

# Pheno 2024 Highlights

Liliana Apolinário



**TÉCNICO**  
LISBOA



# Pheno News

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PI Elections in April 2023

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New 2 CEECs (junior 22 and assistant 23)

Braga (**jet theory**) and Lisbon  
poles and (**phenomenology**)

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New Collaborations with LIP Astroparticle  
Physics Groups

**Pierre Auger:** Master thesis “Impact of the  
Quark-Gluon Plasma in Extensive Air Showers”

**Southern Hemisphere Gamma-Ray  
Observatory (SWG0):** Synergy for pattern  
recognition (jet expertise)

Identification of low energy neutral and charged cosmic ray  
events in large wide field observatories

L. Apolinário<sup>1,2</sup>, P. Assis<sup>1,2</sup>, P. Brogueira<sup>1,2</sup>, R. Conceição<sup>1,2,a</sup>, P. J.  
Costa<sup>1,2</sup>, G. La Mura<sup>1,3</sup>, M. Pimenta<sup>1,2</sup>, B. Tomé<sup>1,2</sup>

<sup>1</sup>LIP - Laboratório de Instrumentação e Física Experimental de Partículas, Lisbon, Portugal

<sup>2</sup>Departamento de Física, Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal

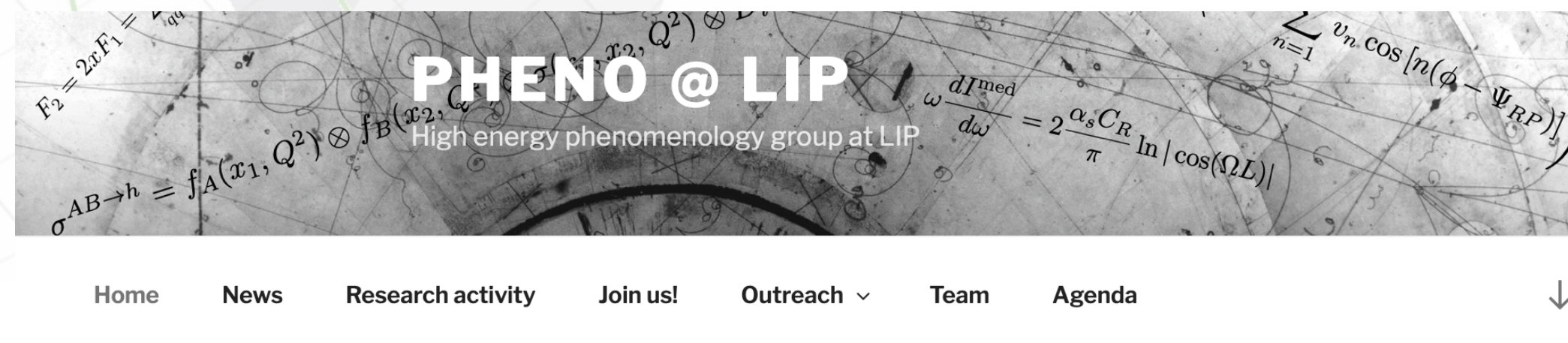
<sup>3</sup>INAF - Osservatorio Astronomico di Cagliari, Selargius, Italy



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New group webpage



Outreach material

Hands-on QCD Jets

(Unity) Jet Visualizer (together with LIP-ECO)

MsC and PhD Lectures

Regular (bi-weekly)  
meetings

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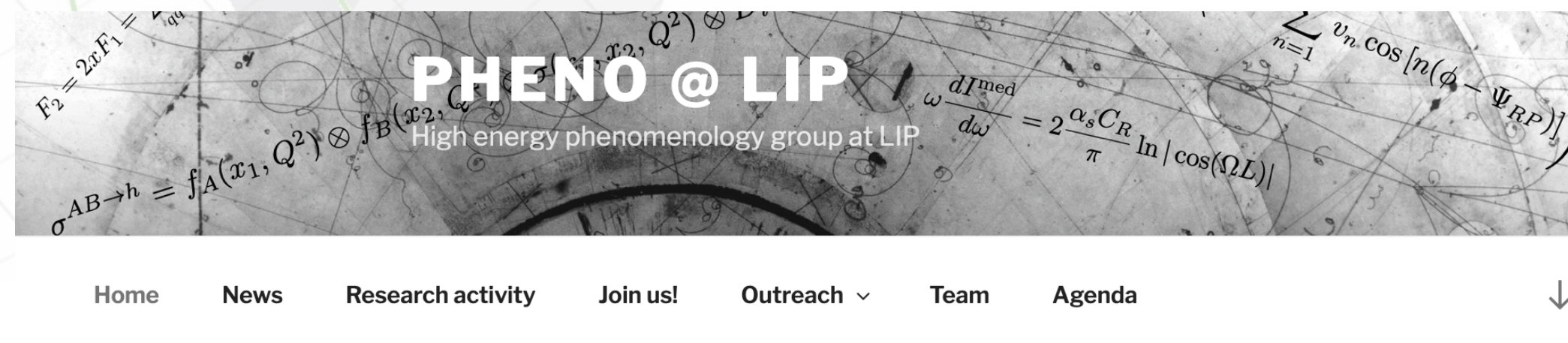
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1 on-going application to ERC (Consolidator)  
[+1 on-going ERC Starting (researcher now at LIP)]

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# Pheno Activities

## Scientific Activities:

Main Focus areas:

New Physics Searches

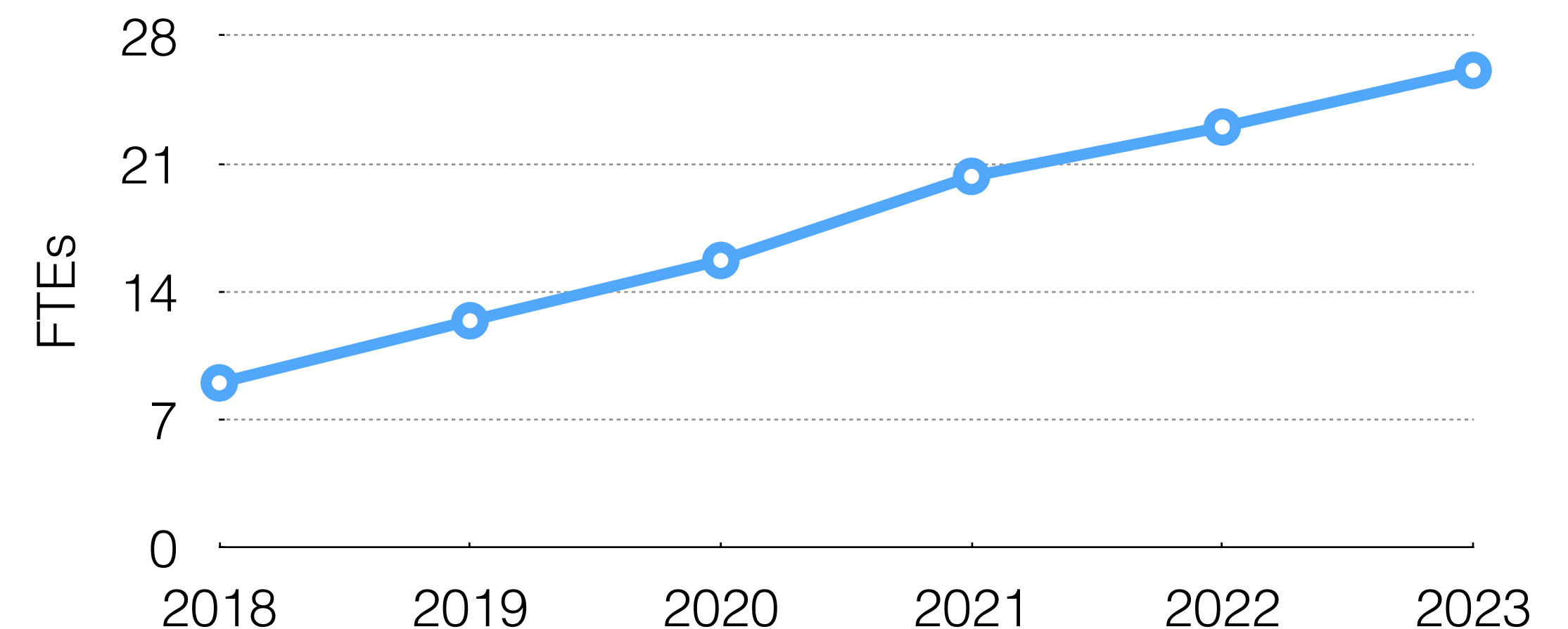
Precision QCD

Saturation Physics

Heavy-Ions

8 on-going PhD thesis, 1 concluded

11 on-going MsC thesis, 3 concluded

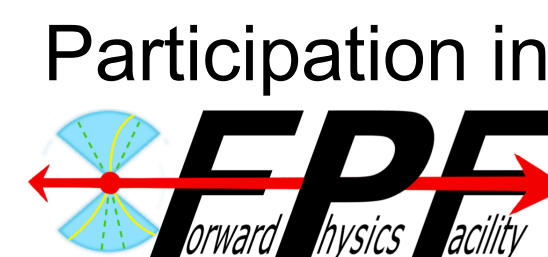


## Organization:

3 dedicated workshops

IAC of Initial Stages 2023

Theory Convener for LPCC Heavy-Ion Working group and ICHEP24 Heavy-Ion



at the High-Luminosity LHC



NEW JET QUENCHING TOOLS TO EXPLORE EQUILIBRIUM AND NON-EQUILIBRIUM DYNAMICS IN HEAVY-ION COLLISIONS



November 6-9, 2023

**Workshop: 2nd Workshop on Advancing the Understanding of Non-Perturbative QCD Using Energy Flow**  
**Location: Stony Brook University**  
**Organizers:** Bill Li (Stony Brook University), Charles-Joseph Naim (Stony Brook University), Liliana Apolinario (Laboratory of Instrumentation and Experimental Particles Physics (LPT), Raghav Kunawalkam Elayavalli (Vanderbilt University), Xiaoxuan Chu (Brookhaven National Laboratory), Xuan Li (Los Alamos National Laboratory), Yang-Ting Chien (Georgia State University)

# Pheno SWOT Analysis

## ◆ Strengths:

- ◆ **Internationally recognised and very active** research of high impact in **QCD & related subjects and BSM searches**; Growing number of students being trained in the group across the different research topics of the group; **Demonstrated ability to seek competitive National/European funding.**

## ◆ Weaknesses:

- ◆ **Insufficient critical mass** to cover phenomenologically wealth of physics addressed by experimental groups at LIP; Most of the more **senior members still depend** on national scientific **temporary employment calls** whose contracts will end soon.

## ◆ Opportunities:

- ◆ **High level of interest** from researchers at various levels of experience to **join the group**; strong **synergy with Astroparticle groups and the Simulation and Big Data Competence Centre at LIP**; mature collaborations with centres of excellence including CERN-TH, Santiago de Compostela, Granada, Jyvaskyla, MIT;

## ◆ Threats:

- ◆ Uncertainty in the ability to **retain current precariously employed** researchers and corresponding risk in demoting established activity areas within the group. **Reduction of available PhD grants** and consequently reduction in ability to **secure current MSc students** and attract external candidates willing to pursue a PhD degree.



# Acknowledgments

