

Chiara Capelli

Curriculum Vitae

Employment

- Senior researcher (P.I. of SNSF Grant 216274) 2024-present
Physik-Institut, Universität Zürich (Switzerland)
- Postdoctoral Fellow 2021-2024
Nuclear Science Division, Lawrence Berkeley National Laboratory (USA)
- Doctoral Fellow 2016-2020
Physik-Institut, Universität Zürich (Switzerland)

Education

- Ph.D. in Astroparticle Physics 2016-2020
Physik-Institut, Universität Zürich (Switzerland)
Supervisor: Prof. Dr. Laura Baudis
- InvisiblePlus secondment July 2018
Columbia University, New York (USA)
Host: Prof. Dr. Elena Aprile
- M.Sc. in Physics 2014-2016
Università degli studi di Milano-Bicocca, Milano (Italy)
Supervisor: Prof. Dr. Angelo Nucciotti
- B.Sc. in Physics 2010-2014
Università degli studi di Milano-Bicocca, Milano (Italy)
Supervisor: Prof. Dr. Maura Pavan

Grants/Other

- Italian national scientific qualification as associate professor March 2025-present
(Abilitazione scientifica nazionale per professore di II fascia - settore 02/A1)
- Principal Investigator of Ambizione Grant 216274 2024-2028
CHF 854'630 from the Swiss National Science Foundation (SNSF)
- Member of the Swiss Institute for Particle Physics (CHIPP) 2024-present
2017-2020
- Member of the American Physical Society (APS) 2021-2023

Leadership Positions

- XENON Collaboration:
 - Team leader of the high-energy analyses group of XENONnT 2024-present
 - Team leader of the high-energy analyses group of XENON1T 2019-2021
 - Responsible for the light calibration system of XENONnT 2018-2020
- CUPID Collaboration:
 - L3 deputy manager for WBS 1.02.04 light detectors 2023-2024
 - L3 manager for WBS 1.06.05 crystal validation runs 2023
 - L3 manager for WBS 1.05.07 computing and data storage 2021-2024
 - Speaker board 2022-2024
 - Vetting board 2022
- CUORE Collaboration: speaker board 2022-2024

Other Responsibilities

- Organizer of Dark Matter seminars at the University of Zurich 2024-present
- External reviewer for National Science Centre Poland grant 2025
- External reviewer for UK Research and Innovation (UKRI) grant 2024
- Reviewer for APS: Physical Review C and Physical Review D 2022
- Session chair at the APS April meeting April 2022
- LBNL: committee member for the Institute for Nuclear and Particle Astrophysics (INPA) seminars 2021-2022

Student Supervision

- Supervising PhD student S. Ouahada under SNSF Ambizione grant; ongoing (2024-2028)
- Co-supervising part of the work of PhD students A.P. Cimental at the University of Zurich
- Co-supervised part of the work of PhD student K.J. Vetter at UC Berkeley; graduated 2024
- Supervised activities of undergraduate students in the Weak Interactions group at UC Berkeley (2022-2023)
- Supervised thesis work of undergraduate student S. Buse at the University of Zurich, 2019

Teaching

- Astroparticle Physics lectures for PhD students at the CHIPP Winter School, Jan 19-24 2025 (<https://indico.cern.ch/event/1463355/>)
- May 13th 2022: Lecture on dark matter for GREAT-NS undergrad program at LBL (<https://great-ns.lbl.gov>)
- Sep 2019 - Jan 2020 (1 semester): Exercise classes for Physics I course (mechanics and fluids) for physics majors; Universität Zürich, Zürich (Switzerland)
- Feb 2017 - Jun 2019 (3 semesters): Exercise classes for Physics II (electromagnetism) course for physics majors; Universität Zürich, Zürich (Switzerland)
- Oct 2016 - Dec 2018 (3 semesters): Exercise classes for Physics I (mechanics and fluids) course for physics minors and chemistry majors; Universität Zürich, Zürich (Switzerland)
- Mar 2015 - Jul 2015 (1 semester): Tutor for first year physics majors undergraduates; Università degli studi di Milano-Bicocca, Milano (Italy)

Outreach

- Career talk at the CHIPP 2024 annual meeting for Early Career Researcher - panelist, June 20, 2024, Geneva, Switzerland
- LBNL 90th anniversary: Unlocking the Mysteries of the Universe - panelist, July 30, 2021, virtual
- Contributed in writing the article on APECC on the XENONnT assembly during COVID-19: <https://www.appec.org/news/assembling-the-xenonn-t-dark-matter-detector-during-covid-19-times>
- European Researchers Night: Sharper, September 27, 2019, L'Aquila, Italy
- Scientifica 2019: Science Fiction-Science Facts, August 30-September 1, 2019, Zurich, Switzerland
- University of Zurich open day, November 2017 and 2018
- Lab tours for high school students at the University of Zurich
- BergamoScienza, October 2009 and 2017, Bergamo, Italy

Presentations at National and International Conferences

- LIDINE 2025: Light Detection In Noble Elements, October 21-24, 2025, Hong Kong;
invited talk: *Xenoscope: a vertical demonstrator for the XLZD observatory*
- UCLA Dark Matter 2025 Conference , March 24-27, 2025, Los Angeles, USA;
talk: *Search for electronic recoil signals with XENONnT*
- 15th international Workshop on the Identification of Dark Matter (IDM2024), July 8-12, 2024, L'Aquila, Italy;
talk: *The DARWIN R&D towards the XLZD detector*
- APS-DNP meeting, November 26-December 1, 2023, Waikoloa Village, Hawaii, USA;
talk: *Transition-edge sensors with multiplexing readout for the CUPID experiment*
- Technology and Instrumentation in Particle Physics (TIPP 2023), September 4-8, 2023, Cape Town, South Africa;
talk: *The CUPID double beta decay experiment*
- The Applied Superconductivity Conference (ASC 22), October 23-28, 2022, Honolulu, Hawaii, USA;
talk: *Low-threshold wide-area photon calorimeter with Ir/Pt bilayer transition-edge sensors for next-generation nuclear and particle physics experiments*
invited poster: *Transition-edge sensor multiplexing readout for double beta decay search*
- 18th Rencontres du Vietnam, Neutrino physics, July 17-23, 2022, ICISE, Quy Nhon, Vietnam;
talk: *Latest results from the CUORE experiment*
- The XXX International Conference on Neutrino Physics and Astrophysics, NEUTRINO 2022, May 30-June 4, 2022 Seoul, virtual;
poster: *Pileup rejection studies for the CUPID experiment*
- APS meeting, April 9-12, 2022, New York, USA;
talk: *Transition-edge sensor multiplexing readout for CUPID-1T*
- LBNL NSD scientific talk, December 14, 2021;
talk: *The CUPID Double Beta Decay Experiment*
- 7th Symposium on Prospects in the Physics of Discrete Symmetries, DISCRETE 2020-2021 conference, November 29-December 3, 2021, Bergen, Norway, virtual;
talk: *Latest Results from the CUORE Experiment*
- APS-DNP meeting, October 11-14, 2021, Boston, virtual;
talk: *Detector Response Simulation for Double Beta Studies*
- The XXIX International Conference on Neutrino Physics and Astrophysics, NEUTRINO 2020, June 22-July 2, 2020, Fermilab, virtual;
poster: *Analysis of High Energy Events in XENON1T*
- SPS meeting, August 26-30, 2019, Zurich, Switzerland;
talk: *Analysis of high energy events in XENON1T*
- An Alpine LHC Physics Summit, ALPS 2019, April 22-27, 2019, Obergurgl University Center, Austria;
talk: *The XENON dark matter project: latest results and future prospects*
- SPS meeting, August 28-31, 2018, EPFL Lausanne, Switzerland;
talk: *New results from the XENON1T dark matter experiment*
- The XXVIII International Conference on Neutrino Physics and Astrophysics, NEUTRINO 2018, June 4-9, 2018, Heidelberg, Germany;
poster: *Search for neutrinoless double beta decay of ^{136}Xe with the XENON1T experiment*
- SPS meeting, August 21-25, 2017, Genève, Switzerland;
talk: *Energy calibration of the XENON1T dark matter detector*

Invited Seminars and Colloquia

- Invited seminar, November 28, 2024, Technische Universität Dresden, Germany;
talk: *Dark matter searches with dual-phase xenon TPCs*
- Invited department colloquium, November 3, 2022, University of Hawaii, Honolulu, USA;
talk: *From CUORE to CUPID: present and future of double beta decay with bolometers*
- Invited seminar, February 21, 2020, Lawrence Berkeley National Laboratory (LBNL), Berkeley, USA;
talk: *Data analysis at high energies for the XENON1T experiment and light calibration system of XENONnT*

Collaborations and Research Work

My research activity is in the field of astroparticle physics. I have made significant contributions to cutting-edge experiments and research projects, with a particular focus on the search for rare events such as neutrinoless double beta decay and dark matter. My work spans from the development of innovative technologies to data analysis.

Dark matter - XENON1T, XENONnT and DARWIN/XLZD experiments

A significant part of my scientific career has taken place within the XENON collaboration, which aims to directly detect dark matter in the form of WIMPs (Weakly Interacting Massive Particles) via scattering in a dual-phase xenon time projection chamber (TPC).

During my PhD, I worked with the astroparticle physics group at the University of Zurich. I began with a local R&D project using a small-scale TPC to measure scintillation and ionization in liquid xenon (Eur. Phys. J. C 78 (2018) 351). I then contributed to the main WIMP search analysis for XENON1T, focusing on energy calibration and ionization signal corrections related to electron mean free paths in liquid xenon (Phys. Rev. Lett. 121 (2018) 111302).

My interest then shifted to the potential of dual-phase TPCs to explore other rare-event phenomena. I worked on software corrections to enhance detector performance at MeV energy scales (beyond the typical ~ 100 keV WIMP region), enabling searches for processes such as neutrinoless double beta decay ($0\nu\beta\beta$) of Xe-136. This effort led to the best energy resolution in liquid xenon at the time of publication (Eur. Phys. J. C 80 (2020) 785) and enabled the first $0\nu\beta\beta$ search with XENON1T (Phys. Rev. C 106 (2022) 024328). I also founded and coordinated the high-energy physics analysis group within the collaboration.

For XENONnT, the upgrade of XENON1T, I was responsible for designing and developing the calibration and monitoring system for all the 494 photomultiplier tubes (PMTs). I participated in the TPC assembly and commissioning campaign at LNGS in 2020 and contributed to the development of calibration data processing software.

After completing a postdoctoral fellowship in the USA, I returned to the University of Zurich with a competitively awarded SNSF grant (<https://data.snf.ch/grants/grant/216274>), for which I am the Principal Investigator and includes the funding for a PhD student under my supervision. One of the goals of the project is the search for double weak decays of ^{124}Xe with XENONnT, such as two-neutrino electron capture with positron emission and neutrinoless double electron capture, using machine learning to identify complex signal topology. The project also includes R&D for DARWIN/XLZD, a next-generation experiment targeting WIMP-nucleon cross-sections down to the neutrino fog from coherent elastic neutrino-nucleus scattering. XLZD will also investigate neutrino physics channels including double beta decay and solar neutrino flux. The experiment will employ a TPC 3m in height and diameter. I lead the effort to measure the optical properties of liquid xenon using the Xenoscope detector in Zurich, comparable in height to XLZD (JINST 20 (2025) 04, P04013). Since signal detection relies on scintillation light, characterizing light attenuation in large detectors is critical. In addition, I contribute to the development of SiPM-based readout systems as alternatives to PMTs.

Neutrinoless double beta decay – CUORE and CUPID experiments

In January 2021, I joined the Weak Interactions Group at Berkeley as a postdoc, and became a member of CUORE (Cryogenic Underground Observatory for Rare Events) and CUPID (CUORE Upgrade with Particle Identification), focused on current and future searches for neutrinoless double beta decay, a process that can probe the Majorana nature and mass ordering of the neutrino.

In CUORE, I served as analysis shifter for two months, performing data quality checks. I worked on the thermal model of the detector for simulations and optimized the thermal stabilization module for the data processing of the 988 bolometers. I also installed accelerometers and antennas on the cryostat to study and subtract environmental noise, improving detector resolution (Eur. Phys. J. C 84 (2024) 243). This work contributed to the two-tonnes year $0\nu\beta\beta$ search analysis (arXiv:2404.04453).

To demonstrate CUPID’s ability to reach its background goals I applied machine learning algorithms to identify and reject pile-up events. I also characterized transition-edge sensors (TES) and their pile-up rejection performance (Phys. Rev. Applied 20 (2023) 064017), and led the development of their frequency-domain multiplexed readout. I designed a resonator chip, later fabricated and tested in the Berkeley cryostat, and integrated it into the TES readout system. The multiplexing system was successfully demonstrated.

As deputy L3 coordinator, I contributed to the technical process for light detector development, particularly for TES-based alternatives with multiplexed readout. I also served as L3 coordinator for bolometer validation under US responsibility. I participated in assembling a tower with 10 crystals and 12 Ge light detectors at IJCLab (Orsay) and in installation and data-taking at the Canfranc Underground Laboratory (arXiv:2507.15732). Finally, I served as L3 coordinator for CUPID’s computing and data storage resources.

Other technology development – HOLMES, QROCODILE, and DRD2 experiments

The only model-independent method to measure the neutrino mass is through the kinematic analysis of beta decay or electron capture products. The HOLMES experiment aims to achieve the most sensitive calorimetric measurement of this kind, targeting a sensitivity down to 1 eV using the electron capture spectrum of ^{163}Ho . For my Master’s thesis, I worked on HOLMES during its early phase, contributing to the setup and characterization of the first TES-based detectors with bismuth and gold absorbers. I helped develop GHz-range multiplexed readout electronics, transitioning from single-channel to dual-channel systems. I wrote the reconstruction software for load curves, resonance characterization, and energy resolution estimation using ^{55}Fe sources, and performed numerical simulations to assess pile-up rejection.

Since 2024, I have joined the QROCODILE experiment (Quantum Resolution-Optimized Cryogenic Observatory for Dark matter Incident at Low Energy), which aims to develop superconducting nanowire single-photon detectors (SNSPDs) for detecting sub-eV energy depositions from low-mass dark matter. Promising early measurements were conducted at the University of Zurich (Phys.Rev.Lett. 135 (2025) 8, 081002), and I am leading the organisation of new underground measurements to be carried out at LNGS.

Also in 2024, I joined the DRD2 collaboration, focused on developing technologies for future large-scale liquid detectors. This initiative brings together the xenon and argon communities. At Zurich, I contribute to the development of SiPMs and large-scale test infrastructures.

Publications

- ORCID: 0000-0003-3330-621X
- Inspirehep Author Identifier: Chiara.Capelli.1
- Scopus ID: 57200204188
- Number of peer-reviewed international papers: 50
- Total impact factor: 305.894
- Total citations: 4’630
- Average citation per product: 92.6
- Hirsch (H) index: 24 (from Scopus)
- Normalized H-index (by academic seniority): 3.0 (from year of first publication: 2017)

Selected 12 publications:

- [1] L. Baudis, A. Bismark, N. Brugger, C. Capelli, I. Charaev, J. C. García, G. D. Hadas, Y. Hochberg, J. K. Hohmann and A. Kavner, *et al.* “First Sub-MeV Dark Matter Search with the QROCODILE Experiment Using Superconducting Nanowire Single-Photon Detectors,” Phys. Rev. Lett. **135** (2025) no.8, 081002 doi:10.1103/4hb6-f6jl
- [2] K. Alfonso *et al.* [CUPID], “CUPID, the Cuore upgrade with particle identification,” Eur. Phys. J. C **85** (2025) no.7, 737 doi:10.1140/epjc/s10052-025-14352-1 [arXiv:2503.02894 [physics.ins-det]].

- [3] M. Adrover, M. Babicz, L. Baudis, Y. Biondi, A. Bismark, C. Capelli, A. P. Cimental Chávez, J. J. Cuenca-García, M. Galloway and F. Girard, *et al.* “Commissioning of the 2.6 m tall two-phase xenon time projection chamber of Xenoscope,” *JINST* **20** (2025) no.04, P04013 doi:10.1088/1748-0221/20/04/P04013 [arXiv:2411.08022 [physics.ins-det]].
- [4] E. Aprile *et al.* [XENON], “First Indication of Solar B8 Neutrinos via Coherent Elastic Neutrino-Nucleus Scattering with XENONnT,” *Phys. Rev. Lett.* **133** (2024) no.19, 191002 doi:10.1103/PhysRevLett.133.191002 [arXiv:2408.02877 [nucl-ex]].
- [5] K. J. Vetter, M. Beretta, C. Capelli, F. Del Corso, E. V. Hansen, R. G. Huang, Y. G. Kolomensky, L. Marini, I. Nutini and V. Singh, *et al.* “Improving the performance of cryogenic calorimeters with nonlinear multivariate noise cancellation algorithms”, *Eur. Phys. J. C* **84** (2024) no.3, 243 doi:10.1140/epjc/s10052-024-12595-y [arXiv:2311.01131 [physics.ins-det]].
- [6] V. Singh, M. Beretta, E. V. Hansen, K. J. Vetter, G. Benato, L. Marini, C. Capelli, B. K. Fujikawa, B. Schmidt and C. L. Chang, *et al.* “Large-area photon calorimeter with Ir-Pt bilayer transition-edge sensor for the CUPID experiment”, *Phys. Rev. Applied* **20** (2023) no.6, 064017 doi:10.1103/PhysRevApplied.20.064017 [arXiv:2210.15619 [physics.ins-det]].
- [7] E. Aprile *et al.* [XENON], “Search for New Physics in Electronic Recoil Data from XENONnT”, *Phys. Rev. Lett.* **129** (2022) no.16, 161805 doi:10.1103/PhysRevLett.129.161805 [arXiv:2207.11330 [hep-ex]].
- [8] E. Aprile *et al.* [XENON], “Double-Weak Decays of ^{124}Xe and ^{136}Xe in the XENON1T and XENONnT Experiments”, *Phys. Rev. C* **106** (2022) no.2, 024328 doi:10.1103/PhysRevC.106.024328 [arXiv:2205.04158 [hep-ex]].
- [9] E. Aprile *et al.* [XENON], “Energy resolution and linearity of XENON1T in the MeV energy range”, *Eur. Phys. J. C* **80** (2020) no.8, 785 doi:10.1140/epjc/s10052-020-8284-0 [arXiv:2003.03825 [physics.ins-det]].
- [10] E. Aprile *et al.* [XENON], “XENON1T Dark Matter Data Analysis: Signal Reconstruction, Calibration and Event Selection,” *Phys. Rev. D* **100** (2019) no.5, 052014 doi:10.1103/PhysRevD.100.052014 [arXiv:1906.04717 [physics.ins-det]].
- [11] E. Aprile *et al.* [XENON], “Dark Matter Search Results from a One Ton-Year Exposure of XENON1T”, *Phys. Rev. Lett.* **121** (2018) no.11, 111302 doi:10.1103/PhysRevLett.121.111302 [arXiv:1805.12562 [astro-ph.CO]].
- [12] L. Baudis, Y. Biondi, C. Capelli, M. Galloway, S. Kazama, A. Kish, P. Pakarha, F. Piastra and J. Wulf, “A Dual-phase Xenon TPC for Scintillation and Ionisation Yield Measurements in Liquid Xenon”, *Eur. Phys. J. C* **78** (2018) no.5, 351 doi:10.1140/epjc/s10052-018-5801-5 [arXiv:1712.08607 [astro-ph.IM]].

List of all publications on peer-reviewed journals from most recent to last:

- [1] L. Baudis, A. Bismark, N. Brugger, C. Capelli, I. Charaev, J. C. García, G. D. Hadas, Y. Hochberg, J. K. Hohmann and A. Kavner, *et al.* “First Sub-MeV Dark Matter Search with the QROCODILE Experiment Using Superconducting Nanowire Single-Photon Detectors,” *Phys. Rev. Lett.* **135** (2025) no.8, 081002 doi:10.1103/4hb6-f6jl
- [2] D. Q. Adams *et al.* [CUORE], “Half-Life and Precision Shape Measurement of the $2\nu\beta\beta$ Decay of Te130 ,” *Phys. Rev. Lett.* **135** (2025) no.8, 082501 doi:10.1103/jdhf-hn4l [arXiv:2503.24137 [nucl-ex]].
- [3] K. Alfonso *et al.* [CUPID], “A gravity-based mounting approach for large-scale cryogenic calorimeter arrays,” *Eur. Phys. J. C* **85** (2025) no.9, 935 doi:10.1140/epjc/s10052-025-14613-z
- [4] K. Alfonso *et al.* [CUPID], “CUPID, the Cuore upgrade with particle identification,” *Eur. Phys. J. C* **85** (2025) no.7, 737 doi:10.1140/epjc/s10052-025-14352-1 [arXiv:2503.02894 [physics.ins-det]].
- [5] E. Aprile *et al.* [XENON], “The neutron veto of the XENONnT experiment: results with demineralized water,” *Eur. Phys. J. C* **85** (2025) no.6, 695 doi:10.1140/epjc/s10052-025-14105-0 [arXiv:2412.05264 [physics.ins-det]].
- [6] E. Aprile *et al.* [XENON and (XENON Collaboration)**], “Search for Light Dark Matter in Low-Energy Ionization Signals from XENONnT,” *Phys. Rev. Lett.* **134** (2025) no.16, 161004 doi:10.1103/PhysRevLett.134.161004 [arXiv:2411.15289 [hep-ex]].

- [7] M. Adrover, M. Babicz, L. Baudis, Y. Biondi, A. Bismark, C. Capelli, A. P. Cimental Chávez, J. J. Cuenca-García, M. Galloway and F. Girard, *et al.* “Commissioning of the 2.6 m tall two-phase xenon time projection chamber of Xenoscope,” *JINST* **20** (2025) no.04, P04013 doi:10.1088/1748-0221/20/04/P04013 [arXiv:2411.08022 [physics.ins-det]].
- [8] J. Aalbers *et al.* [XLZD], “Neutrinoless double beta decay sensitivity of the XLZD rare event observatory,” *J. Phys. G* **52** (2025) no.4, 045102 doi:10.1088/1361-6471/adb900 [arXiv:2410.19016 [physics.ins-det]].
- [9] E. Aprile *et al.* [XENON], “First Search for Light Dark Matter in the Neutrino Fog with XENONnT,” *Phys. Rev. Lett.* **134** (2025) no.11, 111802 doi:10.1103/PhysRevLett.134.111802 [arXiv:2409.17868 [hep-ex]].
- [10] E. Aprile *et al.* [XENON], “First Indication of Solar B8 Neutrinos via Coherent Elastic Neutrino-Nucleus Scattering with XENONnT,” *Phys. Rev. Lett.* **133** (2024) no.19, 191002 doi:10.1103/PhysRevLett.133.191002 [arXiv:2408.02877 [nucl-ex]].
- [11] D. Q. Adams *et al.* [CUORE], “Search for Fractionally Charged Particles with CUORE,” *Phys. Rev. Lett.* **133** (2024) no.24, 241801 doi:10.1103/PhysRevLett.133.241801 [arXiv:2406.12380 [hep-ex]].
- [12] D. Q. Adams *et al.* [CUORE], “Data-driven background model for the CUORE experiment,” *Phys. Rev. D* **110** (2024) no.5, 052003 doi:10.1103/PhysRevD.110.052003 [arXiv:2405.17937 [nucl-ex]].
- [13] K. J. Vetter, M. Beretta, C. Capelli, F. Del Corso, E. V. Hansen, R. G. Huang, Y. G. Kolomensky, L. Marini, I. Nutini and V. Singh, *et al.* “Improving the performance of cryogenic calorimeters with nonlinear multivariate noise cancellation algorithms,” *Eur. Phys. J. C* **84** (2024) no.3, 243 doi:10.1140/epjc/s10052-024-12595-y [arXiv:2311.01131 [physics.ins-det]].
- [14] M. Adrover *et al.* [DARWIN], “Cosmogenic background simulations for neutrinoless double beta decay with the DARWIN observatory at various underground sites,” *Eur. Phys. J. C* **84** (2024) no.1, 88 doi:10.1140/epjc/s10052-023-12298-w [arXiv:2306.16340 [physics.ins-det]].
- [15] K. Alfonso *et al.* [CUPID and CROSS], “Twelve-crystal prototype of Li_2MoO_4 scintillating bolometers for CUPID and CROSS experiments,” *JINST* **18** (2023) no.06, P06018 doi:10.1088/1748-0221/18/06/P06018 [arXiv:2304.04611 [physics.ins-det]].
- [16] K. Alfonso *et al.* [CUPID], “A first test of CUPID prototypal light detectors with NTD-Ge sensors in a pulse-tube cryostat,” *JINST* **18** (2023) no.06, P06033 doi:10.1088/1748-0221/18/06/P06033 [arXiv:2304.04674 [physics.ins-det]].
- [17] K. Alfonso *et al.* [CUPID], “CUPID: The Next-Generation Neutrinoless Double Beta Decay Experiment,” *J. Low Temp. Phys.* **211** (2023) no.5-6, 375-383 doi:10.1007/s10909-022-02909-3
- [18] E. Aprile *et al.* [XENON], “Low-energy calibration of XENON1T with an internal ^{37}Ar source,” *Eur. Phys. J. C* **83** (2023) no.6, 542 doi:10.1140/epjc/s10052-023-11512-z [arXiv:2211.14191 [physics.ins-det]].
- [19] V. Singh, M. Beretta, E. V. Hansen, K. J. Vetter, G. Benato, L. Marini, C. Capelli, B. K. Fujikawa, B. Schmidt and C. L. Chang, *et al.* “Large-area photon calorimeter with Ir-Pt bilayer transition-edge sensor for the CUPID experiment,” *Phys. Rev. Applied* **20** (2023) no.6, 064017 doi:10.1103/PhysRevApplied.20.064017 [arXiv:2210.15619 [physics.ins-det]].
- [20] E. Aprile *et al.* [XENON], “Effective field theory and inelastic dark matter results from XENON1T,” *Phys. Rev. D* **109** (2024) no.11, 112017 doi:10.1103/PhysRevD.109.112017 [arXiv:2210.07591 [hep-ex]].
- [21] E. Aprile *et al.* [XENON], “An approximate likelihood for nuclear recoil searches with XENON1T data,” *Eur. Phys. J. C* **82** (2022) no.11, 989 doi:10.1140/epjc/s10052-022-10913-w [arXiv:2210.07231 [hep-ex]].
- [22] E. Aprile *et al.* [XENON], “Search for New Physics in Electronic Recoil Data from XENONnT,” *Phys. Rev. Lett.* **129** (2022) no.16, 161805 doi:10.1103/PhysRevLett.129.161805 [arXiv:2207.11330 [hep-ex]].
- [23] E. Aprile *et al.* [XENON], “Double-Weak Decays of ^{124}Xe and ^{136}Xe in the XENON1T and XENONnT Experiments,” *Phys. Rev. C* **106** (2022) no.2, 024328 doi:10.1103/PhysRevC.106.024328 [arXiv:2205.04158 [hep-ex]].
- [24] D. Q. Adams *et al.* [CUORE], “An energy-dependent electro-thermal response model of CUORE cryogenic calorimeter,” *JINST* **17** (2022) no.11, P11023 doi:10.1088/1748-0221/17/11/P11023 [arXiv:2205.04549 [physics.ins-det]].

- [25] D. Q. Adams *et al.* [CUORE], “New Direct Limit on Neutrinoless Double Beta Decay Half-Life of Te128 with CUORE,” *Phys. Rev. Lett.* **129** (2022) no.22, 222501 doi:10.1103/PhysRevLett.129.222501 [arXiv:2205.03132 [nucl-ex]].
- [26] D. Q. Adams *et al.* [CUORE], “Search for neutrinoless β +EC decay of Te120 with CUORE,” *Phys. Rev. C* **105** (2022) no.6, 065504 doi:10.1103/PhysRevC.105.065504 [arXiv:2203.08684 [nucl-ex]].
- [27] J. Aalbers, S. S. AbdusSalam, K. Abe, V. Aerne, F. Agostini, S. A. Maouloud, D. S. Akerib, D. Y. Akimov, J. Akshat and A. K. A. Musalhi, *et al.* “A next-generation liquid xenon observatory for dark matter and neutrino physics,” *J. Phys. G* **50** (2023) no.1, 013001 doi:10.1088/1361-6471/ac841a [arXiv:2203.02309 [physics.ins-det]].
- [28] K. Alfonso *et al.* [CUPID], “Optimization of the first CUPID detector module,” *Eur. Phys. J. C* **82** (2022) no.9, 810 doi:10.1140/epjc/s10052-022-10720-3 [arXiv:2202.06279 [physics.ins-det]].
- [29] E. Aprile *et al.* [XENON], “Emission of single and few electrons in XENON1T and limits on light dark matter,” *Phys. Rev. D* **106** (2022) no.2, 022001 [erratum: *Phys. Rev. D* **110** (2024) no.10, 109903] doi:10.1103/PhysRevD.106.022001 [arXiv:2112.12116 [hep-ex]].
- [30] E. Aprile *et al.* [XENON], “Application and modeling of an online distillation method to reduce krypton and argon in XENON1T,” *PTEP* **2022** (2022) no.5, 053H01 doi:10.1093/ptep/ptac074 [arXiv:2112.12231 [physics.ins-det]].
- [31] E. Aprile *et al.* [XENON], “Material radiopurity control in the XENONnT experiment,” *Eur. Phys. J. C* **82** (2022) no.7, 599 doi:10.1140/epjc/s10052-022-10345-6 [arXiv:2112.05629 [physics.ins-det]].
- [32] E. Aprile *et al.* [XENON], “Search for Coherent Elastic Scattering of Solar ^8B Neutrinos in the XENON1T Dark Matter Experiment,” *Phys. Rev. Lett.* **126** (2021), 091301 doi:10.1103/PhysRevLett.126.091301 [arXiv:2012.02846 [hep-ex]].
- [33] E. Aprile *et al.* [XENON], “Search for inelastic scattering of WIMP dark matter in XENON1T,” *Phys. Rev. D* **103** (2021) no.6, 063028 doi:10.1103/PhysRevD.103.063028 [arXiv:2011.10431 [hep-ex]].
- [34] E. Aprile *et al.* [XENON], “ ^{222}Rn emanation measurements for the XENON1T experiment,” *Eur. Phys. J. C* **81** (2021) no.4, 337 doi:10.1140/epjc/s10052-020-08777-z [arXiv:2009.13981 [physics.ins-det]].
- [35] E. Aprile *et al.* [XENON], “Projected WIMP sensitivity of the XENONnT dark matter experiment,” *JCAP* **11** (2020), 031 doi:10.1088/1475-7516/2020/11/031 [arXiv:2007.08796 [physics.ins-det]].
- [36] E. Aprile *et al.* [XENON], “Excess electronic recoil events in XENON1T,” *Phys. Rev. D* **102** (2020) no.7, 072004 doi:10.1103/PhysRevD.102.072004 [arXiv:2006.09721 [hep-ex]].
- [37] J. Aalbers *et al.* [DARWIN], “Solar neutrino detection sensitivity in DARWIN via electron scattering,” *Eur. Phys. J. C* **80** (2020) no.12, 1133 doi:10.1140/epjc/s10052-020-08602-7 [arXiv:2006.03114 [physics.ins-det]].
- [38] F. Agostini *et al.* [DARWIN], “Sensitivity of the DARWIN observatory to the neutrinoless double beta decay of ^{136}Xe ,” *Eur. Phys. J. C* **80** (2020) no.9, 808 [erratum: *Eur. Phys. J. C* **83** (2023) no.11, 996] doi:10.1140/epjc/s10052-020-8196-z [arXiv:2003.13407 [physics.ins-det]].
- [39] E. Aprile *et al.* [XENON], “Energy resolution and linearity of XENON1T in the MeV energy range,” *Eur. Phys. J. C* **80** (2020) no.8, 785 doi:10.1140/epjc/s10052-020-8284-0 [arXiv:2003.03825 [physics.ins-det]].
- [40] E. Aprile *et al.* [XENON], “Search for Light Dark Matter Interactions Enhanced by the Migdal Effect or Bremsstrahlung in XENON1T,” *Phys. Rev. Lett.* **123** (2019) no.24, 241803 doi:10.1103/PhysRevLett.123.241803 [arXiv:1907.12771 [hep-ex]].
- [41] E. Aprile *et al.* [XENON], “Light Dark Matter Search with Ionization Signals in XENON1T,” *Phys. Rev. Lett.* **123** (2019) no.25, 251801 doi:10.1103/PhysRevLett.123.251801 [arXiv:1907.11485 [hep-ex]].
- [42] E. Aprile *et al.* [XENON], “XENON1T Dark Matter Data Analysis: Signal Reconstruction, Calibration and Event Selection,” *Phys. Rev. D* **100** (2019) no.5, 052014 doi:10.1103/PhysRevD.100.052014 [arXiv:1906.04717 [physics.ins-det]].
- [43] E. Aprile *et al.* [XENON], “The XENON1T Data Acquisition System,” *JINST* **14** (2019) no.07, P07016 doi:10.1088/1748-0221/14/07/P07016 [arXiv:1906.00819 [physics.ins-det]].

- [44] E. Aprile *et al.* [XENON], “Observation of two-neutrino double electron capture in ^{124}Xe with XENON1T,” *Nature* **568** (2019) no.7753, 532-535 doi:10.1038/s41586-019-1124-4 [arXiv:1904.11002 [nucl-ex]].
- [45] E. Aprile *et al.* [XENON], “XENON1T dark matter data analysis: Signal and background models and statistical inference,” *Phys. Rev. D* **99** (2019) no.11, 112009 [erratum: *Phys. Rev. D* **111** (2025) no.5, 059904] doi:10.1103/PhysRevD.99.112009 [arXiv:1902.11297 [physics.ins-det]].
- [46] E. Aprile *et al.* [XENON], “Constraining the spin-dependent WIMP-nucleon cross sections with XENON1T,” *Phys. Rev. Lett.* **122** (2019) no.14, 141301 doi:10.1103/PhysRevLett.122.141301 [arXiv:1902.03234 [astro-ph.CO]].
- [47] E. Aprile *et al.* [XENON], “First results on the scalar WIMP-pion coupling, using the XENON1T experiment,” *Phys. Rev. Lett.* **122** (2019) no.7, 071301 doi:10.1103/PhysRevLett.122.071301 [arXiv:1811.12482 [hep-ph]].
- [48] E. Aprile *et al.* [XENON], “Dark Matter Search Results from a One Ton-Year Exposure of XENON1T,” *Phys. Rev. Lett.* **121** (2018) no.11, 111302 doi:10.1103/PhysRevLett.121.111302 [arXiv:1805.12562 [astro-ph.CO]].
- [49] L. Baudis, Y. Biondi, C. Capelli, M. Galloway, S. Kazama, A. Kish, P. Pakarha, F. Piastra and J. Wulf, “A Dual-phase Xenon TPC for Scintillation and Ionisation Yield Measurements in Liquid Xenon,” *Eur. Phys. J. C* **78** (2018) no.5, 351 doi:10.1140/epjc/s10052-018-5801-5 [arXiv:1712.08607 [astro-ph.IM]].
- [50] E. Aprile *et al.* [XENON100], “Search for Bosonic Super-WIMP Interactions with the XENON100 Experiment,” *Phys. Rev. D* **96** (2017) no.12, 122002 doi:10.1103/PhysRevD.96.122002 [arXiv:1709.02222 [astro-ph.CO]].

Zurigo, 24/09/2025

Firma