Alexandre Lindote

Curriculum Vitae

Contacts

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Preamble

I am currently a junior researcher at LIP (Laboratório de Instrumentação e Física Experimental de Partículas) with a fixed term 6 year contract (ending in July 2024), and a *pro bono* auxiliary professor in physics at the Physics Department of the University of Coimbra.

I received my Ph.D in Experimental Physics from the University of Coimbra in May 2009. I have worked in 2-phase xenon time projection chambers (TPCs) and their use in direct search for dark matter (in the form of Weakly Interacting Massive Particles, WIMPs) since 2005. During this period I was part of state of the art experiments which have significantly contributed to the advancement of the field (ZEPLIN-II, ZEPLIN-III, LUX and LUX-ZEPLIN), as shown by my full publication list. I have acquired expertise in the various aspects of these experiments, from construction, operation and monitoring to data acquisition hardware and software, data management, processing and analysis. In the last three years I started focusing my research on the search for the lepton number violating process $0\nu 2\beta$ decay in the ¹³⁶Xe isotope, which can prove the existence of new physics beyond the Standard Model and shed light on the Majorana nature of neutrinos and their mass hierarchy. My accumulated experience has allowed me to occupy several coordination positions in international collaborations, namely as data processing coordinator in LUX (2015-present), backgrounds coordination and modelling in LZ (2016-2019), and high-energy physics analysis in LZ coordination (2019-present), as shown below in the Academic and Scientific Positions section, proving the confidence of fellow collaborators on my scientific work. I have been directly involved in highly impacting publications from these experiments, as shown by my selected publications list, and have worked in fundamental research for this detector technology. I am co-author

of 185 publications, with a total of 6981 citations and an h-index of 39 (information from Scopus).

Since 2013 I am also *pro bono* auxiliary professor in the Physics Department of the University of Coimbra, having lectured on topics directly related to the areas of this application, as shown in the *Teaching experience* section of this CV. I have also supervised Masters and Ph.D level students working in these areas, and have been a member of various academic juries. In parallel, I have organized or participated in numerous Outreach activities, in order to communicate Science to the general public and attract young people to Physics.

Scientific Production

Selected publications

Listed below are my publications in the last 5 years that I consider of higher relevance. I had direct and considerable contributions to all of them, as described in each case. Their content and relevance to the respective field are succinctly described below.

- A. Lindote, I. Olcina et al., "A 3rd generation liquid xenon TPC dark matter experiment sensitivity to neutrino properties: magnetic moment and $0\nu_{2\beta}$ decay of 136Xe", Snowmass2021 Letter of Interest (NF05, 156), available at this link. The study presented in this Letter of Interest (LoI), led by me and submitted to the Snowmass2021 process, shows that a 3rd generation xenon TPC with 75 tonnes of natural abundance xenon in the active region, can be highly competitive in the search for $0\nu_{2\beta}$ decay of the order of 10^{28} years. Observation of the $0\nu_{2\beta}$ decay can reveal the Majorana nature of the neutrino and new physics beyond the SM. Further optimisation of detector parameters and background rejection techniques can further improve its sensitivity, allowing it to directly compete with dedicated experiments in this area. This LoI and its conclusions are directly cited in the final report of the Snowmass NF05 (Neutrino properties) topical group.
- D. Akerib et al. (LZ Collaboration), "Projected sensitivity of the LUX-ZEPLIN experiment to the 0ν2β decay of 136Xe", Phys. Rev. C 102 (2020) 1, 014602, doi:10.1103/PhysRevC.102.0146 02 (25 citations, Journal Impact Factor: 3.3). This publication shows that LZ can competitively search for 0ν2β decay in Xe-136, reaching sensitivities comparable to those of the best current dedicated experiments. As coordinator of the LZ backgrounds group I was responsible for the development of the background model at high energies used to estimate this sensitivity, and I later oversaw the final stages of this publication in my role as high-energy physics coordinator. The main corresponding author of this paper was my PhD student, whom I supervised during this study.
- D. Akerib et al. (LZ Collaboration), "Projected sensitivity of the LUX-ZEPLIN experiment to the two-neutrino and neutrinoless double β decays of 134Xe", Phys. Rev. C 104 (2021), 065501, doi:10.1103/PhysRevC.104.065501 (1 citation, Journal Impact Factor: 3.3)
 Xenon contains two isotopes which can undergo 2ν2β decay: it has already been observed in Xe-136, but not in Xe-134 (due to the lower Q-value of the decay). The neutrinoless mode of this decay can also occur in Xe-134, providing another

interesting probe to new physics. This publication shows that LZ can easily beat the current best limits for both modes of this decay, in just a few months of operation, and can be the first experiment to measure the half-life of the $2\nu 2\beta$ decay in Xe-134, reaching theoretical model predictions by the end of the run. I developed the background model used in this study and coordinated the full analysis and sensitivity estimates.

• D. Akerib et al. (LUX Collaboration), "Search for two neutrino double electron capture of 124Xe and 126Xe in the full exposure of the LUX detector", J. Phys. G 47 (2020) 10, 105105, doi:10.1088/1361-6471/ab9c2d (3 citations, Journal Impact Factor: 3.0).

Two neutrino double electron capture is a rare decay allowed in the SM, observed in Kr-78, Ba-130 and more recently in Xe-124. It is useful to compare predictions from different nuclear models and provides knowledge about the underlying nuclear matrix elements. This publication, of which I am the main corresponding author, presents the analysis and results of the search for this decay in Xe-124 and Xe-126 using all the available LUX data, an analysis entirely done by me.

• D. Akerib et al. (LZ Collaboration), "Projected WIMP Sensitivity of the LUX-ZEPLIN (LZ) Dark Matter Experiment", Phys. Rev. D 101 (2020) 5, 052002, doi:10.1016/j.astropartphys.2019.02. 006 (317 citations, Journal Impact Factor: 5.3).

This publication shows that the LZ experiment can improve the current best WIMP exclusion limits for masses in the tens to hundreds of GeV by almost two orders of magnitude with 1000 days of exposure and a 5.6 tonnes fiducial mass, and lead the field in the coming years. Preparation of this paper occurred during my tenure as LZ backgrounds coordinator, and I was responsible for the development of the background model at low energies used to estimate the WIMP sensitivity in this study.

• F. Neves, A. Lindote, et al., "Measurement of the absolute reflectance of polytetrafluoroethylene (PTFE) immersed in liquid xenon", JINST 12 (01), p. P01017, 2017, doi:10.1088/1748-0221/12/01/P01017 (31 citations, Journal Impact Factor: 1.4).

WIMPs scattering off nuclei are expected to produce a quickly falling energy recoil spectrum. The energy threshold of xenon TPCs is ultimately driven by the ability to collect the small signals from primary scintillation light. These detectors typically use PTFE as reflector, covering all the internal surfaces to maximise this light collection, but the reflectivity of this material while immersed in liquid xenon had never been measured directly before. The dedicated setup described in this publication allowed such a measurement for the first time, showing that the reflectivity of the PTFE used in the LZ detector was \geq 97%, leading to a 30% improvement in the expected WIMP sensitivity compared to previous assumptions. I worked in the simulation, design, operations and data analysis of this setup.

Selected communications

Below I present a selection of my most relevant communications in international conferences and meetings in the last 5 years.

• A. Lindote, F. Kuger, "Neutrinoless Double Beta Decay", WG1 (Science) report talk at the joint DARWIN/XENON + LUX-ZEPLIN Summer Meeting 2022, Karlsruhe, 27-29 June 2022.

- A. Lindote, I. Olcina, "Sensitivity to neutrinoless double beta decay of 136Xe with a third generation TPC dark matter experiment", poster presented at the Neutrino 2022 conference, Seoul, 30 May - 4 June 2022."
- A. Lindote, "Status of the LUX-ZEPLIN (LZ) experiment", invited talk at the XeSAT 2022 workshop, Coimbra, 23-26 May 2022.
- A. Lindote, "Background model and science reach of the LUX-ZEPLIN (LZ) experiment", poster presented at the PANIC2021 conference, Lisbon, 5 10 September 2021.
- A. Lindote, I. Olcina, "0ν2β decay searches with a G3 liquid Xe TPC experiment", talk at the Snowmass Mini Workshop: "0ν2β experiments II", online, 19 August 2020.
- A. Lindote, "New Results from LUX", invited talk at the EPS Conference on High-Energy Physics, Venice, 5-10 July 2017.
- A. Lindote, "Direct Dark Matter Searches with LUX and LZ", invited talk at the 13th Patras Workshop on Axions, WIMPs and WISPs, Thessaloniki, 14-19 May 2017.

Impact and Recognition of the Scientific Production

Main coordination positions

Listed below are the coordination positions I consider of highest relevance in my career.

2019 - present: Joint coordinator of the high-energy working group of the LZ collaboration. This group is responsible for the analyses of rare and forbidden decays in xenon isotopes $(2\nu 2\beta \text{ and } 0\nu 2\beta \text{ in Xe-134}$ and Xe-136, as well as the 2ν and 0ν decays in Xe-124 – 2EC, EC β^+ , $2\beta^+$). In this role I have already supervised the publication of two sensitivity papers from the LZ collaboration (on Xe-136 and Xe-134 decays), and am also responsible for coordinating the related analyses with real data. Simultaneously, this role has allowed me to be deeply involved in the sensitivity studies for a next generation (G3) detector.

2016 - 2019: Coordinator of the backgrounds working group of the LZ collaboration. This is one of the 4 top analysis coordination positions in the LZ collaboration (below only that of the general Physics Coordination position) for which I was elected by a board composed by all Principal Investigators in the collaboration. This group was responsible for providing a full background model of the experiment prior to the start of data taking and for developing the required techniques to tune and validate the model once data acquisition begins.

2014 - 2016: Coordinator of the analysis subgroup responsible for the WIMP search data for the reanalysis of the first science run of the LUX experiment, for which I was nominated by the analysis coordinator of the experiment. This reanalysis was performed after a set of very detailed calibrations of the detector and comprised a complete revision of the initial data processing and analysis algorithms, leading to the publication of an improved WIMP exclusion limit, particularly relevant at low WIMP masses.

2013 - present: Coordinator of the Data Processing group of the LUX experiment, for which I was elected by the board composed by all Principal Investigators in the collaboration. In this position I made many contributions to the software framework used and

various of the data analysis modules, and am still to this day responsible for maintaining the data processing framework and for reprocessing LUX data for specific analyses.

Scientific and publication committees, refereeing activity

Vice-president of the LIP Scientific Council board (2021-2023)

Chairman of the editorial board of the PANIC2021 conference proceedings

Member of the Local Organizing Committee of the PANIC2021 conference

Referee for the Journal of Intrumentation (JINST) since 2015, the Astroparticle Physics journal since 2016 and the Radiation Physics and Chemestry journal since 2019.

Member of four paper writing committees and three review committees in the LUX and LZ collaborations (2016 - 2022).

Outreach activities

The entries below provide a summary of my outreach activities of the past 5 years. A full list can be found below.

Summer internships and activities

Coordination of Summer Internships: with the goal of providing undergraduate students the experience of working in a research environment, I have organised (and coorganised) since 2017 Summer internships in a variety of topics: from data analysis and Dark Matter phenomenology, Monte Carlo simulations and sensitivity studies in the field of $0\nu 2\beta$ decay, to the development of simple particle physics detectors and associated electronics. A total of 25 students have participated in these internships since 2017.

I am also a member of the LIP internship program coordination group, responsible for the organisation of the LIP internships and the various activities of this program (introductory lectures and tutorials week, final workshop).

Coordination of Summer University activities: Between 2017 and 2019 (before the COVID pandemic) I organised week-long activities each Summer, in which groups of 5 high-school students learned about Dark Matter and analysed simplified real data from the LUX detector mixed with fake WIMP signals, and tried to identify the WIMP candidate events.

Outreach communications

I have presented various outreach talks on the topic of Dark Matter and direct search for WIMPs for a variety of audiences. Below is a selected list of these talks in the last 5 years:

- "LIP: from particles to health", presented to students of the Physics Department of the University of Coimbra, December 2020.
- "Dark Matter: from the galaxies to the deep mines", presented in the National Encounter of Physics Students, Coimbra, February 2020.
- "Dark Matter: from the galaxies to the deep mines", presented to undergraduate students in the 4th Lisbon Mini-School on Particle and Astroparticle Physics, Caparica, February 2019.

• "Matéria Escura: das galáxias ao fundo de uma mina", presentation to the general public at the "Lojas de Saber" conference cycle, Coimbra, March 2018.

End of Preamble

Full Curriculum Vitae

Research Interests

Experimental and computational physics. Astroparticle physics, with a special focus on direct Dark Matter searches, neutrinoless double beta decay and neutrino physics. Experiments for rare event searches using low background detectors based in liquid xenon. Software development for data acquisition and processing, data analysis and simulation tools. Programming languages and operating systems.

Academic and Scientific Positions

- Member of the XLZD consortium (towards a G3 experiment): 2022 present
- Data and run coordinator of the MIGDAL experiment: 2020 present
- Coordinator of the high energy ER group of the LZ experiment: 2019 present
- Junior researcher at LIP: 2018 present
- Coordinator of the backgrounds working group of the LZ experiment: 2015 2019
- Coordinator of the Data Processing framework of the LUX experiment: 2013 present
- Coordinator of the LUX WIMP and Low Energy Backgrounds group: 2014 2016
- Coordinator of the Data Processing group of the LUX experiment: 2013 2014
- Invited Auxiliar Professor at the Physics Department of the University of Coimbra: 2013 present
- Member of the LZ collaboration: 2012 present
- Member of the LUX collaboration: 2011 present
- Postdoctoral researcher at LIP: 2009 2018
- Visiting Researcher at the Rutherford Appleton Laboratory (STFC-RAL): 2009 2012
- Member of the UKDM and ZEPLIN-III collaborations: 2005 2012
- Member of the n-ToF collaboration: 2004 2015

Scientific Activity

The activities listed below were mainly developed in the framework of competitive international collaborations (LUX-ZEPLIN, LUX, ZEPLIN-III, UKDM), and constitute a blend of coordination of working groups, data analysis, software development (for data acquisition and processing), Monte Carlo simulation and experimental work.

- Sensitivity studies and design strategies of a next generation (G3) xenon TPC detector to neutrinoless double beta decay (NDBD) in Xe-136. In this context, I am a member of WG1 (Science Impact) of the new XLZD consortium for a G3 xenon TPC and I lead the NDBD subgroup: 2022 present
- Data and run coordinator of the MIGDAL experiment, in which I am responsible for the data acquisition software (digitized waveforms and optical camera images), data management and processing coordination, and run planning and coordination. This experiment will try to observe the Migdal effect for the first time using a GEM-based gas TPC. Understanding this effect will allow liquid xenon TPC to significantly extend their sensitivity to low mass WIMPs: 2020 present
- Coordinator of the high-energy working group of the LZ collaboration. This group is responsible for the analyses of rare and forbidden decays in xenon isotopes (2ν2β and 0ν2β in Xe-134 and Xe-136, as well as the 2ν and 0ν decays in Xe-124 2EC, ECβ⁺, 2β⁺): 2019 present
- Design, optimization and construction of a prototype liquid xenon Time-Projection-Chamber with SiPM readout for the development of discrimination techniques for the identification of ¹³⁶Xe neutrinoless double beta decay signals, with possible application in future large scale detectors (in a collaboration with Imperial College London): 2018 – present
- Coordinator of the backgrounds working group of the LZ collaboration, responsible for providing a full background model of the experiment prior to the start of data taking and for developing the required techniques to tune and validate the model once data acquisition begins: 2016 2019
- Search for the rare double electron capture in ¹²⁴Xe (normal decay and the neutrinoless mode) in the Run04 of the LUX experiment, and the study of the sensitivity of the LZ detector to these decays: 2017 – present
- Coordinator of the backgrounds and background simulations subgroup of the LZ project, responsible for estimating the backgrounds created by the detector building materials and contaminants mixed in the xenon (merging information on the radioactivity levels with the results from detailed Monte Carlo simulations of each of each detector component): 2016 2019
- Coordinator of the LUX experiment analysis subgroup responsible for the WIMP search data for the reanalysis of the first science run: 2014 2016
- Coordinator of the Data Processing Framework (DPF) of the LUX experiment, responsible for the upgrades of the DPF and processing all LUX data: 2013 – present
- Coordinator of the Data Processing group of the LUX experiment, with several contributions to the software framework used and the analysis modules: 2013 – 2014
- Data analysis contributions for the first run of the LUX experiment, namely estimating the efficiency of the detector and the data processing framework to low energy single scatter recoils such as those expected from WIMP interactions: 2012 2013
- Design, construction and Monte Carlo simulation (using the GEANT4 toolkit) of a dedicated 2-phase (liquid/gas) xenon chamber with the objective of measuring the reflectivity of xenon VUV scintillation light in the PTFE/liquid xenon interface: 2012 – 2015
- Participation in the Second Science Run of the ZEPLIN-III Dark Matter experiment. Main contributions were the upgrade of the data acquisition software, update of

the GEANT4 simulation of the experiment, participation in the commissioning, calibration and data taking stages of the detector, and participation in various areas of the data analysis: 2009 – 2011

- Monte Carlo simulation (using the GEANT4 toolkit) of the neutron background caused by high energy muons in the Boulby Underground Laboratory. This work also included the benchmarking of the different models available in GEANT4 for the treatment of hadronic interactions against other simulation tools and experimental data: 2008 2009
- Participation in the First Science Run of the ZEPLIN-III Dark Matter experiment. Main contributions were the data acquisition software, which handled the communication with a 62-channel Acqiris system using a multi-thread approach to reduce the dead-time and enable on-line data analysis, and a template-based position reconstruction algorithm capable of achieving resolutions of a few millimetres at the energy threshold of the detector (~2 keV). Other contributions include the participation in the commissioning, calibration and data taking stages of the detector, as well as different areas of the data analysis: 2007 – 2009
- Participation in the ZEPLIN-II Dark Matter experiment. This includes experimental aspects such as the commissioning of the detector and its operation during calibration and data taking, monitoring of the detector stability and background level and most stages of the data analysis: 2005 2007
- Monte Carlo simulation (using the GEANT4 toolkit) of a liquid xenon calorimeter to measure cascades originated by neutron captures for the n-ToF experiment: 2005
- Monte Carlo simulation (using the GEANT4 toolkit) of a (1.2 litre) single phase liquid xenon prototype chamber with the objective of measuring fundamental properties of liquid xenon (e.g. quenching factor, scintillation linearity): 2001 – 2004
- Analysis of data from the test flight of the AMS detector: 1999 2000

Participation in funded projects

- PTDC/FIS-PAR/2831/2020, "Participation in the LUX-ZEPLIN experiment: analysis of the data from the first science run and preparations for the second run" (2021 2024)
- PTDC/FISPAR/28567/2017, "Participation in the LUX-ZEPLIN Experiment: Scientific and Technical Contributions" (2018 – 2021)
- POCI/01/0145/FEDER/029147, "Understanding Big Data in High Energy Physics: finding a needle in many haystacks" (2018 2021)
- PTDC/FIS-NUC/1525/2014, "Direct detection of dark matter: participation in LUX-ZEPLIN and LUX experiments" (2015 2018)
- PTDC/BBB-BMD/2395/2012, "Métodos Adaptativos para Imagiologia Médica com Câmaras Gama" (2012)
- CERN/FP/123610/2011, "Participation in the LUX Experiment and R&D on Liquid Xenon Detectors for Dark Matter Search" (2011 2014)
- CERN/FP/116374/2010, "Participation in Dark Matter experiments and R&D on Liquid Xenon Detectors for Dark Matter Search" (2010)
- CERN/FP/83501/2008, "Participation in the ZEPLIN-III Experiment and R&D of Liquid Xenon Detectors for Dark Matter Search" (2008)

	 POCI/FP/81928/2007, "Development of Liquid Xenon Detectors for Dark Matter Search and Participation in the ZEPLIN Collaboration" (2007)
	 POCI/FP/63446/2005, "Desenvolvimento de Detectores de Xénon Líquido para Matéria Escura e Participação no Programa ZEPLIN da Colaboração UKDM" (2005)
	 POCTI/FNU/50208/2003, "Development of Liquid Xenon Detectors for WIMP Search and for the n-ToF Project at CERN" (2003 – 2004)
	 POCTI/FNU/43729/2002, "Desenvolvimento de Detectores de Xénon Líquido e Árgon Líquido para a Detecção de WIMPs e para o Projecto n-TOF no CERN" (2002)
	 CERN/P/15194/1999, CERN/P/40110/2000, CERN/FNU/43729/2001, "Desenvolvimento de detectores de xénon e/ou árgon líquidos para detecção de WIMPs e para a experiência CERN PS213" (2000 – 2001)
Education	PhD in Experimental Physics, May 2009 Physics Department University of Coimbra Thesis: Dark matter searches using the ZEPLIN detectors Supervisor: Prof. José Pinto da Cunha
	MSc in Experimental Physics, April 2004 Physics Department University of Coimbra Thesis: Estudo da Simulação de um Detector de Xenon Líquido com Aplicações na Detecção de Matéria Escura (Study and Simulation of a Liquid Xenon Detector with Applications in Dark Matter Searches) Final Classification: Very Good Supervisor: Prof. José Pinto da Cunha
	Degree in Physics, Scientific Branch (Specialisation in Experimental Physics), May 2000 Physics Department University of Coimbra Final Classification: Good, 15 (0-20 scale) Final Project: Medidas de Fluxos de Protões na Experiência AMS (Proton Flux Measurements in the AMS Experiment) Supervisor: Prof. José Pinto da Cunha

Teaching experience

Teaching material

I have prepared an introductory course on the Monte Carlo simulation method in general, and in the GEANT4 simulation toolkit in particular. I teach this course in introductory GEANT4 workshops and also to advanced physics students as part of various more general courses related with radiation interaction with matter and particle physics detectors. This course includes a set of introductory slides and examples of increasing complexity, which are publicly available on my website (http://www.lip.pt/~alex).

Lecturing

Listed below are the courses in which I lectured as *pro bono* auxiliary professor, and before that as demonstrator, of the Physics Department of the University of Coimbra.

- Astroparticle Physics, course for Masters degrees in Physics, Physical Eng. and Astronomy and Space Instrumentation of the Physics Department of the University of Coimbra, in which I teach about Dark Matter and its detection. (2021/2022).
- Astrophysics and Astroparticles, course for PhD students in the Physics Doctoral Program of the University of Coimbra, in which in teach about Dark Matter and its detection. (2021/2022).
- Statistical Methods and Simulation, course for students of the Medical Physics Masters degree of the University of Coimbra, in which I teach about integrated software packages for Monte Carlo simulation. (2020-22).
- Instrumentation for Radiation Detection, part of the Physical Eng. PhD course of the University of Coimbra: I teach an introductory course on the Monte Carlo simulation method in general, and in the GEANT4 simulation toolkit in particular. (2018-19)
- Radiation Interaction with Matter, part of the Masters degrees in Physics, Physical Eng. and Astronomy and Space Instrumentation of the Physics Department of the University of Coimbra: I teach an introductory course on the Monte Carlo simulation method in general, and in the GEANT4 simulation toolkit in particular. (2013-2022).
- Nuclear Physics and Nuclear and Particle Physics (laboratory classes only), part of the Masters degree in Physical Eng. and the degree in Physics (respectively) of the Physics Department of the University of Coimbra (2016-17, 2017-18)
- Dosimetry, Safety and Radiological Protection, part of the Masters degree in Biomedical Eng. of the Physics Department of the University of Coimbra: I teach an introductory course on the Monte Carlo simulation method in general, and in the GEANT4 simulation toolkit in particular. (2013-16).
- Radiations in Biomedicine (laboratory classes only) at the Physics Department of the University of Coimbra (2013-16).
- Optics and Waves (laboratory classes only) at the Physics Department of the University of Coimbra (2013-16).
- Thermodynamics (laboratory classes only) at the Physics Department of the University of Coimbra (2013-16).
- Physics Demonstrator in Electronics at the Physics Department of the University of Coimbra (2012)
- Physics Demonstrator in Nuclear Physics at the Physics Department of the University of Coimbra (2011/2012)
- Physics demonstrator in Introductory Laboratory Physics at the Physics Department of the University of Coimbra (2006)
- Physics demonstrator at the Physics Department of the University of Coimbra, various laboratory classes (2000-2004)

Experience in Supervision

Note that in the list below the designation "co-supervisor" means the student had two supervisors. It is not an indication of a position of lower importance in the supervision process.

- Co-supervision of the Physics PhD student Paulo Brás, on the development of pulse classification algorithms (including the use of Machine Learning techniques) and neutrinoless double beta decay of Xe-136 studies in the LZ experiment (2015 – 2021).
- Co-supervision of the Masters student Sandro Saltão, on the optimization of the vertical separation between close secondary signals in the LZ detector, with direct impact in the detector sensitivity to neutrinoless double beta decay (2021 – present).
- Co-supervision of the Masters student Henrique Almeida, on the search for the double electron capture decay of Xe-124 in the LZ detector and the study of related backgrounds (2021 present).
- Co-supervision of the Masters student Fátima Alcaso, on the development of an end-to-end simulation tool for a prototype xenon chamber dedicated to optimising sensitivity to neutrinoless double beta decay (2020 present)
- Co-supervision of the Masters student Susana Castanheira, on the study of the sensitivity of the LZ detector to the double electron capture decay of Xe-124 (2019/2021.
- Co-supervision of the Masters student Andrey Solovov, on the exploration of machine learning techniques for discrimination of neutrinoless double beta decay of ¹³⁶Xe (2018 – 2021)
- Co-supervision of the Masters Thesis of the ERASMUS student Natalija Novak from the University of Graz (Austria), "Study of neutrino induced backgrounds in the LZ experiment" (2016/2017).
- Co-supervision of the PhD Project Thesis of P. Brás, "New physics phenomenology and development of data processing tools for the LZ Dark Matter direct search experiment", (2015 – 2016)
- Co-supervision of the Masters Thesis of P. Brás (for Masters in Astrophysics and Space Instrumentation) with the title "Finding a Needle in a Haystack: Background Studies and WIMP Detection Efficiency in LUX" (2014 2015).

Academic juries

S. Castanheira, Masters Thesis, "Study of the Sensitivity of the LUX-ZEPLIN Detector to the Double Electron Capture Decay of ¹²⁴Xe", Departamento de Física da Universidade de Coimbra, December 2021.

A. Solovov, Masters Thesis, "Exploration of Machine Learning Techniques for Discrimination of Neutrinoless Double Beta Decay of ¹³⁶Xe", Departamento de Física da Universidade de Coimbra, July 2021.

J. Marques, Masters Thesis, "Microdosimetry of Radium-223 by Monte Carlo Method" (Jury president), Departamento de Física da Universidade de Coimbra, November 2021.

R. Peres, Masters Thesis, "Contributions to the XENON dark matter experiment", Departamento de Física da Universidade de Coimbra, September 2018. J. Basilio dos Santos, Masters Thesis, "Photometry Data Processing for ESA's CHEOPS Space Mission", Departamento de Física da Universidade de Coimbra, July 2018.

A. Solovov, Masters Course Seminar, "CEvNS: theory, implications, experiment", Departamento de Física da Universidade de Coimbra, January 2018.

A. S. Inácio, Masters Thesis, "Optical Calibration of the SNO+ Experiment and Sensitivity Studies for the Neutrinoless Double Beta Decay", Faculdade de Ciências da Universidade de Lisboa, September 2017.

C. Henriques Masters Seminar, "BaTa: the @next step in $0\nu\beta\beta$ experiments", Departamento de Física da Universidade de Coimbra, July 2016.

P. Brás Masters Thesis, "Finding a needle in a haystack: Background studies & WIMP detection efficiency in LUX", Departamento de Física da Universidade de Coimbra, September 2015.

P. Brás Masters Seminar, "Direct Detection of Dark Matter", Departamento de Física da Universidade de Coimbra, 27 April 2015.

Peer Reviewer in International Journals

Referee for the Radiation Physics and Chemestry journal since 2019

Referee for the Astroparticle Physics journal since 2016

Referee for the Journal of Intrumentation (JINST) since 2015

Outreach Activities

Co-coordination of a Summer Internship project for three undergraduate students with the project: "Study of neutrino-less double beta decay in the LZ detector", organised by LIP and the University of Coimbra, Summer 2022.

Co-coordination of two Summer Internship projects for a total of six undergraduate students with the projects: "Measurement of the cosmic muon flux up to the stratosphere" and "Study of neutrino-less double beta decay in the LZ detector", organised by LIP and the University of Coimbra, Summer 2021.

LIP: from particles to health, presentation for the students of the Physics Department of the University of Coimbra, December 2020.

Co-coordination of three Summer Internship projects for a total of eight undergraduate students with the projects: "Observation of cosmic muons", "Neutrinoless double beta decay in the LZ detector" and "Monte Carlo simulations to prepare for dark matter searches at the LZ experiment", organised by LIP and the University of Coimbra, Summer 2020.

Dark Matter: from the galaxies to the deep mines, presentation in the 2020 National Encounter of Physics Students, Coimbra, February 2020.

Co-coordination of three month-long Summer Internship projects for a total of seven university-level students with the projects: *Muões num balão: medidas do fluxo de muões até à estratosfera, Física Experimental de Partículas com os detectores ATLAS, LUX e LZ, e Simulações de Monte Carlo para preparar a procura de matéria escura na experiência LZ,* LIP and Physics Department of the University of Coimbra, Summer 2019. Co-coordination of the project *Matéria escura: à procura da agulha no palheiro*, integrated in the University of Coimbra Summer University project, with an intensive week-long scientific program for five high-school students — University of Coimbra, yearly, 2017 - 2019.

Dark Matter: from the galaxies to the deep mines, presentation for undergraduate level physics students at the Fourth Lisbon mini-school on Particle and Astroparticle Physics, Costa da Caparica, 11-13 February 2019.

O Enigma da Matéria Escura, presentation for high-school teachers and students, integrated in the FISICA 2018 meeting, Covilhã, August 2018.

Co-coordination of a month-long Summer Internship program for three university-level students with the project *Construção de um detector de muões portátil*, LIP and Physics Department of the University of Coimbra, July 2018.

Matéria Escura: das galáxias ao fundo de uma mina, Seminar for the general public presented at the *Lojas de Saber* conference cycle, Coimbra, 16th of March 2018

Co-coordination of a month-long Summer Internship program for two university-level students with the project *O Enigma da Matéria Escura*, Physics Department of the University of Coimbra, July 2017.

Co-coordination of a month-long Summer Internship program for three university-level students with the project *O Enigma da Matéria Escura*, Physics Department of the University of Coimbra, July 2016.

Introduction, commentary and discussion of the documentary *Dancer in the dark: the end of physics*, for the general public and Project *Quark!* high-school students, Centro Ciência Viva Rómulo de Carvalho, January 2016.

Co-author of the seminar *O enigma da matéria escura*, presented during the *30 anos do LIP* Exhibit for the general public, Science Museum of the University of Coimbra, April 2016.

Matéria Escura: O Detector LUX, presented for project Quark! high-school students, Physics Department of the University of Coimbra, January 2016.

O enigma da Matéria Escura, Seminar for high-school level students in the *Quark* project, Coimbra, 24th of May 2014

Participation in several editions of CERN's Masterclasses

Other activities

Organization of Conferences and Meetings

Chairman of the PANIC2021 conference proceedings (2021/22)

Member of the Local Organizing Committee of the PANIC2021 conference (2019/22)

Co-organizer of the 1st LIP Introductory Course on GEANT4 (2019/20)

Management

Vice-president of the Scientific Council Board of LIP (2021/23)

Oral communications

Invited oral communications in international conferences

Status of the LUX-ZEPLIN (LZ) experiment, presented on behalf of the LZ collaboration, XeSAT 2022 Workshop, Coimbra, 23-26 May 2022.

New Results from LUX, presented on behalf of the LUX collaboration at the EPS Conference on High-Energy Physics (HEP2017), Venice, Italy, 5-12 July 2017.

Direct Dark Matter Searches with LUX and LZ, presented on behalf of the LUX and LZ collaborations at the 13th Patras Workshop on Axions, WIMPs and WISPs, Thessaloniki, Greece, 15-19 May 2017.

Recent results from the LUX experiment, presented on behalf of the LUX collaboration, Astroparticle Physics 2014: TeVPA/IDM Conference, Amsterdam, The Netherlands, 23-28 June 2014.

The LUX Experiment: Status and Future Plans, presented on behalf of the LUX collaboration, PPC2012 workshop, Seoul, South Korea, 5-9 November 2012.

The ZEPLIN-III Dark Matter Detector: Second Science Run & Beyond, presented on behalf of the ZEPLIN-III and LUX collaborations, PASC2010 workshop, Sesimbra, Portugal, 18-19 December 2010.

First Results of the ZEPLIN-III Dark Matter Detector, presented on behalf of The ZEPLIN-III Collaboration, 7th New World in Astroparticle Physics Workshop, Sao Tome, Sao Tome e Principe, 8-10 September 2009.

Oral communications in conferences

O Enigma da Matéria Escura, presented at the FISICA 2018 National Physics Conference, Covilhã, August 2018.

The LUX Experiment: Status and Future Plans, presented on behalf of the LUX collaboration, NWPAP2012 workshop, Lisbon, Portugal, 20-21 December 2012.

The ZEPLIN-III Dark Matter Detector: Second Science Run & Beyond, presented at the PASC Winter Workshop 2010, 18-19 December 2010, Sesimbra, Portugal.

The ZEPLIN-III Dark Matter Detector: First Results and Current Status, presented on behalf of the ZEPLIN-III Collaboration, FISICA2010, Vila Real, 1-3 Sept. 2010.

Muon-Induced Neutrons Measured with ZEPLIN-II Veto, presented at the 12th Geant4 Collaboration Workshop, Hebden Bridge (UK), 2007.

Preliminary results on position reconstruction for ZEPLIN III, presented on behalf of The ZEPLIN-III Collaboration at the 7th International Conference on Position Sensitive Detectors, Liverpool (UK), 12-16 September, 2005.

Spectroscopy and proton flux measurements in the AMS experiment, joint presentation with J. M. Moreira and J. P. Marques, International Conference for Physics Students 2000, Zadar (Croatia), 2000.

Spectroscopy and proton flux measurements in the AMS experiment, joint presentation with J. M. Moreira and J. P. Marques, National Conference for Physics Students 2000, Faro (Portugal), 2000.

Seminars for a scientific audience

Dark Matter: Evidence, Candidates and Detection, Seminar for students of the Master in Physics program, IST, Lisbon, January 2022.

Using two-phase xenon detectors for rare event searches, Seminar for graduate students of the Physics Engineering doctoral program, Coimbra, January 2022.

Using two-phase xenon detectors to search for Dark Matter, Seminar for graduate students of the Physics Engineering doctoral program, Coimbra, May 2021.

Optional (but very useful) classes in GEANT4, presentation at the 1st LIP Introductory Course on GEANT4, Universidade do Minho, Braga, February 2020.

Materials and Geometry definition in GEANT4, presentation at the 1st LIP Introductory Course on GEANT4, Universidade do Minho, Braga, February 2020.

First results from the LUX experiment, Seminar at LIP-Lisboa, Portugal, November 28 2013.

Dark Matter Direct Detection: The ZEPLIN-III Experiment, presented in Café com Física -Ciclo de Seminários do Departamento de Física, Coimbra, Portugal, 3rd of May 2011.

Detectores de Xénon Líquido, presented in Café com Física - Ciclo de Seminários do Departamento de Física, Coimbra, Portugal, 27th of March 2007.

Oral communications in meetings

Neutrinoless Double Beta Decay, WG1 (Science) report talk at the joint DARWIN/XENON + LUX-ZEPLIN Summer Meeting 2022, Karlsruhe, 27-29 June 2022.

High energy ER group, presented at the LZ Summer Virtual Meeting, 15th July 2020.

Summary and status of BG validation tasks, presented at the LZ Summer Collaboration Meeting, SDSMT (Rapid City), 16th July 2019.

Status of Backgrounds Analysis, presented at the LZ Winter Collaboration Meeting, UC Davis, 28th January 2019.

Optical measurements of PTFE, presented at the LZ Winter Collaboration Meeting, UC Davis, 28th January 2019.

Backgrounds Status, presented at the DOW Independent Project Review of LZ Status, LBNL, Berkeley, 29-31 January 2019.

MDC2 Analysis Cuts and Background Spectrum, presented at the LZ Summer Collaboration Meeting, Brandeis, 19th July 2018.

2EC Analysis in Run03 & Run04, presented at the LUX Analysis Workshop, Coimbra, Portugal, 22 - 24 April 2018.

Backgrounds budget status, presented at the Spring 2018 LZ Collaboration Meeting, Coimbra, Portugal, 17-20 April 2018.

Latest results from LUX, presented at Jornadas LIP 2018, Évora, Portugal, 16-18 February 2018.

Backgrounds Update & Summary, presented at the LZ Status and Operations Planning DOE Review 2018, LBNL, Berkeley, USA, 9-11 January 2018.

Backgrounds Update & Summary, presented at the LZ Status and Operations Planning Director's Review 2017, LBNL, Berkeley, USA, 13-16 November 2017.

Double Electron Capture Analysis in Run03 & Run04, LUX Analysis Workshop at LBNL, Berkeley, USA, 23-27 October 2017.

Backgrounds Summary, presented at the 2017 LZ Assay, Backgrounds and Sensitivity Annual Review, Fermilab, USA, 4-5 October 2017.

Background Model Overview, presented at the Spring 2017 LZ Collaboration Meeting, SLAC, Menlo Park, USA, 9-12 March 2017.

The Internals of the Backgrounds Table, presented at the LZ Summer Collaboration Meeting 2017 at SURF, Lead (SD), USA, 17-22 July 2017.

Background Model Overview, presented at the LZ Spring Collaboration Meeting at SLAC, Menlo Park, USA, 9-12 March 2017.

Backgrounds Control Table and Simulations, presented at the LZ Assay, Backgrounds and Sensitivity Annual Review at LBNL, Berkeley, USA, 6 October 2016.

Status of the Data Processing Framework, presented at the LUX Collaboration Meeting, Albany, USA, 21-23 October 2015.

Underground experiments: LUX/LZ/SNO+, joint presentation with J. Maneira at Jornadas LIP 2015, Lisbon, 27th April 2015.

Teflon reflectivity measurements, presented at the LZ Collaboration Meeting, Tuscaloosa, Alabama, USA, 20th April 2015.

Tutorial - Finding/Accessing/Loading/Plotting data/Statistics, joint tutorial presented at the LUX Analysis Workshop, Santa Barbara, USA, 16-21 February 2015.

First results from the LUX experiment, presented at Jornadas LIP 2014, Lisbon, 22nd March 2014.

Estimating Corrections and Efficiencies, presented at the LUX Collaboration Meeting, Yale, USA, 11-12 June 2012.

Long Term Data Taking, presented at the LUX Collaboration Meeting, Yale, USA, 11-12 June 2012.

Slow Control Upgrades for Run03, V. Solovov, A. Lindote, presented at the LUX Collaboration Meeting, Yale, USA, 11-12 June 2012.

The LN2 System, F. Neves, A. Lindote, presented at the LUX Collaboration Meeting, Yale, USA, 11-12 June 2012.

LUX Experiment: An Overview, presented on behalf of the LUX Collaboration, Jornadas LIP 2012, Lisboa, 22nd April 2012.

First Science Run Reanalysis, presented at the ZEPLIN-III Collaboration Meeting 2011, 4-5 February 2011, Coimbra, Portugal.

Status of the ZepIII Simulation Upgrade for the Second Science Run, presented at the ZEPLIN-III Second Science Run Analysis Meeting, 19-20 September 2010, Abingdon, UK.

The ZEPLIN-III Dark Matter Detector: First Results and Future Prospects, presented on behalf of The ZEPLIN-III Collaboration, Jornadas LIP 2010, Braga, 7-9 January 2010.

DAQ upgrades for the Second Science Run (software and hardware), presented at the ZEPLIN-III Collaboration Meeting, Cosener's House, Abingdon, UK, 30-31 March 2009.

Data Acquisition Software for ZEPLIN-III, presented at the ZEPLIN-II and ZEPLIN-III Collaboration Meeting, Edinburgh, UK, 6-7 February 2007.

A Template-based Position Reconstruction Algorithm for the ZEPLIN detectors, presented at the ZEPLIN-II and ZEPLIN-III Collaboration Meeting, Edinburgh, UK, 6-7 February 2007.

Benchmarking data compression algorithms, presented at the ZEPLIN-III Collaboration Meeting, Cosener's House, Abingdon, UK, 30-31 March 2009.

ZEPLIN-III DAQ - Present status, presented at the ZEPLIN-III Collaboration Meeting, Coimbra, Portugal, 28-29 August 2007.

Publications

Full list of publications in peer reviewed journals

Aalbers, J. et al., "Cosmogenic production of 37 Ar in the context of the LUX-ZEPLIN experiment", *Phys. Rev. D* 105, p. 082004, 2022, doi:10.1103/PhysRevD.105.082004.

Aalbers, J. et al.: "A Next-Generation Liquid Xenon Observatory for Dark Matter and Neutrino Physics", 2022, doi:10.48550/ARXIV.2203.02309.

Akerib, D. S. et al.: "Fast and Flexible Analysis of Direct Dark Matter Search Data with Machine Learning", 2022, doi:10.48550/arxiv.2201.05734.

Brás, P. et al., "A machine learning-based methodology for pulse classification in dual-phase xenon time projection chambers", *EPJ C* 82, p. 553, 2022, doi:10.1140/epjc/s10052-022-10502-x.

Akerib, D. S. et al., "Constraints on effective field theory couplings using 311.2 days of LUX data", *Phys. Rev. D* 104, p. 062005, 2021, doi:10.1103/PhysRevD.104.062005.

Akerib, D. S. et al., "Effective field theory analysis of the first LUX dark matter search", *Phys. Rev. D* 103, p. 122005, 2021, doi:10.1103/PhysRevD.103.122005.

Akerib, D. S. et al.: "Enhancing the sensitivity of the LUX-ZEPLIN (LZ) dark matter experiment to low energy signals", 2021, doi:10.48550/arxiv.2101.08753.

Akerib, D. S. et al., "Improving sensitivity to low-mass dark matter in LUX using a novel electrode background mitigation technique", *Phys. Rev. D* 104, p. 012011, 2021, doi:10.1103/PhysRevD.104. 012011.

Akerib, D. S. et al., "Projected sensitivities of the LUX-ZEPLIN experiment to new physics via low-energy electron recoils", *Phys. Rev. D* 104, p. 092009, 2021, doi:10.1103/PhysRevD.104.092009.

Akerib, D. S. et al., "Projected sensitivity of the LUX-ZEPLIN experiment to the two-neutrino and neutrinoless double β decays of ¹³⁴Xe", *Phys. Rev. C* 104, p. 065501, 2021, doi:10.1103/PhysRevC.104. 065501.

Akerib, D.S. et al., "Simulations of events for the LUX-ZEPLIN (LZ) dark matter experiment", *Astroparticle Physics* 125, p. 102480, 2021, ISSN 0927-6505, doi:10.1016/j.astropartphys.2020.102480.

Akerib, D. S. et al., "Discrimination of electronic recoils from nuclear recoils in two-phase xenon time projection chambers", *Phys. Rev. D* 102, p. 112002, 2020, doi:10.1103/PhysRevD.102.112002.

Akerib, D. S. et al., "Extending light WIMP searches to single scintillation photons in LUX", *Phys. Rev. D* 101, p. 042001, 2020, doi:10.1103/PhysRevD.101.042001.

Akerib, D. S. et al., "First direct detection constraint on mirror dark matter kinetic mixing using LUX 2013 data", *Phys. Rev. D* 101, p. 012003, 2020, doi:10.1103/PhysRevD.101.012003.

Akerib, D. S. et al., "Investigation of background electron emission in the LUX detector", *Phys. Rev. D* 102, p. 092004, 2020, doi:10.1103/PhysRevD.102.092004.

Akerib, D. S. et al., "The LUX-ZEPLIN (LZ) radioactivity and cleanliness control programs", *EPJ C* 80, p. 1044, 2020, doi:10.1140/epjc/s10052-020-8420-x.

Akerib, D. S. et al., "Projected sensitivity of the LUX-ZEPLIN experiment to the $0\nu\beta\beta$ decay of ¹³⁶Xe", *Phys. Rev. C* 102, p. 014602, 2020, doi:10.1103/PhysRevC.102.014602.

Akerib, D. S. et al., "Projected WIMP sensitivity of the LUX-ZEPLIN dark matter experiment", *Phys. Rev. D* 101, p. 052002, 2020, doi:10.1103/PhysRevD.101.052002.

Akerib, D.S. et al., "Improved modeling of electronic recoils in liquid xenon using LUX calibration data", *Journal of Instrumentation* 15 (02), pp. T02007–T02007, 2020, doi:10.1088/1748-0221/15/02/t02007.

Akerib, D.S. et al., "The LUX-ZEPLIN (LZ) experiment", *NIM A* 953, p. 163047, 2020, ISSN 0168-9002, doi:10.1016/j.nima.2019.163047.

Akerib, D.S. et al., "Measurement of the gamma ray background in the Davis cavern at the Sanford Underground Research Facility", *Astroparticle Physics* 116, p. 102391, 2020, ISSN 0927-6505, doi:10. 1016/j.astropartphys.2019.102391.

Akerib, D. S. et al., "Improved measurements of the β -decay response of liquid xenon with the LUX detector", *Phys. Rev. D* 100, p. 022002, 2019, doi:10.1103/PhysRevD.100.022002.

Akerib, D. S. et al., "Results of a Search for Sub-GeV Dark Matter Using 2013 LUX Data", *Phys. Rev. Lett.* 122 (13), p. 131301, 2019, doi:10.1103/PhysRevLett.122.131301.

Akerib, D. S. et al., "Calibration, event reconstruction, data analysis, and limit calculation for the LUX dark matter experiment", *Phys. Rev. D* 97 (10), p. 102008, 2018, doi:10.1103/PhysRevD.97.102008.

Akerib, D. S. et al., "Chromatographic separation of radioactive noble gases from xenon", *Astropart. Phys.* 97, pp. 80–87, 2018, doi:10.1016/j.astropartphys.2017.10.014.

Akerib, D. S. et al., "Liquid xenon scintillation measurements and pulse shape discrimination in the LUX dark matter detector", *Phys. Rev. D* 97, p. 112002, 2018, doi:10.1103/PhysRevD.97.112002.

Akerib, D. S. et al., "LUX trigger efficiency", Nucl. Instrum. Meth. A908, pp. 401-410, 2018, doi:10. 1016/j.nima.2018.07.094.

Akerib, D. S. et al., "Position Reconstruction in LUX", *JINST* 13 (02), p. P02001, 2018, doi:10.1088/1748-0221/13/02/P02001.

Akerib, D. S. et al., "Search for annual and diurnal rate modulations in the LUX experiment", *Phys. Rev.* D98 (6), p. 062005, 2018, doi:10.1103/PhysRevD.98.062005.

Akerib, D.S. et al., "Chromatographic separation of radioactive noble gases from xenon", *Astroparticle Physics* 97, pp. 80–87, 2018, ISSN 0927-6505, doi:10.1016/j.astropartphys.2017.10.014.

Akerib, D. S. et al., "3D Modeling of Electric Fields in the LUX Detector", *JINST* 12 (11), p. P11022, 2017, doi:10.1088/1748-0221/12/11/P11022.

Akerib, D. S. et al., "⁸³MKr calibration of the 2013 LUX dark matter search", *Phys. Rev.* D96 (11), p. 112009, 2017, doi:10.1103/PhysRevD.96.112009.

Akerib, D. S. et al., "First Searches for Axions and Axionlike Particles with the LUX Experiment", *Phys. Rev. Lett.* 118 (26), p. 261301, 2017, doi:10.1103/PhysRevLett.118.261301.

Akerib, D. S. et al., "Identification of Radiopure Titanium for the LZ Dark Matter Experiment and Future Rare Event Searches", *Astropart. Phys.* 96, pp. 1–10, 2017, doi:10.1016/j.astropartphys.2017.09.002.

Akerib, D. S. et al., "Limits on spin-dependent WIMP-nucleon cross section obtained from the complete LUX exposure", *Phys. Rev. Lett.* 118 (25), p. 251302, 2017, doi:10.1103/PhysRevLett.118.251302.

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Akerib, D. S. et al., "Improved Limits on Scattering of Weakly Interacting Massive Particles from Reanalysis of 2013 LUX Data", *Phys. Rev. Lett.* 116 (16), p. 161301, 2016, doi:10.1103/PhysRevLett.116. 161301.

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Reichhart, L., et al., "Measurement and simulation of the muon-induced neutron yield in lead", *Astroparticle Physics* 47 (0), pp. 67 – 76, 2013, ISSN 0927-6505, doi:http://dx.doi.org/10.1016/j.astropartphys. 2013.06.002.

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Internal writing and review committees

Review committee of the LZ paper "A First Backgrounds Model for the LUX-ZEPLIN (LZ) Dark Matter Experiment", in preparation (2022).

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Writing committee of the LZ paper "The LUX-ZEPLIN (LZ) radioactivity and cleanliness control programs", EPJ C 80 (2020), 1044, doi:10.1140/epjc/s10052-020-8420-x.

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Writing committee of the LUX paper "Position Reconstruction in LUX", JINST, arXiv:1710.02752 [physics.ins-det].

Review committee of the LUX paper "Signal yields, energy resolution, and recombination fluctuations in liquid xenon", Phys. Rev. D 95, 012008 (2017), arXiv:1610.02076 [physics.ins-det].

Review committee of the LUX paper "Tritium calibration of the LUX dark matter experiment", Phys. Rev. D 93, 072009 (2016), arXiv:1512.03133 [physics.ins-det].

Awards and Distinctions

Winner of the National Conference for Physics Students 2000 with the joint presentation with J. M. Moreira and J. P. Marques (Spectroscopy and proton flux measurements in the AMS experiment)

Languages

Portuguese native language **English** Excellent oral and written

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Technical Skills

Proficient:

- Analysis Tools (Python, ROOT, Matlab, PAW)
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Directing member of SAC - Astronomy, Astrophysics and Astronautics Section of the Coimbra Students Union (2002-2003).

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Miscellaneous

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