

Low background R&D

Technology for DARWIN – “The ultimate Dark Matter detector”

Answer following questions:

1. How can we use xenon most effectively in low background experiments?
2. What is the best UV detector for next generation low background experiments?
3. Can we implement novel readout techniques? Pax, strax and what's next?

1. How can we use xenon most effectively in low background experiments?

- We have a fully commissioned cryolab
- R&D PhD theses from R. Schon, E. Hogenbirk + several MSc students
- Joint venture with **R&D group, ET, MT.....**

BONUS: PhD & MSc students with full 'ownership' of their own research project. Publications with small teams.

2. What is the best UV detector for low background experiments?

- Low background PMTs used by all xenon TPCs?
- We started investigation on SiPMs this year.
- Joint venture between DM group and **ET**

BONUS: This R&D may lead to new industrial/medical applications

3. Can we implement novel readout techniques? Pax, strax and what's next?

- XENON1T pioneered software triggering in low background experiments: our DM group as a key developer
- XENONnT will take this to the next level..... all data to shore
- DARWIN will need 'next-to-next level' DAQ. Especially if equipped with SiPMs
- Joint venture with **PDP** group

BONUS: Deliver MSc&PhD students with state-of-the-art and relevant computing skills.