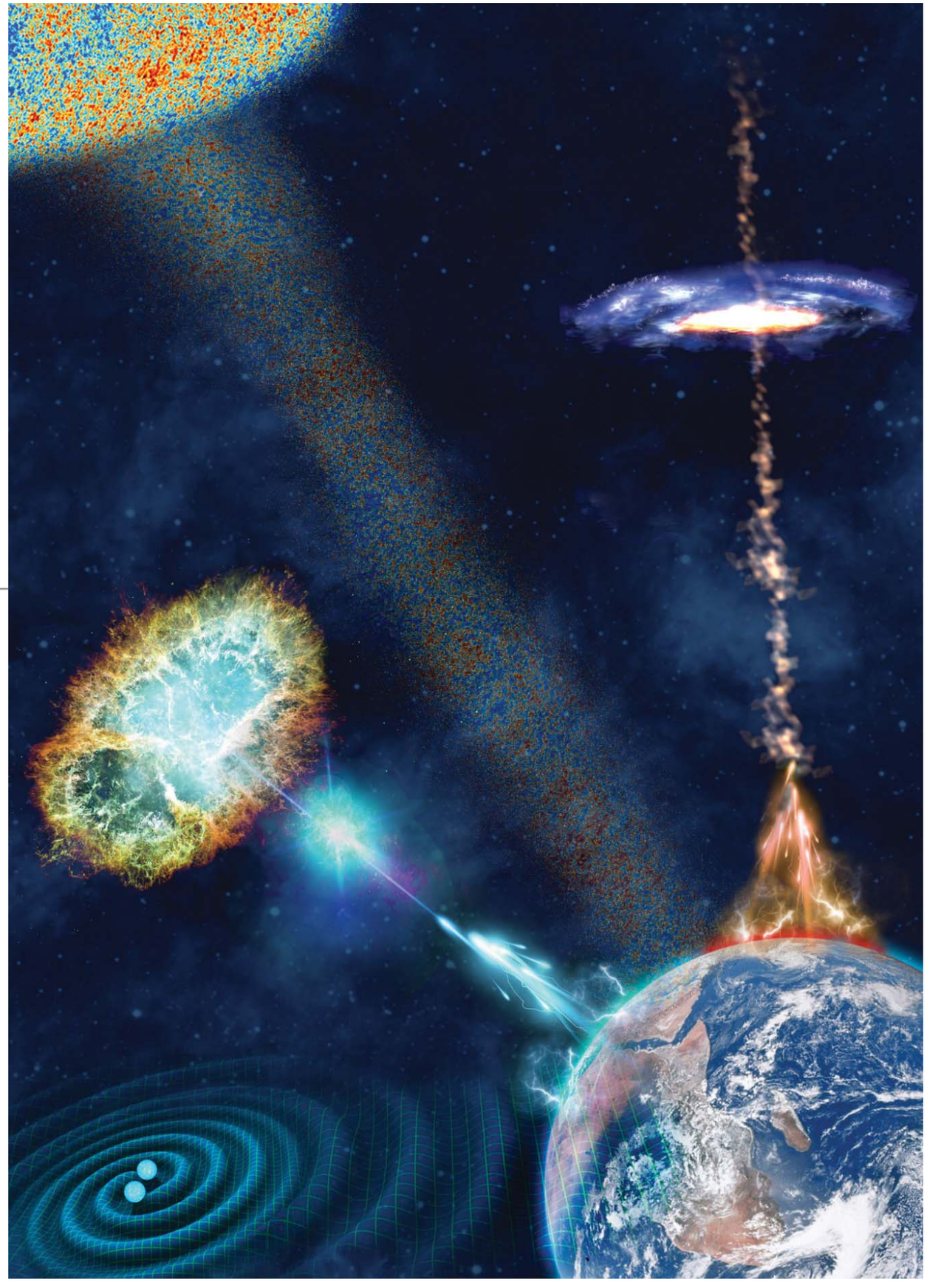
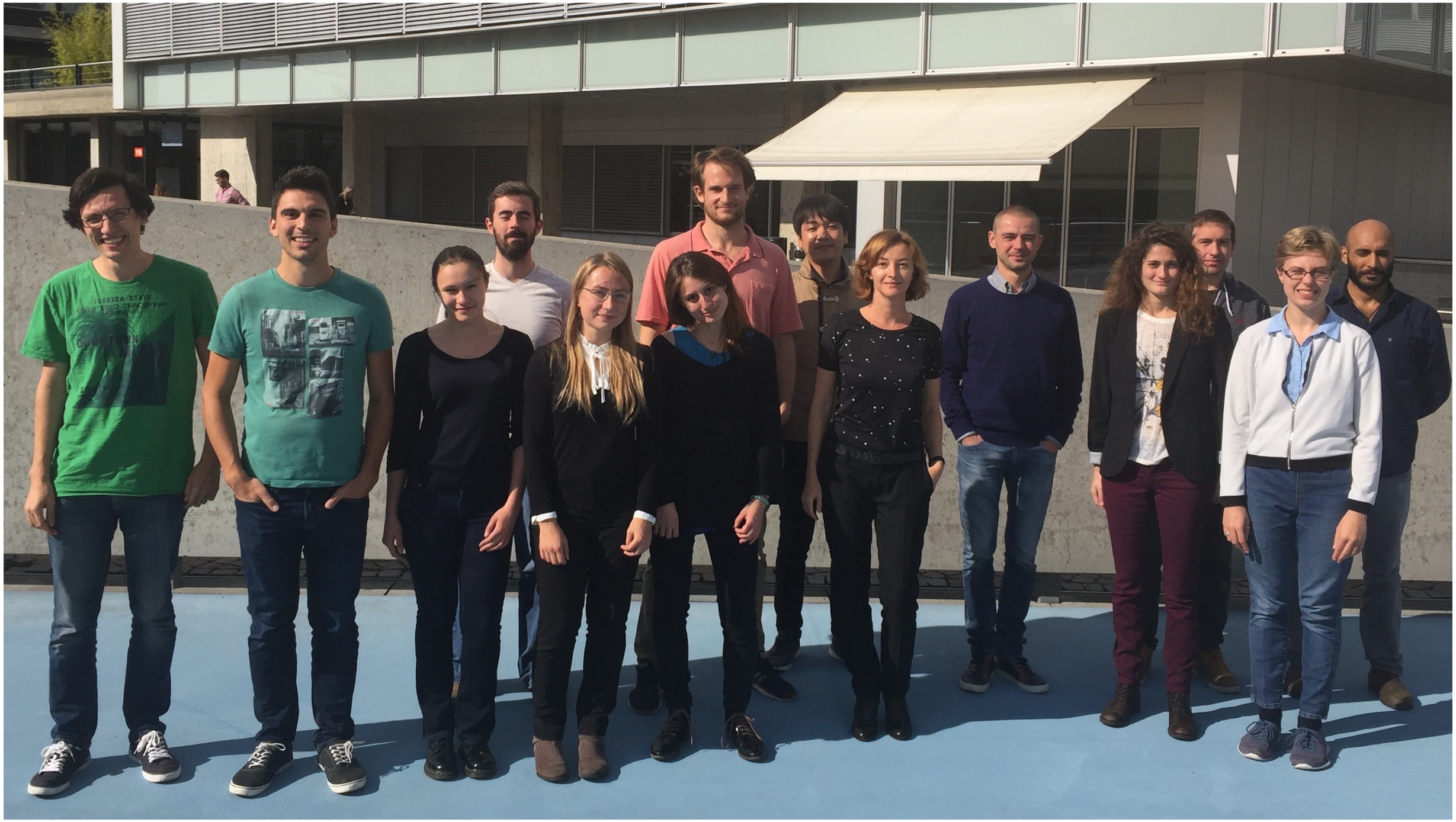
University of Zurich[UZH]

Bachelor and master projects in astroparticle physics

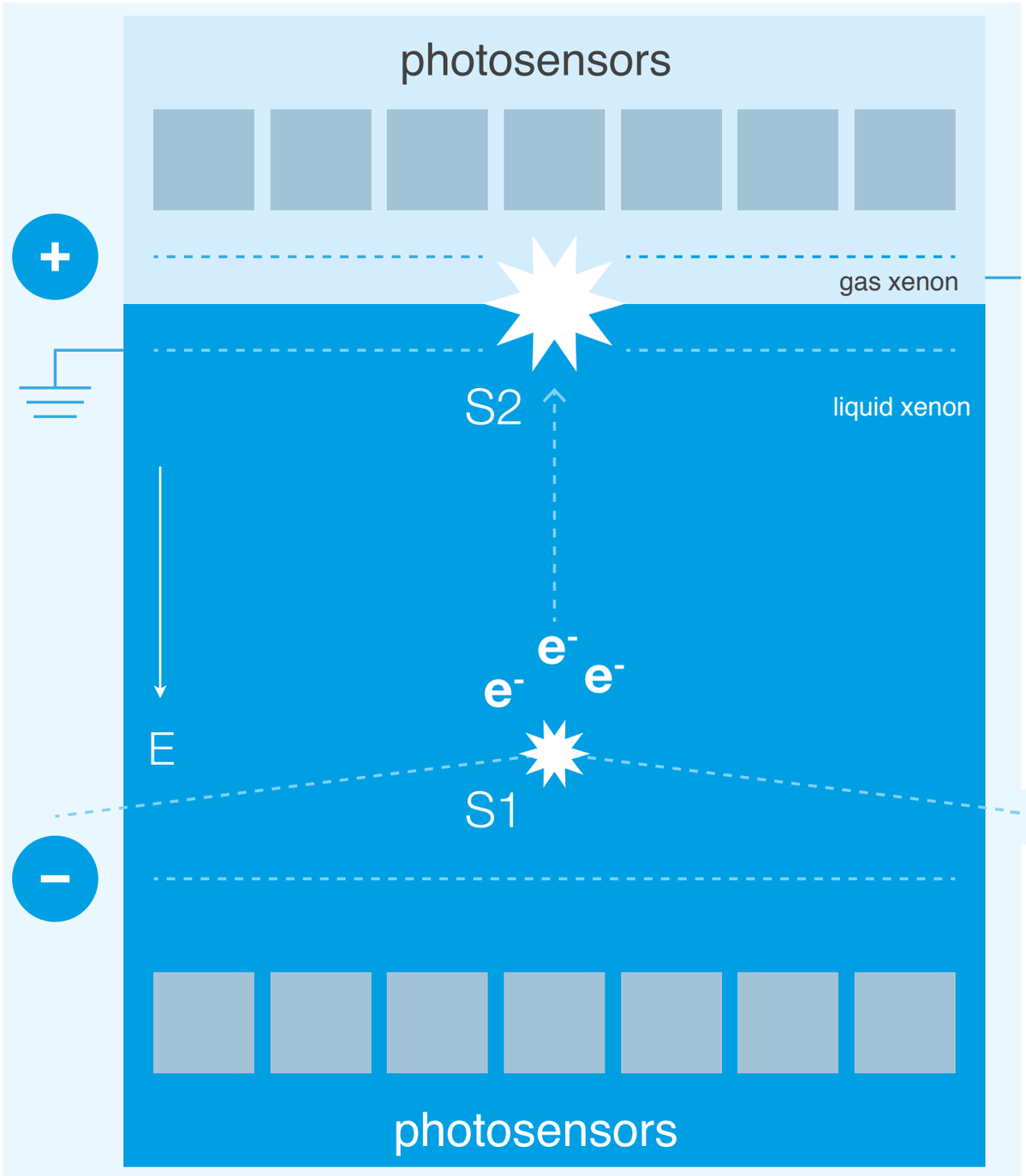
Prof. Laura Baudis
University of Zurich

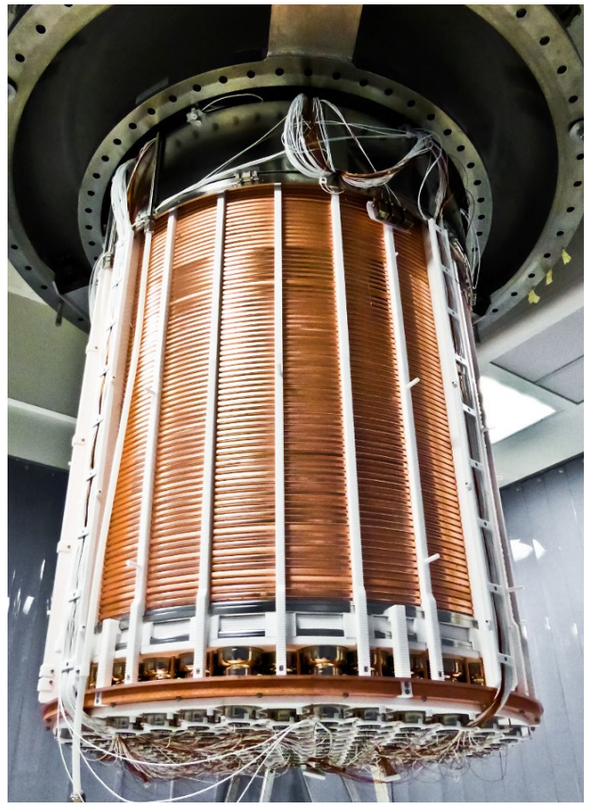


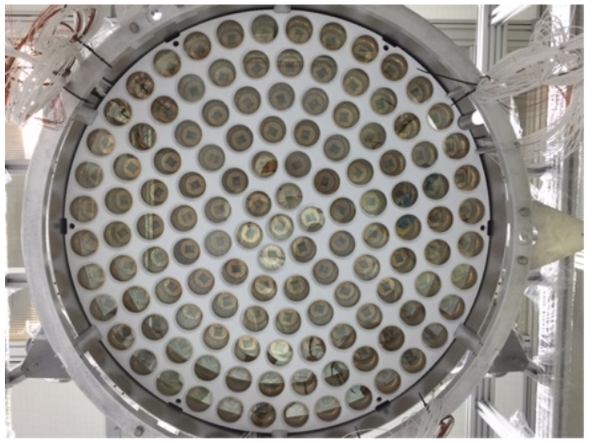
Meet the Group

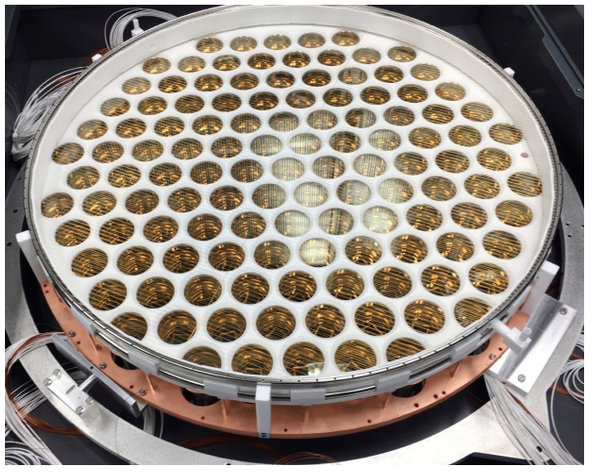


Direct dark matter detection with xenon detectors









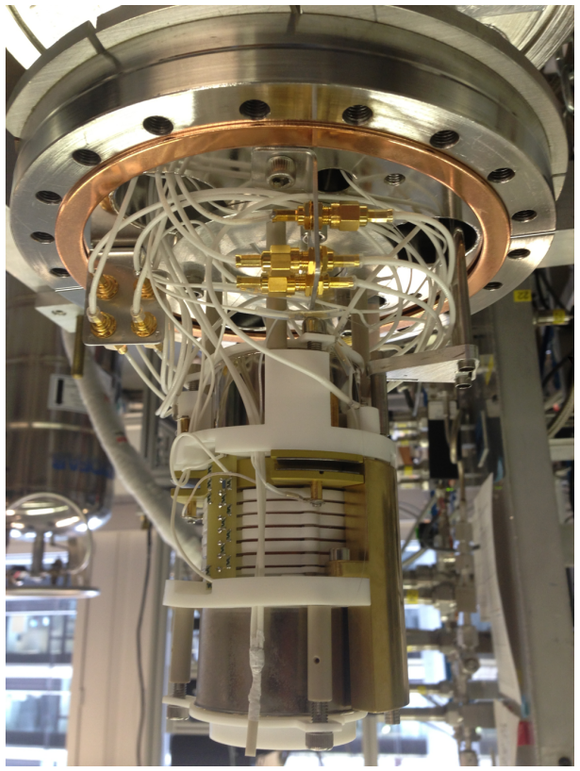
XENON1T: a 3.2 t dark matter detector at LNGS

Taking science data since Nov 2016

Phys.Rev.Lett. 119 (2017)

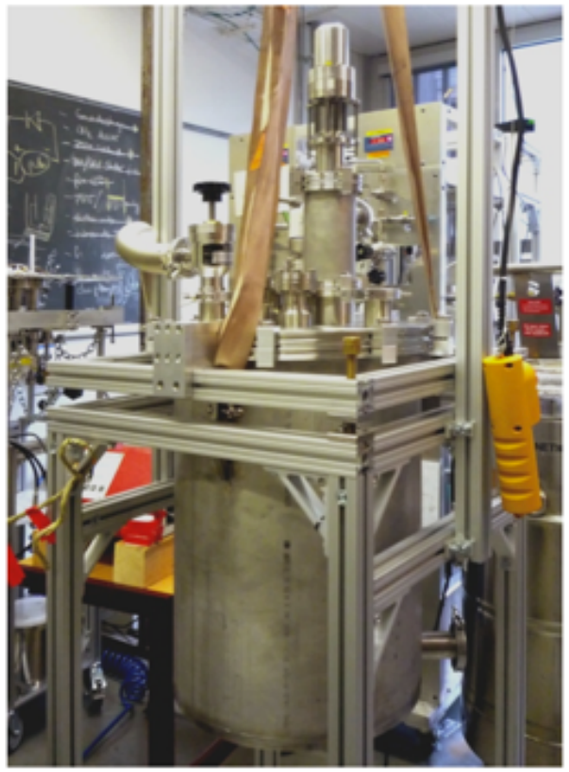
contact: Prof. Laura Baudis, lbaudis@physik.uzh.ch

Direct dark matter detection with xenon detectors



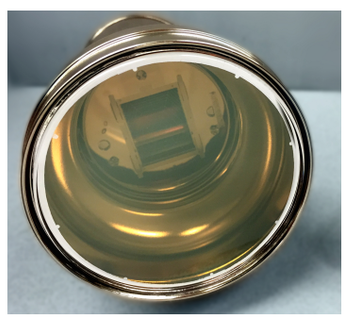
Xürich: a small LXe TPC in our lab at UZH

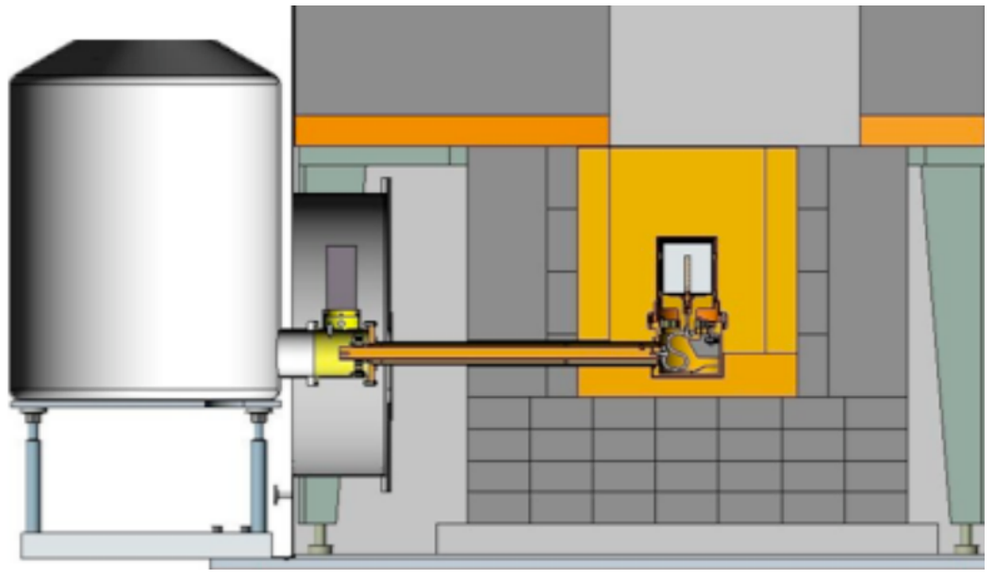
Measure charge and light yields at low energies



MarmotX: a larger LXe setup in our lab at UZH

Test various types of photosensors





Gator: a HPGe detector at LNGS operated by our group

Measure radioactivity of various materials

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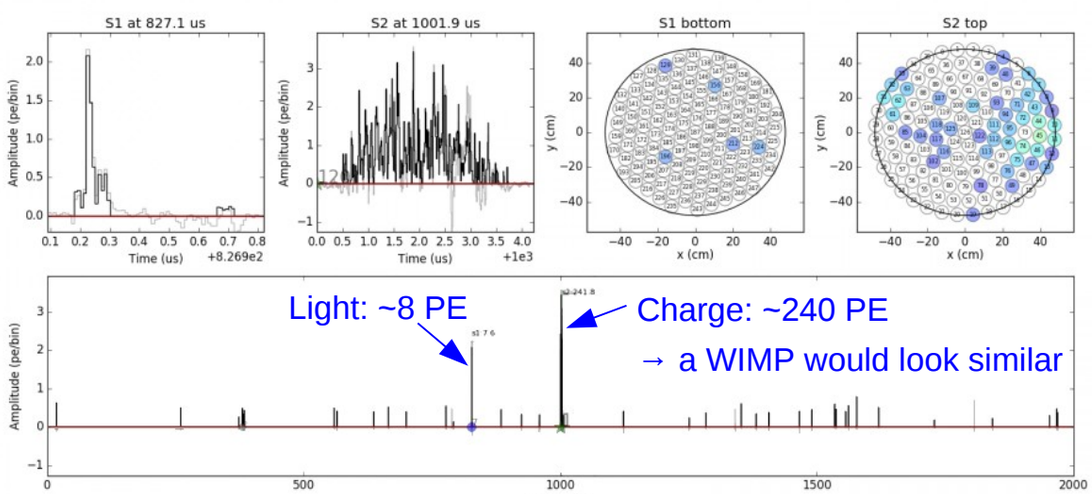
Projects for bachelor & master students

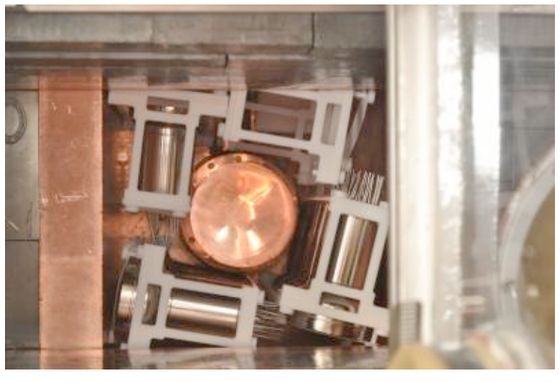
- Analysis of XENON1T data to search for dark matter

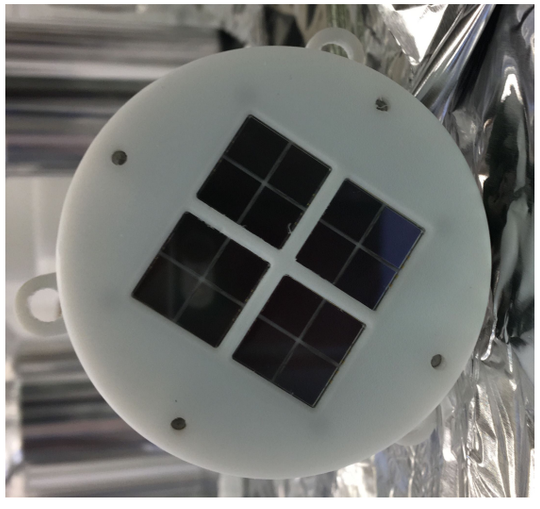
- Measure charge and light yield for low-energy interactions with Xurich

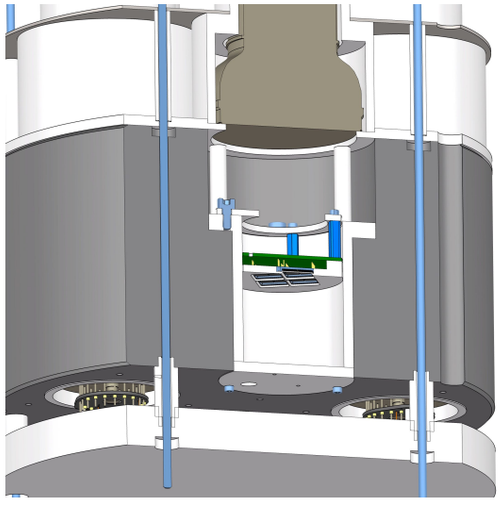


- Test SiPM arrays with Xurich and MarmotX

- Measure radioactivity of materials for XENONnT (upgrade) and DARWIN (future detector) with Gator, analyse the data







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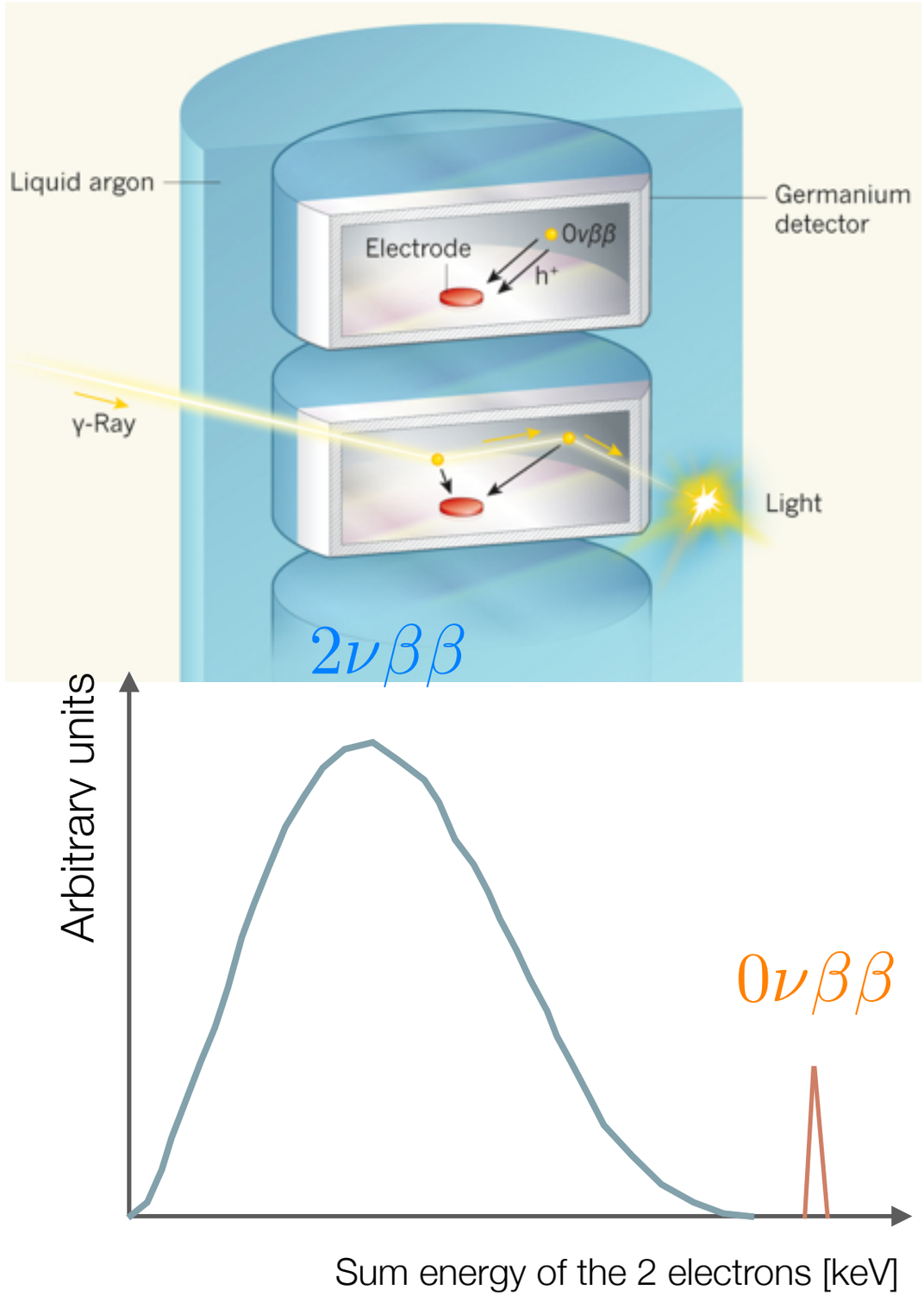
Nature of neutrino with GERDA



- GERDA searches for the neutrinoless double beta decay in ^{76}Ge enriched HPGe detectors at LNGS
- Operates an array of 38 detectors immersed in liquid argon
- Liquid argon cryostat is surrounded by a large water Cherenkov shield to veto cosmic muons

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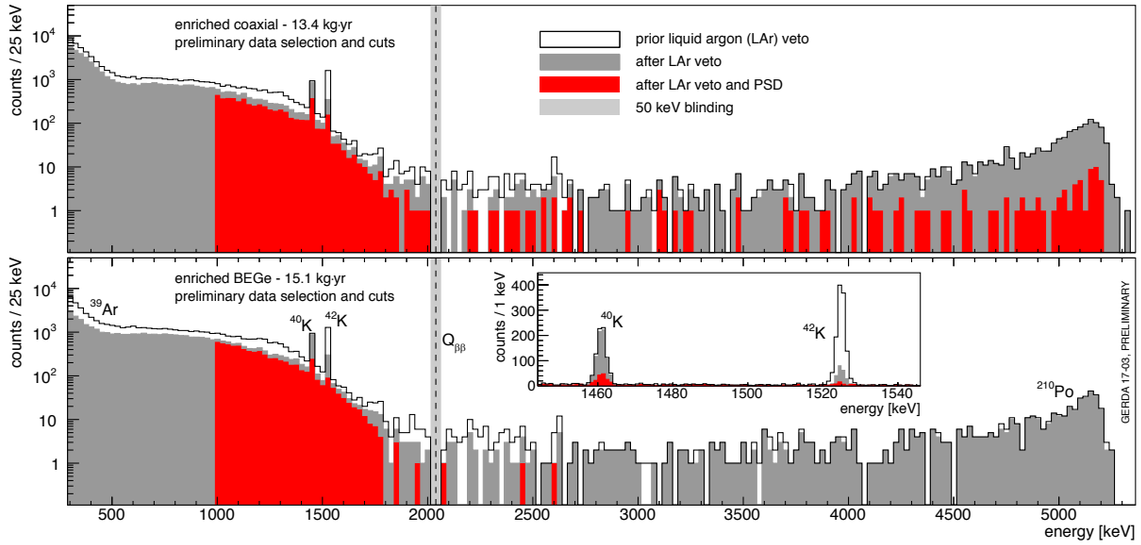
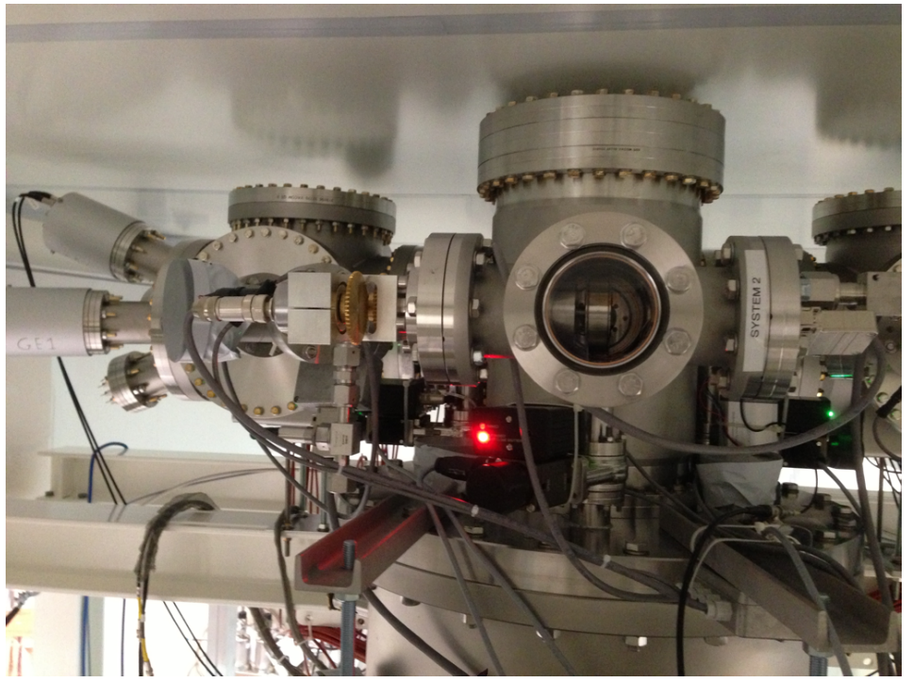
Projects for bachelor & master students

- Analyse GERDA data to search for the neutrinoless double beta decay
- Characterise new GERDA calibration sources with HPGe detector (Gator)
- Analyse GERDA calibration data
- Optimise the pulse shaping filter
- Take data with a small HPGe detector (GeMini) operated in our lab at UZH





Projects for bachelor & master students

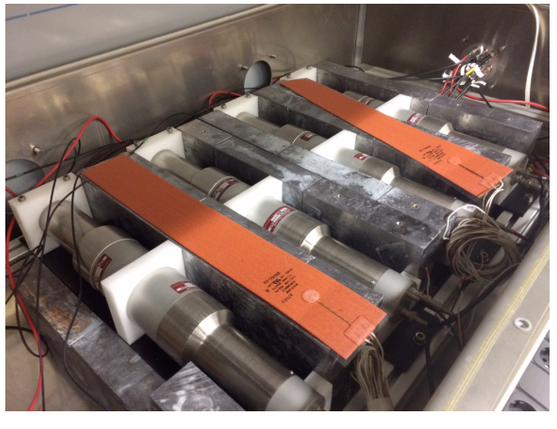
- Modulation experiment to test claims of annual modulation of decay rates of beta-sources

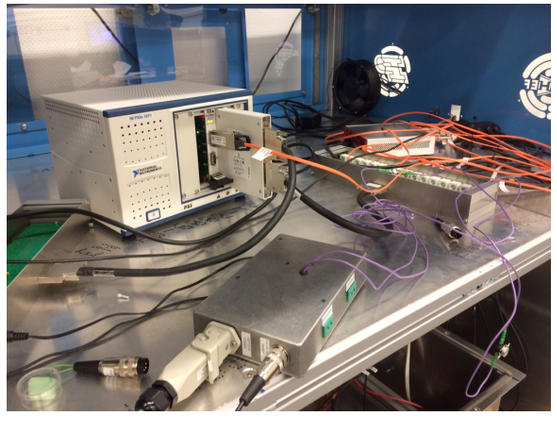
- 4 pairs of NaI detectors in one setup, 4 setups (UZH, Nikhef, Purdue, Brasil)

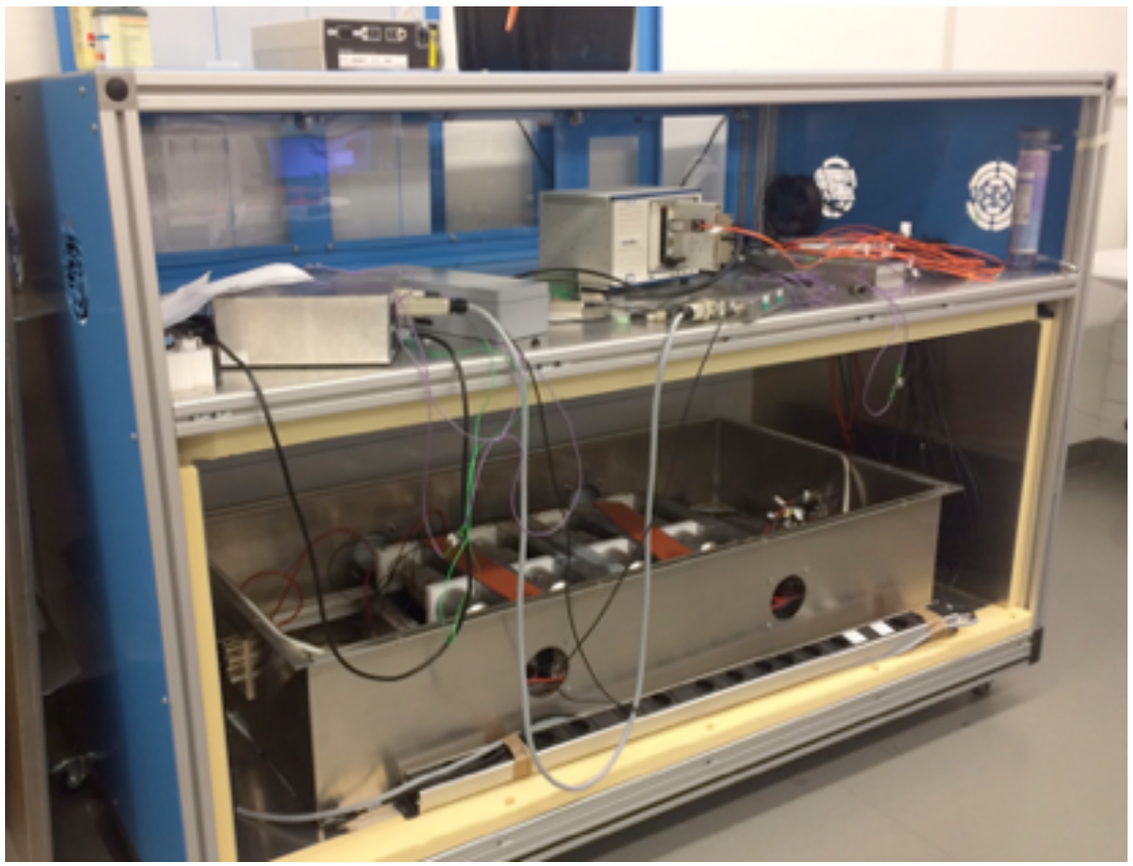
- Analyse long-term data

- Correlate with measurements of temperature, pressure, radon level, magnetic field etc

- Correlate with data from the other 3 setups







GERDA and XENON at LNGS