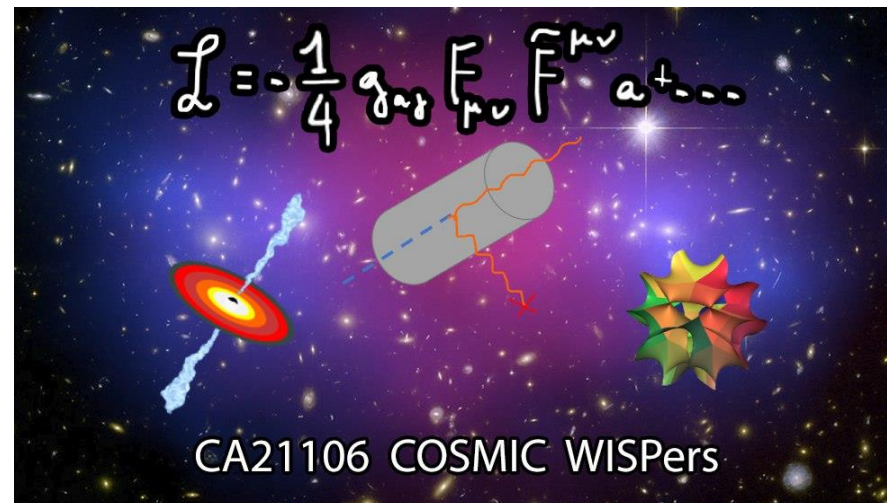
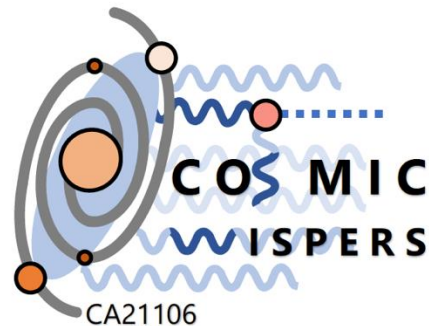


COST ACTION CA21106

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 03/09/2024 at 15:00:00 to 06/09/2024 at 19:00:00

Hybrid, Istanbul, Türkiye

Istinye University, Istanbul, Türkiye

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 Group: 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

24 COST Full or Cooperating Members . 2/3 → 16 Countries

2. a) Recap of minutes of 2nd MC Meeting 06/09/2023 and e-votes

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]  DESY Hamburg, 1-2 Febr. 2024
 - b. General Meeting [4 days, September 2024]: 71,000 euros [location: Istanbul or Belgrade tbd]  Istanbul, 3-6 Sept. 2024
- a) Training School: [4 days, June 2024]: 30,000 euros [location: Lubjiana or Sofia, tbd]  Lubljiana, 11-14 June, 2024
- a) STSMs grants: 13,000 euros  16 STSMs
- a) ITC Conference Grants: 2,000 euros  1 ITC conf. grants
- a) Dissemination Grants: 1,000 euros
- a) Scientific publications in Open Access: 2200 euros  Proceedings of General Meeting + Lecture notes
- a) Action website maintenance: 600 euros
- a) Bank charges: 900 euros

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

| | | | | | | |
|--|-----------|--------|------------|--------------------------|-----------|-----------|
| Replacement of WG3 Leader Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | ✓ Approved | 18/11/2023 25/11/2023 | View vote | Options ▾ |
| Second MC representative from Norway Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | ✓ Approved | 09/10/2023 16/10/2023 | View vote | Options ▾ |
| Budget reallocation Alessandro Mirizzi (Action Chair) | MC-Voting | Closed | ✓ Approved | 29/09/2023 06/10/2023 | View vote | Options ▾ |

→ Andrea Caputo -> Maurizio Giannotti

→ David Fonseca Mota (Oslo Univ.)

→ 14 extra grant attributed (STSM, ITC conf. Grants)

2. b) Core Group

Meeting on monthly basis. Strong input in organizing all events (workshop, training schools), and in budget re-modulation

2. c) Action Memberships

MC participants

Number of COST members represented: 24

Number of ITC countries: 13

Approved WG participants:

2022: 122

2023: 251

2024: 378

MC representatives

| CTRY * | Title | Firstname | Lastname | Group | Position | Email | Institution |
|--------|-------|---------------|------------------|------------|-------------------|---|---|
| | Prof | Alessandro | Mirizzi | MC Members | Action Chair | alessandro.mirizzi@ba.infn.it | Universita' degli Studi di Bari |
| FR | Dr | Francesca | Calore | MC Members | Action Vice-Chair | calore@laph.cnrs.fr | CNRS |
| AT | Dr | Josef | Pradler | MC Members | MC Member | josef.pradler@oeaw.ac.at | Austrian Academy of Sciences - Institute of High Energy Physics (HEPHY) |
| AT | Dr | Philipp | Haslinger | MC Members | MC Member | philipp.haslinger@tuwien.ac.at | TU Wien - Atominstitut |
| CY | Prof | Constantia | Alexandrou | MC Members | MC Member | alexandrou.constantia@ucy.ac.cy | The Cyprus Institute |
| CZ | Dr | Stepan | Kunc | MC Members | MC Member | stepan.kunc@tul.cz | Technical University of Liberec |
| DE | Prof | Loredana | Gastaldo | MC Members | MC Member | Loredana.Gastaldo@kip.uni-heidelberg.de | Heidelberg University |
| DE | Dr | Babette | Doeblich | MC Members | MC Member | babette.dobrich@cern.ch | CERN |
| DK | Prof | Manuel | Meyer | MC Members | MC Member | mey@sdu.dk | University of Southern Denmark |
| ES | Dr | Igor | García Irastorza | MC Members | MC Member | Igor.Irastorza@cern.ch | Universidad de Zaragoza |
| ES | Dr | Olga | Mena | MC Members | MC Member | omena@ific.uv.es | IFIC/CSIC-UV |
| EE | Prof | Martti | Raidal | MC Members | MC Member | martti.raidal@cern.ch | National Institute of Chemical Physics and Biophysics |
| EE | Dr | María | Benito Castaño | MC Members | MC Member | maribenitocst@gmail.com | University of Tartu - Tartu Observatory |
| AL | Prof | Mimoza | Hafizi | MC Members | MC Member | mimoza.hafizi@yahoo.com | University of Tirana |
| FR | Dr | Francesca | Calore | MC Members | MC Member | calore@laph.cnrs.fr | CNRS |
| FR | Dr | Pierre | Pugnat | MC Members | MC Member | Pierre.Pugnat@incmi.cnrs.fr | CNRS - CNRS - Alpes |
| UK | Dr | Clare | Burrage | MC Members | MC Member | clare.burrage@nottingham.ac.uk | University of Nottingham |
| UK | Dr | Francesca | Chadha-Day | MC Members | MC Member | francesca.chadha-day@durham.ac.uk | University of Durham |
| HU | Prof | Attila | Krasznahorkay | MC Members | MC Member | kraszna@atomki.hu | Hungarian Academy of Sciences - Institute for Nuclear Research |
| HR | Prof | Marin | Karuza | MC Members | MC Member | mkaruza@uniri.hr | University of Rijeka |
| IT | Dr | Maria Paola | Lombardo | MC Members | MC Member | lombardo@inf.infn.it | INFN |
| IT | Dr | Claudio | Gatti | MC Members | MC Member | claudio.gatti@inf.infn.it | INFN,Frascati National Laboratories (LNF) |
| MT | Dr | Kristian | Zarb Adami | MC Members | MC Member | Kristian.Zarb-Adami@um.edu.mt | UNIVERSITA TA MALTA |
| NO | Prof | Michael | Kachelriess | MC Members | MC Member | Michael.Kachelriess@ntnu.no | NTNU |
| NO | Prof | David Fonseca | Mota | MC Members | MC Member | mota@astro.uio.no | Universitetet i Oslo |
| NL | Dr | Christoph | Weniger | MC Members | MC Member | c.weniger@uva.nl | University of Amsterdam - Institute of Physics |
| PT | Prof | Michele | Gallinaro | MC Members | MC Member | michgall@cern.ch | LIP - LIP, Laboratório de Instrumentação e Física Experimental de Partículas |
| RO | Prof | Sabin | Stoica | MC Members | MC Member | sabin.stoica@cifra.infm.ro | International Centre for Advanced Training and Research in Physics |
| RO | Dr | Elena-Mirela | BABALIC | MC Members | MC Member | mbabalic@theory.nipne.ro | Institutul National De Cercetare-dezvoltare Pentru Fizica Si Inginerie Nucleara-horia Hulubei |
| SE | Dr | David | Marsh | MC Members | MC Member | david.marsh@fysik.su.se | Stockholm University |
| SI | Dr | Miha | Nemevšek | MC Members | MC Member | miha.nemevsek@ijs.si | Jožef Stefan Institute |
| SI | Dr | Jernej | Fesel Kamenik | MC Members | MC Member | jernej.kamenik@ijs.si | Jozef Stefan Institute |
| TR | Prof | Serkant | Cetin | MC Members | MC Member | serkant.cetin@cern.ch | Istinye University |
| TR | Prof | Salim | CERCI | MC Members | MC Member | Salim.Cerci@cern.ch | YILDIZ TECHNICAL UNIVERSITY |
| BG | Dr | Venelin | Kozhuharov | MC Members | MC Member | Venelin.Kozhuharov@cern.ch | Sofia University St Kliment Ohridski |
| CH | Dr | Andrea | Caputo | MC Members | MC Member | andrea0292@hotmail.it | CERN |
| RS | Dr | Zoran | Grujić | MC Members | MC Member | zoran.grujic@ipb.ac.rs | Institute of Physics Belgrade |
| RS | Prof | Nataša | Trišović | MC Members | MC Member | ntrisovic@mas.bg.ac.rs | Faculty of Mechanical Engineering, University of Belgrade |

No MC representative from:

Greece
Poland
Israel

2.d) Action WG Participations, new MC members and provisional substitutions

WG Participations

| Number | Title | Leader | No. participants |
|--------|---------------------------------------|-----------------------|------------------|
| 1 | WG1: WISPs Model Building | Prof Michele Cicoli | 102 |
| 2 | WG 2: WISPs Dark Matter and Cosmology | Dr Edoardo VITAGLIANO | 211 |
| 3 | WG 3: WISPs in Astrophysics. | Dr Maurizio Giannotti | 130 |
| 4 | WG4: Direct WISPs searches. | Dr Claudio Gatti | 135 |
| 5 | WG 5: Dissemination and Outreach | Dr Olga Mena | 77 |

new MC members

| | | | | | | | |
|----|------|---------------|------------|------------|-----------|-----------------------------------|---|
| RO | Dr | Elena-Mirela | BABALIC | MC Members | MC Member | mbabalic@theory.nipne.ro | Institutul National De Cercetare-dezvoltare Pentru Fizica Si Inginerie Nucleara-horia Hulubei |
| NO | Prof | David Fonseca | Mota | MC Members | MC Member | mota@astro.uio.no | Universitetet I Oslo |
| UK | Dr | Francesca | Chadha-Day | MC Members | MC Member | francesca.chadha-day@durham.ac.uk | University of Durham |
| RS | Prof | Nataša | Trišović | MC Members | MC Member | ntrisovic@mas.bg.ac.rs | Faculty of Mechanical Engineering, University of Belgrade |

MC substitution

| | | | | |
|--|----------------|------------|------------|----------|
| David Marsh  Sweden | Ghosh Oindrila | 15/08/2024 | 09/09/2024 | Upcoming |
|--|----------------|------------|------------|----------|

Replacements in Leadership positions

| WG2 Co-Leader  | Assigned By | Start date | End date | Status |
|---|-------------------------|------------|------------|---|
| Dr Marco Gorghetto | Prof Alessandro Mirizzi | 2024-03-06 | | Assigned |
| Dr Javier Redondo | Prof Alessandro Mirizzi | 2022-10-12 | 2024-03-06 | Expired  |
| ... | | | | |

| Young Researcher Council Representative  | Assigned By | Start date | End date | Status |
|---|-------------------------|------------|------------|---|
| Mr Arturo de Giorgi | Prof Alessandro Mirizzi | 2024-06-21 | | Assigned |
| Dr Joshua Eby | Prof Alessandro Mirizzi | 2023-11-26 | 2024-06-21 | Expired  |
| Mr Pierluca Carena | Prof Alessandro Mirizzi | 2022-10-12 | 2023-11-26 | Expired  |
| + Nominate user | | | | |

2.e) Budget status

2.f) Update from COST Association

3.a) Follow-up discussion on Action Management

No MC representative from:

Greece

Poland

Israel

Problem of silent MC representatives

Second co-leaders to increase gender balance and involvement of YRI?

3.b) Implementation of COST Excellence and Inclusiveness Policy

| Geographical Diversity: COST Inclusiveness Target Countries (ITCs) | | | | | | |
|--|--------------------------------|---------------------|---------------------|--|------------------------------------|----------------------------------|
| | % ITC represented in the MC(2) | % ITC MC Members(3) | % ITC WG Members(4) | % ITC in mandatory leadership roles(5) | % ITC in other leadership roles(6) | % ITC in all leadership roles(7) |
| Action CA21106 | 52% | 45% | 26% | 13% | 32% | 32% |
| All Actions(1) | 57% | 56% | 50% | 37% | 42% | 38% |
| Comment: | | | | | | |
| <p>The Action is well balanced concerning the ITC participation in MC. However, the involvement in the different WGs (26%) should be increased. ITC members are under-represented in mandatory leadership positions, but in all leadership roles their participation is rather adequate. Remarkably, ITC members actively contribute in leading the Action (e.g. the Grant Awarding Coordinator and the Gender Advisor). The representation in mandatory positions should be improved as soon as replacements in mandatory positions will be open. We remark that the WISP research is an emerging field which is not already well established in ITC countries. In some of these countries there are currently no PhD students involved. This explains to some extent the lower involvement of ITC members in WGs with respect to the average of all Actions.</p> | | | | | | |

Career Stage: Young Researcher and Innovators (YRIs)

| | % YRI MC Members(8) | % YRI WG Members(9) | % YRI in mandatory leadership roles(10) | % YRI in other leadership roles(11) | % YRI in all leadership roles(12) |
|----------------|---------------------|---------------------|---|-------------------------------------|-----------------------------------|
| Action CA21106 | 24% | 59% | 38% | 48% | 48% |
| All Actions(1) | 19% | 42% | 21% | 31% | 25% |

Comment:

The participation of YRI in the Action is well above the average of all the Actions. We plan to maintain this high involvement in the future years of the Action.

| Gender Balance(13) | | | | | |
|--|--|--|---|---|---|
| | Gender distribution MC Members (%F/%M)(14) | Gender distribution WG Members (%F/%M)(15) | Gender distribution in mandatory leadership roles (%F/%M)(16) | Gender distribution in other leadership roles (%F/%M)(17) | Gender distribution in all leadership roles (%F/%M)(18) |
| Action CA21106 | 26% / 74% | 19% / 80% | 25% / 75% | 32% / 68% | 32% / 68% |
| All Actions(1) | 49% / 51% | 50% / 49% | 51% / 48% | 55% / 45% | 52% / 47% |
| Comment: | | | | | |
| <p>The Action is not well balanced concerning the female participation in the MC and mostly in the WGs. This situation is reflected with a similar percentage in the involvement of female participants in leadership positions. Unfortunately this lack of gender balance reflects a situation that is typically encountered in STEMs disciplines. Therefore, at some level it is beyond the time scale of our Action to completely revert it. Nevertheless we will actively work to increase the female participation in the 2nd grant period. It should be remarked that in the attribution of leadership positions female participants were invited to take these responsibilities. However, it was not easy to find available people. Indeed, most of the possible candidates declared that they were already overburden with other responsibilities.</p> | | | | | |

Action description of plans to implement SC Recommendations and COST policy in the future:

*SC1: ITC Involvement In 2024 the Training School and the General Meeting will take place both in two ITC countries, to increase the visibility in the international community of local groups from ITCs. Furthermore, YRIs from ITC countries will be attracted towards the Action activities. ITC conference grants will be attributed as well as STSMs. We will also recommend MC members from ITC to advertise the Action in their countries through seminars and events and involve their colleagues to join the Action. Since most of our ITC are in the Balkan area, MC representatives from those countries will contact the Balkan Physical Union to advertise the Action towards National Physics Societies. Involvement of ITC members in leadership positions will be increased. It will be investigated if some replacement is possible in the leadership positions in favor of ITC participants. *SC2: YRI Involvement The high involvement of YRI will be maintained, keeping the ECI Council as well as all responsibilities in which YRI have been involved. *SC3: Gender Balance. Members involved in the network will be encouraged to advertise the Action towards their female colleagues. It is planned to increase the number of female leadership positions, encouraging when possible the replacement in the leadership positions in favor of female participants. The Gender Advisor will form a committee to develop a plan to monitor and implement the gender balance. It will be increased the number of female speakers at Meetings and Schools.

First Progress Review by Scientific Committee

Validated on: 26-6-2024

Scientific Committee classification of Action at PR1

Implementation insufficient but plans adequate - repeat policy implementation monitoring in 1 year
The Action must more actively engage in gender balance dimensions.

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 community discussions** to enable new experiments
- ✓ Stimulate **transfer of knowledge** among established leading groups on the field and emerging excellent scientists in ITC
- ✓ Promote **gender balance**
- ✓ Involve **new research groups** from ITC
- ✓ Attract **young talented researchers**

STRATEGIES

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

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 |
| <ol style="list-style-type: none">1. Provide a discussion forum for the European coordination of WISPs Physics and express collective view on the development of WISPs research.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.3. Coordinate and support in a synergic way WISPs searches carried on by the different WGs, in order to stimulate and consolidate collaborations.4. Develop a common database on WISPs theoretical models, experimental and astrophysical bounds.5. Coordinate the experimental searches in order to maximize the discovery potential of current and future experiments and optimize the detection strategies.6. Compare WISPs theoretical models and assess performance of different experimental technique.7. Provide input to Small and Medium Size Enterprises (SMEs) identifying progresses needed in key technologies for present and future experiments.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.9. Provide cross community discussions to enable new experiments.10. Promote the gender balance of the Action, favoring more women in leading positions.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.12. Involve new research groups from ITC countries into the Action.13. Attract young talented researchers from all over the world towards the activities of the Action through training activities. |

Grant Agreement Period Goals

| Number | Grant Agreement Period Goal | MoU Objective(s) it relates to |
|--------|---|---|
| GAPG 1 | To explore the WISP production mechanisms from astrophysical sources (Sun, stars, supernovae) and provide numerical tables, fitting expressions and plots to characterize these fluxes (WG3) | <ul style="list-style-type: none"> • Secondary objective 4 |
| GAPG 2 | To corner the WISP parameter space in well-motivated benchmark theoretical models, e.g. QCD axion band in the ALP parameter space, Dark Matter Axion window, mass and coupling of axions from string compactification (WG1) | <ul style="list-style-type: none"> • Secondary objective 4 • Secondary objective 6 |
| GAPG 3 | To train Phd students and young post-docs on specific topics of each WG, building on the common background acquired in the 1st Training School | <ul style="list-style-type: none"> • Secondary objective 8 • Secondary objective 11 • Secondary objective 12 • Secondary objective 13 |
| GAPG 4 | To carry on Outreach and Dissemination activities (e.g. outreach talks in person or virtual) | <ul style="list-style-type: none"> • Secondary objective 7 • Secondary objective 8 • Secondary objective 12 |
| GAPG 5 | To explore the role of quantum technologies in next-generation WISP experiments, directly involving representatives of the SMEs | <ul style="list-style-type: none"> • Secondary objective 1 • Secondary objective 7 • Secondary objective 9 • Secondary objective 11 • Secondary objective 12 |
| GAPG 6 | To keep the contributions of Young Researchers and Innovators from ITC, to improve the gender balance and enhancing diversity in the Action | <ul style="list-style-type: none"> • Secondary objective 10 • Secondary objective 11 • Secondary objective 12 • 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 possible synergies and collaborations | <ul style="list-style-type: none"> • Secondary objective 1 • Secondary objective 2 • Secondary objective 5 • Secondary objective 9 |
| GAPG 8 | To study axion DM production mechanisms, in order to identify calculations required to improve relic abundance predictions (WG3) | <ul style="list-style-type: none"> • Secondary objective 4 |
| GAPG 9 | To perform a survey of novel experimental techniques proposed to search for WISPs and identify the technological challenges to be addressed (WG4) | <ul style="list-style-type: none"> • Secondary objective 4 • Secondary objective 5 • Secondary objective 6 • Secondary objective 7 |

→ WG3 online and in presence meetings

→ WG1 online and in presence meetings

→ Training School in Lubljana

→ Outreach talk during Training School and General Meeting. Virtual seminars

→ Technology Forum on quantum technologies in DESY meeting

→ YRI Committee and Gender Balance Committee

→ Talks on different labs during DESY meeting

→ WG2 online and in presence meetings

→ WG4 online and in presence meetings

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 |

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

Use all unspent funds to cover new STSM in October and buy an overleaf licence.

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