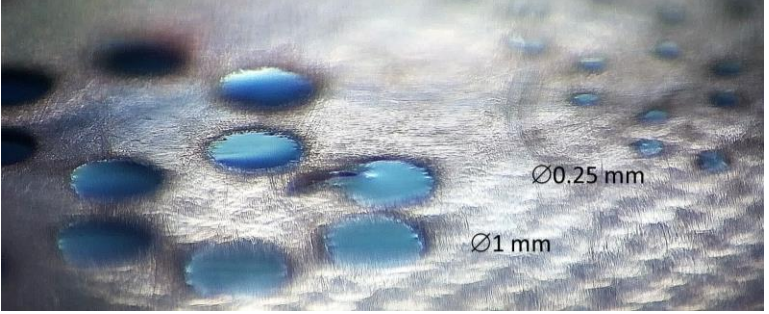
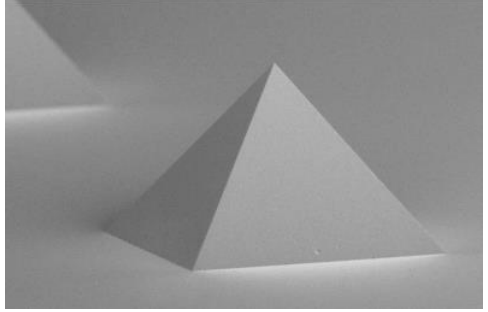
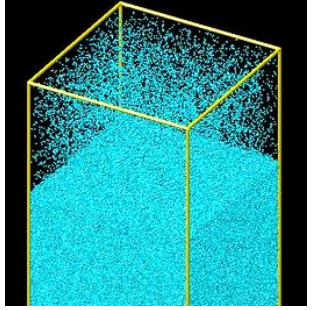
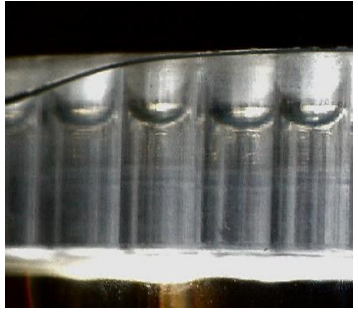
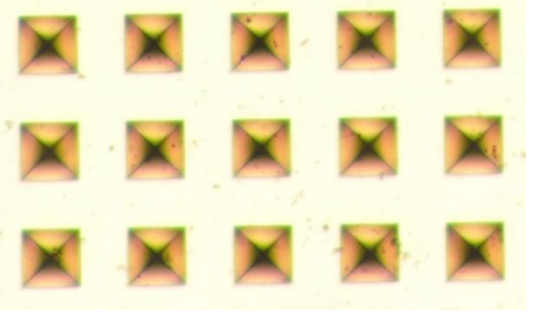


LXe R&D

Members (PhDs):
Vitaly Chepel (full time)
Vladimir Solovov (0.2 FTE)
Francisco Neves (0.15 FTE)

Info update

Prevoius Funding
2022 – 2024: CERN/FIS-INS/0026/2021 -- FCT funding for participation in RD51 - LIP/UC/UA – 70 k€ / 2 years
2022 – 2024: RD51 Common Fund – LIP/UC/WIS – 36kCHF / 2 years
2024 – 2025: 2024.00269.CERN -- FCT funding for participation in DRD1 - LIP/UC/UA – 100 k€ /year for LIP; 25k€ for LXe group
Current Funding – 0 --- submitted proposal to FCT for studies of surface phenomena (~250k€) -- PI: Francisco Neves

Opportunities:

We are members of the **DRD1** (Gas Detectors) and **DRD2** (Liquid Detectors) Collaborations with:

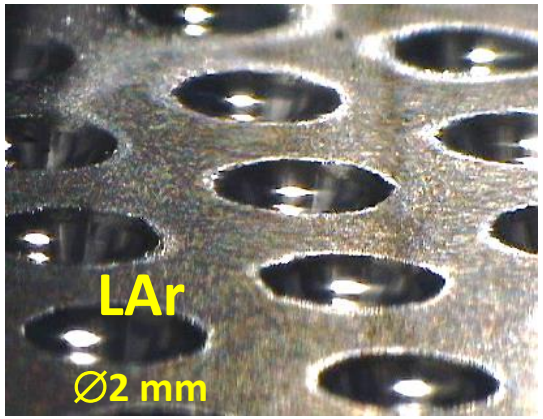
- Development of novel readout techniques **(Floating Hole Multiplier, novel Micropattern structures for electrolumionescence in liquid xenon and argon**)
- LXe physics (**surface studies, electroluminescence in the liquid phase**)

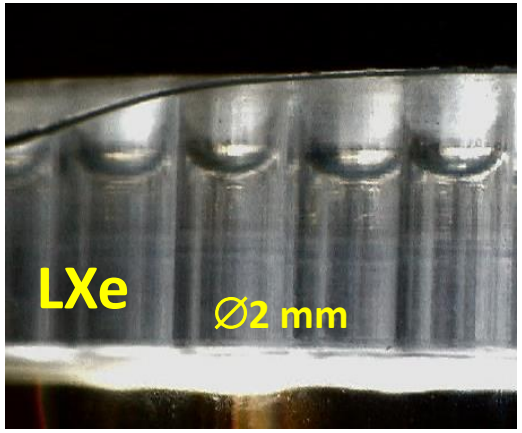
Will apply for support for our participation in DRD1&DRD2 (FCT/CERN; together with the collaborations if there will be a common proposal)

Current activities:

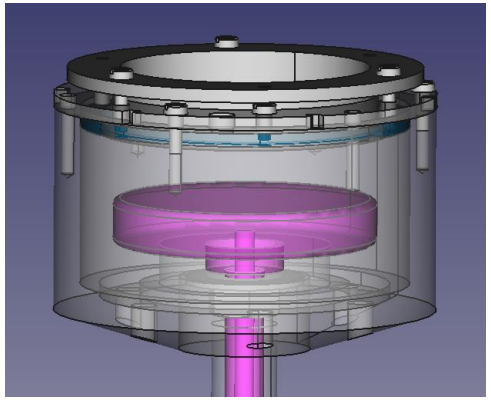
1. Floating Hole Multiplier – studies continued with LXe and LAr (collab. w/AstroCENT, Poland) – lighter materials

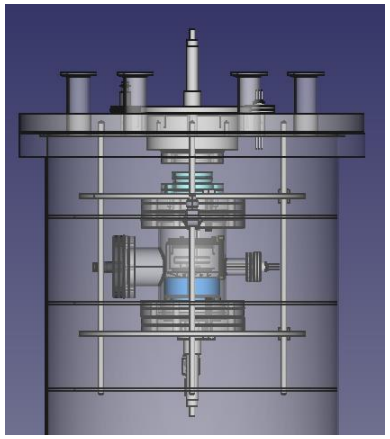
PMMA 6mm thick (FAT GEM)



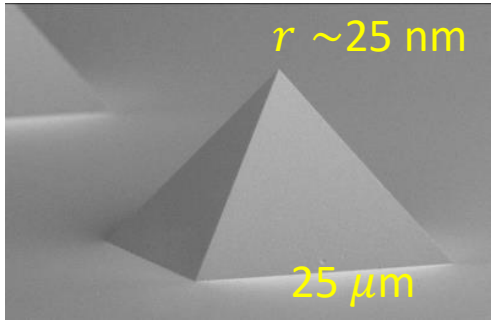


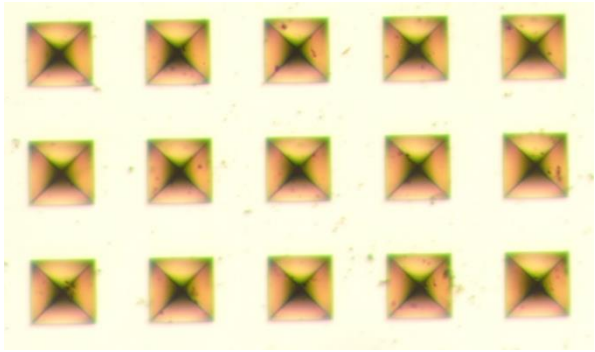
2. LXe/LAr surface studies: new setup is ready



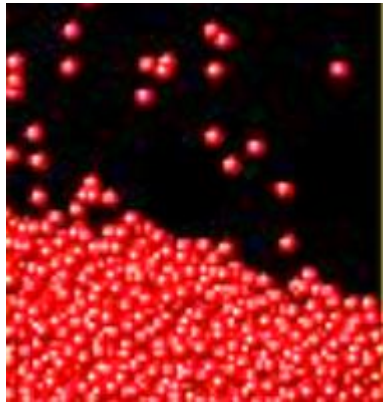


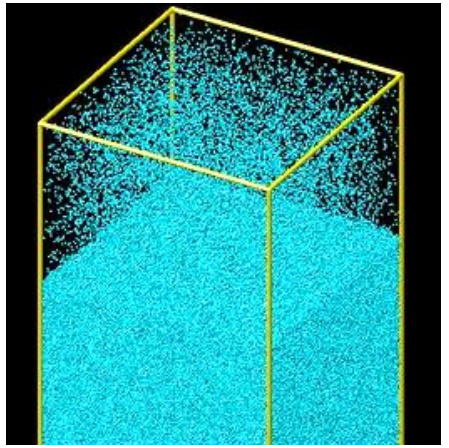
3. Nanotips as electron emitters and anodes (collab. with INL, Braga) – measurements soon

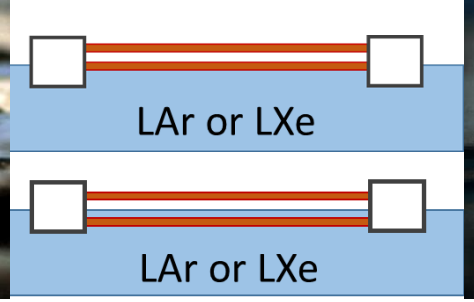


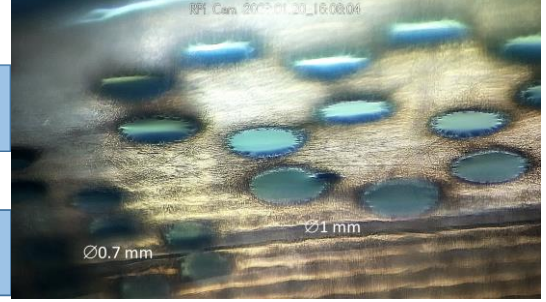


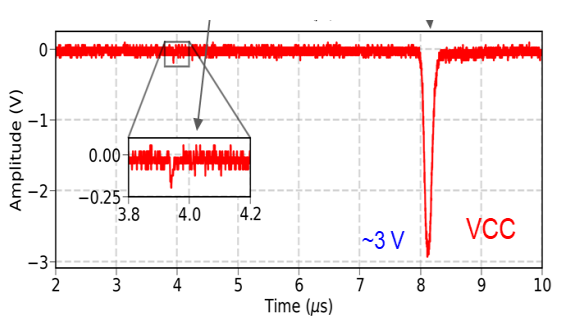
4. Pursuing a new direction – molecular dynamics simulation of liquid surface











SWOT Analysis

Strenghts

Highly qualified group members with many years of experience in the field of detector development. The international recognition and wide contacts of the group members with scientists from other groups. Active involvement in DRD1 and DRD2 Collaborations at CERN as well as in some other collaborations/experiments.

Weaknesses

Limited availability of human resources. Heavy involvement of the group members in other activities and projects.

Opportunities

There is an opportunity for sound contributions to development of liquid xenon and argon detectors and better understanding of the underlying physics in general, and for the development of the next generation of large scale liquid noble gas detectors for rare events in particular. Our involvement in two CERN Collaborations such as DRD1 and DRD2 offers the opportunity for more close collaborations with groups from other institutions.

Threats

Funding uncertainty in general and the gap in funding is a serious threat in 2026 and forthcoming years. With FCT CERN Fund still not opened and current project finished by the end of January 2026, the group activities (experimental in their essence) can hardly be kept at the same quality and intensity levels.