

Physics @ R³B



- **RPC** inserted in *standard* R³B setup (until moving to new exp. cave) for high-E proton detection
- Contribute to preparations for **2024** Physics campaigns
 - ★ SRCs on clustering
 - ★ Assymmetric EoS
 - ★ Hypernuclei
- Work on Proton Arm Spectrometer (PAS) concept based on RPCs

Nuclear Astrophysics

Nuclear Reactions



- ★ Further **involvement** in ISOLDE-CERN

- ★ **Proposals for small scale facilities:** (Seville-Debrecen-Lisbon)

- ★ **Target developments for radioactive ion beam facilities**



Explosive Modelling

- Atomic Structure calculations for Kilonova modeling
- ★ Collaboration with **ERC grantee** (G. M. Pinedo)
- ★ **PhD and M.Sc. Thesis** ongoing

- Explosive **nuclear reaction network** studies (collaboration with Konkoly Observatory, Budapest)

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- RPC inserted in *standard* R³B setup (until moving to new exp. cave) for high-E proton detection



- Contribute to preparations for 2024 Physics campaigns

★ SRCs on clustering 2024

★ Asymmetric EoS 2025 (partially)

★ Hyp 2025 clei

- Proton Arm Spectrometer (PAS) concept based on RPCs **was not selected**

Nuclear Astrophysics

Nuclear Reactions



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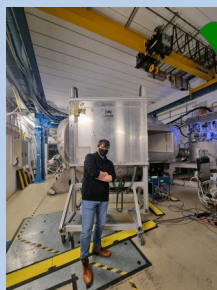


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Nuclear Astrophysics

Nuclear Reactions



- ★ Analysis of IS698 ongoing

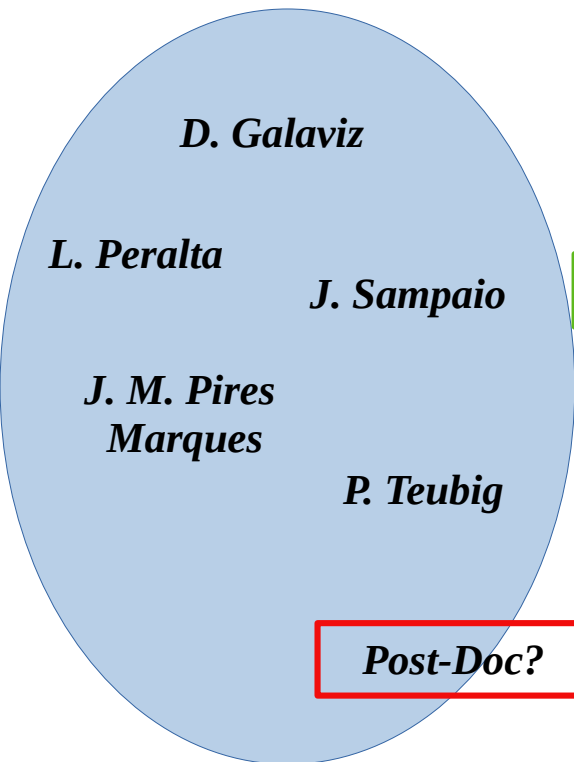
- ★ Proposals for 3 experiments facilities: (S approved for Debrecen-Lisbo 2024!!!)

- ★ Target developments for radioactive ²⁰⁸Pb targets for Notre Dame ⁶He experiment

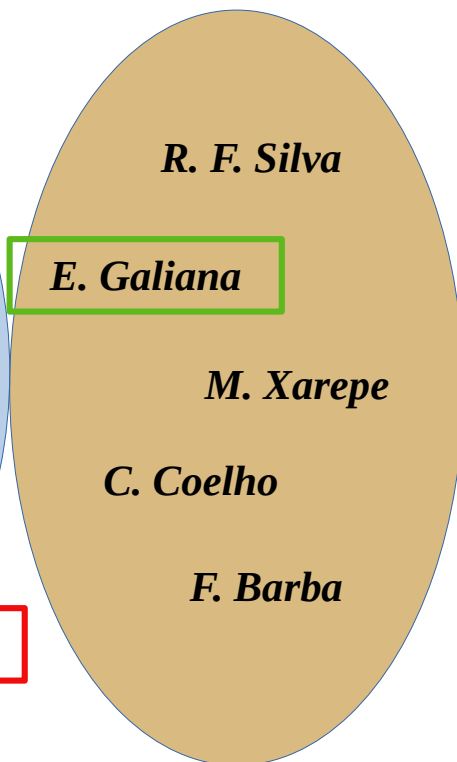
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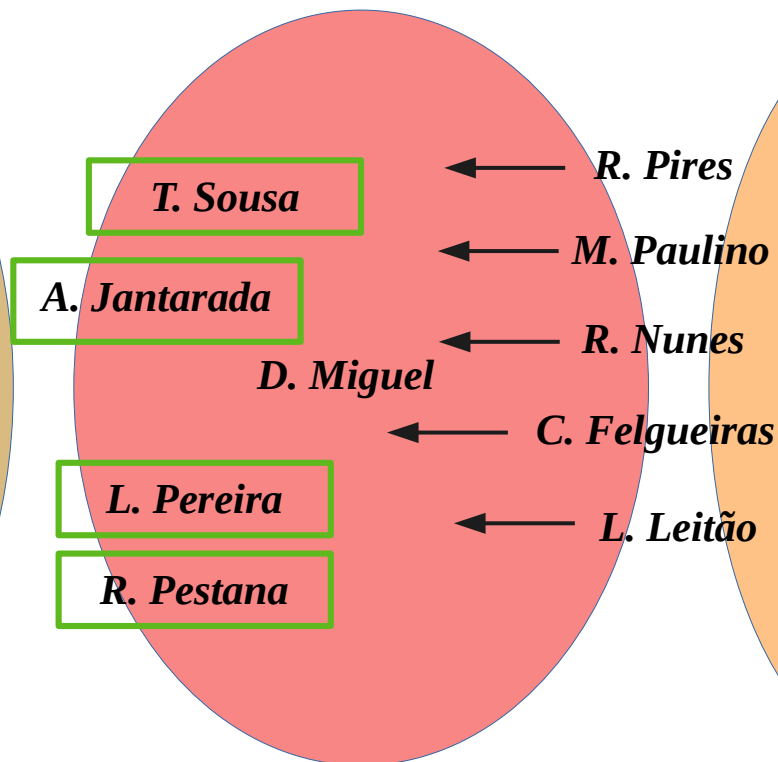
Senior



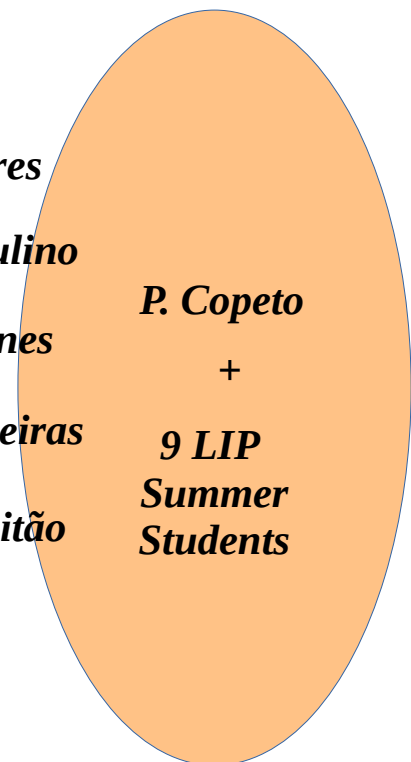
Ph.D.



M.Sc.



B.Sc.



Senior

Ph.D.

M.Sc.

B.Sc.

D. Galaviz

L. Peralta

J. Sampaio

*J. M. Pires
Marques*

P. Teubig

P. Velho

Post-Doc?

R. F. Silva

F. Afonso

M. Xarepe

C. Coelho

F. Barba

R. Pires

M. Paulino

R. Nunes

D. Miguel

C. Felgueiras

L. Leitão

A. Vicente

B. Amorim

P. Copeto

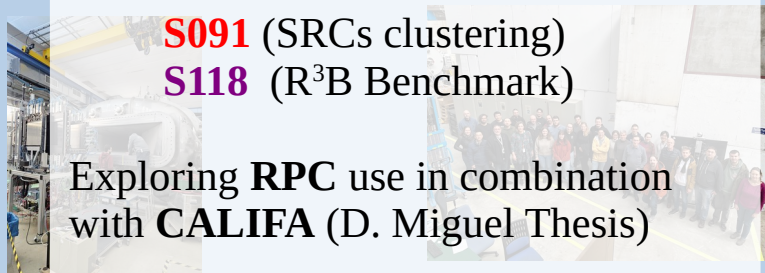
T. Campante

+

*1-2 LIP
Summer
Students*

Physics @ R³B

- RPC included in experiments



S091 (SRCs clustering)

S118 (R³B Benchmark)

Exploring **RPC** use in combination with **CALIFA** (D. Miguel Thesis)

DAQ and **analysis** contributions.

- Prepare for **2025** Physics campaign
- ★ Hypernuclei

-
- Funding application submitted: ~250 k€

Nuclear Astrophysics

Nuclear Reactions



- ★ **New poposals** for ISOLDE-CERN before LS3

-
- ★ **Execute Experiments @ small scale facilities:** (Seville-Debrecen-Lisbon)

-
- ★ **Target developments**



Explosive Modelling

- Atomic calculations:
 - ★ Collision strengths for electron-impact exc.
 - ★ Photoionization & recombination rates
- Advance towards astrophysical simulations
 - ★ ERC – Synergy **HEAVYMETAL**

-
- Funding applications submitted (two projects: ~ 80 k€)

Strength

- Strong **international collaboration** experience.
- Expertise in instrumentation, data analysis, particle transport simulations, and nuclear astrophysics.
- Proven track record of participation in **experiments** at various radioactive and stable beam accelerator institutes.
- Combination of experimental and theoretical work

Opportunities

- International participation offers visibility and potential to attract **young researchers**.
- Opportunities to expand current collaborations to other institutes.
- Participation in **International Networks** (EUROLabs, ChETEC-Infra, IANNA,...) offers growth opportunities.

Weaknesses

- **Limited funding**, which may prevent the group from effectively contribute to the construction of new detection systems in international collaborations.
- **Limited** number of **senior researchers**, with strong teaching commitments.
- Lack of postdoctoral researchers in the group

Threats

- Inability to effectively participate in next-generation facilities like **FAIR** or **ISOLDE** may endanger future involvement.
- Lack of funding may be an obstacle to student retention and recruitment of senior researchers, hindering group growth and sustainability.