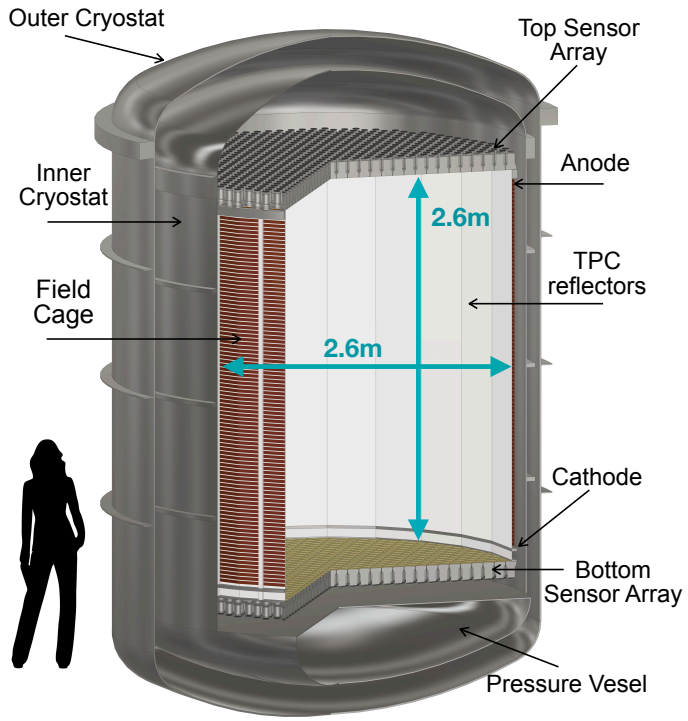
DARWIN: a next-generation LXe dual phase TPC

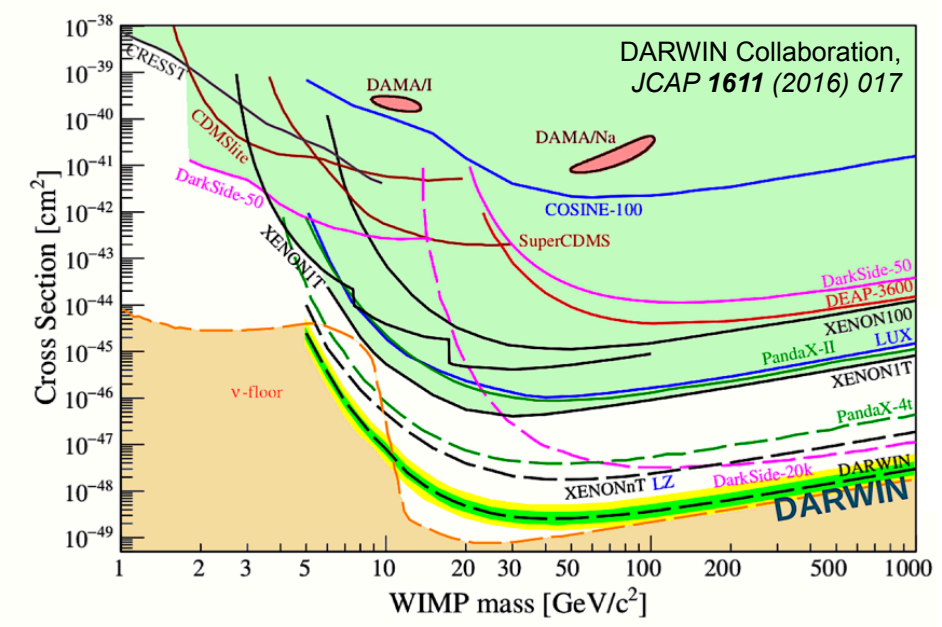
BASELINE DESIGN



data taking ~2027

MAIN GOAL

WIMP searches down to the neutrino floor



Great Features

- 40t LXe active target (3.6t ^{136}Xe)
  no enrichment
- Ultra low background level
- Very good energy resolution

Who covers only one physics channel?

Patricia Sanchez-Lucas (Universität Zürich)

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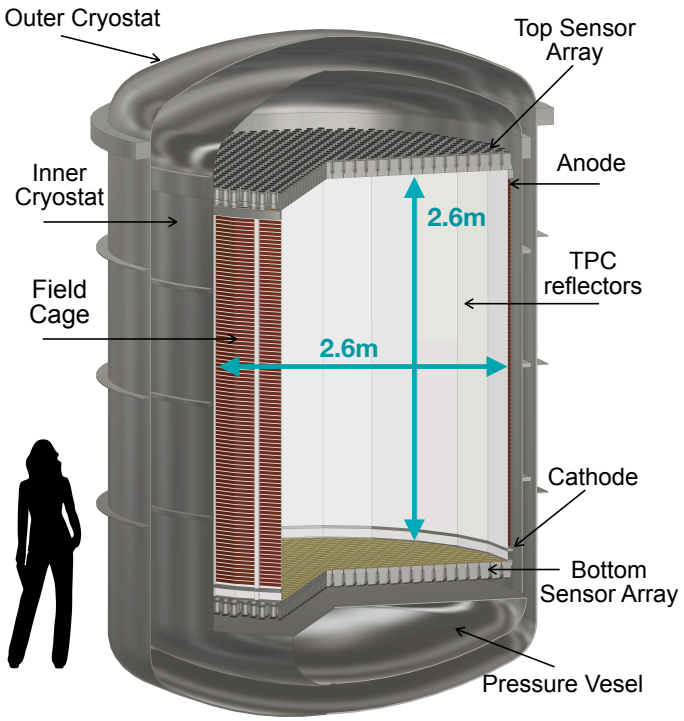

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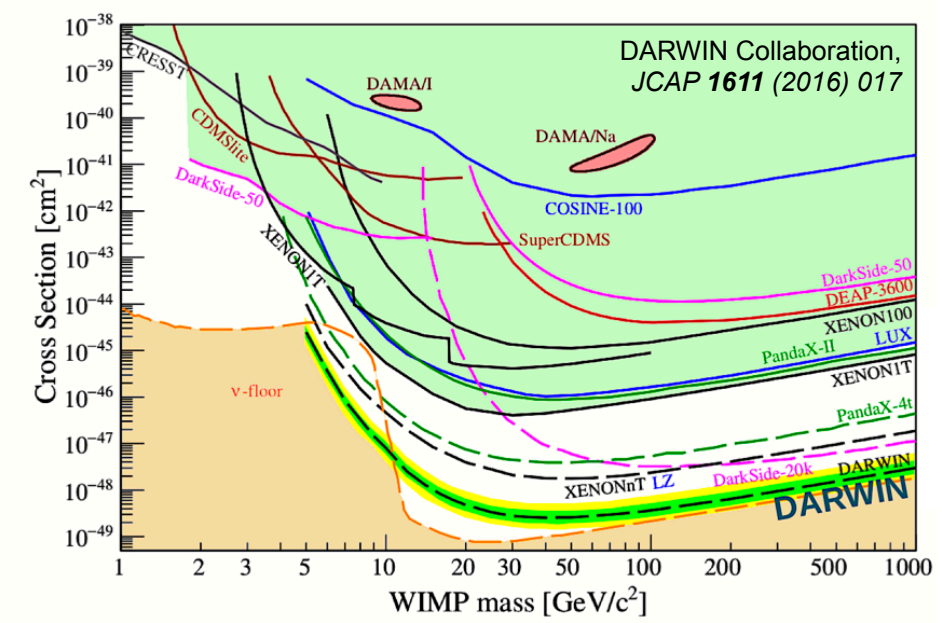
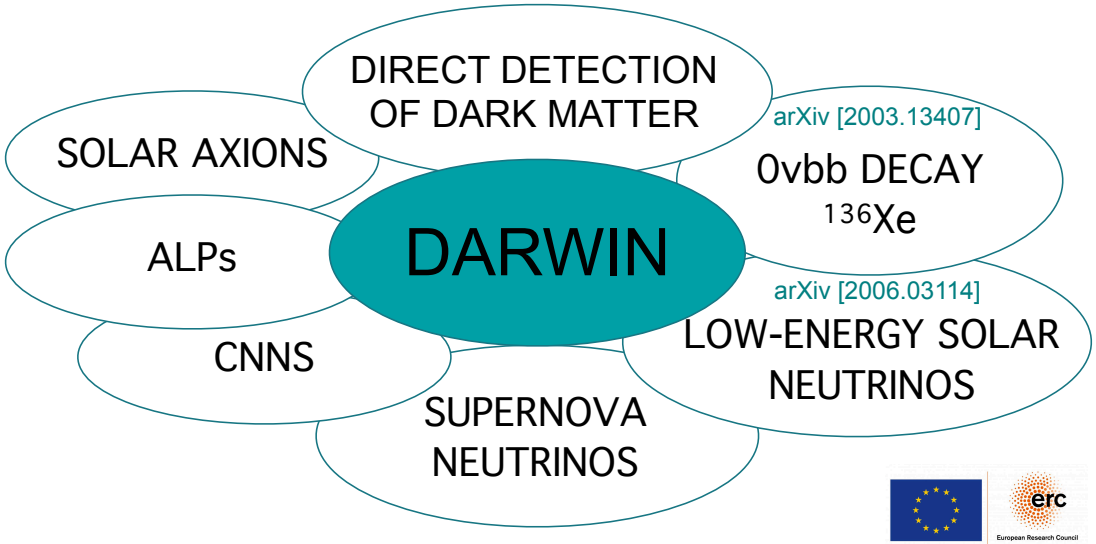




DARWIN: sensitivity to the $0\nu\beta\beta$ decay of ^{136}Xe

4 DIFFERENT SCENARIOS

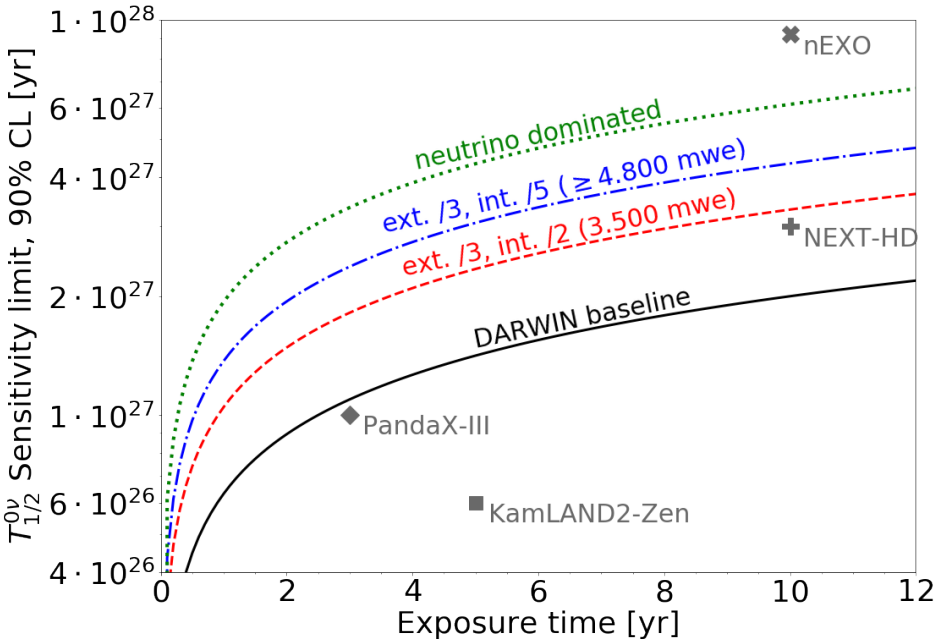
① Conservative baseline scenario

$T^{0\nu}_{1/2}\,(90\,\%\,CL) = 2.4 \times 10^{27} yr$

+ Achievable internal/external background reduction

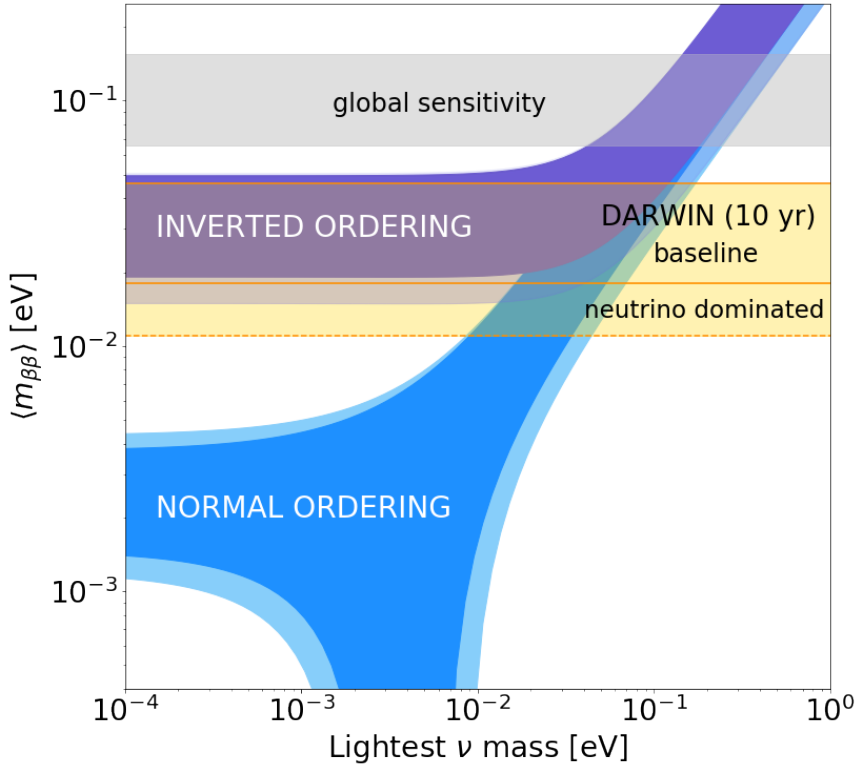
④ Optimistic neutrino dominated scenario

$T^{0\nu}_{1/2}\,(90\%CL) = 6 \times 10^{27} yr$



DARWIN sensitivity comparable to dedicated $0\nu\beta\beta$ experiments

➢ The full IO region is at reach



DARWIN Collaboration, arXiv[2003.13407]

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