COST Excellence and Inclusiveness Policy

## SUGGESTIONS OF THE SCIENTIFIC COMMITTEE

To comply with the COST Excellence and Inclusiveness Policy, in the implementation of the Action:

- the level of involvement of Inclusiveness Target Countries (ITCs) should be maintained and the plans described in the proposal for ensuring ITC involvement should be implemented;

We maintained the level of involvement of ITC countries

At the beginning 39 ITC participants (32 %). Now 72 ITC participants (29 % participants)

We give priority to participants from ITC countries for the participations in the Meetings and in the Training School

1 ITC Conference Grant Attributed

2/6 STSM attributed to ITC participants

Cosmic WISPers member Federico Urban and his team have just been awarded a Czech Inter-COST grant to work on spin-2 WISPs over the next two years. Massive spin-2 fields typically arise in certain extensions of General Relativity, such as bigravity or higher-dimensional gravity; some of these spin-2 fields can be viable dark matter candidates, and can have masses in the WISP range. The focus of the project will be to understand if and how current astrophysical/cosmological WISP production mechanisms and WISP laboratory detection techniques can be adapted for spin-2 WISPs, what new techniques could be used to search specifically for spin-2 WISPs, and how to distinguish them from their spin-0 and spin-1 counterparts. The team will include fellow Action members Alex Vikman, Iggy Sawicki, Sabir Ramazanov and the students Georg Trenkler and Pavel Kůs and is based out of CEICO, Prague.

## SUGGESTIONS OF THE SCIENTIFIC COMMITTEE

- the level of involvement of Early Career Investigators (ECIs) should be increased and a plan should be developed and implemented to ensure the full involvement of ECIs in all aspects of the Action's implementation (including in Action leadership positions);

We estabilished the ECI Council which is in charge of the Monthly Colloqium, the Journal Club, the monthly newsletter, the twitter account and the newsletter

4/8 Grants attributed to ECI

## SUGGESTIONS OF THE SCIENTIFIC COMMITTEE

the gender balance should be improved and a plan should be developed and implemented to ensure gender balance in all aspects of the Action's implementation (including in Action leadership positions).

We nominated a Gender Advisor

14 Leadership positions: 5 F. Possibility to improve.
Difficulty to find  available candidates.

# 3.c) Grant Awarding by the Action

# 3.d) Progress by each WG

# 3.e) Science Communication Plan

# 3.f) Progress on MoU objectives, WG tasks, deliverables and goals

# 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 comunity discussions to enable new experiments
- ✓ Stimulate transfer of knowledge among estabilished 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

## MoU objectives, Action deliverables and Grant Agreement Period Goals

### Action Objectives from MoU

| Aim/primary Objective |
| --- |
| 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 |
| **Secondary objectives** |
| 1. Provide a discussion forum for the European coordination of WISPs Physics and express collective view on the development of WISPs research.<br>2. Develop a Roadmap for WISPs Physics in Europe, a description of the status and perspectives of the field within Europe, linking them to activities in other parts of the world.<br>3. Coordinate and support in a synergic way WISPs searches carried on by the different WGs, in order to stimulate and consolidate collaborations.<br>4. Develop a common database on WISPs theoretical models, experimental and astrophysical bounds.<br>5. Coordinate the experimental searches in order to maximize the discovery potential of current and future experiments and optimize the detection strategies.<br>6. Compare WISPs theoretical models and assess performance of different experimental technique.<br>7. Provide input to Small and Medium Size Enterprises (SMEs) identifying progresses needed in key technologies for present and future experiments.<br>8. Disseminate the research results broadly to the scientific community, to the stakeholders and to the general public, attracting representative of SMEs and young students towards these subjects.<br>9. Provide cross community discussions to enable new experiments.<br>10. Promote the gender balance of the Action, favoring more women in leading positions.<br>11. Stimulate transfer of knowledge among established leading groups in the field and emerging excellent scientists in COST Inclusiveness Target Countries (ITC), as well as SMEs.<br>12. Involve new research groups from ITC countries into the Action.<br>13. Attract young talented researchers from all over the world towards the activities of the Action through training activities. |

## Grant Agreement Period

| Grant Agreement Period Start Date | 01/11/2022 | Grant Agreement Period End Date | 31/10/2023 |
|---|---|---|---|

## Grant Agreement Period Goals

| Number | Grant Agreement Period Goal | MoU Objective(s) it relates to |
|---|---|---|
| GAPG 1 | To draft a review on the state-of-the-art concerning: WISP models (WG1), cosmological (WG2), astrophysical (WG3) and experimental (WG 4) bounds | • Secondary objective 2<br>• Secondary objective 6 |
| GAPG 2 | To stimulate discussions in the WGs to investigate the priorities and goals, the possible synergies and collaborations | • Secondary objective 1<br>• Secondary objective 2<br>• Secondary objective 3<br>• Secondary objective 9<br>• Secondary objective 11 |
| GAPG 3 | To train Phd students and young post-docs in order to have a common interdisciplinary background across the WGs to work on the physics case | • Secondary objective 8<br>• Secondary objective 11<br>• Secondary objective 12<br>• Secondary objective 13 |
| GAPG 4 | To prepare a plan of Outreach Activities and of the Dissemination strategies. | • Secondary objective 7<br>• Secondary objective 8<br>• Secondary objective 12 |
| GAPG 5 | To start discussions on the technologies needed to develop next-generation WISP experiments | • Secondary objective 1<br>• Secondary objective 7<br>• Secondary objective 9<br>• Secondary objective 11<br>• Secondary objective 12 |
| GAPG 6 | To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action | • Secondary objective 10<br>• Secondary objective 11<br>• Secondary objective 12<br>• Secondary objective 13 |



Draft review will be published in the proceeding of General Meeting

Online and in presence WG meetings (typically on monthtly basis)

Training School in Lecce

Science Comm. Plan, online Colloqium and JC. Outreach talks in Frascati and Bari Meeting. Webpage. Newsletter, twitter

Technology Forum on magnets in Frascati meeting

Doubled ITC participants. ITC grants attributed

# 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 |

Draft report will be published in the Proceedings of the General Meeting in the Open Access Journal «Proceedings of Science»

# 4.a) Planning. Revision of W&B Plan

Use all unspent funds to cover as much as possible the travel  costs for the participation to the General Meeting and Training School, and slight increase of costs in proceedings and webpage.

# 4.b) Draft Plan of the 2 GP

# 4.c) Upcoming activities

# 5) Monitoring and reporting to the COST Association

6) AOB

# 7) Summary of MC decisions

# 8) Conclusions

# ANNEX 2

| CTRY * | Firstname | Lastname | Presence |
|---|---|---|---|
| IT | Alessandro | Mirizzi | in person |
| FR | Francesca | Calore | no |
| AT | Josef | Pradler | online |
| AT | Philipp | Haslinger | no |
| CY | Constantia | Alexandrou | no |
| CZ | Stepan | Kunc | in person |
| DE | Loredana | Gastaldo | in person |
| DE | Babette | Doebrich | no |
| ES | Igor | García Irastorza | online |
| ES | Olga | Mena | no |
| EE | Martti | Raidal | online |
| EE | María | Benito Castaño | in person |
| AL | Mimoza | Hafizi | in person |
| FR | Francesca | Calore | no |
| FR | Pierre | Pugnat | no |
| UK | Joseph | Conlon | in person |
| UK | Clare | Burrage | online |
| HU | Attila | Krasznahorkay | in person |
| HR | Marin | Karuza | in person |
| IT | Maria Paola | Lombardo | in person |
| IT | Claudio | Gatti | no |
| IL | Marco | Gorghetto | online |
| IL | Edoardo | VITAGLIANO | in person |
| MT | Kristian | Zarb Adami | no |
| NO | Michael | Kachelriess | in person |
| NL | Christoph | Weniger | online |
| PT | Michele | Gallinaro | in person |
| RO | Sabin | Stoica | no |
| RO | Iuliu-Calin | Lazaroiu | no |
| SE | David | Marsh | online |
| SI | Miha | Nemevšek | in person |
| SI | Jernej | Fesel Kamenik | delegate Lorenzo Ubaldi in person |
| TR | Serkant | Cetin | no |

| | | | |
|---|---|---|---|
| TR | Salim | CERCI | in person |
| BG | Venelin | Kozhuharov | in person |
| CH | Nicholas | Rodd | no |
| RS | Zoran | Grujić | in person |
| DK | Manuel | Meyer | online |

| | | |
|---|---|---|
| Deniz Sunar | Cerci | online |
| Straniero | Oscar | online |
| Stuebner | Ralph | online |

| Nome (nome originale) | Email dell'utente | Ora di entrata | Ora di uscita | Durata (minuti) | Guest | In sala d'attesa |
|---|---|---|---|---|---|---|
| **Alessandro Mirizzi** | alessandro.mirizzi@gmail.com | 09/08/2023 05:42:54 AM | 09/08/2023 10:30:16 AM | 288 | No | No |
| **Igor Garcia Irastorza** | | 09/08/2023 05:42:56 AM | 09/08/2023 08:47:05 AM | 185 | Sì | No |
| **Clare Burrage** | | 09/08/2023 05:42:59 AM | 09/08/2023 08:46:09 AM | 184 | Sì | No |
| **Manuel Meyer** | | 09/08/2023 05:43:00 AM | 09/08/2023 06:53:33 AM | 71 | Sì | No |
| **Ilaria Brivio** | | 09/08/2023 05:43:04 AM | 09/08/2023 07:27:09 AM | 105 | Sì | No |
| **Oscar Straniero** | | 09/08/2023 05:43:05 AM | 09/08/2023 08:46:42 AM | 184 | Sì | No |
| **COST Ralph Stuebner (rstuebner)** | | 09/08/2023 05:43:09 AM | 09/08/2023 08:19:26 AM | 157 | Sì | No |
| **Babette Döbrich (bdobrich)** | | 09/08/2023 05:43:11 AM | 09/08/2023 06:02:48 AM | 20 | Sì | No |
| **Josef Pradler** | | 09/08/2023 05:43:20 AM | 09/08/2023 05:55:06 AM | 12 | Sì | No |
| **TR-Deniz Sunar Cerci (Deniz Sunar Cerci)** | | 09/08/2023 05:43:23 AM | 09/08/2023 09:32:53 AM | 230 | Sì | No |
| **TR Salim Cerci (Salim Cerci)** | | 09/08/2023 05:43:39 AM | 09/08/2023 08:46:13 AM | 183 | Sì | No |
| **Martti Raidal** | | 09/08/2023 05:44:30 AM | 09/08/2023 06:14:50 AM | 31 | Sì | No |
| **David Marsh - Sweden (David Marsh)** | | 09/08/2023 05:46:44 AM | 09/08/2023 06:09:13 AM | 23 | Sì | No |
| **Christoph Weniger (Christoph W)** | | 09/08/2023 05:47:02 AM | 09/08/2023 07:29:28 AM | 103 | Sì | No |
| **Serkant Ali Çetin** | | 09/08/2023 05:47:10 AM | 09/08/2023 05:47:28 AM | 1 | Sì | No |
| **Loredana Gastaldo** | | 09/08/2023 05:47:15 AM | 09/08/2023 10:30:11 AM | 283 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 05:49:28 AM | 09/08/2023 05:49:57 AM | 1 | Sì | No |
| **Josef Pradler** | | 09/08/2023 05:55:24 AM | 09/08/2023 07:09:32 AM | 75 | Sì | No |
| **Natasa Trisovic** | | 09/08/2023 06:01:59 AM | 09/08/2023 07:39:22 AM | 98 | Sì | No |
| **David Marsh - Sweden** | | 09/08/2023 06:09:27 AM | 09/08/2023 06:11:19 AM | 2 | Sì | No |
| **Marco Gorghetto** | | 09/08/2023 06:15:27 AM | 09/08/2023 06:30:45 AM | 16 | Sì | No |
| **David Marsh** | | 09/08/2023 06:18:43 AM | 09/08/2023 06:21:20 AM | 3 | Sì | No |
| **David Marsh** | | 09/08/2023 06:21:20 AM | 09/08/2023 06:27:27 AM | 7 | Sì | No |
| **Marco Gorgheggi** | | 09/08/2023 06:34:09 AM | 09/08/2023 06:35:19 AM | 2 | Sì | No |
| **46855378597** | | 09/08/2023 06:35:23 AM | 09/08/2023 06:43:50 AM | 9 | Sì | No |
| **Marco Gorghetto** | | 09/08/2023 06:35:34 AM | 09/08/2023 07:18:30 AM | 43 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 06:44:51 AM | 09/08/2023 06:45:43 AM | 1 | Sì | No |

| | | | | | | |
|---|---|---|---|---|---|---|
| **46855378597** | | 09/08/2023 06:46:12 AM | 09/08/2023 06:49:58 AM | 4 | Sì | No |
| **46855378597** | | 09/08/2023 06:54:04 AM | 09/08/2023 06:54:44 AM | 1 | Sì | No |
| **Serkant Ali Çetin** | | 09/08/2023 06:55:26 AM | 09/08/2023 10:06:12 AM | 191 | Sì | No |
| **David Marsh** | | 09/08/2023 06:56:22 AM | 09/08/2023 07:26:55 AM | 31 | Sì | No |
| **marco.gorghetto@weizmann.ac.il** | | 09/08/2023 07:18:08 AM | 09/08/2023 07:49:26 AM | 32 | Sì | No |
| **David Marsh** | | 09/08/2023 07:26:42 AM | 09/08/2023 07:28:48 AM | 3 | Sì | No |
| **Ilaria Brivio** | | 09/08/2023 07:33:27 AM | 09/08/2023 08:31:13 AM | 58 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 07:39:46 AM | 09/08/2023 07:40:05 AM | 1 | Sì | No |
| **Josef Pradler** | | 09/08/2023 07:39:51 AM | 09/08/2023 09:32:26 AM | 113 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 07:46:01 AM | 09/08/2023 07:47:14 AM | 2 | Sì | No |
| **Marco Gorghetto** | | 09/08/2023 07:48:32 AM | 09/08/2023 09:06:27 AM | 78 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 08:03:56 AM | 09/08/2023 08:16:51 AM | 13 | Sì | No |
| **COST Ralph Stuebner** | | 09/08/2023 08:19:32 AM | 09/08/2023 08:46:12 AM | 27 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 08:24:43 AM | 09/08/2023 09:07:29 AM | 43 | Sì | No |
| **TR Salim Cerci (Salim Cerci)** | | 09/08/2023 08:47:19 AM | 09/08/2023 09:35:37 AM | 49 | Sì | No |
| **marco.gorghetto@weizmann.ac.il** | | 09/08/2023 09:06:27 AM | 09/08/2023 09:51:19 AM | 45 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 09:35:27 AM | 09/08/2023 09:52:47 AM | 18 | Sì | No |
| **David Marsh** | | 09/08/2023 06:27:34 AM | 09/08/2023 06:28:56 AM | 2 | Sì | No |
| **David Marsh** | | 09/08/2023 07:29:46 AM | 09/08/2023 10:03:30 AM | 154 | Sì | No |

# ANNEX 3

# Work And Budget Plan

**CA21106 Grant Agreement Period 2**
01/11/2023 to 31/10/2024

## Action Profile

### Action General Information

| | | | |
|---|---|---|---|
| Action Code | CA21106 | MC Chair | Prof Alessandro Mirizzi |
| Action Title | CA21106 - COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments | | |
| MOU | 020/22 | Draft MOU | OC-2021-1-25120 |
| CSO Approval Date | 2022-05-27 | | |
| Action Start Date | 03/10/2022 | Action End Date | 02/10/2026 |
| Science Officer | Dr Ralph Stuebner | Administrative Officer | Ms Rose Cruz Santos |

### Participation in the Action:

| Number of | COST Full or Cooperating Members | | COST Partner Members | Specific Organisations | Near Neighbour Countries | Third States | Total |
|---|---|---|---|---|---|---|---|
| **Countries** | | | | | | | |
| COST Members / Specific Organisations represented in the MC | 25 | | 0 | 0 | n.a. | n.a. | 25 |
| | ITC | 52% | | | | | |
| | Non-ITC | 48% | | | | | |
| Countries represented in the Working Groups | 30 | | 0 | 0 | 1 | 9 | 40 |
| | ITC | 53% | | | | | |
| | Non-ITC | 47% | | | | | |
| **Individuals** | | | | | | | |
| Nominated MC Members / MC Observers | 38 | | 0 | 0 | n.a. | n.a. | 38 |
| | ITC | 47% | | | | | |
| | Non-ITC | 53% | | | | | |
| Approved Working Group members | 229 | | 0 | 0 | 2 | 20 | 251 |
| | ITC | 29% | | | | | |
| | Non-ITC | 71% | | | | | |



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## Working Groups

| | WG Title | WG Leader | Number of WG members |
|---|---|---|---|
| WG1 | WG1: WISPs Model Building | Prof Michele Cicoli | 69 |
| WG2 | WG 2: WISPs Dark Matter and Cosmology | Dr Edoardo VITAGLIANO | 148 |
| WG3 | WG 3: WISPs in Astrophysics. | Dr Andrea Caputo | 94 |
| WG4 | WG4: Direct WISPs searches. | Dr Claudio Gatti | 88 |
| WG5 | WG 5: Dissemination and Outreach | Dr Olga Mena | 63 |

## MoU objectives, Action deliverables and Grant Agreement Period Goals

### Action Objectives from MoU

| Aim/primary Objective |
| --- |
| 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 |
| **Secondary objectives** |
| 1. Provide a discussion forum for the European coordination of WISPs Physics and express collective view on the development of WISPs research.<br>2. Develop a Roadmap for WISPs Physics in Europe, a description of the status and perspectives of the field within Europe, linking them to activities in other parts of the world.<br>3. Coordinate and support in a synergic way WISPs searches carried on by the different WGs, in order to stimulate and consolidate collaborations.<br>4. Develop a common database on WISPs theoretical models, experimental and astrophysical bounds.<br>5. Coordinate the experimental searches in order to maximize the discovery potential of current and future experiments and optimize the detection strategies.<br>6. Compare WISPs theoretical models and assess performance of different experimental technique.<br>7. Provide input to Small and Medium Size Enterprises (SMEs) identifying progresses needed in key technologies for present and future experiments.<br>8. Disseminate the research results broadly to the scientific community, to the stakeholders and to the general public, attracting representative of SMEs and young students towards these subjects.<br>9. Provide cross community discussions to enable new experiments.<br>10. Promote the gender balance of the Action, favoring more women in leading positions.<br>11. Stimulate transfer of knowledge among established leading groups in the field and emerging excellent scientists in COST Inclusiveness Target Countries (ITC), as well as SMEs.<br>12. Involve new research groups from ITC countries into the Action.<br>13. Attract young talented researchers from all over the world towards the activities of the Action through training activities. |

## Action Deliverables

| Deliverable | Month |
|---|---|
| 1. Action webpage, twitter account and repositories concerning the activities of the network | 6 |
| 2. Set the Dissemination, Outreach and Communication plans related to the Action activities | 6 |
| 3. Draft report on theory and phenomenology on axion and WISP properties in Beyond the Standard Model frameworks | 12 |
| 4. Draft report on axion and WISP in cosmology as dark matter candidates | 12 |
| 5. Draft report on bounds and signatures of axions and WISPs in astrophysics | 12 |
| 6. Draft report on axions and WISPs direct detection with different experimental techniques | 12 |
| 7. Interim report on theory and phenomenology on axion and WISP properties in Beyond the Standard Model frameworks | 24 |
| 8. Interim report on axion and WISP in cosmology as dark matter candidates | 24 |
| 9. Interim report on bounds and signatures of axions and WISPs in astrophysics | 24 |
| 10. Interim report on axions and WISPs direct detection with different experimental techniques | 24 |
| 11. Public code to simulate axion effects on Large Scale Structures in the Universe | 40 |
| 12. Report on Technologies Forums on technological challenges to detect axions and WISPs | 40 |
| 13. Final report on theory and phenomenology on axion and WISP properties in Beyond the Standard Model frameworks | 48 |
| 14. Final report on axion and WISP in cosmology as dark matter candidates | 48 |
| 15. Final report on bounds and signatures of axions and WISPs in astrophysics | 48 |
| 16. Final report on axions and WISPs direct detection with different experimental techniques | 48 |
| 17. Lecture notes of the training Schools organized by the Action on topics relevant for axions and WISPs | 48 |
| 18. Final White Paper on the Physics case for axions and WISPs based on the results of the Action | 48 |

## Grant Agreement Period

| | | | |
|---|---|---|---|
| Grant Agreement Period Start Date | 01/11/2023 | Grant Agreement Period End Date | 31/10/2024 |

## Grant Agreement Period Goals

| Number | Grant Agreement Period Goal | MoU Objective(s) it relates to |
|---|---|---|
| GAPG 1 | To continue and update the review on the state-of-the-art concerning: WISP models (WG1), cosmological (WG2), astrophysical (WG3) and experimental (WG 4) bounds | • Secondary objective 2<br>• Secondary objective 6 |
| GAPG 2 | To continue discussions in the WGs to agree on motivated benchmark theoretical models, on their current indirect (astro and cosmo) and direct constraints and on future discovery potential | • Secondary objective 1<br>• Secondary objective 2<br>• Secondary objective 3<br>• Secondary objective 4<br>• Secondary objective 9<br>• Secondary objective 11 |
| GAPG 3 | To train Phd students and young post-docs on both general interdisciplinary topics across the WGs and on specific topics of each WG | • Secondary objective 8<br>• Secondary objective 11<br>• Secondary objective 12<br>• Secondary objective 13 |
| GAPG 4 | To carry on and update the plan of Outreach Activities and of the Dissemination strategies | • Secondary objective 7<br>• Secondary objective 8<br>• Secondary objective 12 |
| GAPG 5 | To continue discussions on the technologies needed to develop next-generation WISP experiments, directly involving representatives of the SMEs | • Secondary objective 1<br>• Secondary objective 7<br>• Secondary objective 9<br>• Secondary objective 11<br>• Secondary objective 12 |
| GAPG 6 | To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action | • Secondary objective 10<br>• Secondary objective 11<br>• Secondary objective 12<br>• Secondary objective 13 |
| GAPG 7 | To start a review on the status and future plans of international laboratories to carry on WISPs searches, to develop possibile synergies and collaborations | • Secondary objective 1<br>• Secondary objective 2<br>• Secondary objective 5<br>• Secondary objective 9 |

# Work and Budget Plan for the Grant Agreement Period

## Work and Budget Plan Summary

| A. COST Networking Tools | EUR |
|---|---|
| (1) Meetings | 97,650.00 |
| (2) Training Schools | 30,000.00 |
| (3) Mobility of Researchers and Innovators | 13,000.00 |
| (4) Presentation at Conferences organised by Third Parties | 3,000.00 |
| (5) Dissemination and Communication Products | 2,800.00 |
| (6) Other Expenses Related to Scientific Activities (OERSA) | 900.00 |
| **B. Total Science Expenditure (sum of (1) to (6))** | 147,350.00 |
| **C. Financial and Scientific Administration and Coordination (FSAC) (max. of 15% of B)** | 22,102.50 |
| **Total Grant (B+C)** | 169,452.50 |

**Meetings**

Overview

| Meeting Title | Meeting Type | Dates | Location | ITC | Total Cost (EUR) |
|---|---|---|---|---|---|
| Working group Meeting of CA21106 COSMIC WISPers | Working Group Meeting | 14/02/2024 - 15/02/2024 | bari (Italy) | No | 26,650.00 |
| 2st General Meeting of CA21106 | Management Committee Meeting, Workshops/Conferences | 03/09/2024 - 06/09/2024 | BARI (Italy) | No | 71,000.00 |
| | | | | Total | 97,650.00 |

Details

| | | | |
|---|---|---|---|
| Title of the Meeting | Working group Meeting of CA21106 COSMIC WISPers | | |
| Meeting Type(s) | Working Group Meeting | | |
| Grant Period Goal(s) it will address | To continue and update the review on the state-of-the-art concerning: WISP models (WG1), cosmological (WG2), astrophysical (WG3) and experimental (WG 4) bounds,To continue discussions in the WGs to agree on motivated benchmark theoretical models, on their current indirect (astro and cosmo) and direct constraints and on future discovery potential,To carry on and update the plan of Outreach Activities and of the Dissemination strategies,To continue discussions on the technologies needed to develop next-generation WISP experiments, directly involving representatives of the SMEs,To start a review on the status and future plans of international laboratories to carry on WISPs searches, to develop possibile synergies and collaborations | | |
| Description | The Working Group Meeting will structure the WG activities of the GP. The plan of the meeting is the following: 1st day-morning. Plenary session with Introduction + talks by WG leaders and key talks to define the state-of-the-art of the different WG (4+4 talks). 1st day-afternoon: Parallel WG sessions (4 talks in each Session). 2 day morning: 4 talks from different international laboratories to present current and future plans for WISP searches. Common Round table to plan directions of investigations and possible collaborations among WGs. 2nd day afternoon: Technology forum (4 speakers). All the speakers will receive reimbursement for travel and accommodation. In order to guarantee a broad participation of COST members, this meeting is planned in hybrid version | | |
| Output(s) | Definition of the working plan for the 2st GP of the different WGs. Start the interim report of different WGs. Discuss and update of the Communication and Dissemination Plan. Slides will be available on the Action webpage. | | |
| Location | bari (Italy) | ITC | No |
| Start Date | 2024-02-14 09:00:00 | End Date | 2024-02-15 18:00:00 |
| Duration | 2 days | Attendance Type | Hybrid |
| Total number of expected participants | 65 | Number of participants expected to be reimbursed from COST funds | 43 |
| Daily allowance (EUR) | 100.00 | Average number of daily allowances per participant | 3 |
| Average Long-Distance Costs (EUR) | 250.00 | | |
| Average reimbursement (per participant) (EUR) | 550.00 | | |

| | | | |
|---|---|---|---|
| Total Travel, Accommodation and Subsistence Costs (EUR) | 23,650.00 | | |
| Total unique participants to be accounted for LOS grant | 30 | Local Organiser Support (EUR) | 3,000.00 |
| Total cost of the meeting (EUR) | 26,650.00 | | |

| | | | |
|---|---|---|---|
| Title of the Meeting | 2st General Meeting of CA21106 | | |
| Meeting Type(s) | Management Committee Meeting,Workshops/Conferences | | |
| Grant Period Goal(s) it will address | To continue and update the review on the state-of-the-art concerning: WISP models (WG1), cosmological (WG2), astrophysical (WG3) and experimental (WG 4) bounds,To continue discussions in the WGs to agree on motivated benchmark theoretical models, on their current indirect (astro and cosmo) and direct constraints and on future discovery potential,To carry on and update the plan of Outreach Activities and of the Dissemination strategies,To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action,To start a review on the status and future plans of international laboratories to carry on WISPs searches, to develop possibile synergies and collaborations | | |
| Description | The 2st General Meeting of the CA21106 is provided to combine the Management Committee Meeting with a workshop to discuss the developments in the activities of the different WGs. It will be a 4-days event with the following structure: 1-2-3-4 day morning: Review talks from WG1,2,3,4 1-2-3 day afternoon: Parallel sessions of the different WGs 4 day afternoon: Management Committee It will be also devoted time to round tables. An outreach talk will be organized. One representative of the MC from each country will be financially supported. The MC meeting will be in hybrid form in order to allow a larger participation of members. Leaders of mandatory positions will be also supported. | | |
| Output(s) | Slides of the talks will be available on the Action webpage. Proceedings with all contributions will be published on open-access journal | | |
| Location | BARI (Italy) | ITC | No |
| Start Date | 2024-09-03 09:00:00 | End Date | 2024-09-06 19:00:00 |
| Duration | 4 days | Attendance Type | Hybrid |
| Total number of expected participants | 80 | Number of participants expected to be reimbursed from COST funds | 50 |
| Daily allowance (EUR) | 200.00 | Average number of daily allowances per participant | 5 |
| Average Long-Distance Costs (EUR) | 250.00 | | |
| Average reimbursement (per participant) (EUR) | 1,250.00 | | |
| Total Travel, Accommodation and Subsistence Costs (EUR) | 62,500.00 | | |
| Total unique participants to be accounted for LOS grant | 55 | Local Organiser Support (EUR) | 8,500.00 |
| Total cost of the meeting (EUR) | 71,000.00 | | |

**Training Schools**

Overview

| Title of the Training School | Dates | Location | ITC | Total Cost (EUR) |
|---|---|---|---|---|
| 2nd CA21106 COSMIC WISPers Training School | 10/06/2024 - 13/06/2024 | Lecce (Italy) | No | 30,000.00 |
| | | | Total | 30,000.00 |

Details

| | | | |
|---|---|---|---|
| Title of the Training School | 2nd CA21106 COSMIC WISPers Training School | | |
| Grant Period Goal(s) it will address | To train Phd students and young post-docs on both general interdisciplinary topics across the WGs and on specific topics of each WG,To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action | | |
| Description | The Training School will highlight to young researchers but also to others interested in the topic, the challenges of WISPs physics and will discuss the latest developments in the field. The theoretical background, observational motivation, and experimental avenues to observe WISPs signatures in the laboratory will be covered. Lectures will be complemented with exercise sessions and students sessions in which they will present the results of their research. Financial support will be provided to PhD students, with priority to improve gender balance and for students from ITC countries. Lecturers will also be reimbursed. Established researchers with own travel funds can join the Training School without reimbursement by the Action. The daily allowance will be fixed in relation to the typical local costs. | | |
| Output(s) | Slides of the lectures will be available on the Action website. Lectures notes will be published on electronic version. | | |
| Location | Lecce (Italy) | ITC | No |
| Start Date | 2024-06-10 09:00:00 | End Date | 2024-06-13 18:00:00 |
| Duration | 4 days | Attendance Type | Face to face |
| Participant information | | Trainers | Trainees |
| • Daily allowance (EUR) | | 150.00 | 100.00 |
| • Average number of daily allowances per participant | | 5 | 5 |
| • Average Long-Distance Costs (EUR) | | 250.00 | |
| • Average reimbursement (EUR) | | 1,000.00 | 750.00 |
| • Total number of expected trainers/trainees | | 9 | 30 |
| • Trainers/trainees expected to be reimbursed from COST funds | | 9 | 20 |
| Total Travel, Accommodation and Subsistence Costs (EUR) | 24,000.00 | | |
| Total unique participants to be accounted for LOS grant | 30 | | |
| Local Organiser Support (EUR) | 6,000.00 | | |
| Total cost of the Training School (EUR) | 30,000.00 | | |

**Mobility of Researchers and Innovators**

| | | |
|---|---|---|
| Grant Period Goal(s) it will address: | To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action | |
| Description: | The mobility of Researchers and Innovators will be awarded via a call | |
| Budget (EUR) | Short Term Scientific Missions (STSM) grants | 13,000.00 |
| | This budget would allow for approx. 7 STSM grants (based on the average costs per STSM grant spent by all Actions). | |
| | Virtual Mobility grants | 0.00 |
| | This budget would allow for approx. 0 Virtual Mobility grants (based on the average costs per VM grant spent by all Actions). | |
| | Total | 13,000.00 |

**Presentations at Conferences organised by Third Parties**

| | | |
|---|---|---|
| Description: | Those grants are aimed to even further publicise the work of the Action and of individuals participating in the Action. Targeted conferences are the “Patras workshop”, a renowned conference on WISP physics, and the TAUP (Topics in Astroparticle and Underground Physics) Conference, a highly-attended general conference discussing WISPs physics. | |
| Budget (EUR) | ITC Conference grants | 2,000.00 |
| | This budget would allow for approx. 2 ITC Conference grants (based on the average costs per ITC Conference grant spent by all Actions). | |
| | Dissemination Conference grants | 1,000.00 |
| | This budget would allow for approx. 1 Dissemination Conference grants (based on the average costs per DC grant spent by all Actions). | |
| | Total | 3,000.00 |

## Dissemination and Communication Products

Overview

| Dissemination and Communication Product | Title | Total Cost (EUR) |
|---|---|---|
| Scientific publication in Open Access | Proceedings of the General Meeting and of Training School | 2,200.00 |
| Action Website | Action website | 600.00 |
| | Total (without VAT) | 2,800.00 |

Details

| | |
|---|---|
| Dissemination and Communication Product: | Scientific publication in Open Access |
| Title: | Proceedings of the General Meeting and of Training School |
| Description: | The talks of the 1st General Meetings and the Lectures of the Training School will be published in OPEN ACCESS journal. This will help to disseminate the Action results to a larger audience. Action participants will be involved as coauthors, editors and will be in charge of the peer-review. |
| Total (EUR): (without VAT) | 2,200.00 |

| | |
|---|---|
| Dissemination and Communication Product: | Action Website |
| Title: | Action website |
| Description: | Action website maintaining |
| Total (EUR): (without VAT) | 600.00 |

**Other Expenses Related to Scientific Activities (OERSA)**

Overview

| Item | Total Cost (EUR) |
|---|---|
| Bank charges | 900.00 |
| Total | 900.00 |

Details

| Type: | Bank charges |
|---|---|
| Total (EUR): (without VAT) | 900.00 |

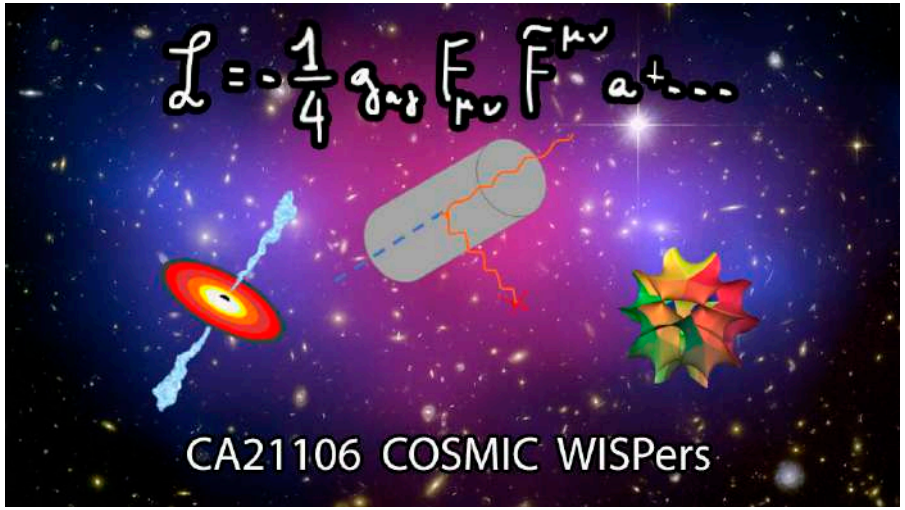
2nd CA21106 Management Committee Meeting, Bari, 8 September 2023

# COST ACTION CA21106

## COSMIC WISPers in the Dark Universe:

## Theory, astrophysics and experiments

Alessandro Mirizzi
(Bari Univ. & INFN, Italy)




Funded by the European Union

**COST Action CA21106: "COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments"**
**Management Committee Meeting**
**Draft Agenda**
**From 05/09/2023 at 09:00:00 to 08/09/2023 at 18:00:00**
**Hybrid, Bari, Italy**
**Centro Polifunzionale Studenti (ex Palazzo delle Poste e Telegrafi), Bari, Italy**

1. Welcome to participants, verification of the quorum and adoption of agenda
2. Information to the MC
   a) Recap of the minutes of the last meeting, e-votes and matters arising since the last meeting
   b) Core Croup: report from the Core Group, including delegated decisions
   c) Action Membership: New Specific Organisations and COST Members represented in the MC
   d) Action Participation: WG membership and applications, New MC members/Observers and provisional substitution.
   e) Budget status: summary from the Grant Holder.
   f) Update from the COST Association (if representative is present)
3. Follow up and discussion on the
   a) Action management: structure, leadership positions and other supporting roles. Mandates to the Core Group (if applicable)
   b) Implementation of the COST Excellence and Inclusiveness Policy
   c) Grant Awarding by the Action
   d) Progress of each working group
   e) Science Communication Plan
   f) Progress on MoU Objectives, WG tasks, deliverables, and Goals for the current GP.
4. Planning
   a) Revision of Work and Budget Plan of the current GP (if applicable)
   b) Draft plans for the following GP(s).
   c) Upcoming activities
5. Monitoring and Reporting to the COST Association
6. AOB
7. Summary of MC decisions
8. Closing

# 1. WELCOME TO PARTICIPANTS, VERIFICATION OF THE QUORUM AND ADOPTION OF AGENDA

QUORUM

•At Action MC meetings if a quorum of 2/3 of COST Full and Cooperating Members is present (including virtually) or represented

25 COST Full or Cooperating Members . 2/3 → 17 Countries

# 2. a) Recap of minutes of 1 st MC Meeting 03/10/2022 and e-votes

## 5) Decisions by the Management Committee

### a. Election of the Chair and Vice-chair and selection of the Grant Holder (Scientific Representative)

Prof Alessandro Mirizzi (Italy) was elected Chair.
Dr Francesca Calore (France) was elected Vice Chair.
The MC selected Universita' degli Studi di Bari (Italy) as Grant Holder Institution, represented at the MC by Prof Alessandro Mirizzi.

### b. Agreement on the Action Structure

The MC decided that the Action structure shall be as followed:

- WG1 – WISPs Model Building
- WG2 – WISPs Dark Matter and Cosmology
- WG3 – WISPs in Astrophysics
- WG4 – Direct WISPs searches
- WG5 – Dissemination and Outreach

Further to the mandatory leadership position the Action agreed on the following leadership positions or committees:

- Equity and Inclusiveness Advisor → Deniz Sunar Cerci (TR)
- Young Researchers and Innovators Representative → Pierluca Carenza (SW)
- Grant Evaluation Committee → Venelin Kozhuharov (BL)
- Working Group leaders will be supported by co-leads.

## c. Election of other mandatory leadership positions

The following participants were elected for mandatory leadership positions:

| Position | Name | Country | YRI | Gender |
|---|---|---|---|---|
| Grant Awarding Coordinator | Venelin Kozhuharov | BG | N | M |
| Science Communication Coordinator | Olga Mena | ES | N | F |
| WG1 Lead | Michele Cicoli | IT | N | M |
| | Ilaria Brivio | DE | Y | F |
| WG2 Lead | Nick Rodd | CH | Y | M |
| | Javier Redondo | ES | N | M |
| WG3 Lead | Inma Dominguez | ES | N | F |
| | Andrea Caputo | IL | Y | M |
| WG4 Lead | Claudio Gatti | IT | N | M |
| | Marin Karuza | HR | N | M |

Edoardo Vitagliano (IL, Y, M)

Oscar Straniero (IT, N, M)

| | | | | |
|---|---|---|---|---|
| WG5 Lead | Olga Mena | ES | N | F |
| | Loredana Gastaldo | DE | N | F |

Science Communication Leader

# 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)

## d. Core Group and mandates

A Core Group was established. It is constituted by Chair, Vice-Chair, WG Leaders, Grant Holder Scientific Representative, Science Communication Coordinator, Grant Awardarding Coordinator, Young Researchers Council Represresentative, Gender Advisor. The Management Committee gives a mandate to the Core Group to relocate budget up to EUR 7500, which was not used for already implemented activities, to any other upcoming activity foreseen in the Grant Period or to any new activity deemed in line with the Goals of the current Grant Agreement Period. The MC also gives mandate to the Core Group for the acceptance of WG membership.

The MC gives mandate for the Grant Holder: "Upon receipt of the official e-COST invitation to an Action activity the recipient shall respond within two weeks, either accepting or declining their participation. The GH is mandated upon Core Group approval to withdraw the entitlement for reimbursement of an invitee, when they do not have accepted the invitation via the e-COST platform within this deadline, even when they later participate in the respective activity. This applies also to invitees being Management Committee Members or their substitutes. The invitee shall be duly informed about the withdrawal.»

## e. Discussion on Work and Budget Plan

During the first Grant Period it was planned to carry on the following activities:

- ✓ Development of the webpage of the Action
- ✓ Present a Science Communication plan withing 6 months
- ✓ Organize online Monthly Webinars about the physics case of the Action
- ✓ Organize WG Online Meetings.
- ✓ Organize a Hybrid Kick-off Meeting (2 days) to plan WG activities (National INFN Laboratory, Frascati, IT, Febr. 2023)
- ✓ Organize a General Conference (Bari, IT, Sept. 2023, 4-5 days)
- ✓ Organize a Training School 4-5 days (Lecce, IT, Sept. 2023, 4-5 days)
- ✓ Support STSM

The tentative proposed budget plan is the following:

- Meetings. Hybrid Kick-off meeting Frascati (10.5 kE), General Conference+MC Bari: 37.5 kE (37.5 kE)
- Training School. Lecce (20 kE)
- Mobility of researchers and innovators (28 kE)
- Presentations at Conferences organized by Third Parties (3 kE)
- Dissemination and Communication products. Webpage, brochure, poster, online proceedings (5 kE)
- Other expenses Related to Scientific Activities. E.g. zoom licences (2 kE)
- **Total Science Expediture:** 106.25 kE
- Financial and Scientific Administration (max 15 % of B): 18.75 kE

- Total budget: 125 kE → 153,582.50 EUR

# MC Decisions

Please carefully read the e-Vote Guide before using this tool

Filter by status:

Select one or more status

| Title / Initiator | Type | Status | Result | Dates | | |
|---|---|---|---|---|---|---|
| Search a vote ... | | | | | | Export |
| **Budget reallocation**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 16/07/2023<br>23/07/2023 | View vote | Options |
| **Leadership position WG2**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 11/05/2023<br>18/05/2023 | View vote | Options |
| **Guiding principles for the procedure and application for grants and schools**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 19/04/2023<br>26/04/2023 | View vote | Options |
| **Science Communication Plan**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 13/03/2023<br>20/03/2023 | View vote | Options |
| **Rules for Applications to ITC Conference, STSMs, Dissemination Conferences GRANTS**<br>Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | Approved | 10/03/2023<br>17/03/2023 | View vote | Options |
| **Leadership positions in WG3**<br>Alessandro Mirizzi | MC-Voting | Closed | Approved | 05/01/2023<br>13/01/2023 | View vote | Options |
| **Rules for Approvals of WG Applications**<br>Alessandro Mirizzi | MC-Voting | Closed | Approved | 24/10/2022<br>31/10/2022 | View vote | Options |

Showing 7 total votes

# 2. b) Core Group

Meeting on monthly basis. Strong input in organizing all events (workshop, training schools), setting rules for participations to WGs and for STSMs and in budget re-modulation

# 2. c) Action Memberships

Beginning of Action

**Participation in the Action:**

| Number of | COST Full or Cooperating Members | | COST Partner Members | Specific Organisations | Near Neighbour Countries | Third States | Total |
|---|---|---|---|---|---|---|---|
| **Countries** | | | | | | | |
| COST Members / Specific Organisations represented in the MC | 25 | | 0 | 0 | n.a. | n.a. | 25 |
| | ITC | 56% | | | | | |
| | Non-ITC | 44% | | | | | |
| Countries represented in the Working Groups | 26 | | 0 | 0 | 0 | 7 | 33 |
| | ITC | 50% | | | | | |
| | Non-ITC | 50% | | | | | |
| **Individuals** | | | | | | | |
| Nominated MC Members / MC Observers | 35 | | 0 | 0 | n.a. | n.a. | 35 |
| | ITC | 51% | | | | | |
| | Non-ITC | 49% | | | | | |
| Approved Working Group members | 109 | | 0 | 0 | 0 | 13 | 122 |
| | ITC | 32% | | | | | |
| | Non-ITC | 68% | | | | | |

Sept. 2023

## Action Profile

### Action General Information

| | | | |
|---|---|---|---|
| Action Code | CA21106 | MC Chair | Prof Alessandro Mirizzi |
| Action Title | CA21106 - COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments | | |
| MOU | 020/22 | Draft MOU | OC-2021-1-25120 |
| CSO Approval Date | 2022-05-27 | | |
| Action Start Date | 03/10/2022 | Action End Date | 02/10/2026 |
| Science Officer | Dr Ralph Stuebner | Administrative Officer | Ms Rose Cruz Santos |

**Participation in the Action:**

| Number of | COST Full or Cooperating Members | | COST Partner Members | Specific Organisations | Near Neighbour Countries | Third States | Total |
|---|---|---|---|---|---|---|---|
| **Countries** | | | | | | | |
| COST Members / Specific Organisations represented in the MC | 25 | | 0 | 0 | n.a. | n.a. | 25 |
| | ITC | 52% | | | | | |
| | Non-ITC | 48% | | | | | |
| Countries represented in the Working Groups | 30 | | 0 | 0 | 1 | 9 | 40 |
| | ITC | 53% | | | | | |
| | Non-ITC | 47% | | | | | |
| **Individuals** | | | | | | | |
| Nominated MC Members / MC Observers | 38 | | 0 | 0 | n.a. | n.a. | 38 |
| | ITC | 47% | | | | | |
| | Non-ITC | 53% | | | | | |
| Approved Working Group members | 229 | | 0 | 0 | 2 | 20 | 251 |
| | ITC | 29% | | | | | |
| | Non-ITC | 71% | | | | | |

# 2.d) Action WG Participations

Beginning of Action

**Working Groups**

| | WG Title | WG Leader | Number of WG members |
|---|---|---|---|
| WG1 | WG1: WISPs Model Building | Prof Michele Cicoli | 37 |
| WG2 | WG 2: WISPs Dark Matter and Cosmology | Prof Nicholas Rodd | 74 |
| WG3 | WG 3: WISPs in Astrophysics. | Prof María Inmaculada Domínguez Aguilera | 58 |
| WG4 | WG4: Direct WISPs searches. | Dr Claudio Gatti | 49 |
| WG5 | WG 5: Dissemination and Outreach | Dr Olga Mena | 38 |

Sept. 2023

**Working Groups**

| | WG Title | WG Leader | Number of WG members |
|---|---|---|---|
| WG1 | WG1: WISPs Model Building | Prof Michele Cicoli | 69 |
| WG2 | WG 2: WISPs Dark Matter and Cosmology | Dr Edoardo VITAGLIANO | 148 |
| WG3 | WG 3: WISPs in Astrophysics. | Dr Andrea Caputo | 94 |
| WG4 | WG4: Direct WISPs searches. | Dr Claudio Gatti | 88 |
| WG5 | WG 5: Dissemination and Outreach | Dr Olga Mena | 63 |

# 2.e) Budget status

COST Action CA21106 Annex A of the Grant Agreement (not editable) from 2022-11-01 to 2023-10-31

| Networking Tools | Quantity | Budget |
|---|---|---|
| Meetings | 2 | EUR 64 840.12 |
| Training Schools | 1 | EUR 37 500.00 |
| Mobility of Researchers and Innovators | tbd. | EUR 22 300.00 |
| Presentation at Conferences organised by Third Parties | tbd. | EUR 3 250.00 |
| Dissemination and Communication Products | 3 | EUR 4 150.00 |
| Other Expenses Related to Scientific Activities (OERSA) | 2 | EUR 1 400.00 |
| **Total Science Expenditure** | | **EUR 133 440.12** |
| Financial and Scientific Administration and Coordination (FSAC) - MAX. 15% | 15 % | EUR 20 016.02 |
| **Total Grant** | | **EUR 153 456.14** |

**Funds available to spend globally:** EUR 11 950.00

| Total | Grant budget (a) | Expenditure | | | | | Delta (g=f-a) |
|---|---|---|---|---|---|---|---|
| | | Actuals (b) | Accruals (c) | Total (d=b+c) | Forecast (e) | Total (f=d+e) | |
| Meeting | 64 840.12 | 0.00 | 11 340.12 | 11 340.12 | 53 500.00 | 64 840.12 | 0.00 |
| Training School | 37 500.00 | 0.00 | 0.00 | 0.00 | 37 500.00 | 37 500.00 | 0.00 |
| Short-Term Scientific Mission Grant | 22 300.00 | 0.00 | 11 500.00 | 11 500.00 | 0.00 | 11 500.00 | -10 800.00 |
| Virtual Mobility Grant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Inclusiveness Target Countries Conference Grant | 2 000.00 | 0.00 | 850.00 | 850.00 | 0.00 | 850.00 | -1 150.00 |
| Dissemination Conference Grant | 1 250.00 | 0.00 | 1 250.00 | 1 250.00 | 0.00 | 1 250.00 | 0.00 |
| Dissemination and Communication Products | 4 150.00 | 0.00 | 1 600.00 | 1 600.00 | 2 550.00 | 4 150.00 | 0.00 |
| Other Expenses Related to Scientific Activities (OERSA) | 1 400.00 | 0.00 | 0.00 | 0.00 | 1 400.00 | 1 400.00 | 0.00 |
| Virtual Networking Support Grant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Networking expenditure | **133 440.12** | **0.00** | **26 540.12** | **26 540.12** | **94 950.00** | **121 490.12** | **-11 950.00** |
| | | | | | | | |
| Eligible Networking expenditure | 133 440.12 | 0.00 | 26 540.12 | 26 540.12 | 94 950.00 | 121 490.12 | -11 950.00 |
| FSAC 15% of Eligible Networking expenditure | 20 016.02 | 0.00 | 3 981.02 | 3 981.02 | 14 242.50 | 18 223.52 | -1 792.50 |
| Eligible Costs | **153 456.14** | **0.00** | **30 521.14** | **30 521.14** | **109 192.50** | **139 713.64** | **-13 742.50** |

# 2.f) Update from COST Association

# 3.a) Follow-up discussion on Action Management

- Need to replace WG1 co-leader Ilaria Brivio. She is chair of new COST Action CA22130 COMETHA (Comprhensive Multi-boson Experiment-Theory Action).
Congratulations to Ilaria for this great achievement !!

- Find a new ECI Council Coordinator

14 Leadership positions: 3 from ITC countries, 4 ECI, 5 F

Proposal: increase Leadership positions from ITC and/or F, e.g. co-leaders?

# 3.b) Implementation of COST Excellence and Inclusiveness Policy

SUGGESTIONS OF THE SCIENTIFIC COMMITTEE

To comply with the COST Excellence and Inclusiveness Policy, in the implementation of the Action:

- the level of involvement of Inclusiveness Target Countries (ITCs) should be maintained and the plans described in the proposal for ensuring ITC involvement should be implemented;

We maintained the level of involvement of ITC countries

At the beginning 39 ITC participants (32 %). Now 72 ITC participants (29 % participants)

We give priority to participants from ITC countries for the participations in the Meetings and in the Training School

1 ITC Conference Grant Attributed

2/6 STSM attributed to ITC participants

Cosmic WISPers member Federico Urban and his team have just been awarded a Czech Inter-COST grant to work on spin-2 WISPs over the next two years. Massive spin-2 fields typically arise in certain extensions of General Relativity, such as bigravity or higher-dimensional gravity; some of these spin-2 fields can be viable dark matter candidates, and can have masses in the WISP range. The focus of the project will be to understand if and how current astrophysical/cosmological WISP production mechanisms and WISP laboratory detection techniques can be adapted for spin-2 WISPs, what new techniques could be used to search specifically for spin-2 WISPs, and how to distinguish them from their spin-0 and spin-1 counterparts. The team will include fellow Action members Alex Vikman, Iggy Sawicki, Sabir Ramazanov and the students Georg Trenkler and Pavel Kůs and is based out of CEICO, Prague.

## SUGGESTIONS OF THE SCIENTIFIC COMMITTEE

- the level of involvement of Early Career Investigators (ECIs) should be increased and a plan should be developed and implemented to ensure the full involvement of ECIs in all aspects of the Action's implementation (including in Action leadership positions);

We estabilished the ECI Council which is in charge of the Monthly Colloqium, the Journal Club, the monthly newsletter, the twitter account and the newsletter

4/8 Grants attributed to ECI

## SUGGESTIONS OF THE SCIENTIFIC COMMITTEE

the gender balance should be improved and a plan should be developed and implemented to ensure gender balance in all aspects of the Action's implementation (including in Action leadership positions).

We nominated a Gender Advisor

14 Leadership positions: 5 F. Possibility to improve.
Difficulty to find  available candidates.

# 3.c) Grant Awarding by the Action

# 3.d) Progress by each WG

# 3.e) Science Communication Plan

# 3.f) Progress on MoU objectives, WG tasks, deliverables and goals

# 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 comunity discussions to enable new experiments
- ✓ Stimulate transfer of knowledge among estabilished 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

## MoU objectives, Action deliverables and Grant Agreement Period Goals

### Action Objectives from MoU

| Aim/primary Objective |
| --- |
| 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 |
| **Secondary objectives** |
| 1. Provide a discussion forum for the European coordination of WISPs Physics and express collective view on the development of WISPs research.<br>2. Develop a Roadmap for WISPs Physics in Europe, a description of the status and perspectives of the field within Europe, linking them to activities in other parts of the world.<br>3. Coordinate and support in a synergic way WISPs searches carried on by the different WGs, in order to stimulate and consolidate collaborations.<br>4. Develop a common database on WISPs theoretical models, experimental and astrophysical bounds.<br>5. Coordinate the experimental searches in order to maximize the discovery potential of current and future experiments and optimize the detection strategies.<br>6. Compare WISPs theoretical models and assess performance of different experimental technique.<br>7. Provide input to Small and Medium Size Enterprises (SMEs) identifying progresses needed in key technologies for present and future experiments.<br>8. Disseminate the research results broadly to the scientific community, to the stakeholders and to the general public, attracting representative of SMEs and young students towards these subjects.<br>9. Provide cross community discussions to enable new experiments.<br>10. Promote the gender balance of the Action, favoring more women in leading positions.<br>11. Stimulate transfer of knowledge among established leading groups in the field and emerging excellent scientists in COST Inclusiveness Target Countries (ITC), as well as SMEs.<br>12. Involve new research groups from ITC countries into the Action.<br>13. Attract young talented researchers from all over the world towards the activities of the Action through training activities. |

## Grant Agreement Period

| | | | |
|---|---|---|---|
| Grant Agreement Period Start Date | 01/11/2022 | Grant Agreement Period End Date | 31/10/2023 |

## Grant Agreement Period Goals

| Number | Grant Agreement Period Goal | MoU Objective(s) it relates to |
|---|---|---|
| GAPG 1 | To draft a review on the state-of-the-art concerning: WISP models (WG1), cosmological (WG2), astrophysical (WG3) and experimental (WG 4) bounds | • Secondary objective 2<br>• Secondary objective 6 |
| GAPG 2 | To stimulate discussions in the WGs to investigate the priorities and goals, the possible synergies and collaborations | • Secondary objective 1<br>• Secondary objective 2<br>• Secondary objective 3<br>• Secondary objective 9<br>• Secondary objective 11 |
| GAPG 3 | To train Phd students and young post-docs in order to have a common interdisciplinary background across the WGs to work on the physics case | • Secondary objective 8<br>• Secondary objective 11<br>• Secondary objective 12<br>• Secondary objective 13 |
| GAPG 4 | To prepare a plan of Outreach Activities and of the Dissemination strategies. | • Secondary objective 7<br>• Secondary objective 8<br>• Secondary objective 12 |
| GAPG 5 | To start discussions on the technologies needed to develop next-generation WISP experiments | • Secondary objective 1<br>• Secondary objective 7<br>• Secondary objective 9<br>• Secondary objective 11<br>• Secondary objective 12 |
| GAPG 6 | To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action | • Secondary objective 10<br>• Secondary objective 11<br>• Secondary objective 12<br>• Secondary objective 13 |



Draft review will be published in the proceeding of General Meeting

Online and in presence WG meetings (typically on monthtly basis)

Training School in Lecce

Science Comm. Plan, online Colloqium and JC. Outreach talks in Frascati and Bari Meeting. Webpage. Newsletter, twitter

Technology Forum on magnets in Frascati meeting

Doubled ITC participants. ITC grants attributed

# 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 |

Draft report will be published in the Proceedings of the General Meeting in the Open Access Journal «Proceedings of Science»

# 4.a) Planning. Revision of W&B Plan

Use all unspent funds to cover as much as possible the travel  costs for the participation to the General Meeting and Training School, and slight increase of costs in proceedings and webpage.

# 4.b) Draft Plan of the 2 GP

# 4.c) Upcoming activities

# 5) Monitoring and reporting to the COST Association

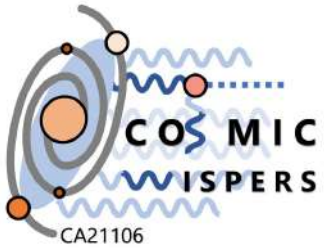
6) AOB

# 7) Summary of MC decisions

# 8) Conclusions

# report from WG1
# WISPs Model Building

Ilaria Brivio, Michele Cicoli
*University & INFN Bologna*





# WG1 targets in a nutshell

**Tasks**

- coordinate theory advancements and promote knowledge exchange among groups
- bring together diverse communities in a synergic way, to address open issues with different approaches
- give theoretical guidance to experimental searches

**Top-down**

start from **concrete BSM scenarios**
[string theory, axion models...]

↓

determine UV-motivated WISP properties
*how many and which WISPs are produced?*
*when is a QCD axion produced?*
*what are natural values for masses and couplings?*

**Bottom-up**

identify UV scenarios
compatible with observation

↑

start from phenomenological study
in **Effective Field Theory**

# Organization & Internal communication

WG Leader: Michele Cicoli michele.cicoli@unibo.it
WG Co-Leader: Ilaria Brivio ilaria.brivio@unibo.it [stepping down]

⭐ **New incoming Co-Leader: Sophie Renner** sophie.renner@glasgow.ac.uk

Google Group “CosmicWISPers WG1”
https://groups.google.com/g/cosmicwispers-wg1/

- 78 registered members so far
- mailing list: cosmicwispers-wg1@googlegroups.com
- address book visible to all members

# WG1 Monthly meetings

https://agenda.infn.it/category/1832/

- virtual format (zoom)
- Mondays 2pm. so far: 4 meetings since March. resuming again in October.
- about 1h30 long:

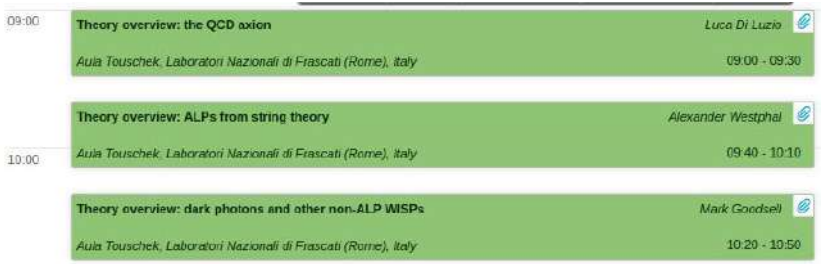
  3 x 20' **talks** by WG1 members, to present research interests and activities
  30' **discussion**

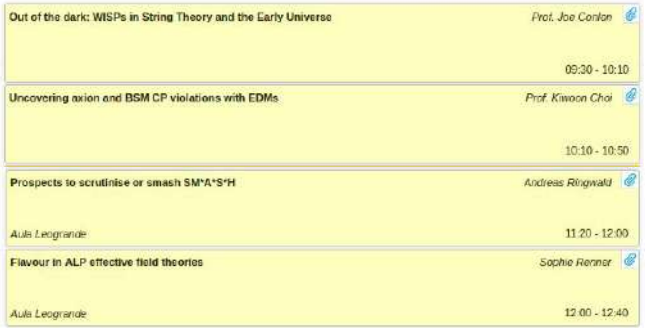
**Goal for the first year:**
get to know each other & stimulate physics discussions

image: Flaticon.com

# WG1 contributions to Action events

Kickoff Meeting , Feb 2023




1st General Meeting , Sept 2023

plenary session yesterday morning
+ parallels on Tue & Thu

1st Training School , Sept 2023

*“Axion theory and production in the early universe”*

Lecturer: Kiwoon Choi (IBS, Daejon). Trainer: Nicole Righi (King's College, London)

# Other WG1 Activities so far

- Dissemination talk
  *Ultra-light axions in string cosmology*
  Michele Cicoli, String Phenomenology 2023, 3-7 July 2023, IBS, Daejeon

- Outreach talk
  *String theory multiverse*
  Michele Cicoli, European researchers' night 2023, 27 Sep 2023, Bologna

- STSM: Matteo Licheri Bologna → Cambridge

# Plans for future activities

## year 2

- continue monthly meetings series
- contributions to 2nd GM and training school
- STSM, dissemination and outreach talks

## year 3 - 4

- upgrade monthly meetings format.
  eg: invite external speakers, organize by topics, target specific recent papers...
- organize topical workshops. one potentially hosted in Bologna

# Topical Meetings

plan to organize in-person / hybrid Topical Meetings starting from GP3

possible topics:

- the **QCD axion window** in the axion/ALP parameter space
- the **DM window** in the ALP parameter space
- properties of **ALPs from string** compactifications
- Hidden photons
- ...

# Deliverables and further plans

📚 preparation of a WG1 **report**.
possible content:

- catalogue of WISPs and their properties from TH and pheno points of view
- dictionary between them
- overview of BSM scenarios WISPs emerge from
- ...

👬 increase cooperation with **other WGs**

📄 more scientific **publications** and **talks** at international conferences

Credit: ESO (eso0708a)

# WG2 Discussion

1st General Meeting of COST Action COSMIC WISPers (CA21106),
Bari, Italy
September 8, 2023


Edoardo Vitagliano
edoardo.vitagliano@mail.huji.ac.il
Hebrew University of Jerusalem


האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

European Research Council
Established by the European Commission

cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

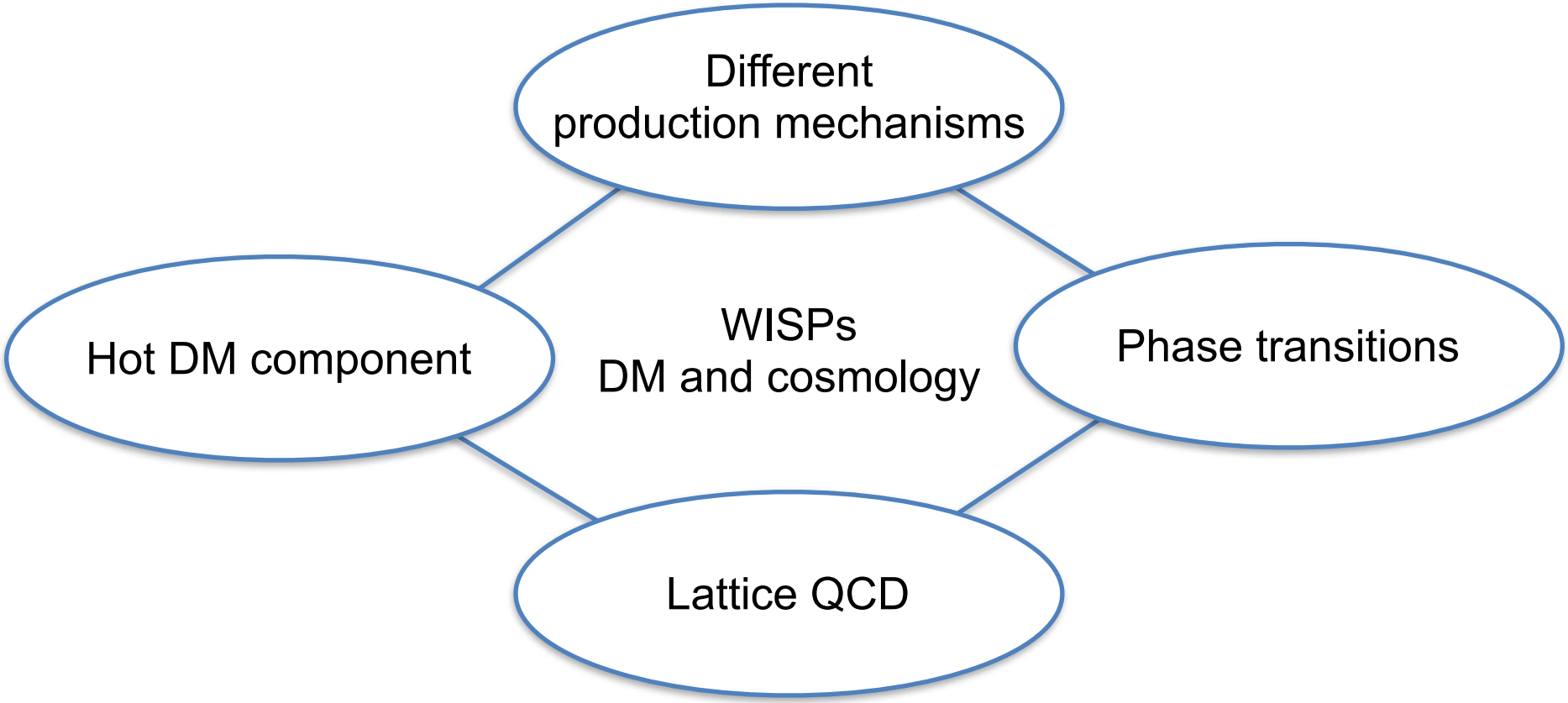
COSMIC WISPERS
CA21106

# Working group 2 in a glance

Many questions:

- WISPs are a great DM candidate—how many ways to produce them?
- Different non-thermal processes, misalignment mechanism, phase transitions, topological defects networks
- If QCD axion is *the* DM, can we reliably predict its mass and couplings?
- What is the abundance of miniclusters? Huge consequences for WG3 and WG4

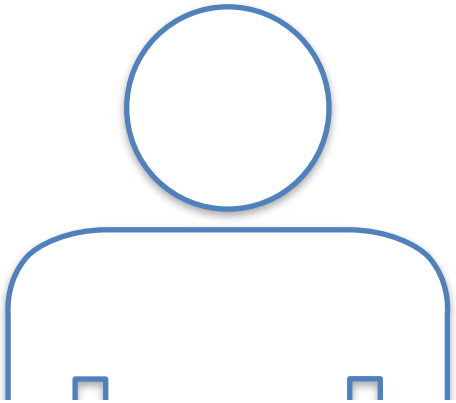
# Working group 2 in a glance



# A large community with many different expertises

- Around 150 people in the WG
- Great overlap with all the other WGs
- Several activities organized together with WG3

Coordinators



Edoardo Vitagliano

Javier Redondo

# Important to get results

- Great experimental efforts to detect the QCD axion—extremely valuable to identify an expected mass range
- Very important consequences for large density variations
- Astrophysical signals might be very important to discover the nature of dark matter

# Ongoing activities

Together with WG3, we have organized a timely online mini workshop on NANOGrav results

Wednesday, 5th of July

- 3pm Prof. Alberto Sesana, **Nano-Hz gravitational waves: first evidence and implications**

From 4pm on the same day

- Fabrizio Rompineve (CERN), **Footprints of the QCD Crossover on Cosmological Gravitational Waves at Pulsar Timing Arrays**
- Yann Gouttenoire (Tel Aviv University), **TBC**
- Marek Lewicki (University of Warsaw), **Cosmic Superstrings Revisited in Light of NANOGrav 15-Year Data**
- Antonio Iovino (La Sapienza University of Rome), **The recent gravitational wave observation by pulsar timing arrays and primordial black holes: the importance of non-gaussianities**
- Anish Goshal (University of Warsaw), **Probing the Dark Matter density with gravitational waves from super-massive binary black holes**

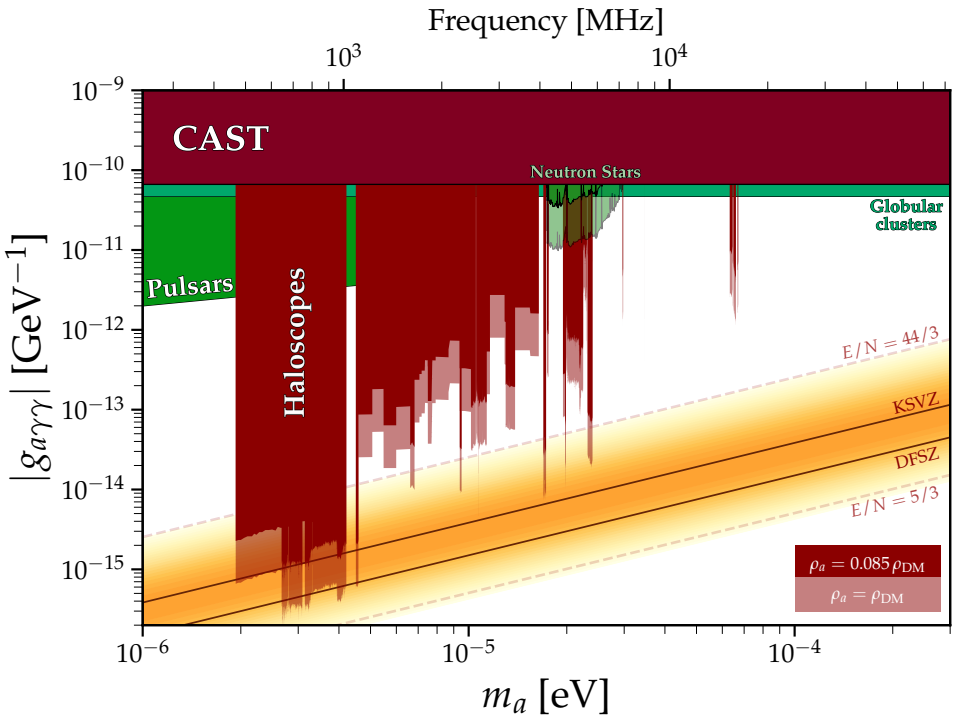
# Planning ahead

- Possible workshops and schools dedicated to prediction of the DM abundances
- Possibility of funding visiting periods
- We plan to ask all the people in the working group to fill up a form with name, institution, reasons why they join the working group, and how they could contribute to the success in reaching the goals of the WG
- Continued collaboration with WG3 (planning a mini-workshop similar to the one dedicated to NANOGrav)
- Subtask 2.1.4 an important goal to be reached with the collaboration of the members
- Other subtasks could be realized as the result of collaborations inspired by the WG

# This workshop

Ciaran O'Hare talk

## Implications for haloscopes




Eggemeier, CAJO+ [2212.00560]

Typical density in the minivoids is ~0.085 of the mean density of dark matter

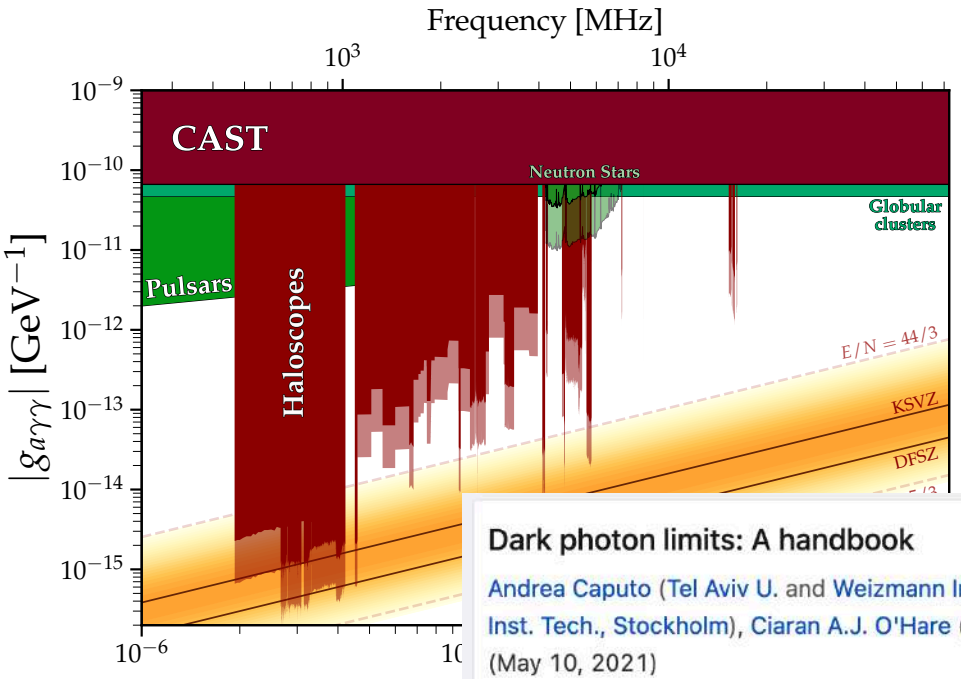
→ the miniclusters are no longer growing at the final redshift of the simulation, therefore this places a **lower bound** on the density of axions

→ Not a nice conclusion, but it could have been much worse!

# This workshop

Ciaran O'Hare talk

## Implications for haloscopes




Eggemeier, CAJO+ [2212.0056

Typical density in the minivoids is ~0.085 of the mean density of dark matter

→ the miniclusters are no longer growing at the final redshift of the simulation, therefore this places a **lower bound** on the density of

**Dark photon limits: A handbook** #4

Andrea Caputo (Tel Aviv U. and Weizmann Inst.), Alexander J. Millar (Stockholm U., OKC and Nordita and Royal Inst. Tech., Stockholm), Ciaran A.J. O'Hare (Australia, CSIRO, Sydney and Sydney U.), Edoardo Vitagliano (UCLA)
(May 10, 2021)

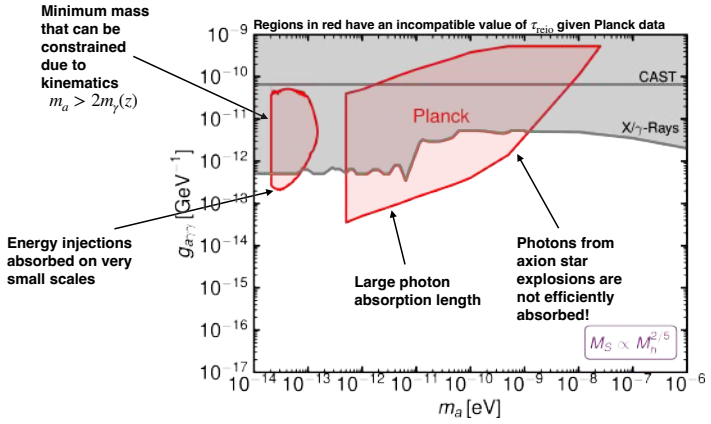
Published in: *Phys.Rev.D* 104 (2021) 9, 095029 • e-Print: 2105.04565 [hep-ph]

pdf links DOI cite claim reference search 125 citations

# This workshop

## Miguel Escudero talk

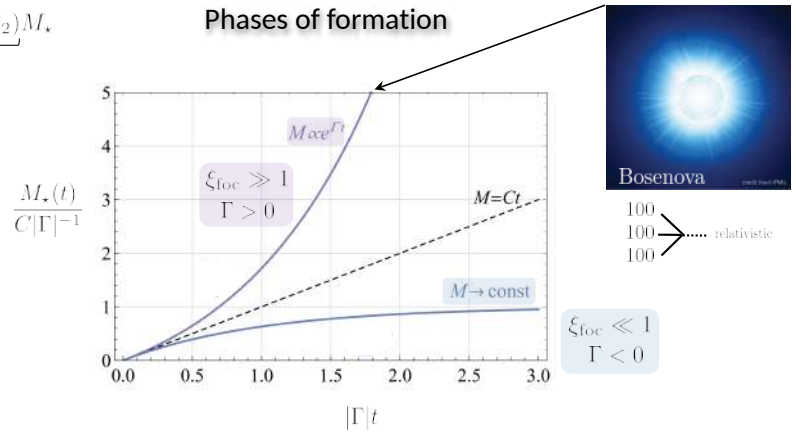
### Resulting Constraints






## Marco Gorghetto talk

$$\dot{M}_\star = C + \underbrace{(\Gamma_1 - \Gamma_2)}_{\Gamma} M_\star$$




$$\rho_{\rm crit} \equiv \frac{2\Phi_{\rm ex} m^2}{|g|} \simeq 2\frac{\alpha^2 m^2}{|g|} \simeq 6 \cdot 10^4 \rho_{\rm dm} \left[\frac{f_a}{5 \cdot 10^7\,{\rm GeV}}\right]^2 \left[\frac{m}{1.7 \cdot 10^{-14}\,{\rm eV}}\right]^4 \left[\frac{M}{M_\odot}\right]^2 \left[\frac{0.4\,{\rm GeV/cm^3}}{\rho_{\rm dm}}\right]$$

# This workshop

WG1: Which particle models are interesting?

WG2: Computing the abundance, large overlaps with numerical simulation communities

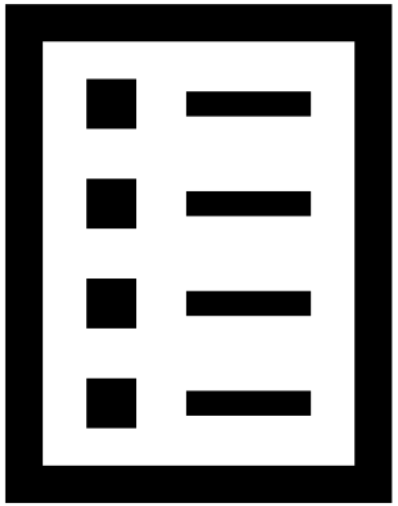
WG3: Effects on astrophysical bounds!

WG4: Effects on laboratory searches!

WG5: Nice plots and visualizations, good help for outreach

# WG 4 REPORT

CLAUDIO GATTI, MARIN KARUZA



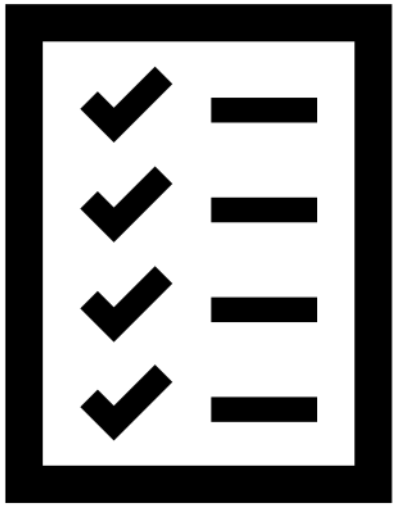
# Tasks

**T4.1**: Review of present and future WISPs experiments (including DM ones) in order to assess their discovery potential.

- **Subtask 4.1.1**: Perform an update of summary plots of present limits for various WISPs models (axion, hidden photons, chameleons etc.). For the axion constraints on the coupling with photons, electrons, nucleons. For HP, bounds on the kinetic mixing angle. Reinterpretation of existing experimental limits with new WISPs models.
- **Subtask 4.1.2**: Combination of experimental results with astrophysical and cosmological limits to extract summary plots.
- **Subtask 4.1.3**: Highlight regions of the parameter space not yet covered by experiments and discuss feasibility of the experimental searches in these regions. Discuss the feasibility of testing all the couplings (to leptons, photons, baryons etc.) in all the parameter space.

**T4.2**: Identify progress need in the key technologies and techniques (data analysis, signal filtering) for present and future experiments needed to cover the theoretically motivated region in the parameter space.

- **Subtask 4.2.1**: perform a survey of technology (materials, detection, sources, cryogenics, magnets, high resolution detectors) needed in WISP experiments.
- **Subtask 4.2.2**: perform a survey of solutions available (in SME or academic research) and of the competences available.



## Activities [WG1-4]:

- Organization of workshops on specific topics of the WGs.
- Organization of Short Term Scientific Missions (STSM).
- Organization of Technology Forums (WG4).
- Publication of report on the scientific results in the webpage (in cooperation with WG5). Participation in outreach activities (in cooperation with WG5).
- Preparation of the final White Paper and of the Training School Lecture Notes.

## Milestones [WG1-4]:

- WG meetings to track the progress of each WG and to take corrective measures in case of problems.

## Deliverables:

- D4.1 Draft Report on direct detection (month 12)
- D4.2 Interim Report on direct detection (month 24)
- D4.3 Final Report on direct detection
- D4.4 Report on Technologies Forums

# WG4 - General organization

- WG4 meetings one per month

- Report on direct detection and Tech. Forums: Overleaf LATEX

- WG4 documents on Drive/Dropbox

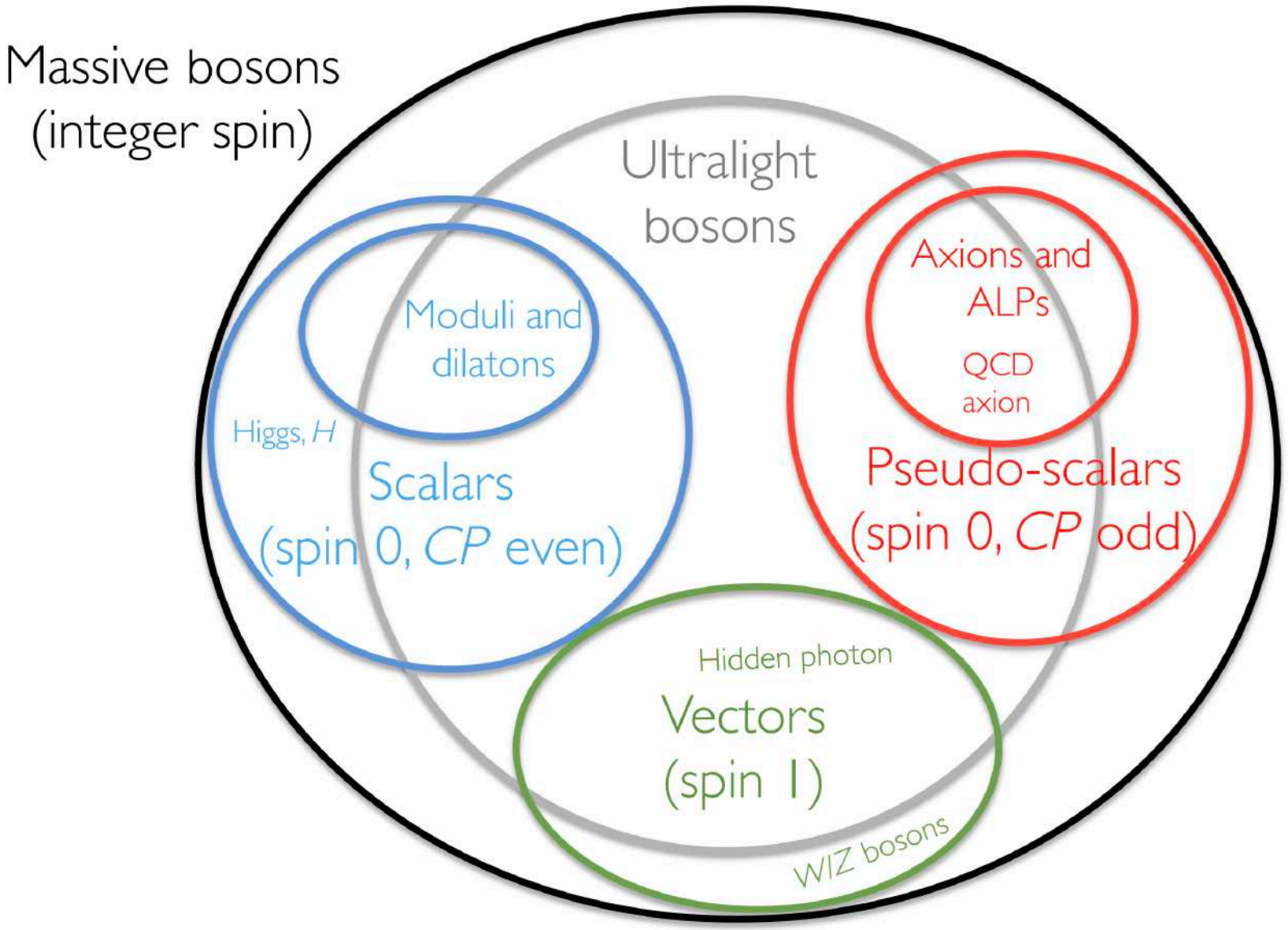
- Mailing List cosmicwisperwg4@lists.infn.it
- INDICO meetings https://agenda.infn.it/category/1831/

# Contact Persons

- WG contact persons:
  - WG1 Mario Reig
  - WG2 Jose Cembranos
  - WG3 Maurizio Giannotti, Federico Urban
  - WG5 Loredana Gastaldo, Serkant Ali Cetin
- Contact person with CERN-PBC Technology working group:  Giovanni Cantatore, Pierre Pugnat
- Contact person with ECFA Quantum Sensing WG (tbd)

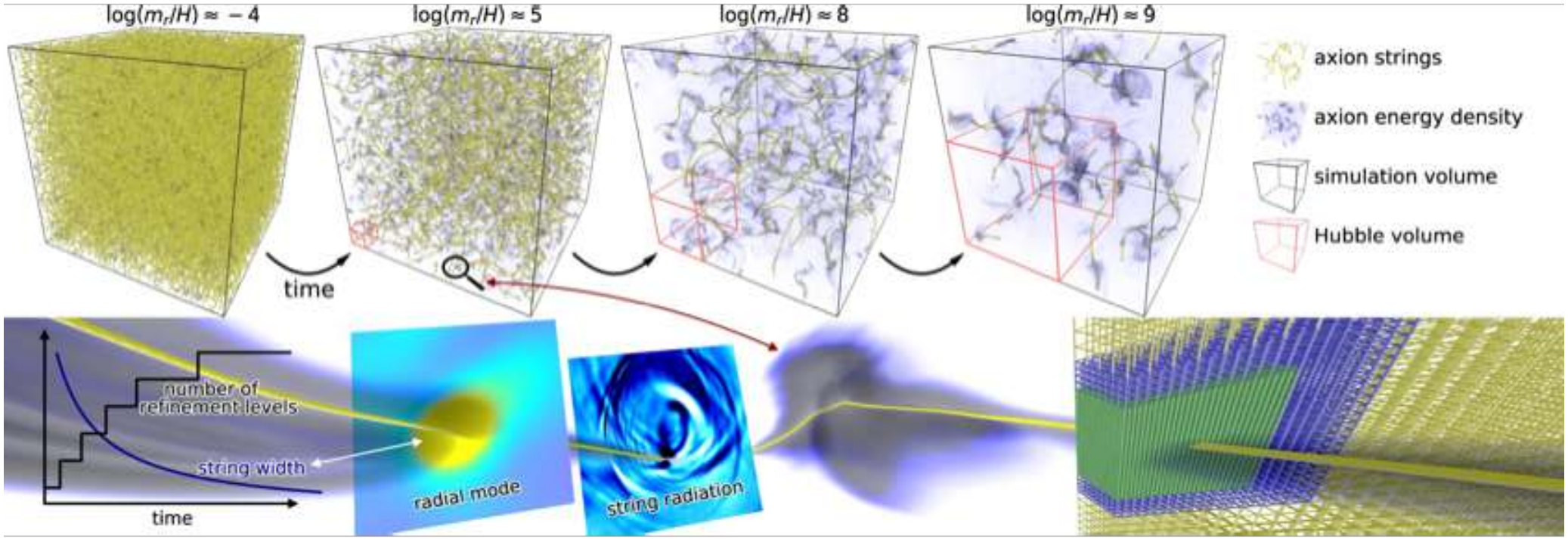
Inputs from WG1

# Models

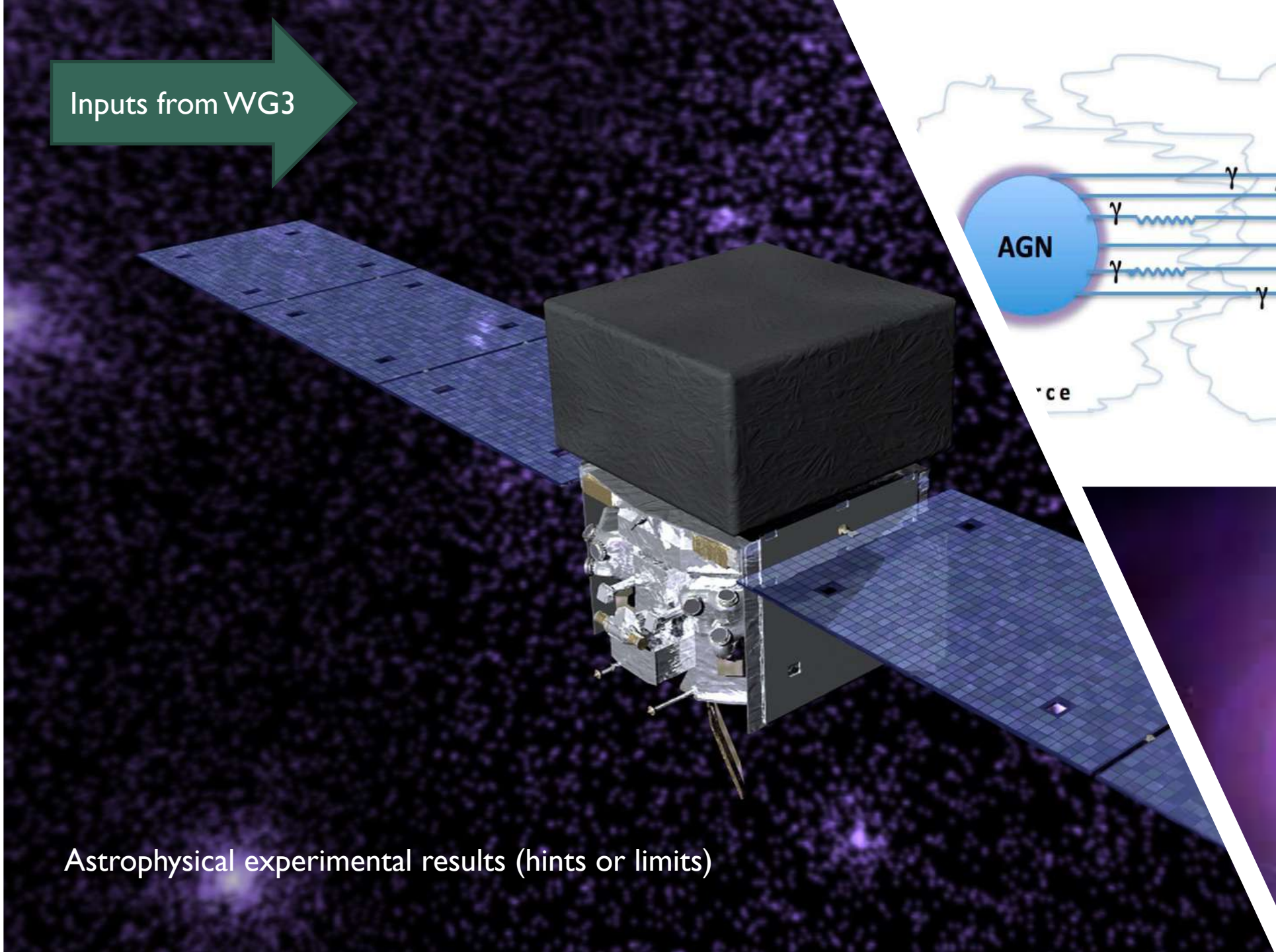


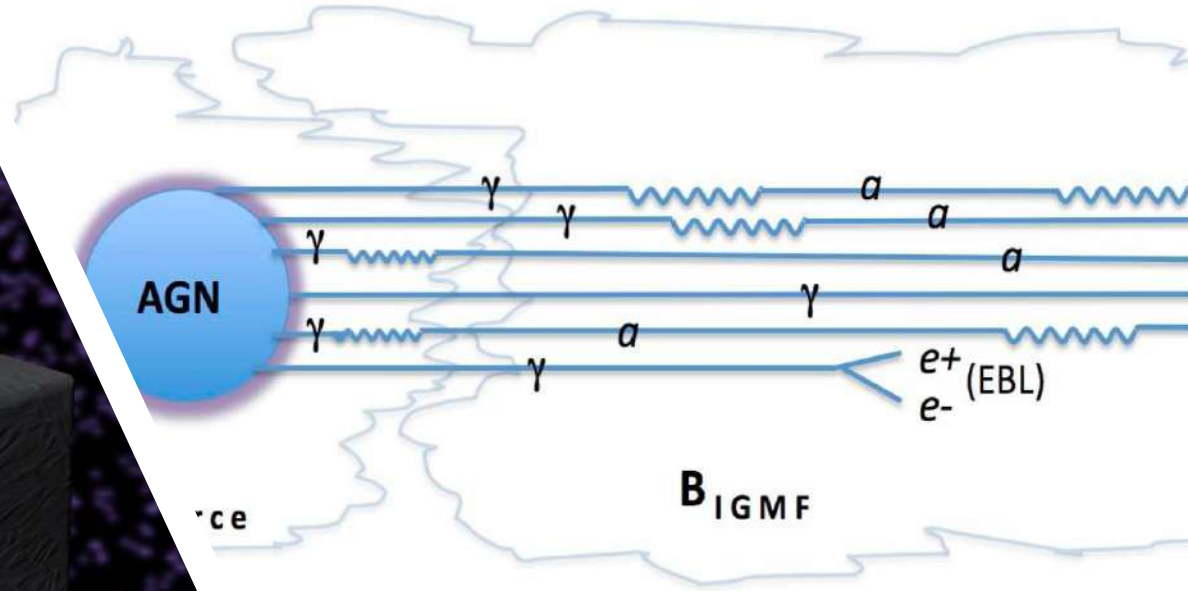
Inputs from WG2

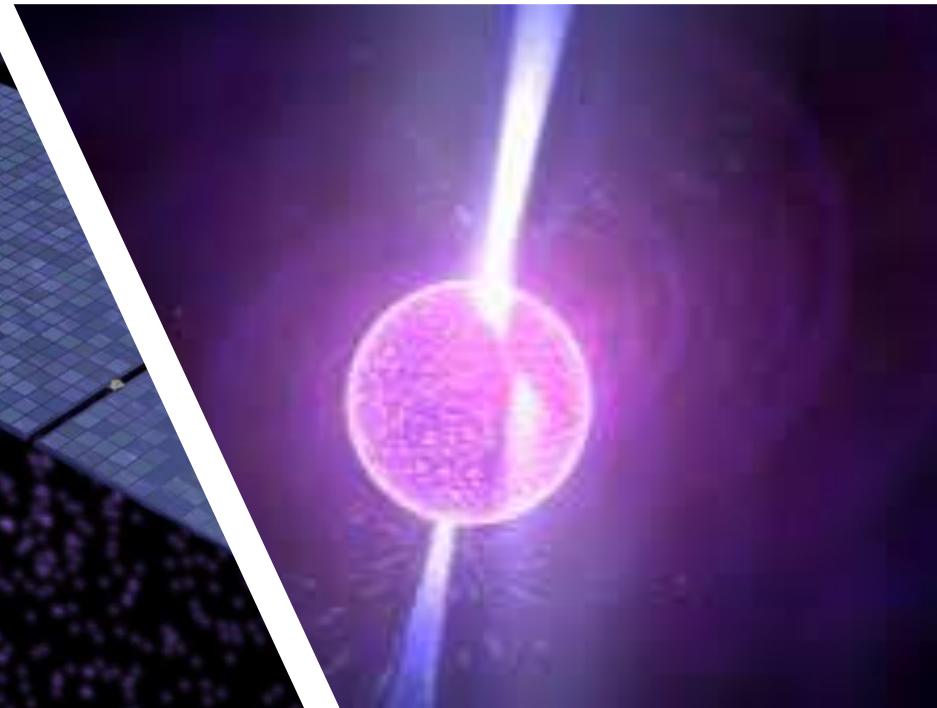
Preferred parameter space for WISP dark matter candidates



Inputs from WG3





Astrophysical experimental results (hints or limits)

# Experiments and Techniques

- Helioscopes
- Haloscopes
- LSW
- polarization
- AMO
- Magnetometers

- 5th Force exp.
- Casimir
- Torsion balance
- Atomic tests
- Levitated microspheres
- Micro resonators
- GW Interferometer
- Atom Interferometer
- Neutron interferometry
- Cold neutrons
- Variation of fundamental constants

- Colliders
- Beam dump/on target
- Underground

…

# Plots for Exclusion Limits

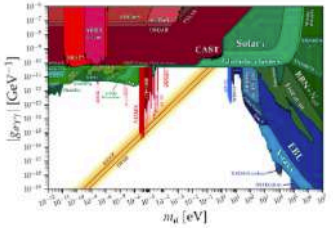
We will use the software from Ciaran O'Hare (COST member)

https://cajohare.github.io/AxionLimits/

Ciaran's project already rich of data on limits for several couplings of WISPS. We can help to extend the physics case, collect data and create new summary plots. Will organize a subworking group on this.

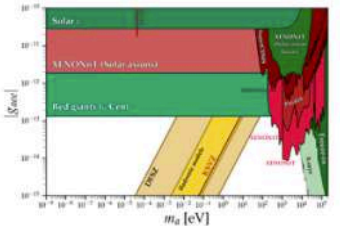
## Axion-photon coupling

**Data files**
Plot (pdf, png)
Plot with projections (pdf, png)
Plot of dimensionless coupling (pdf, png)
Plot of dimensionless coupling with projections (pdf, png)



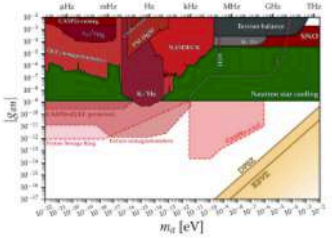

## Axion-electron coupling

**Data files**
Plot (pdf, png)
Plot with projections (pdf, png)



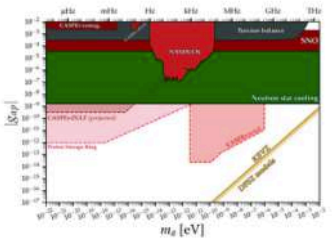

## Axion-neutron coupling

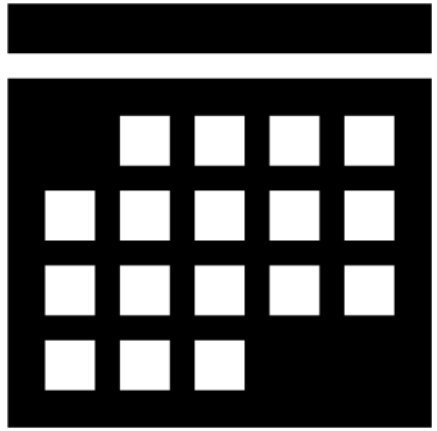
**Data files**
Plot (pdf, png)
Plot with projections (pdf, png)




## Axion-proton coupling

**Data files**
Plot (pdf, png)
Plot with projections (pdf, png)

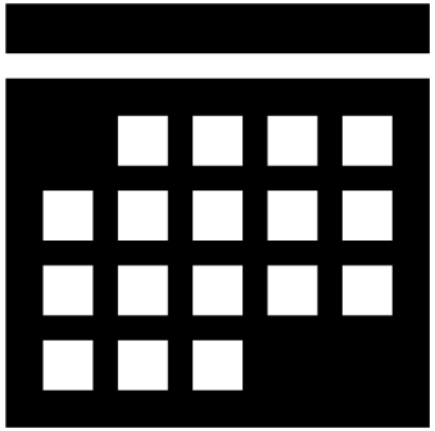




First year plan

- Make a list of WISPs models
- Make a list of WISPs experiments
- Preliminary Summary Plots
- Contact experts in specific experiments and techniques within and outside the COST. Invite them to join the COST.
- Make a list of technology needed by WISP experiments
- Draft of Direct Search Report

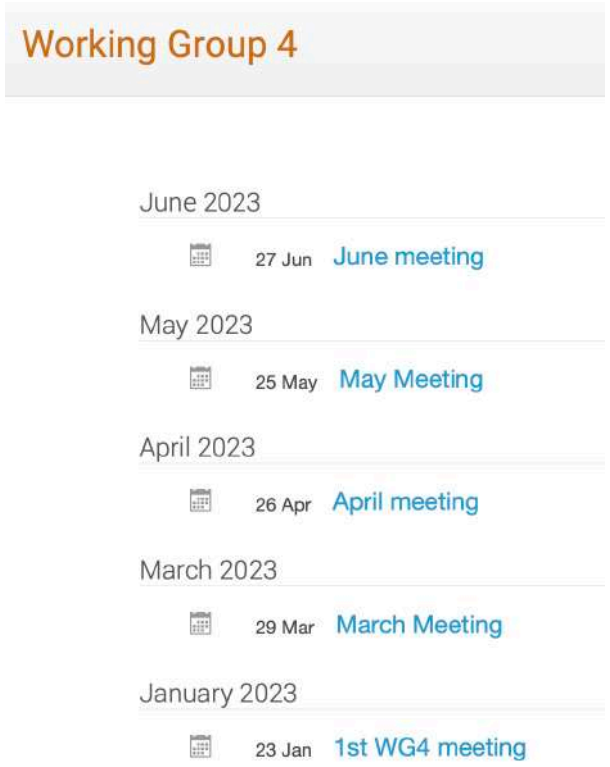
# D4.1 DRAFT REPORT ON DIRECT DETECTION (MONTH 12)



## Tentative agenda

- February: List of editors; Latex/Word template
- March-June: Meeting to define Report index/sections. Identify Editors for each section. Collect bibliography. Collect list of particles/models/experiments. Updated results for plots/limits. Combine experiment results. Inputs from other WGs.
- September-October: First draft; Identify missing models/experiments. Invite experts to join COST.
- December: Draft Report on direct detection (State of Art)

Link to agenda: https://agenda.infn.it/category/1835/




## Experiments

- Axion limits package and data combination - C Ohare
- BRASS Experiment - LH Nguyen
- WISPFI Experiment - M Maroudas
- Haloscopes - A Rettaroli
- Helioscopes - J Vogel
- Gnome - G Zoran

## Experimental techniques

- Microcalorimeters at Heidelberg - L Gastaldo

## Theory Models

- Spin 2 ULDM - F Urban

## Experimental Schemes

- Axions in plasma - H Tercas
- Directly Deflecting Particle Dark Matter - S Ellis

Link to Report: https://www.overleaf.com/4678842289cfhfndnmvtyr

# CosmicWispers WG4 Report: WISPs direct searches

Claudio Gatti[1], Alessio Rettaroli[1], Marin Karuza[2], and Name[3]

[1]INFN, Laboratori Nazionali di Frascati, via Enrico Fermi 54, Roma, 00044 Italy
[2]Rijeka University
[3]Institution name



***Abstract.***

Version September 4, 2023

**Contents**



# REPORT CONTENT

# REPORT CONTENT

### 3.6. TEMPLATE Experiment

- 5-10 lines of description (1 or 2 pictures of experimental site)
- Experimental site
- goal of experiment
- Collaboration
- Status: Proposal, R&D, Construction, Running, Finished
- (expected) Period of operation
- R&D and technologies
- Bibliography

Plots of results and projections will be shown in the summary plots by Ciaran in a separate section and are not needed here.

Additional information useful for the summary plots are:

- Definition of coupling (i.e. what lagrangian interaction term)
- Assumed dark matter density
- Definition of the projection (i.e. is it an estimated sensitivity, projected 90% CL limit, order-of-magnitude estimate etc.)
- Location (required for the dark photon case and for experiments sensitive to a daily modulation)

Template experiment uses the following Lagrangian definition:

$$\mathcal{L} = \frac{1}{2}(\partial^\mu a)(\partial_\mu a) + \frac{\alpha_s}{8\pi}\frac{a}{f_a}\tilde{G}^{\mu\nu}G_{\mu\nu} + \frac{1}{4}g^0_{a\gamma\gamma}a\tilde{F}^{\mu\nu}F_{\mu\nu} + \frac{1}{2f_a}(\partial_\mu a)j^\mu_{a,0}\,, \qquad (1)$$

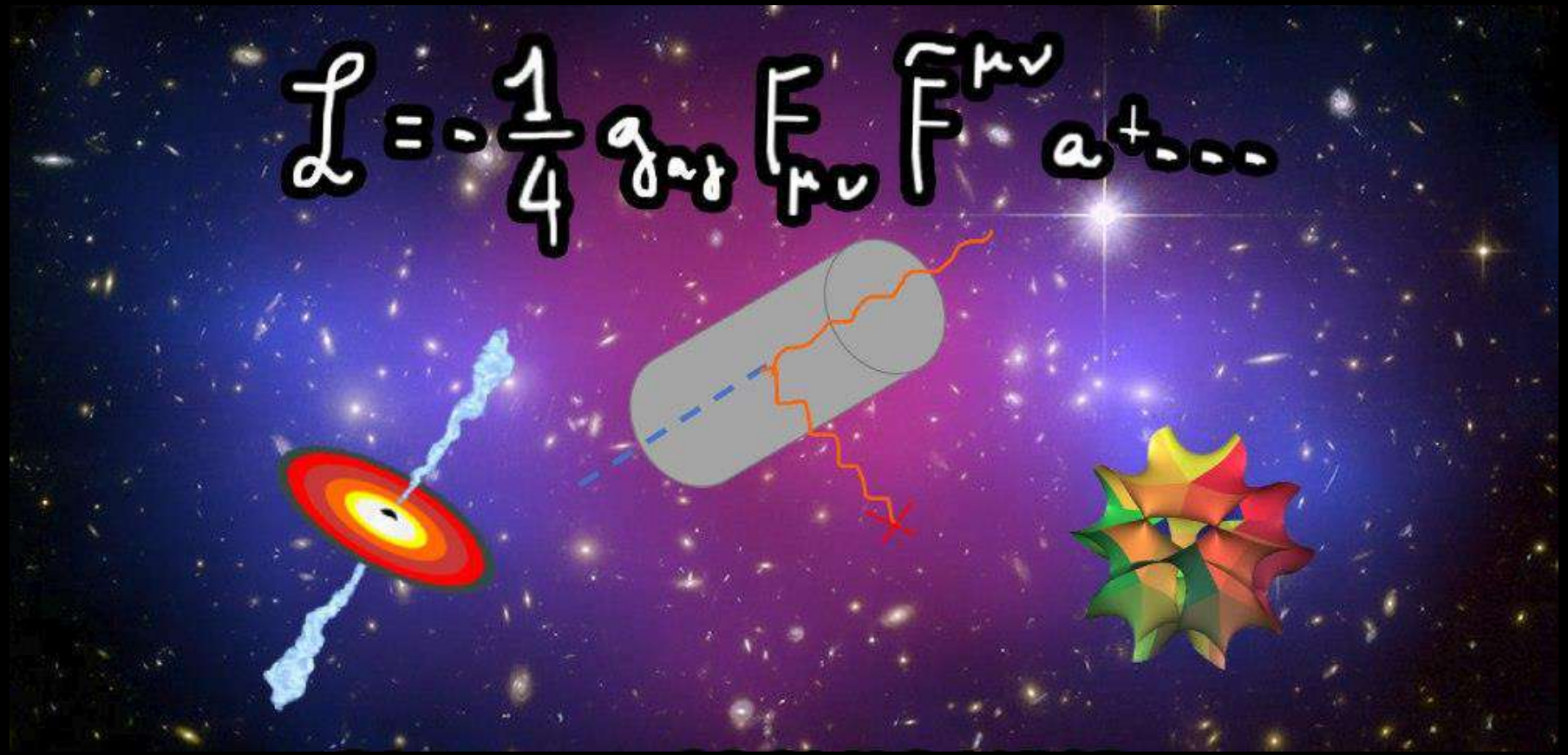
Experiment position and orientation are listed in Tab. 1.

**Table 1. Position and magnetic-field direction of template experiment**

| | |
|---|---|
| Latitude | 41° 49′ 26″ |
| Longitude | 12° 40′ 13″ |
| Elevation | 100 m |
| B field direction | East−northeast |

# LATEX TEMPLATE FOR EXPERIMENTS

- Distribute Latex template for experiment and complete the overview on experiments by end of November
- Started working on R&D, facility and experimental schemes sections will be completed in 2024
- Keep inviting speakers to monthly meeting and involve them in report preparation
- Organization of second Technology Forum on (quantum) sensors.




# COST Action CA21106

WG 5: Communication and Dissemination

COSMIC WISPERS
CA21106

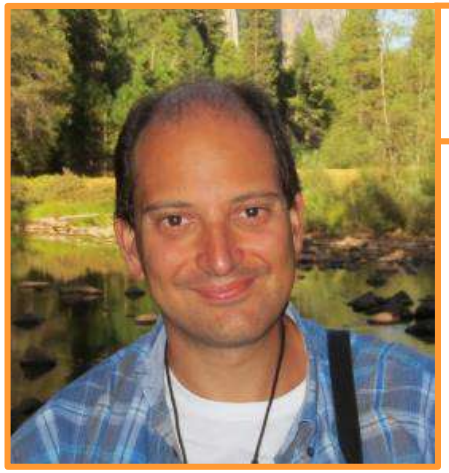
cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Funded by the European Union

Loredana Gastaldo
Kirchhoff Institute for Physics
Heidelberg University

# COST21106 aims and structure

The aim of this Action is to coordinate and support WISPs searches (on axions, dark photons, etc.) in a synergic way at the boundary between particle physics, astrophysics and cosmology.



Chair: Alessandro Mirizzi, Bari University, IT

Vice-Chair: Francesca Calore Annecy University, FR

## Working groups

| | Topic |
|---|---|
| WG1 | WISPs Model Building |
| WG2 | WISPs DM and Cosmology |
| WG3 | WISPs in Astrophysics |
| WG4 | Direct WISPs searches |
| WG5 | Dissemination and Outreach |

## Horizontal Committees

| Topic | Coordinator |
|---|---|
| Grant Evaluation Committee | Venelin Kozhuharov (Sofia Univ., BG) |
| Young Researchers and Innovators Representative Council | Pierluca Carenza (Stockholm Univ., SW) |
| Gender and Diversity Advisor | Deniz Sunar Cerci (Adiyaman Univ., TR) |

# WG5: Dissemination and Outreach

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

Leader: Olga Mena, Valencia University, ES

Deputy: Loredana Gastaldo, Heidelberg University, DE

# Science Communication Plan

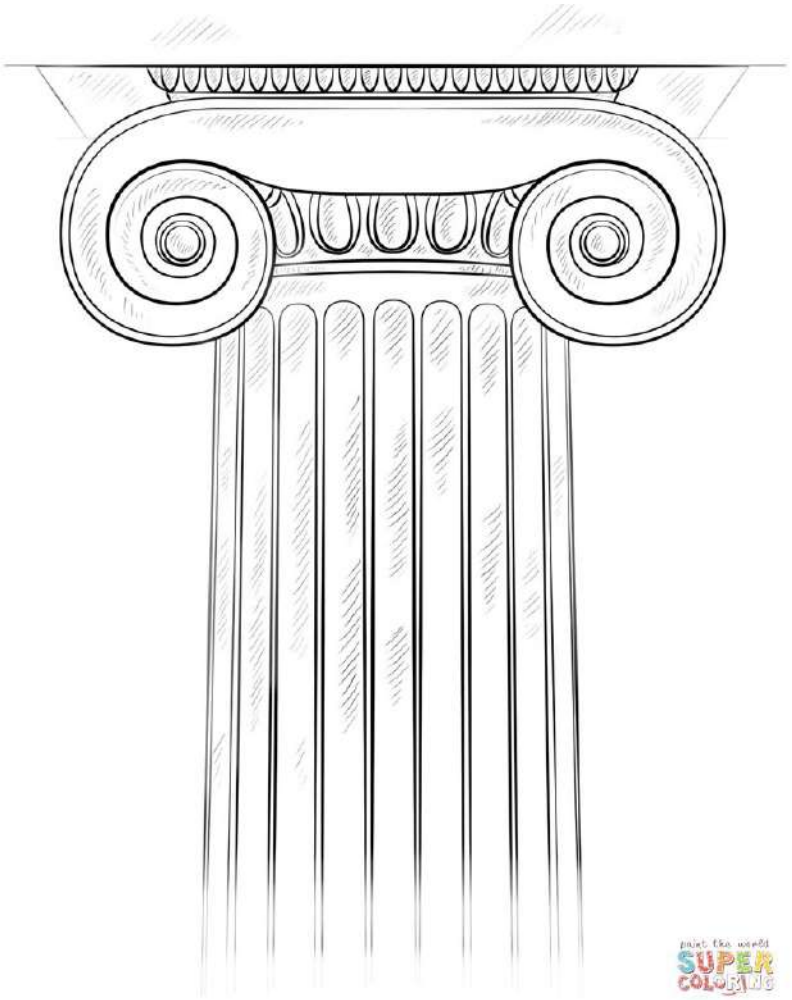
Or why it is relevant to communicate about the Action

A few examples:

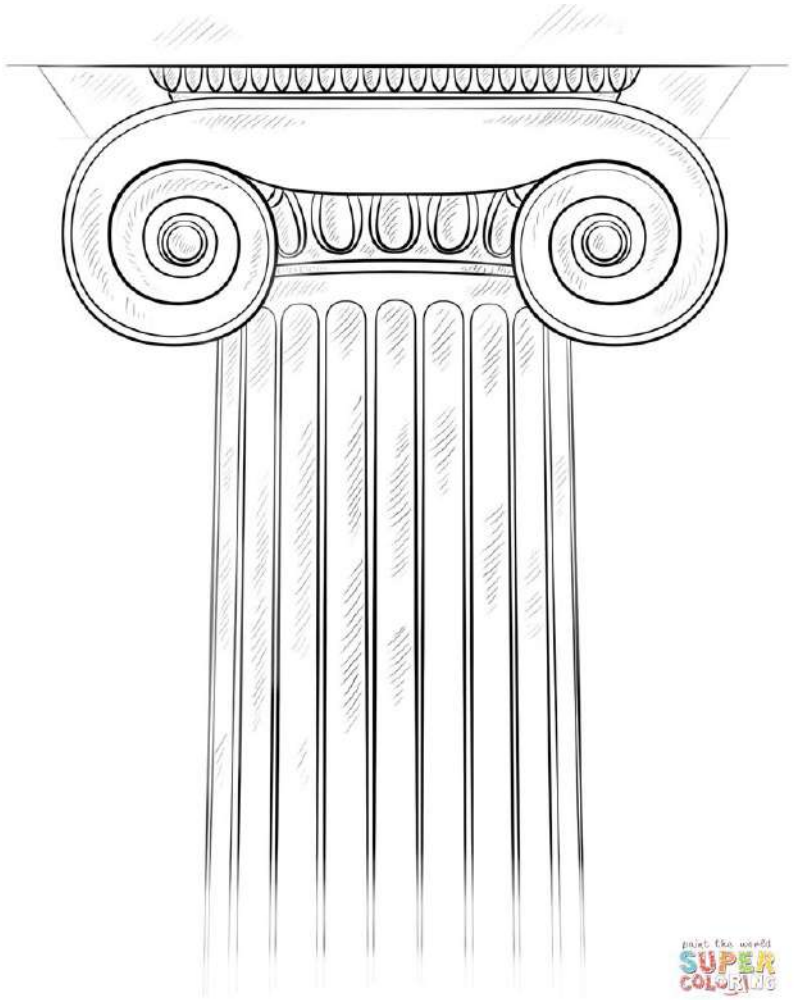
- Research has been **scattered** across Europe
- Urgent need for coordinated and joint effort to build a **collaborative platform** linking science, industry and management
- Raise **awareness**
- Bring added value of belonging to a **multidisciplinary network** involving **numerous countries**
- To spark **new collaborations**

# 3 Pillars

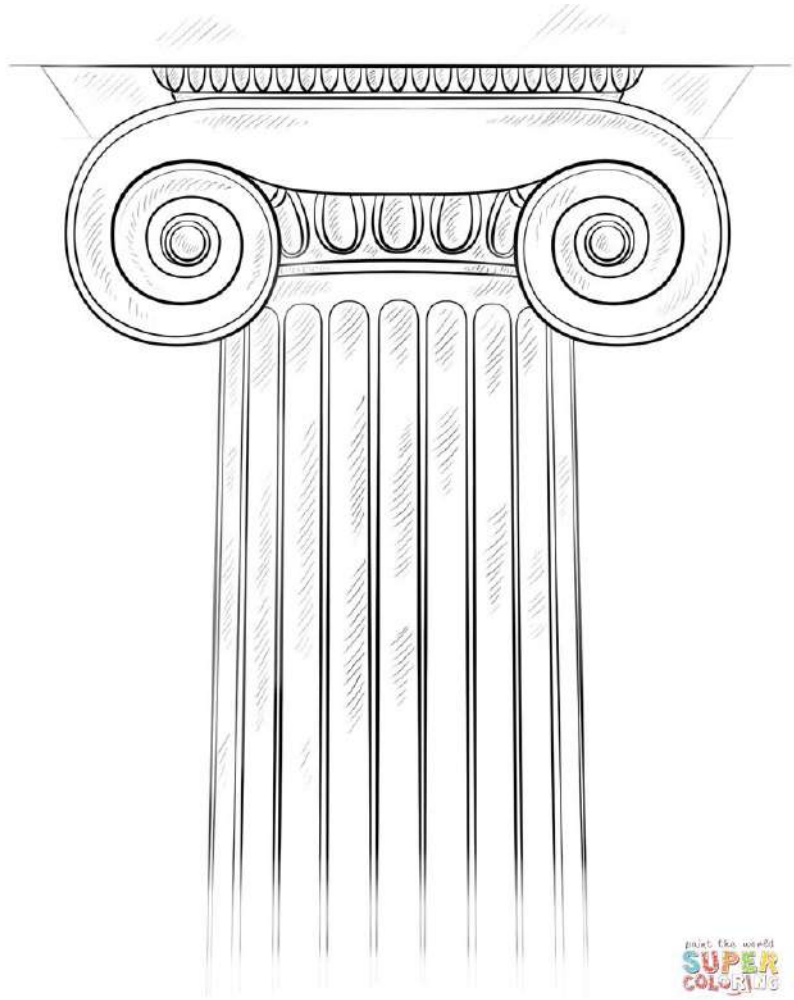
Communication



Dissemination



Valorization

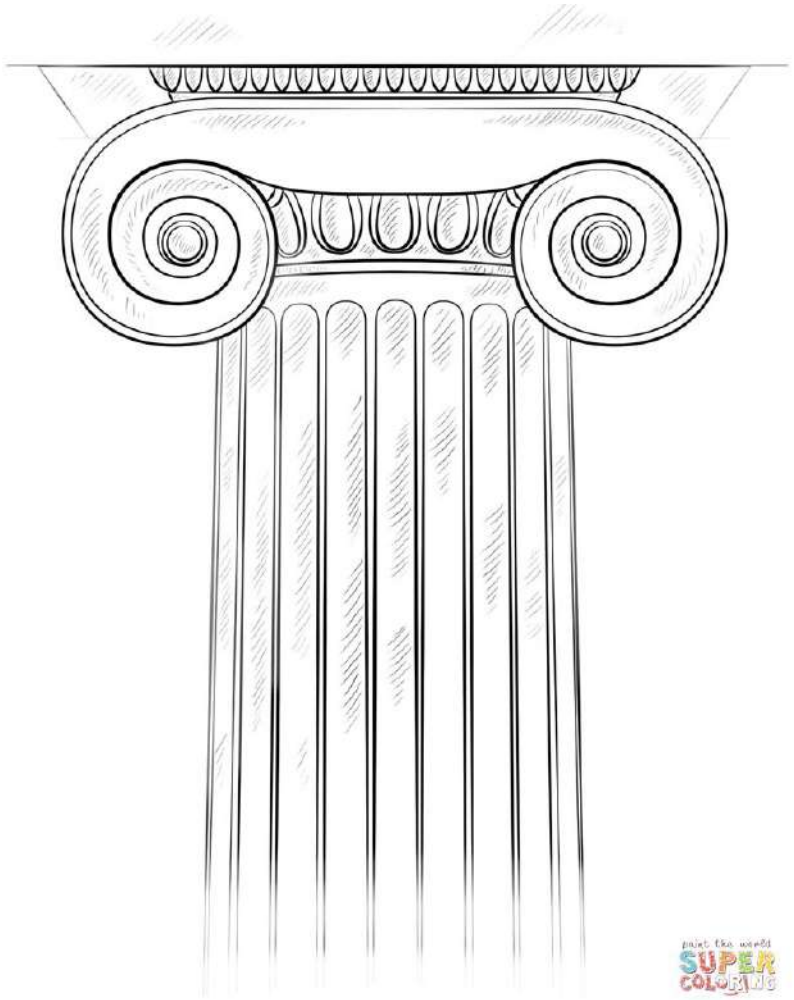


# 3 Pillars

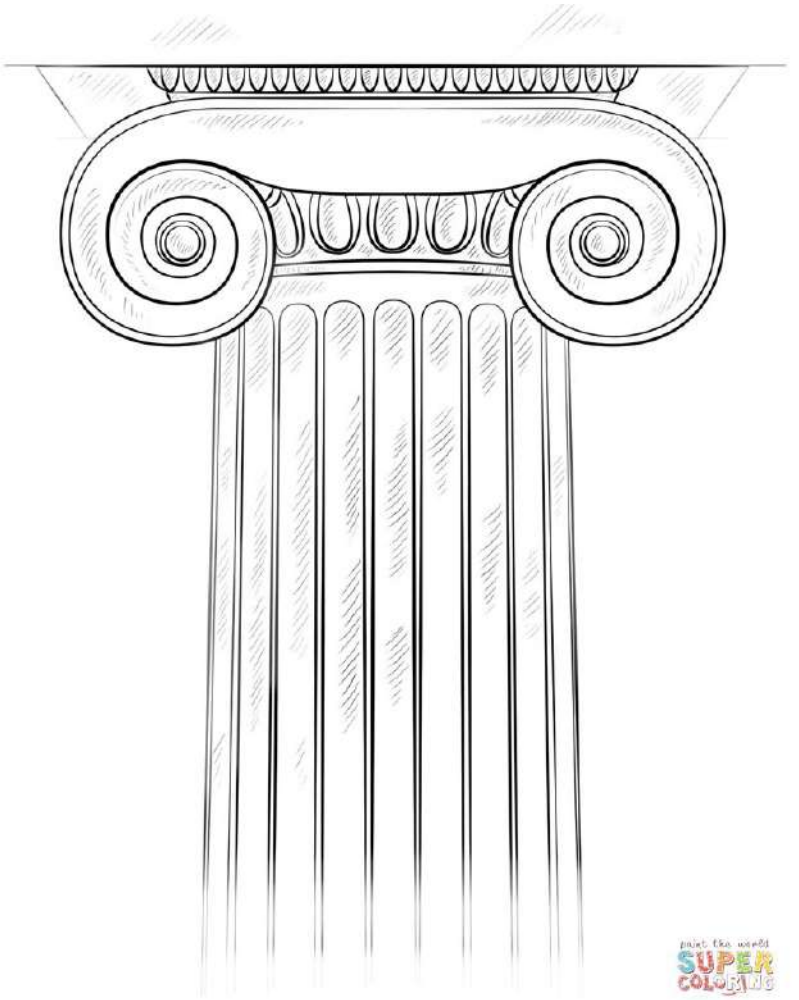
## Communication

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

## Dissemination



## Valorization



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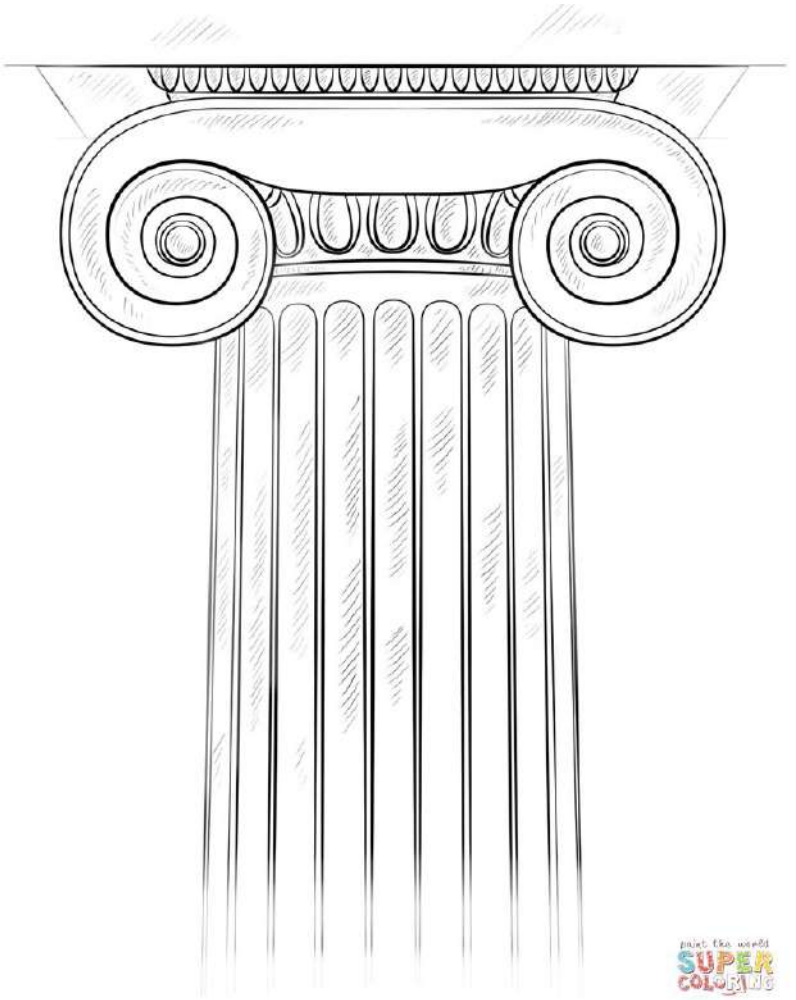
## Dissemination

Make research performed within groups in CA21106 and results obtained by joint efforts to reach high impact in the scientific community and funding agencies

## Valorization



# 3 Pillars

## Communication

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

## Dissemination

Make research performed within groups in CA21106 and results obtained by joint efforts to reach high impact in the scientific community and funding agencies

## Valorization

Attract Small and Medium Size Enterprises (SMEs) as well as funding agencies to support technological developments for WISPs related experiments

# Who can contribute

| Working group | Communication | Dissemination | Valorization |
|---|---|---|---|
| WG1<br>WISPs Model Building | ✓ | ✓ | |
| WG2<br>WISPs DM and Cosmology | ✓ | ✓ | |
| WG3<br>WISPs in Astrophysics | ✓ | ✓ | |
| WG4<br>Direct WISPs searches | ✓ | ✓ | ✓ |
| WG5<br>Dissemination and Outreach | ✓ | ✓ | |

NOT ONLY WG5!

# Communication strategy – implementation

| Deliverable | Title | Due date |
|---|---|---|
| | Setting on the webpage and a repository concerning the Action activities | 6 + periodic updates |
| | Video to introduce to general public the topics of the Action translated in different languages | 12 months + updates |
| | Twitter account to quickly communicate information related to the Action to general public | 6 months + maintainance |
| | Poster and brochure translated in different languages | 6 + periodic updates |
| | Outreach events at local level (Open Days, Science Weeks and the Night of Researchers) | minimum of twice per year |
| | Public talk in universities, research and cultural centres | each three months |
| | Games | twice per year |
| | Masterclasses for high school students | 18 months + updates |
| | Didactic material translated in different languages addressed to school of different levels | 12 months |

# Dissemination strategy - implementation

| 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 |

# Valorization strategy - implementation

| 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 |

# Meetings

- Kick-off meeting 23 – 24 Feb. 2023, Frascati LNF
  https://agenda.infn.it/event/33570/

  Public talk by Caterina Braggio about "Axion Searches with Quantum Technologies" (in Italian)

- Annual Conference 05 – 08 Sept. 2023, Bari (+Management Committee Meeting)
  https://agenda.infn.it/event/33570/

  Public talk by Andrea Caputo about "Dark Matter, Gravitational Wave and Black holes" (in Italian)


- Training School 11 – 14 Sept. 2023, Lecce
  https://agenda.infn.it/event/34190/

  37 registered students

# On-line Events and Communication

- Journal Club + presentation of ongoing projects
  Maria Benito Castano (Tartu Obs., EE)
  Michele Tammaro (Jozef Stefan Inst., SI)


- Monthly Online Colloqium
  Arturo de Giorgi (Inst. De Fis. Teor, ES)
  Giuseppe Lucente (Bari Univ., IT)
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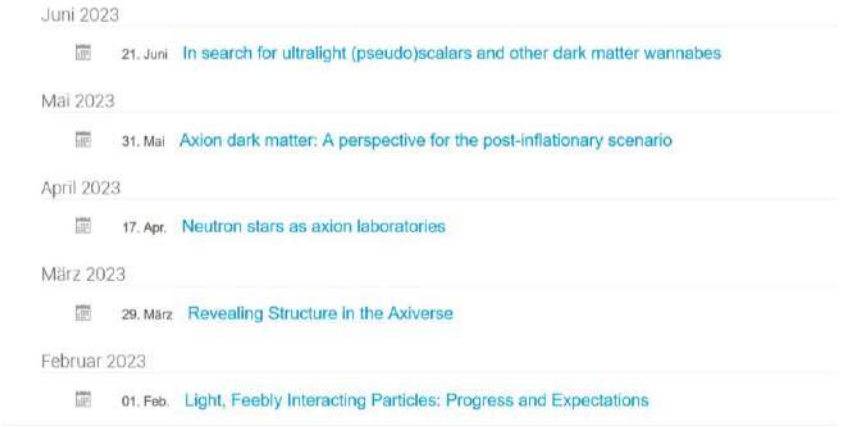
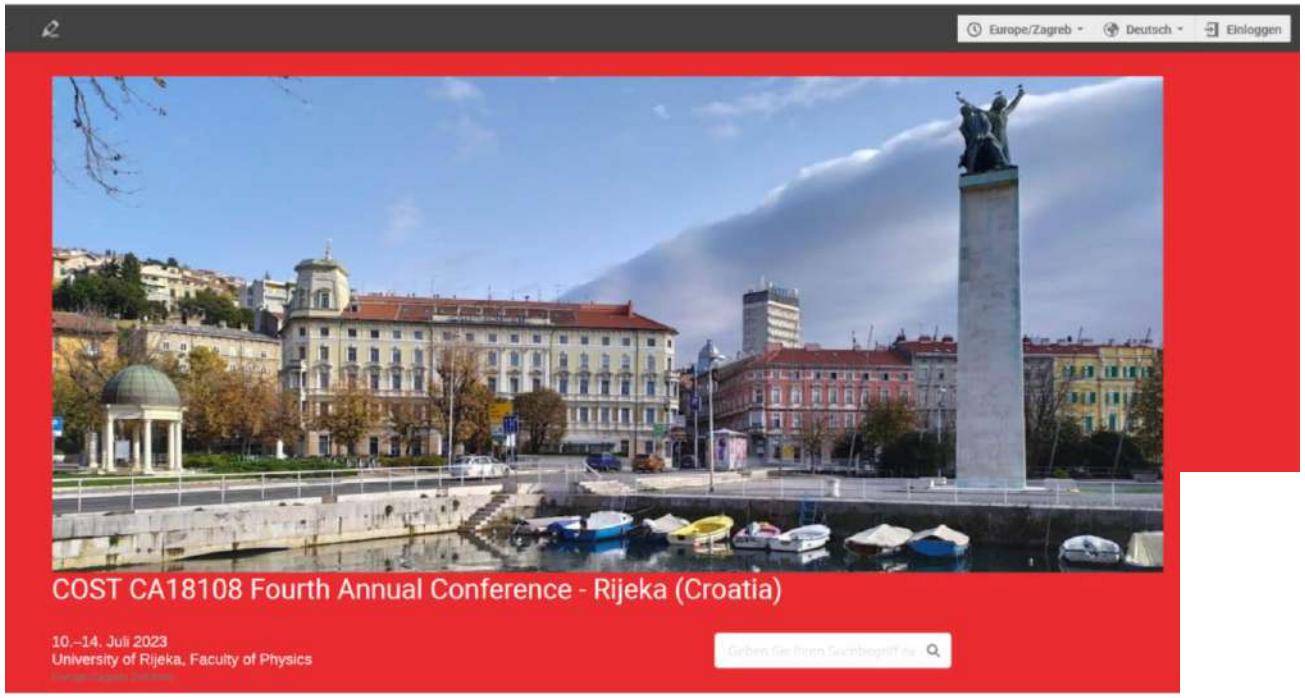



- Monthly e-mail with papers and events
  Damiano Fiorillo (NBI, Copenhagen, DK)
  Giovanni Grilli de Cortona (INFN, IT)

- Social media (Twitter)

- WG meeting about every month

- Presenting CA21106 and science at conferences
  4 Annual Meeting COST Action CA18108, 10-14 July 2023 Rijeka KR
  Marin Karuza “Cosmic WISPers“




https://indico.capa.unizar.es/event/31/

# COST ACTION CA21106

## COSMIC WISPers in the Dark Universe:

## Theory, astrophysics and experiments

Marin Karuza
Rijeka University

A talk completely dedicated to our COST Action!

Funded by the European Union

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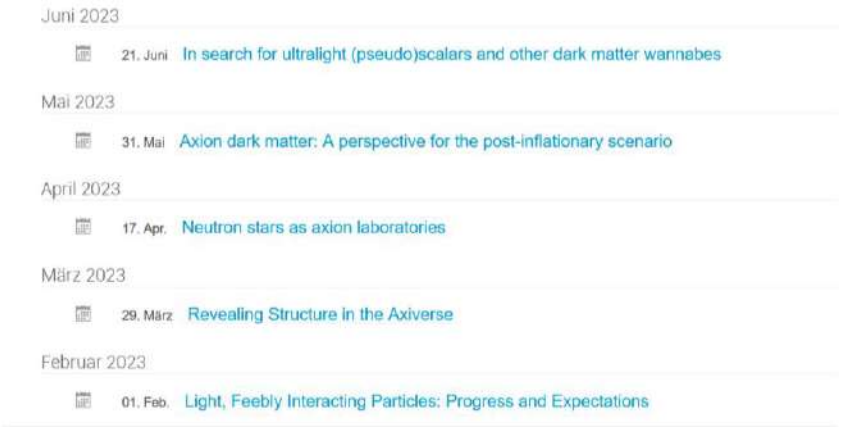


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  String Phenomenology 2023, 3-7 July 2023, Daejeon, South Korea
  Michele Cicoli “Ultra-light axions in string cosmology”


https://indico.cern.ch/event/1270020/

At the end of the scientific talks a dedicated slide for our COST Action!

DISSEMINATION GRANT

# COSMIC WISPers in the Dark Universe

- Relatively new COST action:
  Start: Oct 2022
  End: Sep 2026
- Website: https://www.cost.eu/actions/CA21106/
- Chair: Alessandro Mirizzi (Bari)
- Vice-chair: Francesca Calore (Annecy)
- Keywords: axion and hidden photon theory - axion dark matters searches
  axion and hidden photon astrophysics - axion and hidden photon experiments
- 5 Working Groups:
  WG1: WISPs Model Building – Michele Cicoli and Ilaria Brivio
  WG2: WISPs Dark Matter and Cosmology – Vitagliano and Redondo
  WG3: WISPs in Astrophysics – Caputo and Straniero
  WG4: Direct WISPs Searches – Gatti and Karuza
  WG5: Dissemination and Outreach – Mena and Gastaldo
- Activities:
  i) Kick-off Meeting, 23-24 Feb 2023, Frascati
  ii) 1st General Meeting, 5-8 Sep 2023, Bari
  iii) 1st Training School, 11-14 Sep 2023, Lecce
  iv) Monthly WG online meetings
- Funding for:
  Short term scientific missions, Workshops, PhD Schools, ……

→ Apply online to join WG1 + another WG (if interested)!

Funded by the European Union

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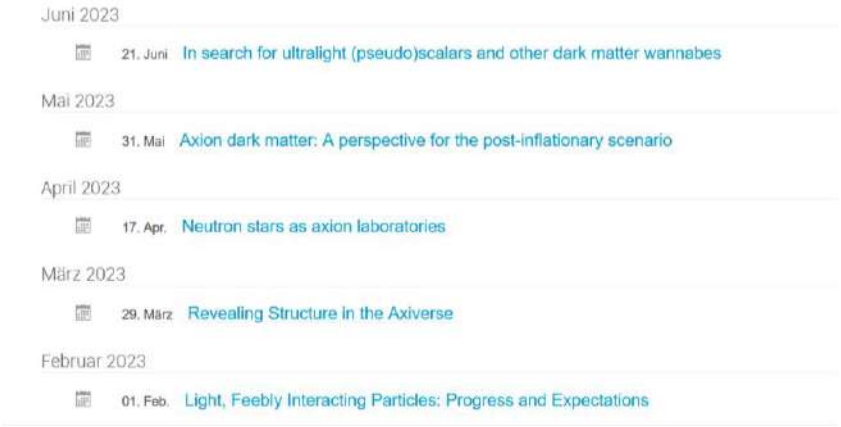


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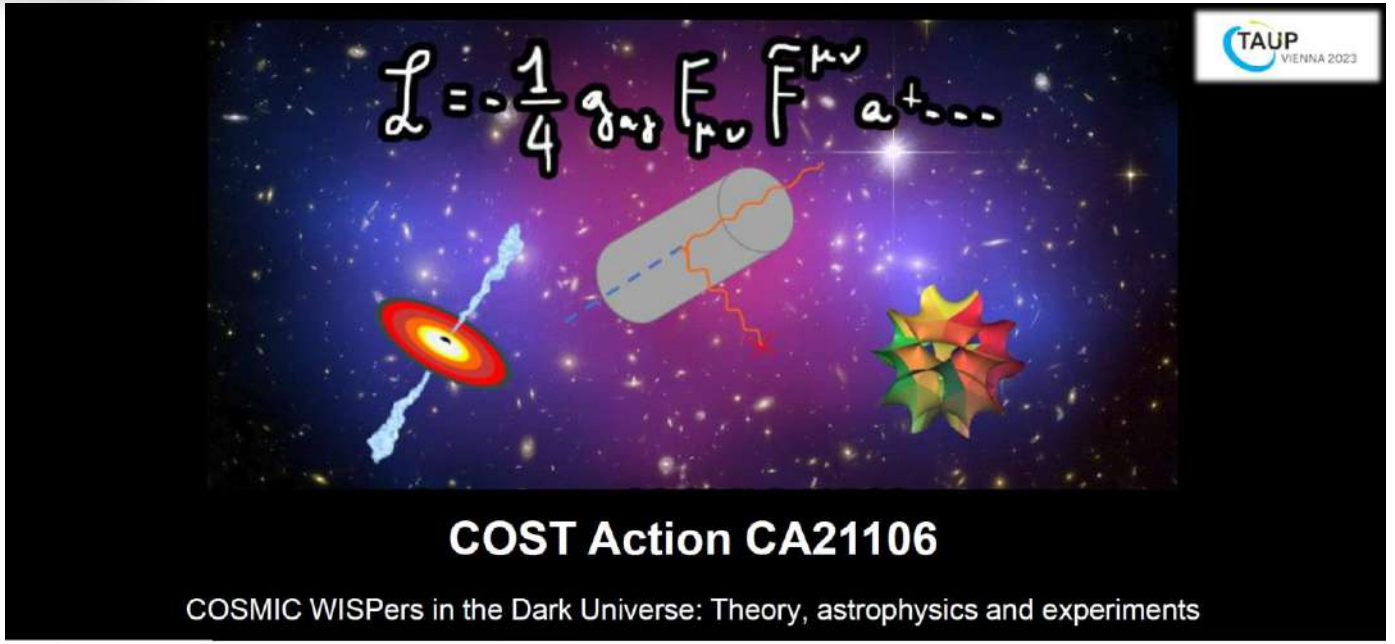
  TAUP 2023, 28 August – 1 September 2023, Vienna, AT
  Loredana Gastaldo “COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments”


https://indico.cern.ch/event/1199289/

Talk fully dedicated to CA21106 with focus on outreach




Loredana Gastaldo
Kirchhoff Institute for Physics
Heidelberg University

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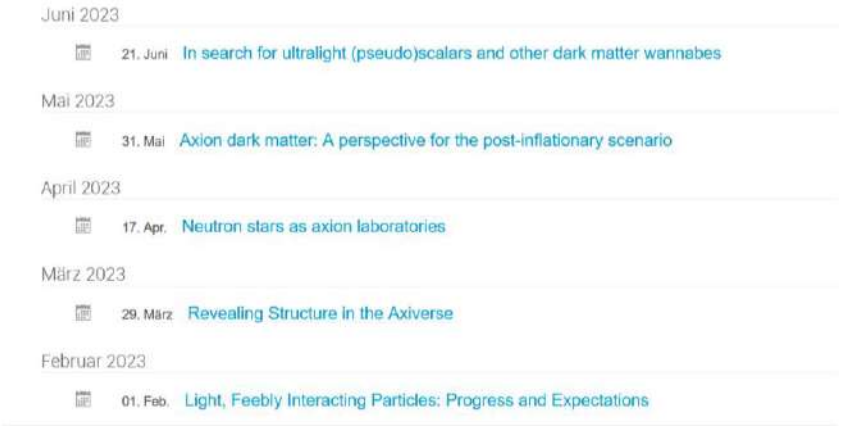


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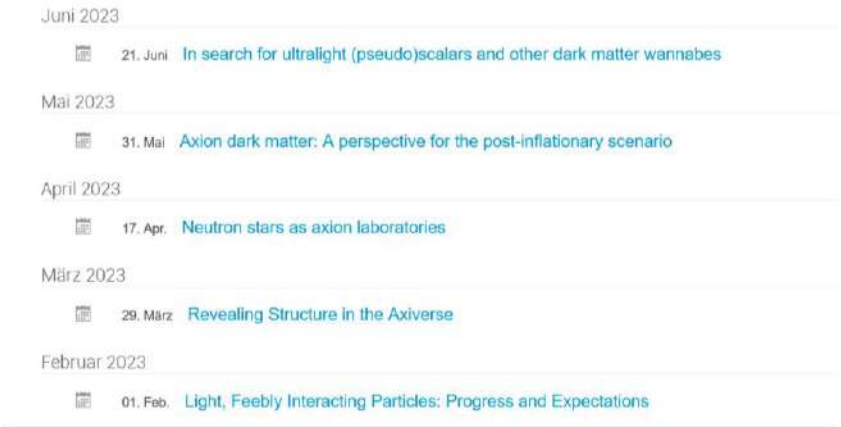


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- 1st Training School COST Action COSMIC WISPers (CA21106)

  "Topics in science communication". Lecturer: Giuliana Galati (Bari Univ.).

# Communication Material

## Webpage

https://cosmicwispers.eu/


## Poster & Brochure


# Communication Material

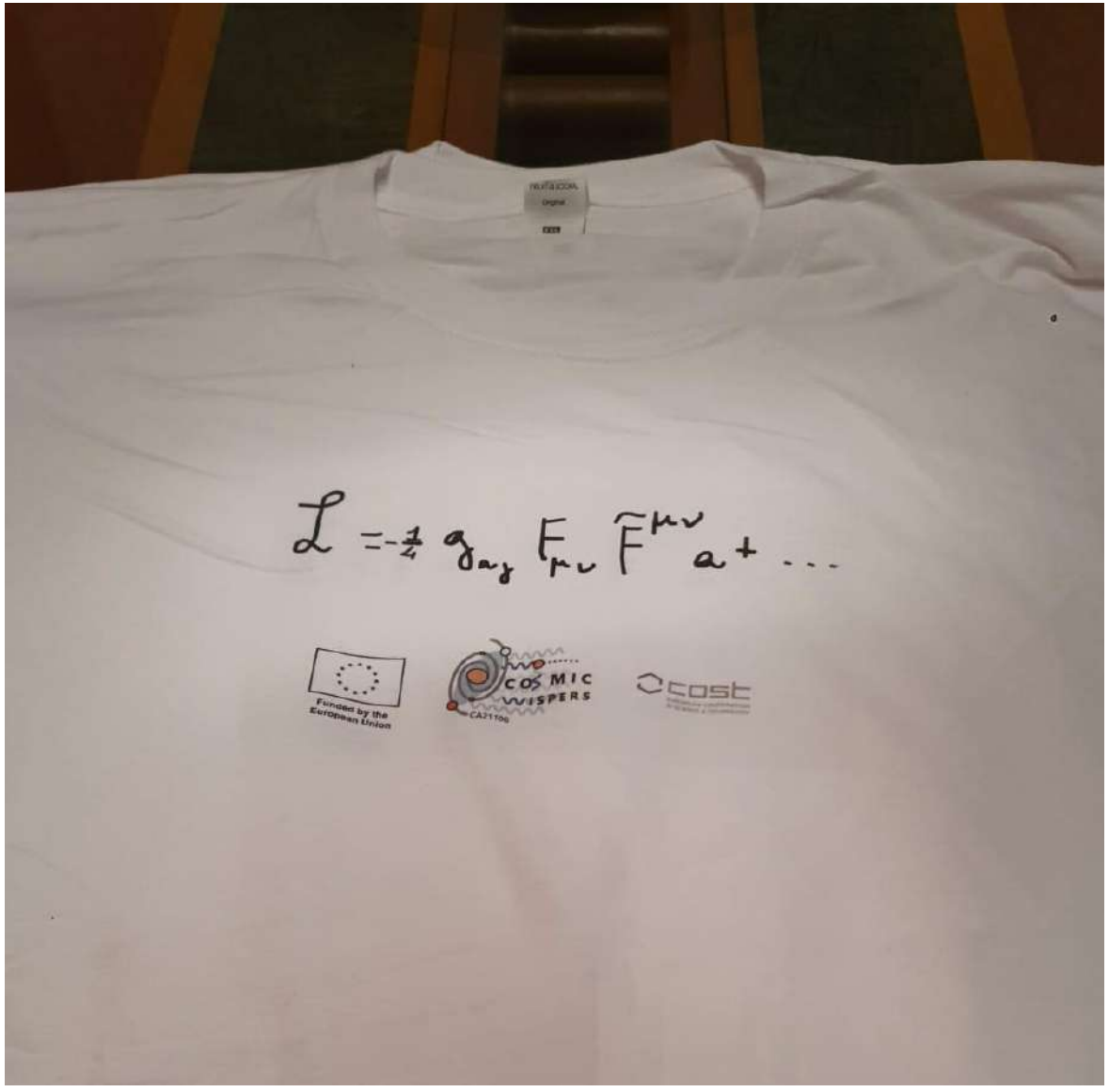
## @ TAUP 2023


## Poster & Brochure


# New ideas 1

We have wonderful T-shirt
every axion-friend would like to have one

→ monthly quiz on WISP on CA21106 webpage
one person among those with correct answer
will be extracted
(Accumulation is not foreseen)



# New ideas 2

How to reach school

Competition with xx EUR prize to buy a scientific instrument for the school

possible topics

- prepare a short video on axion detection
- prepare a comics on axion detection

The winner will have the project posted on the webpage (or we could consider to post all….)


Symmetry Magazine

# Outlook

- We have a Science Communication Plan
- Many Communication and Dissemination items have been covered over the last months
- New ideas for outreach have been presented
- We welcome more ideas

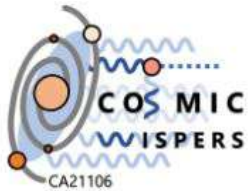
Don’t lose and occasion to acknowledge CA21106

# Grant Awarding Committee review

Venelin Kozhuharov
for the
Faculty of Physics, Sofia University

2nd Management Committee Meeting of COST Action COSMIC WISPers (CA21106)
8 September 2023
Centro Polifunzionale Studenti, Bari (Italy).



# Structure

- María Benito Castaño, Estonia, young scientist (ITC)
- Andrea Caputo, CERN - Switzerland, young scientist
- Iuliu-Calin Lazaroiu, România, (ITC)
- Serkant Cetin, Türkiye, (ITC)
- Venelin Kozhuharov, Grant Awarding Coordinator, Bulgaria (ITC)

Majority of the ITC members!

40 % young scientists, 80 % ITC …

Decisions based on voting (not on agreement), equal weight of the vote of each member

# Grant types

- Short-Term Scientific Mission grant
  - Support the mobility of scientists, evaluated on quantized basis
  - Evaluations on quantized basis
- ITC Conference grant
  - Participation of members from ITC in events
  - Evaluated continuously,
- Dissemination Conference grant
  - Represent the action activities at high profile conferences
  - Prerogative of Action Chair approval
- Virtual Networking Support
- Virtual Mobility grant

**Apply for grants: https://e-services.cost.eu/activity/grants/add**

# Decision policy

https://e-services.cost.eu/evoting/vote/cfb2045f-43cb-4a95-8e48-272533064bfe/documents/907/download

- Aimed for transparent decision policy, documented as much as possible

Guiding principles for the procedure and application for grants and schools
within
COST action CA21106

**COSMIC WISPers in the Dark Universe**

**Grant Evaluation Committee**

- So far we considered only **eligibility** on the basis of Grant Awarding Committee decision

**Evaluation criteria and scoring table for STSM**

| Criteria | Range | Score |
|---|---|---|
| I. Eligibility | | |
| 1. Is the scientific topic of the application within the scope of the action? | Yes/No | |
| 2. Is the applicant a member of a working group from 1 to 4? | Yes/No | |
| II. Reference letters | | |
| 3. Evaluation of the reference letter | 0 - 5 points | |
| III. Scientific quality | | |
| 4. Capacity of the proposed activity to enlarge the research group potential | 0 - 5 points | |
| 5. Quality of the research proposal | 0 - 5 points | |
| 6. CV of the candidate | 0 - 5 points | |
| IV. Budget | | |
| 7. Is the budget prepared with detailed expenses breakout? | 0 - 5 points | |
| 8. Are all foreseen expenses justified? | 0 - 5 points | |

# Applications

- Short-Term Scientific Mission grant

| Session | Number of applications | Approved |
|---|---|---|
| **I** | **3** | **2** |
| **II** | **5** | **3** |
| **III** | **1** | **1** |

Success rate: 66 %

STSM funds: 11500

- ITC Conference grant
  - 2 applications, 1 successful
- Dissemination Conference grant
  - 1 application, 1 approved

ITCG funds: 850

DCG funds: 1250

**Total funds: 13600 euro**

# School participation

- Considered also as part of the grant awarding to individual participants
- A selection procedure developed to choose the successful candidates
  - Aimed to be applied
- For this year the evaluation was based only on **eligibility**
  - due to limited number of applicants
- To be tested next year?

**Addendum 3**

**Evaluation criteria and scoring table for schools**

| Criteria | Range | Score |
|---|---|---|
| I. Eligibility | | |
| 1. Is the scientific topic of the application within the scope of the action? | YES/NO | |
| 2. Does the applicant come from an eligible country? | YES/NO | |
| II. Reference letters | | |
| 3. Evaluation of the reference letter | 0 - 10 points | |
| III. Impact | | |
| 4. Capacity of school to impact the applicant's career | 0 - 5 points | |
| 5. Quality of the motivation letter | 0 - 10 points | |
| 6. CV of the candidate | 0 - 10 points | |
| 7. Plan for scientific contribution of the applicant to the school, when applicable (oral presentation - 5 points, poster - 3 points, no contribution - 0 points; other forms of contribution - judged by the Grant Evaluation Committee) | 0 - 5 points | |

# Conclusions: Grant procedure

- Insufficient interest during the first year
  - Information distribution?
  - Pushing young scientists to apply?
  - Selection of conferences to suggest to young researchers from ITC?
  - something else?
    - The more the applicants, the more the work :)
- A (quasi-working) procedure for grant evaluations established
  - democratic, open vote, but will not disclose the individual votes outside the committee
  - the vote is final and is not changed by the Grant Awarding Coordinator (even in the case of complains)
- Experience of the Grant Evaluation Committee
  - we also learn on the fly, hopefully we will be better next year :)

Apply for grants: https://e-services.cost.eu/activity/grants/add

Bari, 8th September 2023

# Early Career Investigators Committee Report

Pierluca Carenza
Stockholm University, OKC

# Colloquia

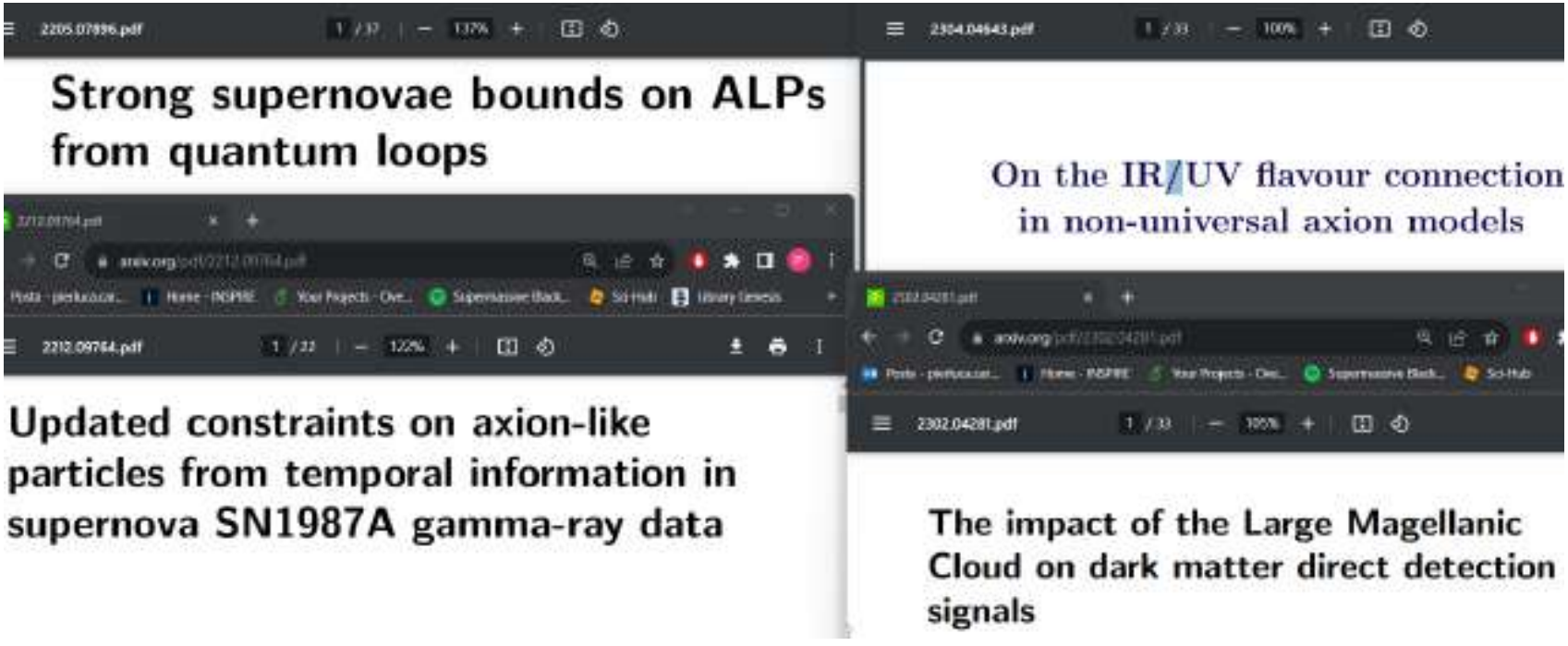
Arturo De Giorgi, Giuseppe Lucente

- *Feb. 1.* Light, Feebly Interacting Particles: Progress and Expectations
  **Maurizio Giannotti**
- *Mar. 29.* Revealing Structure in the Axiverse
  **Liam McAllister**
- *Apr. 17.* Neutron stars as axion laboratories
  **Samuel Witte**
- *May 31.* Axion dark matter: A perspective for the post-inflationary scenario
  **Kenichi Saikawa**
- *Jun. 21.* In search for ultralight (pseudo)scalars and other dark matter wannabes
  **Dmitry Budker**

# Journal Club

María Benito Castano, Michele Tammaro

Monthly meeting to discuss interesting papers



# Newsletter

## Damiano Fiorillo, Giovanni Grilli di Cortona

Monthly update on physics and beyond

Just an extract...

- "**Supernova Simulations Confront SN 1987A Neutrinos**," - D. F. G. Fiorillo, M. Heinlein, H.-T. Janka, G. Raffelt, E. Vitagliano, arXiv:2308.01403 [hep-ph]

We return to interpreting the historical SN 1987A neutrino data from a modern perspective. We construct a suite of spherically symmetric supernova models, using four different equations of state and five choices of final baryonic neutron-star (NS) mass. Our models include muons and proto-neutron star (PNS) convection. Our models generally show compatibility with the combined data of the four relevant experiments, IMB, Kam-II, BUST, and LSD, although IMB alone favors a NS mass of 1.7-1.8 solar masses, while Kam-II alone favors a mass around 1.4 solar masses. Due to PNS convection and nucleon correlations in the neutrino opacities, the predicted PNS cooling time is of 5-9 s, in conflict with late event bunches in Kam-II and BUST after 8-9 s. Speculative interpretations include the onset of fallback of transiently ejected material onto the NS, a late phase transition in the nuclear medium, or other effects adding to the standard PNS cooling emission.

- "**Search for environment-dependent dilatons**," - Hauke Fischer, Christian Käding, René I. P. Sedmik, Hartmut Abele, Philippe Brax, Mario Pitschmann, arXiv: 2307.16243[hep-ph]

The environment-dependent dilaton field is a well-motivated candidate for dark energy and naturally arises in the strong coupling limit of string theory. We present the very first experimental constraints on the parameters of this model. For this, we employ data obtained from the qBounce collaboration and the Lunar Laser Ranging (LLR) experiment. Furthermore, we forecast expected exclusion plots for the Casimir And Non Newtonian force EXperiment (CANNEX) soon to be realized in an improved setup.

**PhD/Postdoc/Junior Positions**

- **September:**
  - Postdoctoral position in particle physics (Belle-II), Strasbourg IPHC, France, link (deadline September 30th)
  - Research Fellow in HEP and Quantum computing, U. Southampton, UK, link (deadline September 15th)
  - PostDoc on the application of Machine Learning to particle Physics, OAW, Vienna, Austria, link (deadline September 15th)
  - Call for Expression of interest: tenure track positions in physics, IST Lisbon, Portugal, link (deadline September 22nd)
- **October:**
  - Arnold Fellowships and Landau Fellowships in Physics and Mathematics, London Institute for Mathematical Sciences, UK, link (deadline October 1st)
  - Research fellowships, Liverpool U., UK, link (deadline October 1st)
  - Postdoc position in theoretical physics, IFT Madrid, Spain, link (deadline October 5th)
  - Junior professorship in Theoretical Physics, KIT, Karlsruhe, Germany, link (deadline October 15th)
  - Tenure track assistant professorship, Eotvos U., Budapest, Hungary, link (deadline October 15th)
- **November:**
  - Postdoc in Theoretical Particle Physics, Stefan Inst., Ljubljana, Slovenia, link (deadline November 5th)

**Conferences:**

- **September:**
  - 1st General meeting of COST Action COSMIC WISPers link
  - Particle Avenues in the Dark Universe Arena link
  - TeVPA 2023 link
  - 1st training school of COST Action COSMIC WISPers link
  - Light Dark World 2023 link

Send paper to Damiano & Giovanni to be advertised

# Social media

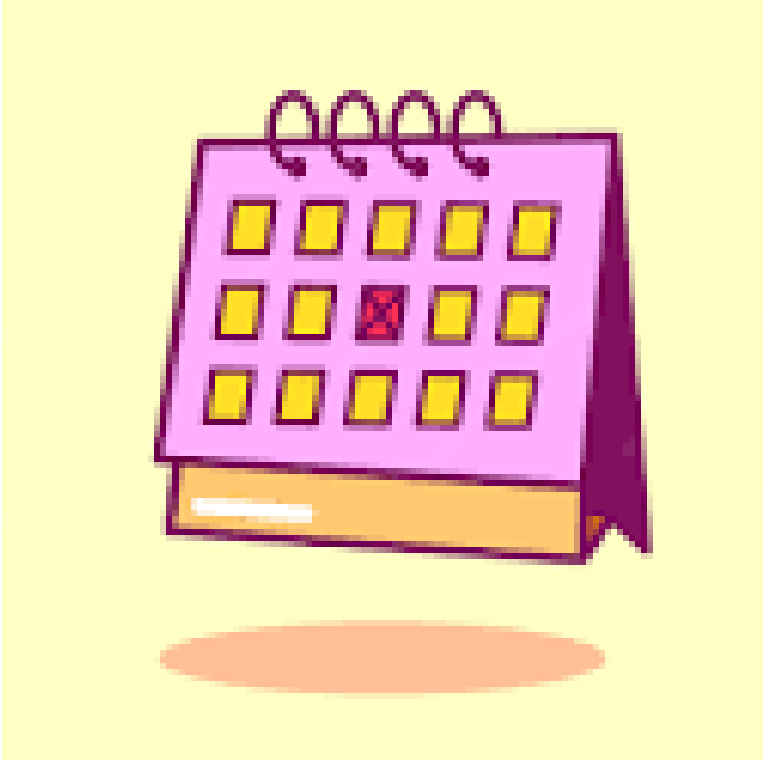
Giuseppe Lucente, Mario Reig

On twitter: cosmicwispers

# Role of these initiatives

- Run daily activities to consolidate a community
- Inform all of us of what's going on
- Drive the interests towards studies with a bright future

# For next year



- Collaboration for outreach activities
- Extend the network

# Discussion time

# Implementation of the COST Excellence and Inclusiveness Policy

Deniz Sunar Cerci
Adiyaman University, Turkiye and
CERN, Switzerland



September 8, 2023

# Excellence and inclusiveness

- COST is committed to bringing out excellence and inclusiveness in science Europe-wide and clearing away obstacles by offering low-barrier entry research networks and creating interdisciplinary research cooperation opportunities for researchers.
- The COST inclusiveness policy is developed around three main elements:
  1. Geographical spread: with a focus on less research-intensive countries and regions (in COST these are known as the ITC countries)
  2. Career stage: involving young researchers,
  3. Gender balance.

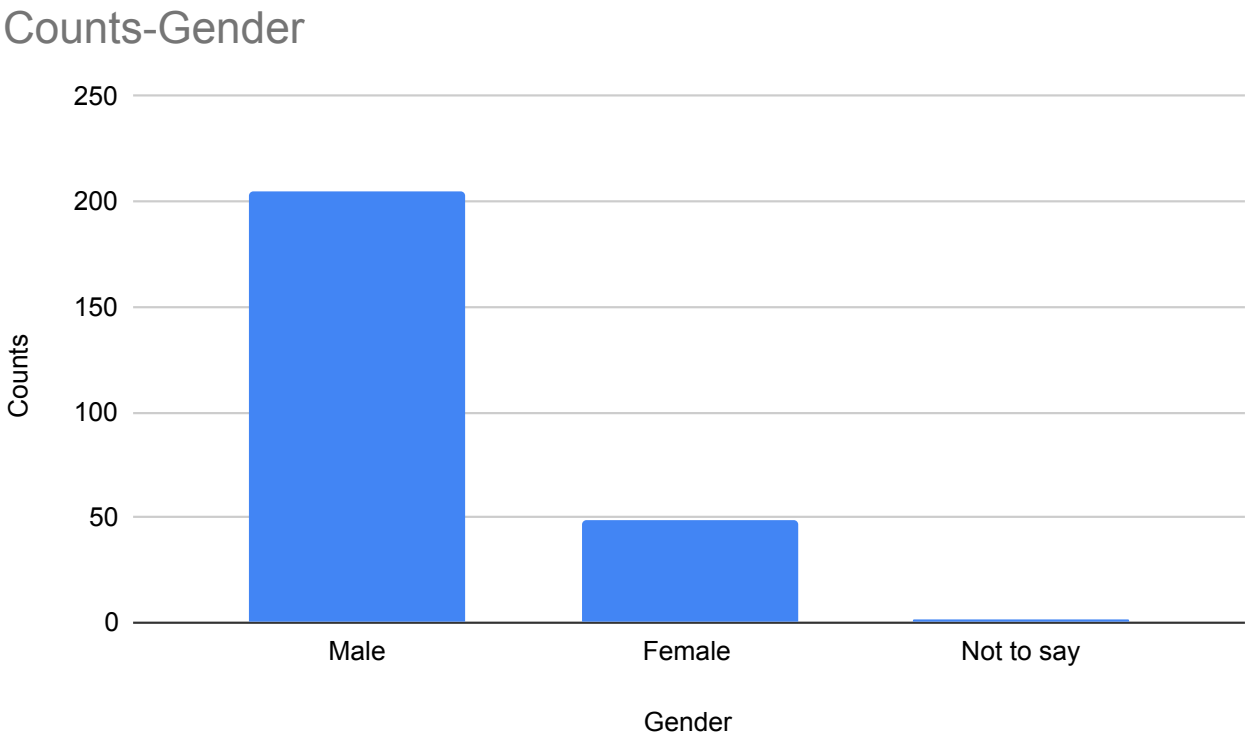
# COST inclusiveness objectives

- Identifying excellence in science and technology across Europe increasing research communities' access to funding and infrastructures triggering structural changes in Members' national research systems The career spread focuses on empowering young talents at the beginning of their careers to acquire the necessary recognition and leadership.
- COST Actions will focus on: leadership: encouraging young researchers to set up and lead COST Actions, as well as manage COST Action grants increasing brain circulation between peripheral regions to research intensive territories.

# Where are we with all these?

- This is our action's objective: Capacity Building 1: Promote the gender balance of the Action, favoring more women in leading positions.
- Geographical spread: 256 participants
- List of MC participants :
  COST members represented: 25, ITC countries: 13
  **Total number of MC participants: 41 (9 women, 18%)**
- 14 Leadership positions: 3 from ITC countries, 4 ECI, 5 women (35%)

# Gender balance

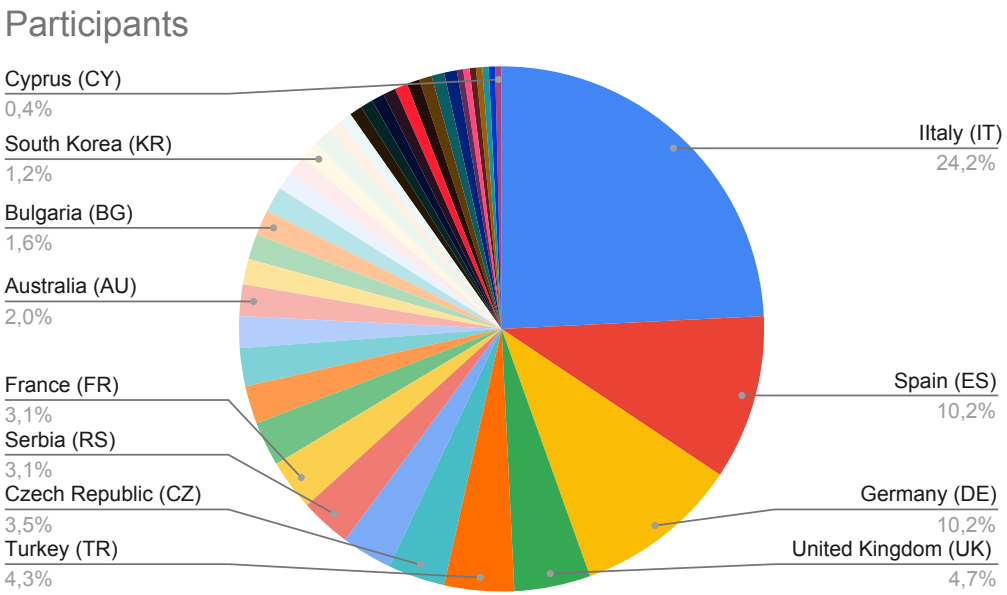



- We have 256 people registered to our action.
  Males: 80.08%
  Females: 19.14%
  Prefer Not to Say: 0.78%

# Analysis of Gender imbalance

- A majority of the participants are male!
- There is an underrepresentation of females in your action compared to males.
- Ultimately, these numbers indicate a clear gender imbalance in our action, with a majority of male participants.
- Depending on our goals and objectives, we need to consider strategies to encourage greater gender diversity and inclusion in our initiative.

# Geographical spread




- 256 people from 40 different countries, from Europe, Asia, North America, South America and Oceania.
- COST Full Member: 228
  International Partner: 21
  Near Neighbour Country: 2
- Inclusiveness Target Countries (ITC): 67

- Leadership: we need to encourage researchers and institutions in ITCs
- Dedicate a certain amount of activities/budget involving researchers from ITCs

# ANNEX 2

| CTRY * | Firstname | Lastname | Presence |
|---|---|---|---|
| IT | Alessandro | Mirizzi | in person |
| FR | Francesca | Calore | no |
| AT | Josef | Pradler | online |
| AT | Philipp | Haslinger | no |
| CY | Constantia | Alexandrou | no |
| CZ | Stepan | Kunc | in person |
| DE | Loredana | Gastaldo | in person |
| DE | Babette | Doebrich | no |
| ES | Igor | García Irastorza | online |
| ES | Olga | Mena | no |
| EE | Martti | Raidal | online |
| EE | María | Benito Castaño | in person |
| AL | Mimoza | Hafizi | in person |
| FR | Francesca | Calore | no |
| FR | Pierre | Pugnat | no |
| UK | Joseph | Conlon | in person |
| UK | Clare | Burrage | online |
| HU | Attila | Krasznahorkay | in person |
| HR | Marin | Karuza | in person |
| IT | Maria Paola | Lombardo | in person |
| IT | Claudio | Gatti | no |
| IL | Marco | Gorghetto | online |
| IL | Edoardo | VITAGLIANO | in person |
| MT | Kristian | Zarb Adami | no |
| NO | Michael | Kachelriess | in person |
| NL | Christoph | Weniger | online |
| PT | Michele | Gallinaro | in person |
| RO | Sabin | Stoica | no |
| RO | Iuliu-Calin | Lazaroiu | no |
| SE | David | Marsh | online |
| SI | Miha | Nemevšek | in person |
| SI | Jernej | Fesel Kamenik | delegate Lorenzo Ubaldi in person |
| TR | Serkant | Cetin | no |

| | | | |
|---|---|---|---|
| TR | Salim | CERCI | in person |
| BG | Venelin | Kozhuharov | in person |
| CH | Nicholas | Rodd | no |
| CH | Andrea | Caputo | in person |
| RS | Zoran | Grujić | in person |
| RS | Natasa | Trisovic | online |
| DK | Manuel | Meyer | online |

| | | |
|---|---|---|
| Deniz Sunar | Cerci | online |
| Straniero | Oscar | online |
| Stuebner | Ralph | online |

| Nome (nome originale) | Email dell'utente | Ora di entrata | Ora di uscita | Durata (minuti) | Guest | In sala d'attesa |
|---|---|---|---|---|---|---|
| **Alessandro Mirizzi** | alessandro.mirizzi@gmail.com | 09/08/2023 05:42:54 AM | 09/08/2023 10:30:16 AM | 288 | No | No |
| **Igor Garcia Irastorza** | | 09/08/2023 05:42:56 AM | 09/08/2023 08:47:05 AM | 185 | Sì | No |
| **Clare Burrage** | | 09/08/2023 05:42:59 AM | 09/08/2023 08:46:09 AM | 184 | Sì | No |
| **Manuel Meyer** | | 09/08/2023 05:43:00 AM | 09/08/2023 06:53:33 AM | 71 | Sì | No |
| **Ilaria Brivio** | | 09/08/2023 05:43:04 AM | 09/08/2023 07:27:09 AM | 105 | Sì | No |
| **Oscar Straniero** | | 09/08/2023 05:43:05 AM | 09/08/2023 08:46:42 AM | 184 | Sì | No |
| **COST Ralph Stuebner (rstuebner)** | | 09/08/2023 05:43:09 AM | 09/08/2023 08:19:26 AM | 157 | Sì | No |
| **Babette Döbrich (bdobrich)** | | 09/08/2023 05:43:11 AM | 09/08/2023 06:02:48 AM | 20 | Sì | No |
| **Josef Pradler** | | 09/08/2023 05:43:20 AM | 09/08/2023 05:55:06 AM | 12 | Sì | No |
| **TR-Deniz Sunar Cerci (Deniz Sunar Cerci)** | | 09/08/2023 05:43:23 AM | 09/08/2023 09:32:53 AM | 230 | Sì | No |
| **TR Salim Cerci (Salim Cerci)** | | 09/08/2023 05:43:39 AM | 09/08/2023 08:46:13 AM | 183 | Sì | No |
| **Martti Raidal** | | 09/08/2023 05:44:30 AM | 09/08/2023 06:14:50 AM | 31 | Sì | No |
| **David Marsh - Sweden (David Marsh)** | | 09/08/2023 05:46:44 AM | 09/08/2023 06:09:13 AM | 23 | Sì | No |
| **Christoph Weniger (Christoph W)** | | 09/08/2023 05:47:02 AM | 09/08/2023 07:29:28 AM | 103 | Sì | No |
| **Serkant Ali Çetin** | | 09/08/2023 05:47:10 AM | 09/08/2023 05:47:28 AM | 1 | Sì | No |
| **Loredana Gastaldo** | | 09/08/2023 05:47:15 AM | 09/08/2023 10:30:11 AM | 283 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 05:49:28 AM | 09/08/2023 05:49:57 AM | 1 | Sì | No |
| **Josef Pradler** | | 09/08/2023 05:55:24 AM | 09/08/2023 07:09:32 AM | 75 | Sì | No |
| **Natasa Trisovic** | | 09/08/2023 06:01:59 AM | 09/08/2023 07:39:22 AM | 98 | Sì | No |
| **David Marsh - Sweden** | | 09/08/2023 06:09:27 AM | 09/08/2023 06:11:19 AM | 2 | Sì | No |
| **Marco Gorghetto** | | 09/08/2023 06:15:27 AM | 09/08/2023 06:30:45 AM | 16 | Sì | No |
| **David Marsh** | | 09/08/2023 06:18:43 AM | 09/08/2023 06:21:20 AM | 3 | Sì | No |
| **David Marsh** | | 09/08/2023 06:21:20 AM | 09/08/2023 06:27:27 AM | 7 | Sì | No |
| **Marco Gorgheggi** | | 09/08/2023 06:34:09 AM | 09/08/2023 06:35:19 AM | 2 | Sì | No |
| **46855378597** | | 09/08/2023 06:35:23 AM | 09/08/2023 06:43:50 AM | 9 | Sì | No |
| **Marco Gorghetto** | | 09/08/2023 06:35:34 AM | 09/08/2023 07:18:30 AM | 43 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 06:44:51 AM | 09/08/2023 06:45:43 AM | 1 | Sì | No |

| | | | | | | |
|---|---|---|---|---|---|---|
| **46855378597** | | 09/08/2023 06:46:12 AM | 09/08/2023 06:49:58 AM | 4 | Sì | No |
| **46855378597** | | 09/08/2023 06:54:04 AM | 09/08/2023 06:54:44 AM | 1 | Sì | No |
| **Serkant Ali Çetin** | | 09/08/2023 06:55:26 AM | 09/08/2023 10:06:12 AM | 191 | Sì | No |
| **David Marsh** | | 09/08/2023 06:56:22 AM | 09/08/2023 07:26:55 AM | 31 | Sì | No |
| **marco.gorghetto@weizmann.ac.il** | | 09/08/2023 07:18:08 AM | 09/08/2023 07:49:26 AM | 32 | Sì | No |
| **David Marsh** | | 09/08/2023 07:26:42 AM | 09/08/2023 07:28:48 AM | 3 | Sì | No |
| **Ilaria Brivio** | | 09/08/2023 07:33:27 AM | 09/08/2023 08:31:13 AM | 58 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 07:39:46 AM | 09/08/2023 07:40:05 AM | 1 | Sì | No |
| **Josef Pradler** | | 09/08/2023 07:39:51 AM | 09/08/2023 09:32:26 AM | 113 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 07:46:01 AM | 09/08/2023 07:47:14 AM | 2 | Sì | No |
| **Marco Gorghetto** | | 09/08/2023 07:48:32 AM | 09/08/2023 09:06:27 AM | 78 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 08:03:56 AM | 09/08/2023 08:16:51 AM | 13 | Sì | No |
| **COST Ralph Stuebner** | | 09/08/2023 08:19:32 AM | 09/08/2023 08:46:12 AM | 27 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 08:24:43 AM | 09/08/2023 09:07:29 AM | 43 | Sì | No |
| **TR Salim Cerci (Salim Cerci)** | | 09/08/2023 08:47:19 AM | 09/08/2023 09:35:37 AM | 49 | Sì | No |
| **marco.gorghetto@weizmann.ac.il** | | 09/08/2023 09:06:27 AM | 09/08/2023 09:51:19 AM | 45 | Sì | No |
| **Mimoza's iPhone** | | 09/08/2023 09:35:27 AM | 09/08/2023 09:52:47 AM | 18 | Sì | No |
| **David Marsh** | | 09/08/2023 06:27:34 AM | 09/08/2023 06:28:56 AM | 2 | Sì | No |
| **David Marsh** | | 09/08/2023 07:29:46 AM | 09/08/2023 10:03:30 AM | 154 | Sì | No |

# ANNEX 3

# Work And Budget Plan

**CA21106 Grant Agreement Period 2**
01/11/2023 to 31/10/2024

## Action Profile

### Action General Information

| | | | |
|---|---|---|---|
| Action Code | CA21106 | MC Chair | Prof Alessandro Mirizzi |
| Action Title | CA21106 - COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments | | |
| MOU | 020/22 | Draft MOU | OC-2021-1-25120 |
| CSO Approval Date | 2022-05-27 | | |
| Action Start Date | 03/10/2022 | Action End Date | 02/10/2026 |
| Science Officer | Dr Ralph Stuebner | Administrative Officer | Ms Rose Cruz Santos |

### Participation in the Action:

| Number of | COST Full or Cooperating Members | | COST Partner Members | Specific Organisations | Near Neighbour Countries | Third States | Total |
|---|---|---|---|---|---|---|---|
| **Countries** | | | | | | | |
| COST Members / Specific Organisations represented in the MC | 25 | | 0 | 0 | n.a. | n.a. | 25 |
| | ITC | 52% | | | | | |
| | Non-ITC | 48% | | | | | |
| Countries represented in the Working Groups | 30 | | 0 | 0 | 1 | 9 | 40 |
| | ITC | 53% | | | | | |
| | Non-ITC | 47% | | | | | |
| **Individuals** | | | | | | | |
| Nominated MC Members / MC Observers | 38 | | 0 | 0 | n.a. | n.a. | 38 |
| | ITC | 47% | | | | | |
| | Non-ITC | 53% | | | | | |
| Approved Working Group members | 229 | | 0 | 0 | 2 | 20 | 251 |
| | ITC | 29% | | | | | |
| | Non-ITC | 71% | | | | | |



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## Working Groups

| | WG Title | WG Leader | Number of WG members |
|---|---|---|---|
| WG1 | WG1: WISPs Model Building | Prof Michele Cicoli | 69 |
| WG2 | WG 2: WISPs Dark Matter and Cosmology | Dr Edoardo VITAGLIANO | 148 |
| WG3 | WG 3: WISPs in Astrophysics. | Dr Andrea Caputo | 94 |
| WG4 | WG4: Direct WISPs searches. | Dr Claudio Gatti | 88 |
| WG5 | WG 5: Dissemination and Outreach | Dr Olga Mena | 63 |

## MoU objectives, Action deliverables and Grant Agreement Period Goals

### Action Objectives from MoU

| Aim/primary Objective |
| --- |
| 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 |
| **Secondary objectives** |
| 1. Provide a discussion forum for the European coordination of WISPs Physics and express collective view on the development of WISPs research.<br>2. Develop a Roadmap for WISPs Physics in Europe, a description of the status and perspectives of the field within Europe, linking them to activities in other parts of the world.<br>3. Coordinate and support in a synergic way WISPs searches carried on by the different WGs, in order to stimulate and consolidate collaborations.<br>4. Develop a common database on WISPs theoretical models, experimental and astrophysical bounds.<br>5. Coordinate the experimental searches in order to maximize the discovery potential of current and future experiments and optimize the detection strategies.<br>6. Compare WISPs theoretical models and assess performance of different experimental technique.<br>7. Provide input to Small and Medium Size Enterprises (SMEs) identifying progresses needed in key technologies for present and future experiments.<br>8. Disseminate the research results broadly to the scientific community, to the stakeholders and to the general public, attracting representative of SMEs and young students towards these subjects.<br>9. Provide cross community discussions to enable new experiments.<br>10. Promote the gender balance of the Action, favoring more women in leading positions.<br>11. Stimulate transfer of knowledge among established leading groups in the field and emerging excellent scientists in COST Inclusiveness Target Countries (ITC), as well as SMEs.<br>12. Involve new research groups from ITC countries into the Action.<br>13. Attract young talented researchers from all over the world towards the activities of the Action through training activities. |

## Action Deliverables

| Deliverable | Month |
|---|---|
| 1. Action webpage, twitter account and repositories concerning the activities of the network | 6 |
| 2. Set the Dissemination, Outreach and Communication plans related to the Action activities | 6 |
| 3. Draft report on theory and phenomenology on axion and WISP properties in Beyond the Standard Model frameworks | 12 |
| 4. Draft report on axion and WISP in cosmology as dark matter candidates | 12 |
| 5. Draft report on bounds and signatures of axions and WISPs in astrophysics | 12 |
| 6. Draft report on axions and WISPs direct detection with different experimental techniques | 12 |
| 7. Interim report on theory and phenomenology on axion and WISP properties in Beyond the Standard Model frameworks | 24 |
| 8. Interim report on axion and WISP in cosmology as dark matter candidates | 24 |
| 9. Interim report on bounds and signatures of axions and WISPs in astrophysics | 24 |
| 10. Interim report on axions and WISPs direct detection with different experimental techniques | 24 |
| 11. Public code to simulate axion effects on Large Scale Structures in the Universe | 40 |
| 12. Report on Technologies Forums on technological challenges to detect axions and WISPs | 40 |
| 13. Final report on theory and phenomenology on axion and WISP properties in Beyond the Standard Model frameworks | 48 |
| 14. Final report on axion and WISP in cosmology as dark matter candidates | 48 |
| 15. Final report on bounds and signatures of axions and WISPs in astrophysics | 48 |
| 16. Final report on axions and WISPs direct detection with different experimental techniques | 48 |
| 17. Lecture notes of the training Schools organized by the Action on topics relevant for axions and WISPs | 48 |
| 18. Final White Paper on the Physics case for axions and WISPs based on the results of the Action | 48 |

## Grant Agreement Period

| | | | |
|---|---|---|---|
| Grant Agreement Period Start Date | 01/11/2023 | Grant Agreement Period End Date | 31/10/2024 |

## Grant Agreement Period Goals

| Number | Grant Agreement Period Goal | MoU Objective(s) it relates to |
|---|---|---|
| GAPG 1 | To continue and update the review on the state-of-the-art concerning: WISP models (WG1), cosmological (WG2), astrophysical (WG3) and experimental (WG 4) bounds | • Secondary objective 2<br>• Secondary objective 6 |
| GAPG 2 | To continue discussions in the WGs to agree on motivated benchmark theoretical models, on their current indirect (astro and cosmo) and direct constraints and on future discovery potential | • Secondary objective 1<br>• Secondary objective 2<br>• Secondary objective 3<br>• Secondary objective 4<br>• Secondary objective 9<br>• Secondary objective 11 |
| GAPG 3 | To train Phd students and young post-docs on both general interdisciplinary topics across the WGs and on specific topics of each WG | • Secondary objective 8<br>• Secondary objective 11<br>• Secondary objective 12<br>• Secondary objective 13 |
| GAPG 4 | To carry on and update the plan of Outreach Activities and of the Dissemination strategies | • Secondary objective 7<br>• Secondary objective 8<br>• Secondary objective 12 |
| GAPG 5 | To continue discussions on the technologies needed to develop next-generation WISP experiments, directly involving representatives of the SMEs | • Secondary objective 1<br>• Secondary objective 7<br>• Secondary objective 9<br>• Secondary objective 11<br>• Secondary objective 12 |
| GAPG 6 | To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action | • Secondary objective 10<br>• Secondary objective 11<br>• Secondary objective 12<br>• Secondary objective 13 |
| GAPG 7 | To start a review on the status and future plans of international laboratories to carry on WISPs searches, to develop possibile synergies and collaborations | • Secondary objective 1<br>• Secondary objective 2<br>• Secondary objective 5<br>• Secondary objective 9 |

# Work and Budget Plan for the Grant Agreement Period

## Work and Budget Plan Summary

| A. COST Networking Tools | EUR |
|---|---|
| (1) Meetings | 97,650.00 |
| (2) Training Schools | 30,000.00 |
| (3) Mobility of Researchers and Innovators | 13,000.00 |
| (4) Presentation at Conferences organised by Third Parties | 3,000.00 |
| (5) Dissemination and Communication Products | 2,800.00 |
| (6) Other Expenses Related to Scientific Activities (OERSA) | 900.00 |
| **B. Total Science Expenditure (sum of (1) to (6))** | 147,350.00 |
| **C. Financial and Scientific Administration and Coordination (FSAC) (max. of 15% of B)** | 22,102.50 |
| **Total Grant (B+C)** | 169,452.50 |

**Meetings**

Overview

| Meeting Title | Meeting Type | Dates | Location | ITC | Total Cost (EUR) |
|---|---|---|---|---|---|
| Working group Meeting of CA21106 COSMIC WISPers | Working Group Meeting | 14/02/2024 - 15/02/2024 | bari (Italy) | No | 26,650.00 |
| 2st General Meeting of CA21106 | Management Committee Meeting, Workshops/Conferences | 03/09/2024 - 06/09/2024 | BARI (Italy) | No | 71,000.00 |
| | | | | Total | 97,650.00 |

Details

| | | | |
|---|---|---|---|
| Title of the Meeting | Working group Meeting of CA21106 COSMIC WISPers | | |
| Meeting Type(s) | Working Group Meeting | | |
| Grant Period Goal(s) it will address | To continue and update the review on the state-of-the-art concerning: WISP models (WG1), cosmological (WG2), astrophysical (WG3) and experimental (WG 4) bounds,To continue discussions in the WGs to agree on motivated benchmark theoretical models, on their current indirect (astro and cosmo) and direct constraints and on future discovery potential,To carry on and update the plan of Outreach Activities and of the Dissemination strategies,To continue discussions on the technologies needed to develop next-generation WISP experiments, directly involving representatives of the SMEs,To start a review on the status and future plans of international laboratories to carry on WISPs searches, to develop possibile synergies and collaborations | | |
| Description | The Working Group Meeting will structure the WG activities of the GP. The plan of the meeting is the following: 1st day-morning. Plenary session with Introduction + talks by WG leaders and key talks to define the state-of-the-art of the different WG (4+4 talks). 1st day-afternoon: Parallel WG sessions (4 talks in each Session). 2 day morning: 4 talks from different international laboratories to present current and future plans for WISP searches. Common Round table to plan directions of investigations and possible collaborations among WGs. 2nd day afternoon: Technology forum (4 speakers). All the speakers will receive reimbursement for travel and accommodation. In order to guarantee a broad participation of COST members, this meeting is planned in hybrid version | | |
| Output(s) | Definition of the working plan for the 2st GP of the different WGs. Start the interim report of different WGs. Discuss and update of the Communication and Dissemination Plan. Slides will be available on the Action webpage. | | |
| Location | bari (Italy) | ITC | No |
| Start Date | 2024-02-14 09:00:00 | End Date | 2024-02-15 18:00:00 |
| Duration | 2 days | Attendance Type | Hybrid |
| Total number of expected participants | 65 | Number of participants expected to be reimbursed from COST funds | 43 |
| Daily allowance (EUR) | 100.00 | Average number of daily allowances per participant | 3 |
| Average Long-Distance Costs (EUR) | 250.00 | | |
| Average reimbursement (per participant) (EUR) | 550.00 | | |

| | | | |
|---|---|---|---|
| Total Travel, Accommodation and Subsistence Costs (EUR) | 23,650.00 | | |
| Total unique participants to be accounted for LOS grant | 30 | Local Organiser Support (EUR) | 3,000.00 |
| Total cost of the meeting (EUR) | 26,650.00 | | |

| | | | |
|---|---|---|---|
| Title of the Meeting | 2st General Meeting of CA21106 | | |
| Meeting Type(s) | Management Committee Meeting,Workshops/Conferences | | |
| Grant Period Goal(s) it will address | To continue and update the review on the state-of-the-art concerning: WISP models (WG1), cosmological (WG2), astrophysical (WG3) and experimental (WG 4) bounds,To continue discussions in the WGs to agree on motivated benchmark theoretical models, on their current indirect (astro and cosmo) and direct constraints and on future discovery potential,To carry on and update the plan of Outreach Activities and of the Dissemination strategies,To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action,To start a review on the status and future plans of international laboratories to carry on WISPs searches, to develop possibile synergies and collaborations | | |
| Description | The 2st General Meeting of the CA21106 is provided to combine the Management Committee Meeting with a workshop to discuss the developments in the activities of the different WGs. It will be a 4-days event with the following structure: 1-2-3-4 day morning: Review talks from WG1,2,3,4 1-2-3 day afternoon: Parallel sessions of the different WGs 4 day afternoon: Management Committee It will be also devoted time to round tables. An outreach talk will be organized. One representative of the MC from each country will be financially supported. The MC meeting will be in hybrid form in order to allow a larger participation of members. Leaders of mandatory positions will be also supported. | | |
| Output(s) | Slides of the talks will be available on the Action webpage. Proceedings with all contributions will be published on open-access journal | | |
| Location | BARI (Italy) | ITC | No |
| Start Date | 2024-09-03 09:00:00 | End Date | 2024-09-06 19:00:00 |
| Duration | 4 days | Attendance Type | Hybrid |
| Total number of expected participants | 80 | Number of participants expected to be reimbursed from COST funds | 50 |
| Daily allowance (EUR) | 200.00 | Average number of daily allowances per participant | 5 |
| Average Long-Distance Costs (EUR) | 250.00 | | |
| Average reimbursement (per participant) (EUR) | 1,250.00 | | |
| Total Travel, Accommodation and Subsistence Costs (EUR) | 62,500.00 | | |
| Total unique participants to be accounted for LOS grant | 55 | Local Organiser Support (EUR) | 8,500.00 |
| Total cost of the meeting (EUR) | 71,000.00 | | |

**Training Schools**

Overview

| Title of the Training School | Dates | Location | ITC | Total Cost (EUR) |
|---|---|---|---|---|
| 2nd CA21106 COSMIC WISPers Training School | 10/06/2024 - 13/06/2024 | Lecce (Italy) | No | 30,000.00 |
| | | | Total | 30,000.00 |

Details

| | | | |
|---|---|---|---|
| Title of the Training School | 2nd CA21106 COSMIC WISPers Training School | | |
| Grant Period Goal(s) it will address | To train Phd students and young post-docs on both general interdisciplinary topics across the WGs and on specific topics of each WG,To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action | | |
| Description | The Training School will highlight to young researchers but also to others interested in the topic, the challenges of WISPs physics and will discuss the latest developments in the field. The theoretical background, observational motivation, and experimental avenues to observe WISPs signatures in the laboratory will be covered. Lectures will be complemented with exercise sessions and students sessions in which they will present the results of their research. Financial support will be provided to PhD students, with priority to improve gender balance and for students from ITC countries. Lecturers will also be reimbursed. Established researchers with own travel funds can join the Training School without reimbursement by the Action. The daily allowance will be fixed in relation to the typical local costs. | | |
| Output(s) | Slides of the lectures will be available on the Action website. Lectures notes will be published on electronic version. | | |
| Location | Lecce (Italy) | ITC | No |
| Start Date | 2024-06-10 09:00:00 | End Date | 2024-06-13 18:00:00 |
| Duration | 4 days | Attendance Type | Face to face |
| Participant information | | Trainers | Trainees |
| • Daily allowance (EUR) | | 150.00 | 100.00 |
| • Average number of daily allowances per participant | | 5 | 5 |
| • Average Long-Distance Costs (EUR) | | 250.00 | |
| • Average reimbursement (EUR) | | 1,000.00 | 750.00 |
| • Total number of expected trainers/trainees | | 9 | 30 |
| • Trainers/trainees expected to be reimbursed from COST funds | | 9 | 20 |
| Total Travel, Accommodation and Subsistence Costs (EUR) | 24,000.00 | | |
| Total unique participants to be accounted for LOS grant | 30 | | |
| Local Organiser Support (EUR) | 6,000.00 | | |
| Total cost of the Training School (EUR) | 30,000.00 | | |

**Mobility of Researchers and Innovators**

| | | |
|---|---|---|
| Grant Period Goal(s) it will address: | To increase the contributions of Young Researchers and Innovators from ITC countries by 20%, while safeguarding gender balance and enhancing diversity in the Action | |
| Description: | The mobility of Researchers and Innovators will be awarded via a call | |
| Budget (EUR) | Short Term Scientific Missions (STSM) grants | 13,000.00 |
| | This budget would allow for approx. 7 STSM grants (based on the average costs per STSM grant spent by all Actions). | |
| | Virtual Mobility grants | 0.00 |
| | This budget would allow for approx. 0 Virtual Mobility grants (based on the average costs per VM grant spent by all Actions). | |
| | Total | 13,000.00 |

**Presentations at Conferences organised by Third Parties**

| | | |
|---|---|---|
| Description: | Those grants are aimed to even further publicise the work of the Action and of individuals participating in the Action. Targeted conferences are the “Patras workshop”, a renowned conference on WISP physics, and the TAUP (Topics in Astroparticle and Underground Physics) Conference, a highly-attended general conference discussing WISPs physics. | |
| Budget (EUR) | ITC Conference grants | 2,000.00 |
| | This budget would allow for approx. 2 ITC Conference grants (based on the average costs per ITC Conference grant spent by all Actions). | |
| | Dissemination Conference grants | 1,000.00 |
| | This budget would allow for approx. 1 Dissemination Conference grants (based on the average costs per DC grant spent by all Actions). | |
| | Total | 3,000.00 |

**Dissemination and Communication Products**

Overview

| Dissemination and Communication Product | Title | Total Cost (EUR) |
|---|---|---|
| Scientific publication in Open Access | Proceedings of the General Meeting and of Training School | 2,200.00 |
| Action Website | Action website | 600.00 |
| | Total (without VAT) | 2,800.00 |

Details

| | |
|---|---|
| Dissemination and Communication Product: | Scientific publication in Open Access |
| Title: | Proceedings of the General Meeting and of Training School |
| Description: | The talks of the 1st General Meetings and the Lectures of the Training School will be published in OPEN ACCESS journal. This will help to disseminate the Action results to a larger audience. Action participants will be involved as coauthors, editors and will be in charge of the peer-review. |
| Total (EUR): (without VAT) | 2,200.00 |

| | |
|---|---|
| Dissemination and Communication Product: | Action Website |
| Title: | Action website |
| Description: | Action website maintaining |
| Total (EUR): (without VAT) | 600.00 |

## Other Expenses Related to Scientific Activities (OERSA)

Overview

| Item | Total Cost (EUR) |
|---|---|
| Bank charges | 900.00 |
| Total | 900.00 |

Details

| Type: | Bank charges |
|---|---|
| Total (EUR): (without VAT) | 900.00 |