Luigi Pertoldi — academic resume

https://gipert.github.io

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Education

- **Università degli Studi di Padova, INFN Sezione di Padova** — Padova, Italy
  Ph.D. in Physics, cum laude — *Oct 2017 – Sep 2020*
- **Università degli Studi di Padova** — Padova, Italy
  Master of Physics. 110/110 cum laude — *Oct 2015 – Jul 2017*
- **Università degli Studi di Padova** — Padova, Italy
  Bachelor of Physics. 104/110 — *Oct 2012 – Sep 2015*

Experience

- **TU München & INFN Padova** — München, DE
  Post-doctoral researcher at TUM & Associated visitor at INFN Padova — *Nov 2020 – Present*
  - **LEGEND-200 analysis software stack**: Development and management of the primary LEGEND software stack for offline data analysis. Low-level data-objects, data compression, metadata, implementation of modern software development practices and tools.
  - **LEGEND-1000 background modeling**: Development and validation of the LEGEND-1000 background model for the DOE project proposal [4].
  - **LEGEND simulation software stack**: Development of a new software stack for LEGEND-related background simulations. Development of a fast optical simulations package for the argon instrumentation system.
  - **HPGe detector characterization**: Modeling and *in-situ* characterization of the GERDA HPGe detectors active volume with low-energy ^{39}Ar events recorded by the experiment.
- **University of Padova & INFN Padova** — Padova, IT
  Ph.D. student, GERDA simulations & background studies co-coordinator — *Oct 2017 – Oct 2020*
  - **Background modeling and new $\beta\beta$ physics searches**: Extraction of expectations for signal and background event distributions in GERDA by means of Monte Carlo simulations. Development of the background model of the experiment [8].
  - **Liquid argon detector modeling**: Development of the Monte Carlo simulation software module responsible for generating and propagating liquid argon scintillation light in the GERDA setup. Development of a predictive model of the GERDA argon veto system [1], tuned on calibration data, employed for sensitive new-physics searches.
  - **$2\nu\beta\beta$half-life precision measurement and new $\beta\beta$ physics searches**: Development of the statistical tools used to constrain the presence of new physics phenomena on top of the $2\nu\beta\beta$ decay spectrum [3]. Development of a precision analysis of the $2\nu\beta\beta$ decay spectrum and extraction of the experimental half-life (publication in preparation).
  - **The MaGe simulation toolkit**: Development of MaGe, a Geant4-based software framework to simulate background and signal events in various $\beta\beta$-decay-related experimental setups, including GERDA, Majorana and LEGEND.
  - **HPGe detector modeling and characterization**: Development of the data acquisition software suite used in the characterization campaign of the new point-type inverted-coaxial germanium detectors used in LEGEND.

Publications

[1] M. Agostini et al. "Liquid argon light collection and veto modeling in GERDA Phase II" (2022). Accepted for publication on EPJC. arXiv: 2212.02856 [physics.ins-det]

[2] M. Agostini et al. "Pulse shape analysis in GERDA Phase II". *Eur. Phys. J. C* 82.4 (2022), p. 284. DOI: 10.1140/epjc/s10052-022-10163-w. arXiv: 2202.13355 [physics.ins-det]

[3] M. Agostini et al. “Search for exotic physics in double-β decays with GERDA Phase II”. *JCAP* 12 (2022), p. 012. DOI: 10.1088/1475-7516/2022/12/012. arXiv: 2209.01671 [nucl-ex]

[4] N. Abgrall et al. “The Large Enriched Germanium Experiment for Neutrinoless $\beta\beta$ Decay: LEGEND-1000 Preconceptual Design Report” (2021). arXiv: 2107.11462 [physics.ins-det]

[5] M. Agostini et al. “Calibration of the GERDA experiment”. *Eur. Phys. J. C* 81.8 (2021), p. 682. DOI: 10.1140/epjc/s10052-021-09403-2. arXiv: 2103.13777 [physics.ins-det]

[6] M. Agostini et al. “Characterization of inverted coaxial ^{76}Ge detectors in GERDA for future double-β decay experiments”. *Eur. Phys. J. C* 81 (2021), p. 505. DOI: 10.1140/epjc/s10052-021-09184-8. arXiv: 2103.15111 [physics.ins-det]

[7] M. Agostini et al. “Final Results of GERDA on the Search for Neutrinoless Double-β Decay”. *Phys. Rev. Lett.* 125.25 (2020), p. 252502. DOI: 10.1103/PhysRevLett.125.252502. arXiv: 2009.06079 [nucl-ex]

[8] M. Agostini et al. “Modeling of GERDA Phase II data”. *JHEP* 03 (2020), p. 139. DOI: 10.1007/JHEP03(2020)139. arXiv: 1909.02522 [nucl-ex]

[9] M. Agostini et al. “The first search for bosonic super-WIMPs with masses up to 1 MeV/c^2 with GERDA”. *Phys. Rev. Lett.* 125.1 (2020), p. 011801. DOI: 10.1103/PhysRevLett.125.011801. arXiv: 2005.14184 [hep-ex]

[10] M. Agostini et al. “Probing Majorana neutrinos with double-β decay”. *Science* 365 (2019), p. 1445. DOI: 10.1126/science.aav8613. arXiv: 1909.02726 [hep-ex]

[11] M. Agostini et al. “GERDA results and the future perspectives for the neutrinoless double beta decay search using ^{76}Ge”. *Int. J. Mod. Phys. A* 33.09 (2018), p. 1843004. DOI: 10.1142/S0217751X18430042

[12] M. Agostini et al. “Improved Limit on Neutrinoless Double-β Decay of ^{76}Ge from GERDA Phase II”. *Phys. Rev. Lett.* 120.13 (2018), p. 132503. DOI: 10.1103/PhysRevLett.120.132503. arXiv: 1803.11100 [nucl-ex]

Links

- **Personal portfolio**: gipert.github.io
- **ORCID ID**: orcid.org/0000-0002-0467-2571
- **INSPIRE-HEP**: inspirehep.net/authors/1667599

March 2023