

4th COMCHA School

Training scientific researchers on advanced
computing technologies



Zaragoza 8 – 15 April 2026

indico.capa.unizar.es/evento/42



Centro de Astropartículas y
Física de Altas Energías
Universidad Zaragoza



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COMCHA Network

www.comcha.es

Teams and Projects

COMCHA
Computing challenges



CAPA in numbers



91 Members
Researchers
Engineers
Early-career



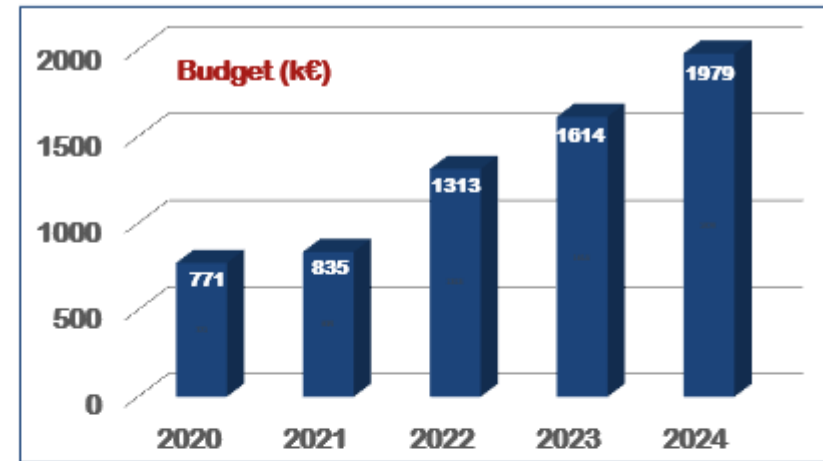
~200 talks in scientific
conferences
(2021 - 2024)



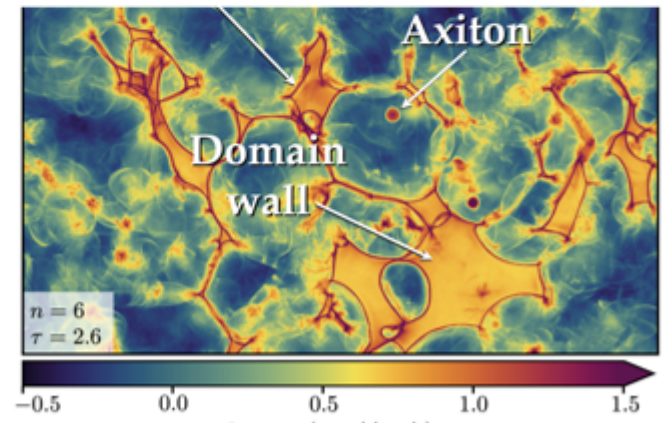
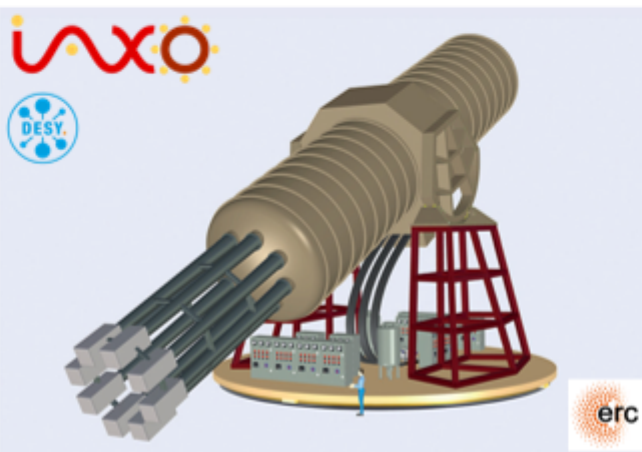
10 PhD theses
(2020 - 2024)
21 ongoing



+35 outreach
events per year



Research lines



Rare events searches: Dark Matter, Axions, Neutrinos, ...

Theoretical Physics, High Energy Physics,
Astroparticles

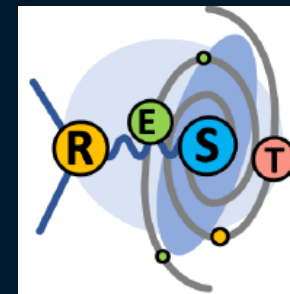
CAPA & COMCHA

- CAPA is positioned at the state-of-the-art of computing techniques in Physics in several domains:

- Lattice
- HEP (Global fits)
- Muography
- ...

- A “particular” case: Rare Event searches

Software development:



Limited and unbalanced datasets	<i>Signal events far fewer than background / noise events</i>	Training difficulty and/or bias
Low visibility of the signal	<i>Low probability of signal process</i>	Potential miss-classifications
Non-standard background distributions	<i>Non-standard statistical distributions</i>	Difficulty to design ML models
Dependence on high-precision simulations	<i>Simulations depends on theoretical models and parameters</i>	Uncertainties during training
Simulation to data mismatch	<i>Unknown background sources, detector response, ...</i>	Generalization problems
Low statistics	<i>Low overall counting rate</i>	ML models extremely sensitive to small systematic variations

Some practical information

- You can find general information at indico webpage: <https://indico.capa.unizar.es/event/42/>
 - Schedule, Locations
- All the school will be held in Sala de Grados and Aula 11 (Second floor of this building)
- Coffe breaks (morning and afternoon) will be served next to Aula 11
- Lunches will be at the Facultad de Ciencias canteen (Basement of this building)
- Some pictures will be taken during the conference: Please tell us if you prefer not to appear
- Specific information about the program, activities, etc will be provided:
 - At the end of the sessions
 - At the mattermost channel (working on it)
- We encourage you to fill the participant information form and the bio template (you received the corresponding links by mail)
- Of course, members of the LOC are available anytime to help you!