



Institut  
Physique de  
l'Univers

Aix\*Marseille Université

*Astro Group*

*High energy astrophysics*

*Astroparticles*

*Coordination:*

*Damien Dornic (CPPM), Emmanuel Nezri (LAM)*

# *Astro Group*

*Main axes:*

- *Gravitationnal waves*
- *High energy sky (multi wavelength, multi-messenger)*
- *Dark matter*

People in the list : 10 LAM, 5 CPT, 14 CPPM

<<>	Email	Domaine	Nom	Réception	Sources	Abonné depuis	Mise à jour
<input type="checkbox"/>	<a href="mailto:albert.bosma@lam.fr">albert.bosma@lam.fr</a>			normal (réception directe des messages)	subscribed	07 févr. 2020	07 févr. 2020
<input type="checkbox"/>	<a href="mailto:aofe.bharucha@cpt.univ-mrs.fr">aofe.bharucha@cpt.univ-mrs.fr</a>			normal (réception directe des messages)	subscribed	20 févr. 2020	20 févr. 2020
<input type="checkbox"/>	<a href="mailto:bertin@cppm.in2p3.fr">bertin@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	13 févr. 2020	13 févr. 2020
<input type="checkbox"/>	<a href="mailto:busto@cppm.in2p3.fr">busto@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	19 févr. 2020	19 févr. 2020
<input type="checkbox"/>	<a href="mailto:cassol@cppm.in2p3.fr">cassol@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	07 févr. 2020	07 févr. 2020
<input type="checkbox"/>	<a href="mailto:chris.marinoni@gmail.com">chris.marinoni@gmail.com</a>			normal (réception directe des messages)	subscribed	09 avril 2020	09 avril 2020
<input type="checkbox"/>	<a href="mailto:costant@cppm.in2p3.fr">costant@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	13 févr. 2020	13 févr. 2020
<input type="checkbox"/>	<a href="mailto:coyle@cppm.in2p3.fr">coyle@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	13 févr. 2020	13 févr. 2020
<input type="checkbox"/>	<a href="mailto:delphine.porquet@lam.fr">delphine.porquet@lam.fr</a>			normal (réception directe des messages)	subscribed	19 févr. 2020	19 févr. 2020
<input type="checkbox"/>	<a href="mailto:dornic@cppm.in2p3.fr">dornic@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	13 févr. 2020	13 févr. 2020
<input type="checkbox"/>	<a href="mailto:emmanuel.nezri@lam.fr">emmanuel.nezri@lam.fr</a>			normal (réception directe des messages)	subscribed	11 févr. 2020	11 févr. 2020
<input type="checkbox"/>	<a href="mailto:eric.kajfasz@univ-amu.fr">eric.kajfasz@univ-amu.fr</a>			normal (réception directe des messages)	subscribed	07 févr. 2020	07 févr. 2020
<input type="checkbox"/>	<a href="mailto:ernenwein@cppm.in2p3.fr">ernenwein@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	14 févr. 2020	14 févr. 2020
<input type="checkbox"/>	<a href="mailto:escoffier@cppm.in2p3.fr">escoffier@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	07 févr. 2020	07 févr. 2020
<input type="checkbox"/>	<a href="mailto:guillaume.bonnet@lam.fr">guillaume.bonnet@lam.fr</a>			normal (réception directe des messages)	subscribed	20 févr. 2020	20 févr. 2020
<input type="checkbox"/>	<a href="mailto:hubaut@in2p3.fr">hubaut@in2p3.fr</a>			normal (réception directe des messages)	subscribed	07 févr. 2020	07 févr. 2020
<input type="checkbox"/>	<a href="mailto:jean-gabriel.cuby@lam.fr">jean-gabriel.cuby@lam.fr</a>			normal (réception directe des messages)	subscribed	19 févr. 2020	19 févr. 2020
<input type="checkbox"/>	<a href="mailto:julien.bel@cpt.univ-mrs.fr">julien.bel@cpt.univ-mrs.fr</a>			normal (réception directe des messages)	subscribed	09 avril 2020	09 avril 2020
<input type="checkbox"/>	<a href="mailto:marceau.limousin@lam.fr">marceau.limousin@lam.fr</a>			normal (réception directe des messages)	subscribed	19 févr. 2020	19 févr. 2020
<input type="checkbox"/>	<a href="mailto:matthew.pieri@lam.fr">matthew.pieri@lam.fr</a>			normal (réception directe des messages)	subscribed	06 févr. 2020	06 févr. 2020
<input type="checkbox"/>	<a href="mailto:nicolas.grosso@lam.fr">nicolas.grosso@lam.fr</a>			normal (réception directe des messages)	subscribed	10 mars 2020	10 mars 2020
<input type="checkbox"/>	<a href="mailto:pralavor@cppm.in2p3.fr">pralavor@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	07 févr. 2020	07 févr. 2020
<input type="checkbox"/>	<a href="mailto:roland.triay@cpt.univ-mrs.fr">roland.triay@cpt.univ-mrs.fr</a>			normal (réception directe des messages)	subscribed	10 févr. 2020	10 févr. 2020
<input type="checkbox"/>	<a href="mailto:secroun@cppm.in2p3.fr">secroun@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	13 févr. 2020	13 févr. 2020
<input type="checkbox"/>	<a href="mailto:stephane.basa@lam.fr">stephane.basa@lam.fr</a>			normal (réception directe des messages)	subscribed	07 févr. 2020	07 févr. 2020
<input type="checkbox"/>	<a href="mailto:stephane.blondin@lam.fr">stephane.blondin@lam.fr</a>			normal (réception directe des messages)	subscribed	10 févr. 2020	10 févr. 2020
<input type="checkbox"/>	<a href="mailto:stephanie.escoffier@univ-amu.fr">stephanie.escoffier@univ-amu.fr</a>			normal (réception directe des messages)	subscribed	13 févr. 2020	13 févr. 2020
<input type="checkbox"/>	<a href="mailto:tao@cppm.in2p3.fr">tao@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	20 févr. 2020	20 févr. 2020
<input type="checkbox"/>	<a href="mailto:yassine@cppm.in2p3.fr">yassine@cppm.in2p3.fr</a>			normal (réception directe des messages)	subscribed	13 févr. 2020	13 févr. 2020

*News:*

# News:

## - *SVOM/ Colibri:*



*Colibri test in progress*

*SVOM instrument sent to China soon (couple of months)*

*More informations and details in Stephane talk*

# News:

Observatory 20 km from volcano

~2200 m asl

- CTA:

~600 m asl

restart after volcanic eruption

September 2021



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**cta** cherenkov telescope array

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**Announcement**  
2021-September-27

# Status of the CTAO-North site and LST-1 after Volcanic Eruption at La Palma (Spain)



# News:



## ANTARES/KM3NeT:

Sea operation currently in progress.

- ANTARES:  
Unplugging lines (~spring)  
Dismantling (~summer)



- KM3NeT:

Successfull sea operation for ORCA (french site of KM3NeT) in November 2021 (10<sup>th</sup> line in water).



# *Animation of the Astro group*



# *Animation of the Astro group*

## **Thematic Transient/MWL/MM meetings: every month**

In the context of the Cercle LAM/CPPM: every last Tuesday of the month between 9 and 10h:

- Sept. 28: SVOM, COLIBRI, MISTRAL
- Oct. 26: Neutrinos from CCSN, KM3NeT, microquasars
- Dec. 6: Seminars of A. de Ugarte and C. Thorne
- Jan XX: cancelled
- Feb XX: Neutrino from AGNs + Pevatrons

Mailing list: [geco\\_transients@lam.fr](mailto:geco_transients@lam.fr)

Slack: <https://join.slack.com/t/transientmman-gzt4774/signup>

→ *Project submission interdisciplinary AAP AMU (PI: D.Dornic)*

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## **Thematic neutrino day @ June 29**

<https://indico.in2p3.fr/category/925/>

# Neutrino day

## Neutrino IPhU day

Tuesday Jun 29, 2021, 2:00 PM → 5:00 PM Europe/Paris

**Description** The main purpose of the meeting is to present the neutrino activities of our 3 labs and see how we can foster these activities.

The meeting will happen in the amphi of CPPM in the respect of the sanitary conditions. If you cannot be present in CPPM, you can participate to the meeting with this zoom

<https://univ-amu-fr.zoom.us/j/93030902188?pwd=eVZrN3RSNDJ0dU9SbFUyZUIxVTh1dz09>

meeting ID: 930 3090 2188

password: 874243



minutes\_neutrino\_I...

2:00 PM → 2:30 PM	<b>Introduction on the neutrino problematics</b>	🕒 30m
	<b>Speaker:</b> Juergen Brunner (CPPM IN2P3/CNRS Univ. Aix-Marseille II, France)	
	Neutrino-Intro-short...	
2:30 PM → 3:00 PM	<b>CPPM activities</b>	🕒 30m
	<b>Speaker:</b> Mathieu Perrin-Terrin (Aix Marseille Univ, CNRS/IN2P3, CPPM, Marseille, France)	
	2021-06-25_NuAtIP...	
3:00 PM → 3:30 PM	<b>CPT activities</b>	🕒 30m
	<b>Speaker:</b> Julien Bel (CPT)	
	neutrino_iphu_days...	
3:30 PM → 4:00 PM	<b>LAM activities</b>	🕒 30m
	<b>Speaker:</b> Emmanuel Nezri (Laboratoire d'Astrophysique de Marseille)	
	slides-neutrinoDay-I...	
4:00 PM → 5:00 PM	<b>Discussion</b>	🕒 1h

Organisers:  
D.Dornic  
J.Bell  
M.Perrin-Terrin

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## **Thematic neutrino day @ June 29**


<https://indico.in2p3.fr/category/925/>

## **Thematic gravitation days @ July 6-7**

<https://indico.in2p3.fr/event/23862/>



# Gravitationnal Waves



Institut  
Physique de  
l'Univers  
Aix-Marseille Université

## Gravitational Waves - A new window to the Universe

Jul 6 – 7, 2021  
Zoom  
Europe/Paris timezone

Overview

Timetable

Contribution List

Registration

Participant List


Contact

✉ [iphu-contact@univ-amu.fr](mailto:iphu-contact@univ-amu.fr)

### First IPhU Conference Series

## Gravitational Waves - A new window to the Universe

*195 participants*



LIGO, NSF, Illustration: A. Simonnet (SSU)

### Lectures:

- Theory of the Gravitational Waves - Luc Blanchet (IAP, France)
- From Sources to Detection - Luis Lehner (Perimeter Institute, Canada)
- Gravitational Waves on Earth - Ligo/Virgo - Gabriela Gonzalez (Louisiana State Univ., USA)
- Gravitational Waves in Space - LISA - Antoine Petiteau & Hubert Halloin (APC, France)
  
- Astrophysics - Lucio Mayer (University of Zurich, Switzerland)
- Cosmology - Germano Nardini (University of Stavanger, Norway)
- Fundamental Physics - Marc Besançon (CEA/Irfu, France)
- Waveforms - Deirdre Shoemaker (Univ. of Texas at Austin, USA)

### Organizing Committee

Eric KAJFASZ  
Christian MARINONI  
Alejandro PEREZ  
Delphine PORQUET

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## **Thematic neutrino day @ June 29**

<https://indico.in2p3.fr/category/925/>

## **Thematic gravitation days @ July 6-7**

<https://indico.in2p3.fr/event/23862/>

## **Thematic Dark Matter day @ Nov 26**

<https://indico.in2p3.fr/event/25340/>

# Dark matter day

**IPhU dark matter day**

Friday Nov 26, 2021, 2:00 PM → 7:05 PM Europe/Paris

Amphi (CPPM)

**Description** Zoom link : <https://univ-amu-fr.zoom.us/j/96718484896?pwd=Vm5nZ2d0Skgzak44N1hKcVVenhDQT09>

Meeting ID: 967 1848 4896  
Passcode: 804165

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**2:00 PM** → 2:30 PM **Dark matter: an overview**  
Speaker: Albert Bosma (LAM) 🕒 30m

**2:30 PM** → 7:05 PM **Tour de table: 3-5 minutes/participant**  
Convener: Emmanuel Nezri (Laboratoire d'Astrophysique de Marseille)

## Organizers:

*E.N*  
*F.Hubaut*  
*M.Limousin*  
*C.Schimd*

*26 participants*

*Round table to describe each individual or group activity as a first step*

→ *Bring closer (astro)particle pheno, detection and cosmology*



# *DARK MATTER*

*- The DM group @ CPPM looking for dark matter with two experiments*

*DarkSide (WIMPs)*

*and*

*MadMax (Axions)*



*= Structuring for IPhU DM activities*



# Dark matter

## Direct search for WIMP dark matter

### Project:

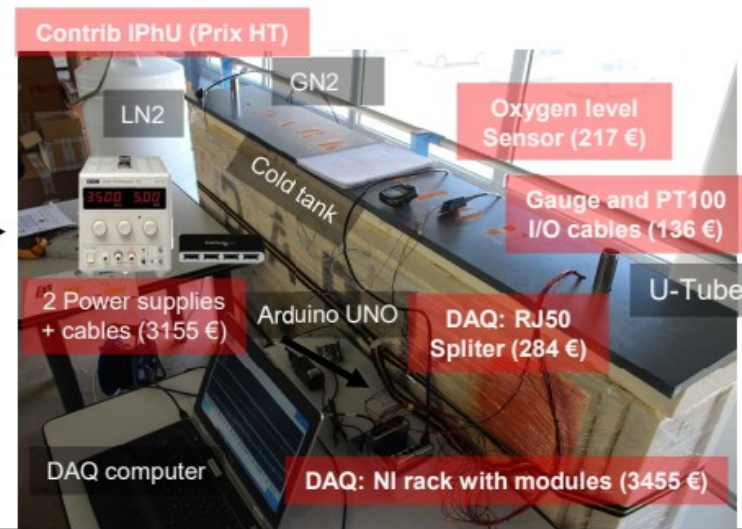
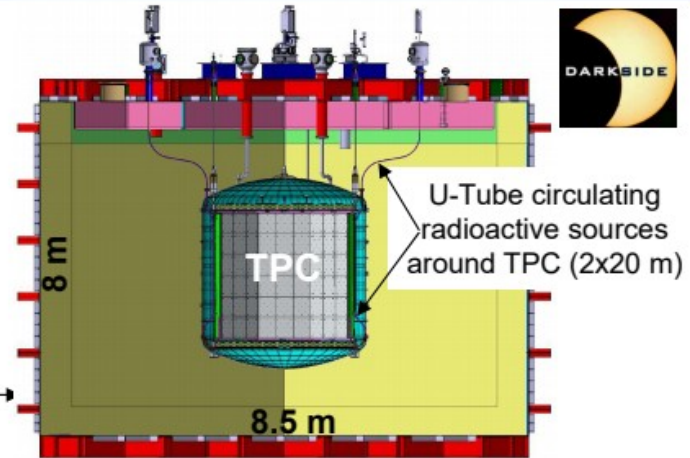
4 years (starting in 2021) between experimentalists and theorists across 3 IPHU science working groups gathering 4 labs (CPPM, CPT, LAM, LUPM)

### Goal :

Prepare at best the search for WIMP dark matter with the first data of **DarkSide-20k expt** [Gran Sasso, 2025] by reducing the experimental and theory systematics

### Progress report in 2021 :

- PhD student, Marie Van Uffelen, started in Oct.
- Equip the mock-up that will validate the **U-tube calibration** system. Cold run at CPPM
- Prepare the calibration program with DarkSide-20k Geant4 simulation
- Started to work on **signal reconstruction** algorithms
- Started to work on **galactic modelling** impact on DarkSide-20k sensitivity



→ See Pascal and Marie talks

# *Dark matter*

*→ Extend collab: Bring closer (astro)particle phenomenology and detection with cosmology*

*Add  
lensing (Eric Jullo, Marceau Limousin) from LAM*

*ANTARES-KM3NeT (Vincent Bertin) from CPPM*

*→ Project submission interdisciplinary AAP AMU (PI: Eric Jullo)*

*Next step ?*

*Make connection with BSM theoretical frameworks (CPT) and collider searches (CPPM)*

## *Coming up*

- AAP Interdisciplinaire AMU: 2 projects submitted
  - NEutrinos and X-ray follow-up for Cosmic-ray Source studies (D.Dornic)
  - Direct and Cosmological characterization of dark matter (E.Jullo)
  
- LAM cafe club (organisation C. Schimd)
  - IphU general seminar
  - Gabriel Chardin : Dirac-Milne Universe
  - 9 march 2022 (zoom)
  
- IPhU doctoral lectures on Dark Matter
  - Julien Laval (LUPM)
  - Spring – Fall 2022 ?

*Thank you for your attention*