



LEGEND

Valentina Biancacci

on behalf of the
LEGEND local groups

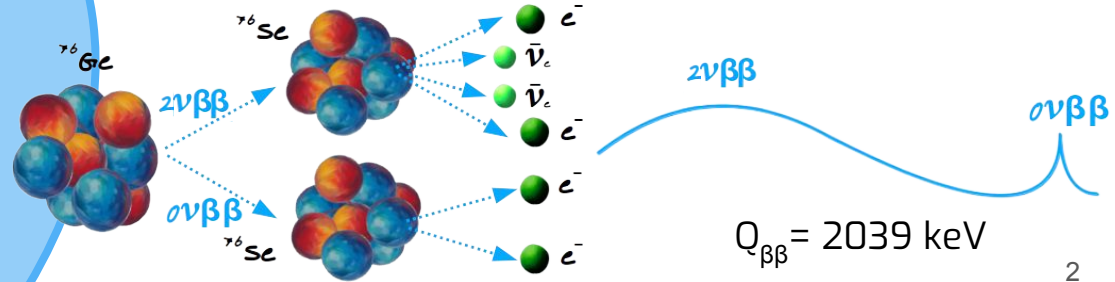
LEGEND = Large Enriched Germanium Experiment for Neutrinoless Double-Beta Decay

270+ members, 50+ institutions, 11 countries Collaboration formed in October 2016



LEGEND mission:

“The collaboration aims to develop a phased Ge-76 based double beta decay experimental program with discovery potential at a half-life significantly longer than 10^{28} years, using existing resources as appropriate to expedite physics results”.



LEGEND collaboration

look at the links!

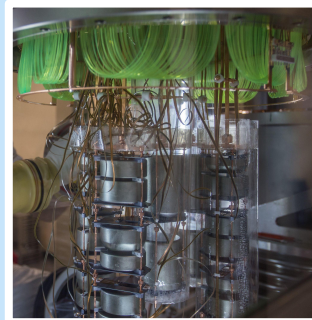


Majorana
Demonstrator



Best energy
resolution

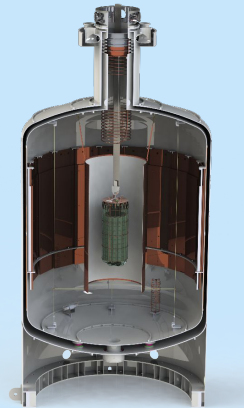
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Lowest background
index

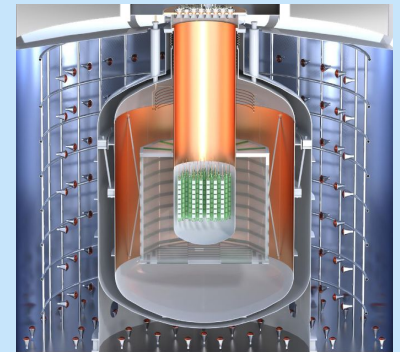
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LEGEND-200



Situated in the existing
GERDA infrastructure at
LNGS

LEGEND-1000



Emerged as the
**portfolio review
winner!**

completed in ~

2020

data taking started in

2023

...

*commissioning
will start in*

2026

LEGEND LOCAL GROUPS

- Natalia Di Marco
Physics Professor
- Riccardo Biondi
RTT
- Valentina Biancacci
PostDoc
- Michele Morella
PhD student
- Raoul Cesarano
PhD student

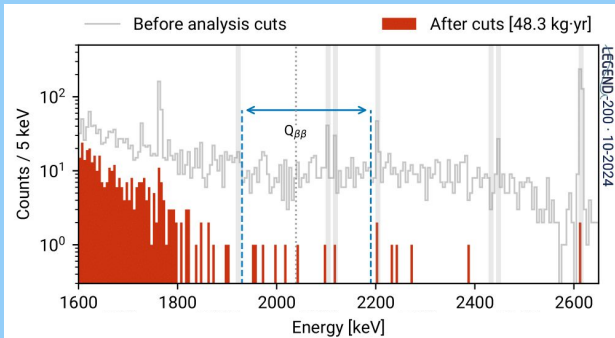


- Marco Balata
- Nina Burlac
- Matthias Laubenstein
- Francesco Ferella
- Chiara Ghiano
- Małgorzata Harańczyk
- Matthias Junker
- Iza Kochanek
- Alessandro Razeto
- Nicola Rossi
- Francesco Salamida
- Chiara Vignoli



LEGEND-200 ACTIVITIES

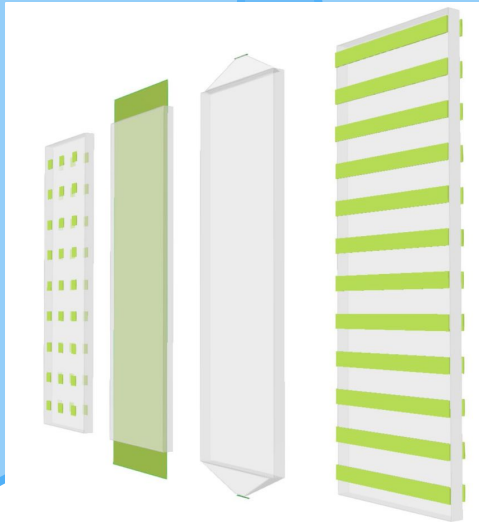
- LEGEND started physics data taking in March 2023 with $\sim 140\text{kg}$ of HPGe detectors
- LEGEND showed the first $0\nu\beta\beta$ limit results at Neutrino24
- Many publications are to be released soon and over the coming years



- **L200 will be taking data during the entire period of your PhD!**
- Data taking are ready to be resumed. Other $\sim 60\text{kg}$ of HPGe will be mounted in the next future
- Analysis of data quality and accurate energy estimation
 - Pulse Shape Discrimination (PSD) for germanium detectors
 - Beyond $0\nu\beta\beta$ Searches dark matter, majoron emission, BSM in liquid Argon, Supernova neutrinos

LEGEND-1000 ACTIVITIES

- LAr instrumentation system is optimized to detect cosmogenic backgrounds
- Neutron capture in germanium detectors can produce $^{77(m)}\text{Ge}$, known sources of background
- The neutron moderator is essential to actively tag the neutrons



- **Many L1000 R&D activities during the entire period of your PhD!**
- LEGENDArYno setup is commissioning at LNGS
neutron moderator test, light guide test, readout option test
- Test of the full light read-out chain in the LEGENDArY facility at LNGS
- Various simulations to estimate the impact of the neutron moderator
- Measurements and simulations of the Xe doping effect on the LAr veto



.... a name, a guarantee...

Join the LEGENDers!!

