# Searching for the ββ0ν decay with NEXT-100

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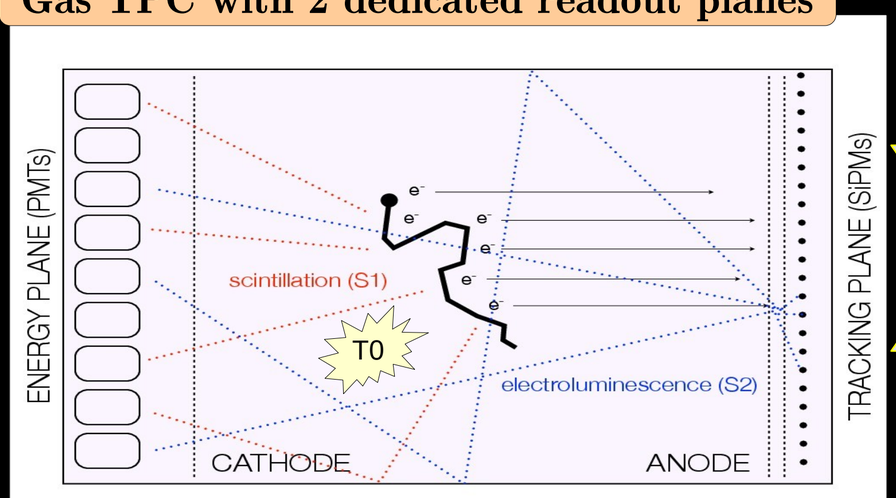
**The NEXT experiment aims at the sensitive search of the neutrino-less double beta decay of $^{136}$Xe at the LSC, operating high-pressure Xe electroluminescent TPCs. The NEXT-100 detector has been installed and is currently under commissioning.**

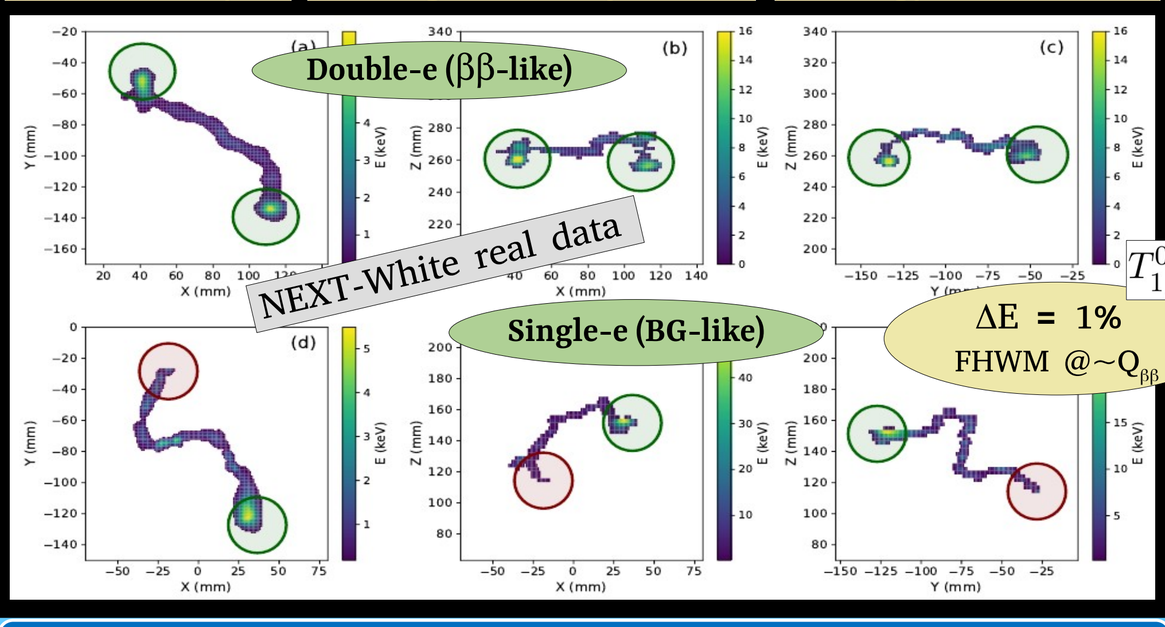
## The NEXT Experiment

**Gas TPC with 2 dedicated readout planes**



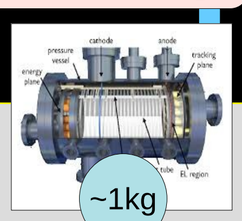

**EL: linear gain, no avalanche fluctuations**

**Scalability** | **Background rejection** | **Energy resolution**

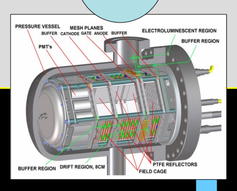



## The NEXT Roadmap

R&D
Proof of Concept

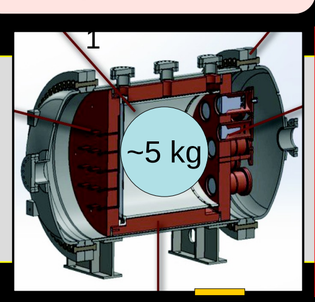


~1kg



2009-2014

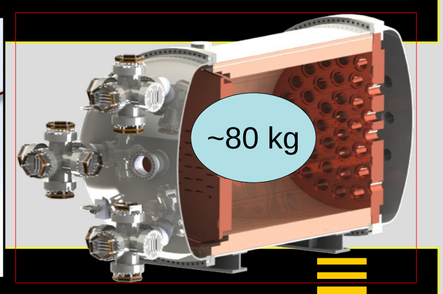
NEXT-White
Background+ββ2ν



~5 kg

2015-2021

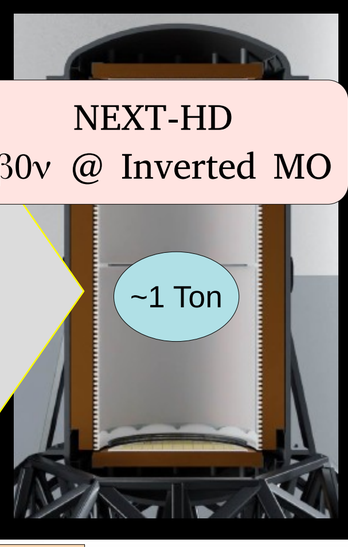
NEXT-100 (+upgrades)
ββ0ν search



~80 kg

2023-2027

NEXT-HD
ββ0ν @ Inverted MO



~1 Ton

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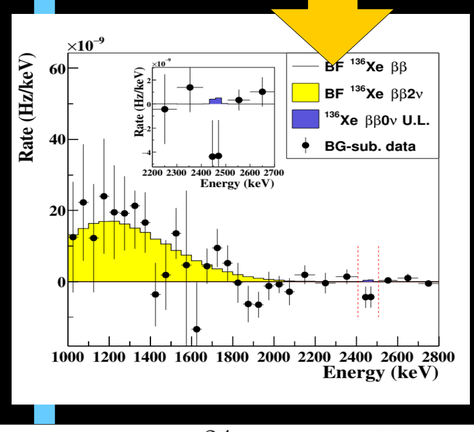


$T^{0\nu}_{1/2} > 1.3 \times 10^{24}$ yr at 90% C.L.

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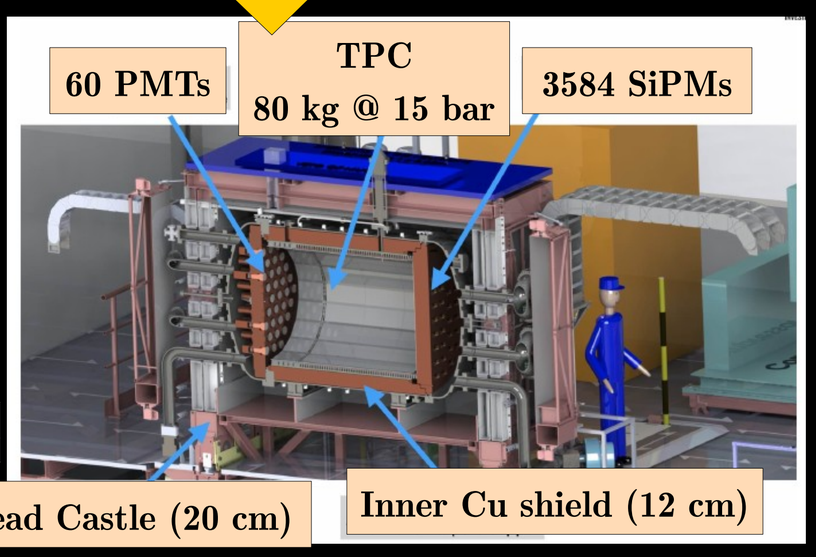
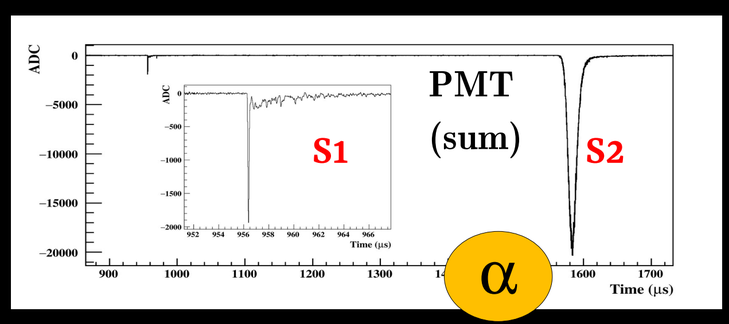
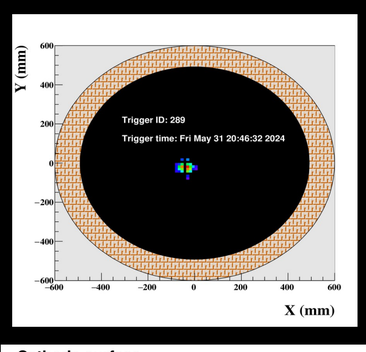
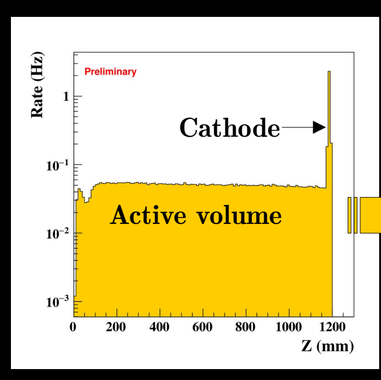


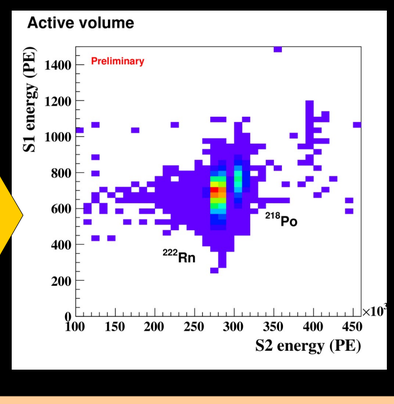

## NEXT-100 Commissioning

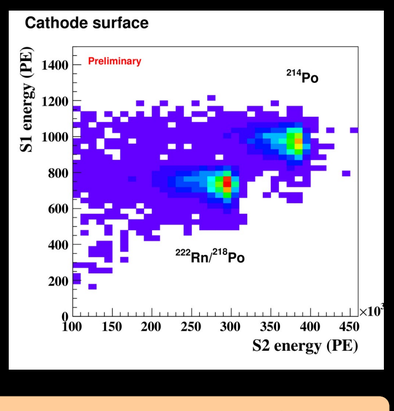
**NEXT-100 in stable operation with Ar at 4.3 bar, drift field of ~67 V/cm and EL field of ~6.9 kV/cm**



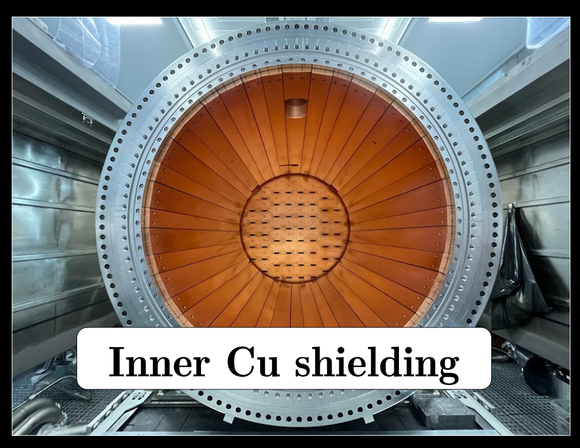



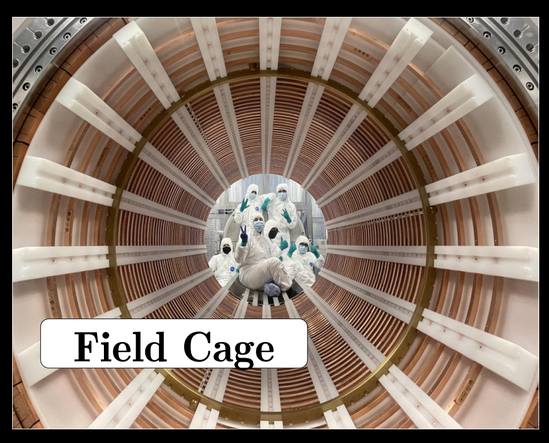

**Detector being characterized with point-like events (αs)**

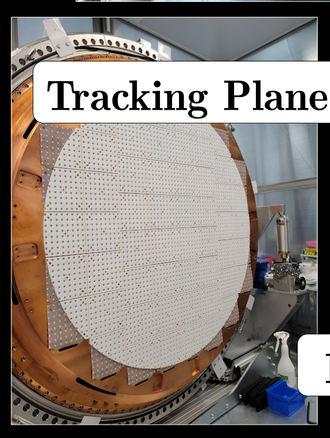
## NEXT-100 Installation @ LSC

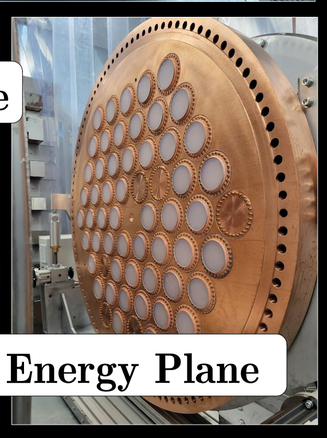
**NEXT-100 and related infrastructures installed in 2023**


Pressure Vessel

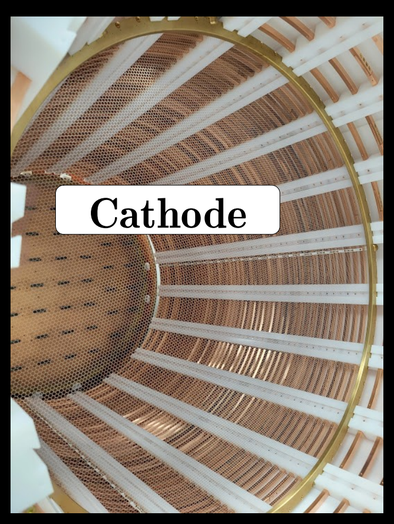

Inner Cu shielding

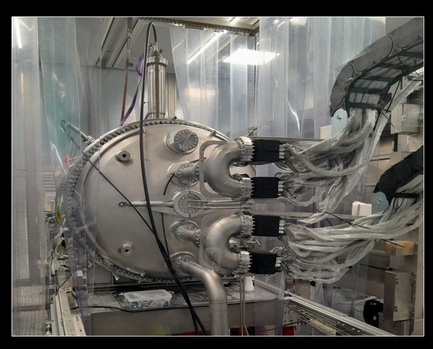

Field Cage


Tracking Plane


Energy Plane


EL Grid


Cathode



**NEXT-100 Ready!**

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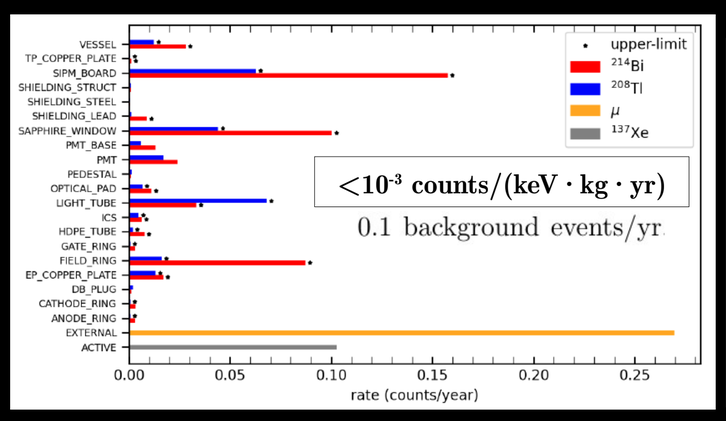
## NEXT-100 Sensitivity

**NEXT-100 sensitivity estimated with full simulation, extensive radiopurity screening, and NEXT-White results**

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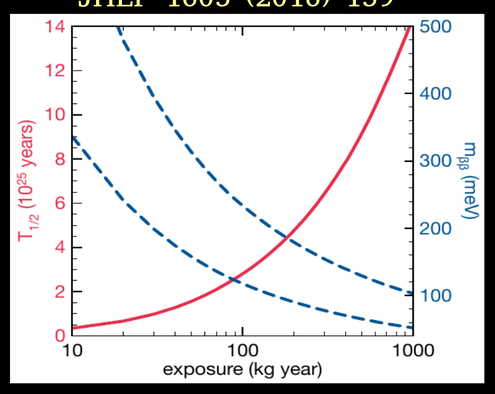


Sensitivity (3 years): 6 x $10^{25}$ yr @ 90% C.L.

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