

COSMIC WISPers

COST Action CA21106 3rd General Meeting

9 – 12 September 2025

Sofia University “St. Kliment Ohridski”, Bulgaria

International Organizing Committee

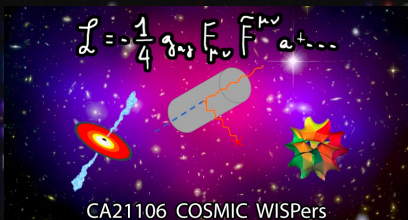
Alessandro MIRIZZI (Bari Univ. & INFN, Italy, CHAIR)
Venelin KOZHUHAROV (Sofia Univ., Bulgaria, CHAIR)
Deniz AYBAS (Bilkent Univ., Turkey)
Elena MIRELA BABALIC (NIPNE, Bucharest, Romania)
Francesca CALORE (LaPTh, CNRS, France)
María BENITO CASTAÑO (Tartu Observatory, Estonia)
Serkant CETIN (Istinye Univ., Turkey)
Michele CICOLI (Bologna Univ. & INFN, Italy)
Loredana GASTALDO (Heidelberg Univ., Germany)
Claudio GATTI (LNF INFN, Italy)
Maurizio GIANNOTTI (Zaragoza Univ., Spain)
Marco GORGHETTO (DESY, Germany)
Marin KARUZA (Rijeka Univ., Croatia)
Mathieu KALTSCHMIDT (Zaragoza Univ., Spain)
Giuseppe LUCENTE (SLAC, USA)
Olga MENA (IFIC, Spain)
Nicole RIGHI (King's College London, UK)
Oscar STRANIERO (INAF, Italy)
Elisa TODARELLO (Nottingham Univ., UK)
Edoardo VITAGLIANO (Padua Univ, Italy)

Plenary sessions and 4 parallel sessions covering:

- Theory and Model Building
Convenors: Michele Cicoli, Nicole Righi, Arturo de Giorgi
- Dark Matter and Cosmology
Convenors: Edoardo Vitagliano, Marco Gorghetto, Maria Benito Castano, Mathieu Kaltschmidt
- Astrophysics
Convenors: Maurizio Giannotti, Oscar Staniero, Elisa Todarello, Giuseppe Lucente
- Experimental Searches
Convenors: Marin Karuza, Claudio Gatti, Deniz Aybas



Event Information:



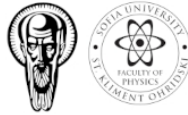
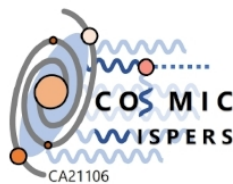
<https://cosmicwispers.eu/>

Local Organizing Committee

Venelin KOZHUHAROV (Faculty of Physics, Sofia University)
Kalina DIMITROVA (Faculty of Physics, Sofia University)
Katerina KOSTOVA (Faculty of Physics, Sofia University)
Radoslav SIMEONOV (Faculty of Physics, Sofia University)
Momchil NAYDENOV (Faculty of Physics, Sofia University)

Program

Sep 9 – 12, 2025



Funded by the
European Union

3rd General Meeting of COST Action COSMIC WISPERs (CA21106)

Sofia, Bulgaria, Sofia University Main Building
Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

Tue, September 9

8:15 AM

Registration

Session | **Location:** Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

9:00 AM

9:00 AM

Welcome to CA21106 General Meeting

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

Convener: Georgi Rainovski (Dean of the Faculty of Physics, Sofia University)

9:20 AM

9:20 AM

WG1 (Theory)

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

9:20 – 10:00 AM

CP, or not CP, that is the question

Speaker

Andreas Ringwald (DESY)

10:00 – 10:40 AM

Open string axiverse

Speaker

Giovanni Villadoro

10:40 AM

10:40 AM

Coffee break

Break | **Location:** Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

11:00 AM

11:00 AM

WG1 (Theory)

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

11:00 – 11:40 AM

Testing interactions in a scalar dark sector

Speaker

Elsa Teixeira

11:40 AM – 12:20 PM

The Thorium-229 revolution: nuclear clocks as quintessometers

Speaker

Cedric Delaunay (LAPTh)

12:20 – 1:00 PM

Axion Quality: Challenges and Pathways to Improvement

Speaker

Federico Mescia

1:00 PM

2:30 PM

Round Table

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

2:30 – 3:00 PM

WG1 Report

Speaker

Michele Cicoli (Istituto Nazionale di Fisica Nucleare)

3:00 – 3:30 PM

Discussion

3:30 PM

3:30 PM

WG1 (Theory)**Session** | **Location:** Sofia University, Hall 2, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

3:30 – 4:00 PM

Topological Portals to the Dark Sector**Speaker**

Nudzeim Selimovic (INFN Padova)

4:00 – 4:30 PM

Cosmic superstrings in large volume compactifications**Speaker**

Gonzalo Villa (DAMTP - University of Cambridge)

4:30 PM

3:30 PM

WG2 (Dark matter & Cosmology)**Session** | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

3:30 – 3:50 PM

Scalar Fields with Quadratic Couplings to Matter around Cavities**Speaker**

Angus Macdonald (University of Nottingham)

3:50 – 4:10 PM

Dark Matter Freeze-In and Small-Scale Observables: Novel Mass Bounds and Viable Particle Candidates**Speaker**

Alessandro Lenoci (The Hebrew University of Jerusalem)

4:10 – 4:30 PM

Constraining ALPs with Cosmic Microwave Background Polarization Birefringence**Speaker**

Matteo Galaverni (Vatican Observatory & INAF/OAS Bologna)

4:30 PM

4:30 PM

Coffee Break**Break** | **Location:** Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

4:50 PM

4:50 PM

WG1 (Theory)**Session** | **Location:** Sofia University, Hall 2, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

4:50 – 5:20 PM

Growth of cosmic strings with field-dependent tension**Speaker**

Luca Brunelli (Istituto Nazionale di Fisica Nucleare)

5:20 – 5:50 PM

Cosmic strings and domain walls of the QCD quark condensate with and without a hidden axion**Speaker**

Anja Stuhlfauth (Max Planck Institute for Physics)

6:10 PM

4:50 PM

WG2 (Dark matter & Cosmology)**Session** | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

4:50 – 5:10 PM

WISP Dark Matter: What's Missing?**Speaker**

María Benito (Tartu Observatory, University of Tartu)

5:10 – 5:30 PM

Dark matter production from axion portal**Speaker**

Tommaso Sassi (INFN Sezione di Firenze, Università degli Studi di Firenze)

5:30 – 5:50 PM

Emission of spin-2 Particles from the Sun**Speaker**

Camilo Garcia Cely (IFIC (CSIC-University of Valencia))

6:10 PM

6:30 PM

8:00 PM

Welcome reception**Break** | **Location:** Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

Wed, September 10

9:30 AM

WG3 (Astrophysics)

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

9:30 – 10:10 AM

X-ray observations and their applications to the physics of axions (or other WISPs)

Speaker

Jaime Ruz

10:10 – 10:50 AM

Axion superradiance

Speaker

Francesca Chadha-Day (IPPP, Durham University)

10:50 AM

10:50 AM

Coffee break

Break | **Location:** Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

11:20 AM

11:20 AM

WG3 (Astrophysics)

Session |

Location: Sofia, Bulgaria, Sofia University Main Building, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

11:20 AM – 12:00 PM

Radio observations and their applications to the physics of axions (or other WISPs)

Speaker

Marco Regis (Istituto Nazionale di Fisica Nucleare)

Location

Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

12:00 – 12:40 PM

Theoretical progress on SN axions.

Speaker

Konstantin Springmann (TU Munich)

Location

Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

12:40 PM

2:30 PM

Round Table

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

2:30 – 3:00 PM

WG3 Report

Speaker

Maurizio Giannotti

3:00 – 3:30 PM

Discussion

3:30 PM

3:30 PM	WG3 (Astrophysics) Session Location: Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria
	3:30 – 3:50 PM X-ray Searches for Axions: The M82 and Betelgeuse Case Studies
	Speaker Francisco Candon
	3:50 – 4:10 PM Probing axion-like particles with multimessenger observations of neutron star mergers
	Speaker Francesca Lecce
	4:10 – 4:30 PM Axion production and conversion in astrophysical transients
4:30 PM	Speaker Ángel Gil Muyor
3:30 PM	WG4 (Experiments) Session Location: Sofia University, Hall 2, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria
	3:30 – 3:50 PM ARCHIMEDES experiment
	Speaker Domenico D'Urso
	3:50 – 4:10 PM Recent Developments in Axion Detection with MADMAX
4:30 PM	Speaker Anton Ivanov
4:30 PM	Coffee break
5:00 PM	Break Location: Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

3:30 PM

WG3 (Astrophysics)**Session** | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

3:30 – 3:50 PM

X-ray Searches for Axions: The M82 and Betelgeuse Case Studies**Speaker**

Francisco Candon

3:50 – 4:10 PM

Probing axion-like particles with multimessenger observations of neutron star mergers**Speaker**

Francesca Lecce

4:10 – 4:30 PM

Axion production and conversion in astrophysical transients**Speaker**

Ángel Gil Muyor

4:30 PM

3:30 PM

WG4 (Experiments)**Session** | **Location:** Sofia University, Hall 2, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

3:30 – 3:50 PM

ARCHIMEDES experiment**Speaker**

Domenico D'Urso

3:50 – 4:10 PM

Recent Developments in Axion Detection with MADMAX**Speaker**

Anton Ivanov

4:30 PM

4:30 PM

5:00 PM

Coffee break**Break** | **Location:** Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

5:00 PM

WG3 (Astrophysics)**Session** | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

5:00 – 5:20 PM

Relaxing supernova constraints: how nucleophobic axions survive finite-density corrections.**Speaker**

Vincenzo Fiorentino

5:20 – 5:40 PM

Probing axion-like particles with very-high-energy gamma rays: Insights from MAGIC and LST-1**Speaker**

Ivana Batkovic

5:40 – 6:00 PM

Sensitivity of CTAO to axion-like particles from blazars: a machine learning approach**Speaker**

Francesco Schiavone

6:00 – 6:20 PM

Probing Ultralight Scalars through Compact Stars and Precision Tests of Gravity**Speaker**

Tanmoy Poddar

6:20 PM

5:00 PM

WG4 (Experiments)**Session** | **Location:** Sofia University, Hall 2, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

5:00 – 5:20 PM

Precision test of fundamental physics with matter wave interferometers**Speaker**

Nicola Poli (Istituto Nazionale di Fisica Nucleare)

5:20 – 5:40 PM

Hunting for Dark Matter using Levitated Superconductors**Speaker**

Gerard Higgins

6:20 PM

Thu, September 11

9:30 AM	WG2 (Dark matter & Cosmology) Session Location: Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria
	9:30 – 10:10 AM New Opportunities for Ultralight DM Search with Stochastic Fluctuations Speaker Hyungjin Kim
	10:10 – 10:50 AM Cosmological tests of the nature of dark matter Speaker Keir Rogers
10:50 AM	
10:50 AM	Coffee break Break Location: Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria
11:20 AM	
11:20 AM	WG2 (Dark matter & Cosmology) Session Location: Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria
	11:20 AM – 12:00 PM Cracks in the Standard Cosmological Model: Anomalies, Tensions, and Hints of New Physics Speaker Eleonora Di Valentino (University of Sheffield)
	12:00 – 12:40 PM Gravitational probes of ultralight dark matter Speaker Kfir Blum
12:40 PM	
2:30 PM	Round Table Session Location: Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria
	2:30 – 3:00 PM WG2 Report Speaker Edoardo Vitagliano (Istituto Nazionale di Fisica Nucleare)
	3:00 – 3:30 PM Discussion
3:30 PM	

3:30 PM	Technology Forum Session Location: Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria
	3:30 – 4:00 PM Advances in optomechanics Speaker Nenad Kralj
	4:00 – 4:30 PM Satellites & Space Missions Speakers Lubomir Toshev (EnduroSat), Viktor Danchev (CTO EnduroSat)
	4:30 – 5:00 PM Magnetometry: from single measurements to network of magnetometers Speaker Boyan Benev (Benev Science & Technology Ltd)
5:00 PM	
5:00 PM	Coffee break Break Location: Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria
5:30 PM	
6:00 PM	WG5 (Dissemination and Outreach): Public talk Session Location: Faculty of Physics, Sofia University, A205, 5 J. Bourchier Blvd., 1164 Sofia, Bulgaria
	6:00 – 7:15 PM Public talk: COSMIC WISPerS in the Dark Universe Speaker Venelin Kozhuharov (Faculty of Physics, University of Sofia "St. Kl. Ohridski")
7:30 PM	
8:00 PM	Official dinner Session Location: Sofia, Restaurant "Stariyat Chinar", 71 Knyaz Al. Dondukov Blvd.
10:00 PM	

Fri, September 12

9:00 AM

WG4 (Experiments)

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

9:00 – 9:40 AM

Preliminary ALPs sensitivity projections for the RES-NOVA Observatory

Speaker

Nahuel Ferreiro Iachellini

9:40 – 10:20 AM

Probing new physics with slow and trapped molecules

Speaker

Steven Hoekstra (University of Groningen, and Nikhef, The Netherlands)

10:20 AM

10:20 AM

Coffee break

Break | **Location:** Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

10:40 AM

10:40 AM

WG4 (Experiments)

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

10:40 – 11:20 AM

WISPFi experiment

Speaker

Marios Maroudas

11:20 AM – 12:00 PM

PADME Experiment

Speaker

Elisa Di Meo

12:00 PM

12:00 PM

Round Table

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

12:00 – 12:40 PM

WG4 report

Speaker

Marin Karuza (Istituto Nazionale di Fisica Nucleare)

12:40 PM

12:40 PM

Concluding talk

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

12:40 – 1:20 PM

Axions explain the formation of supermassive black holes at cosmic dawn

Speaker

Pierre Sikivie

1:20 PM

1:20 PM

1:30 PM

Conclusions

Session | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

3:00 PM

Management Committee Meeting**Session** | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

3:00 – 3:20 PM

CA21106 Introduction**Speaker**

Alessandro Mirizzi (Istituto Nazionale di Fisica Nucleare)

3:20 – 3:40 PM

WG1 report**Speaker**

Michele Cicoli (Istituto Nazionale di Fisica Nucleare)

3:40 – 4:00 PM

WG2 Report**Speaker**

Edoardo Vitagliano (Istituto Nazionale di Fisica Nucleare)

4:00 – 4:20 PM

WG3 Report**Speaker**

Maurizio Giannotti

4:20 – 4:40 PM

WG4 report**Speaker**

Marin Karuza (Istituto Nazionale di Fisica Nucleare)

4:40 – 5:00 PM

WG5 report**Speaker**

Loredana gastaldo (Kirchhoff Institute for Physics, Heidelberg University)

5:00 PM

5:00 PM

Coffee break**Break** | **Location:** Sofia University, Main lobby, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

5:20 PM

5:20 PM

Management Committee Meeting**Session** | **Location:** Sofia University, Aula, Sofia Center, Tsar Osvoboditel Blvd 15, 1504 Sofia, Bulgaria

5:20 – 5:40 PM

Grant awarding coordinator report**Speaker**

Venelin Kozhuharov (University of Sofia "St. Kl. Ohridski" & LNF-INFN)

5:40 – 6:00 PM

ECI Committee Report**Speaker**

Marta Fuentes Zamoro

6:00 – 6:20 PM

Report from Gender and Diversity Advisor**Speaker**

Deniz Sunar Cerci

6:20 – 6:40 PM

Draft of W&B Plan 2026**Speaker**

Alessandro Mirizzi (Istituto Nazionale di Fisica Nucleare)

7:30 PM





A fragment from one of the mosaics, displayed outside the three main halls of the Faculty of Physics, Sofia University.

Author: Toma Varbanov, 1989