



# Dark Matter search with the XENON and DARWIN experiments

M. Babicz, L. Baudis, A. Bismark, P. Cimental, J. Cuenca García, M. Galloway, F. Piastra, M. Rajado Silva, D. Ramírez García, R. Peres, C. Wittweg

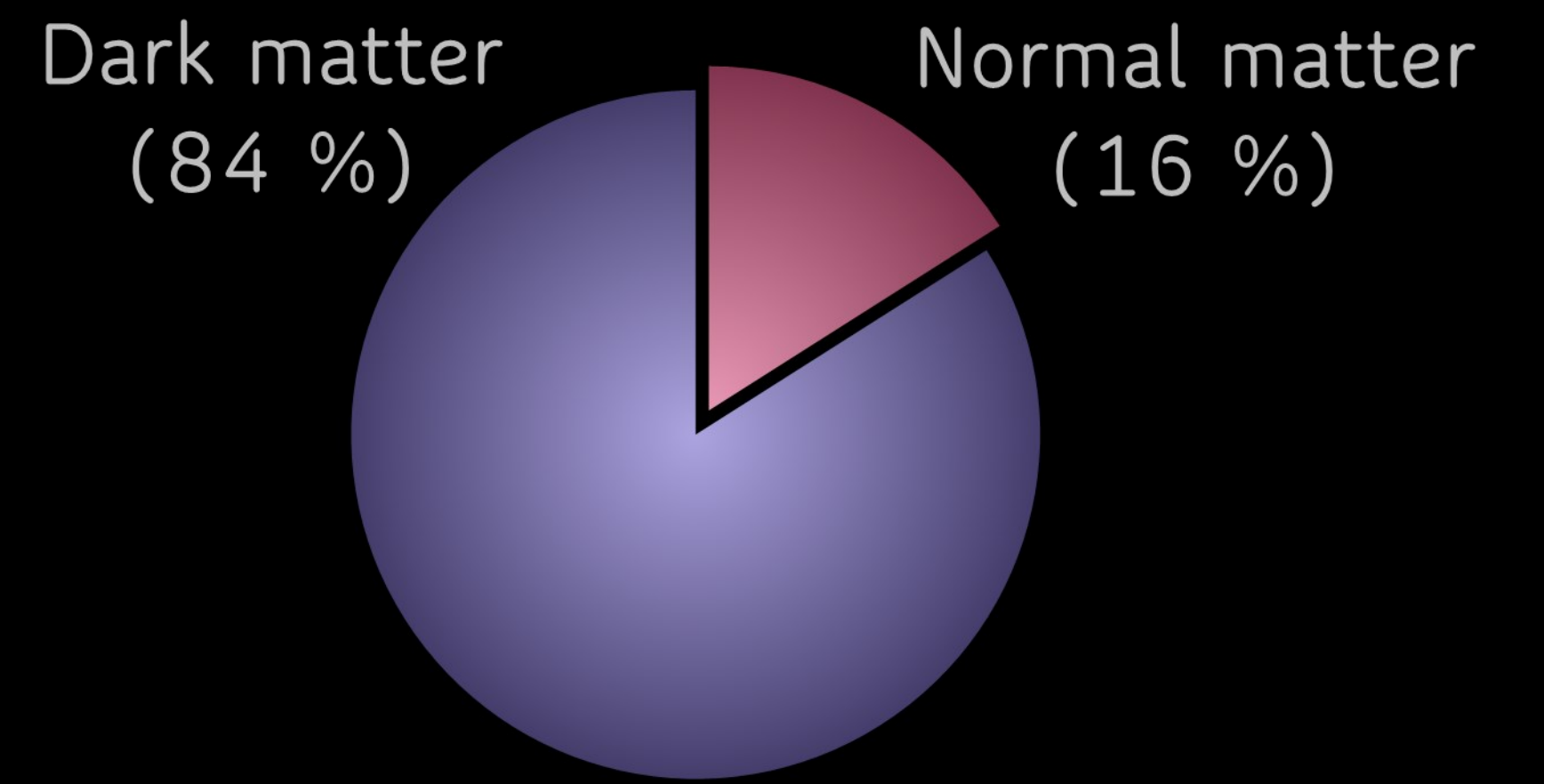
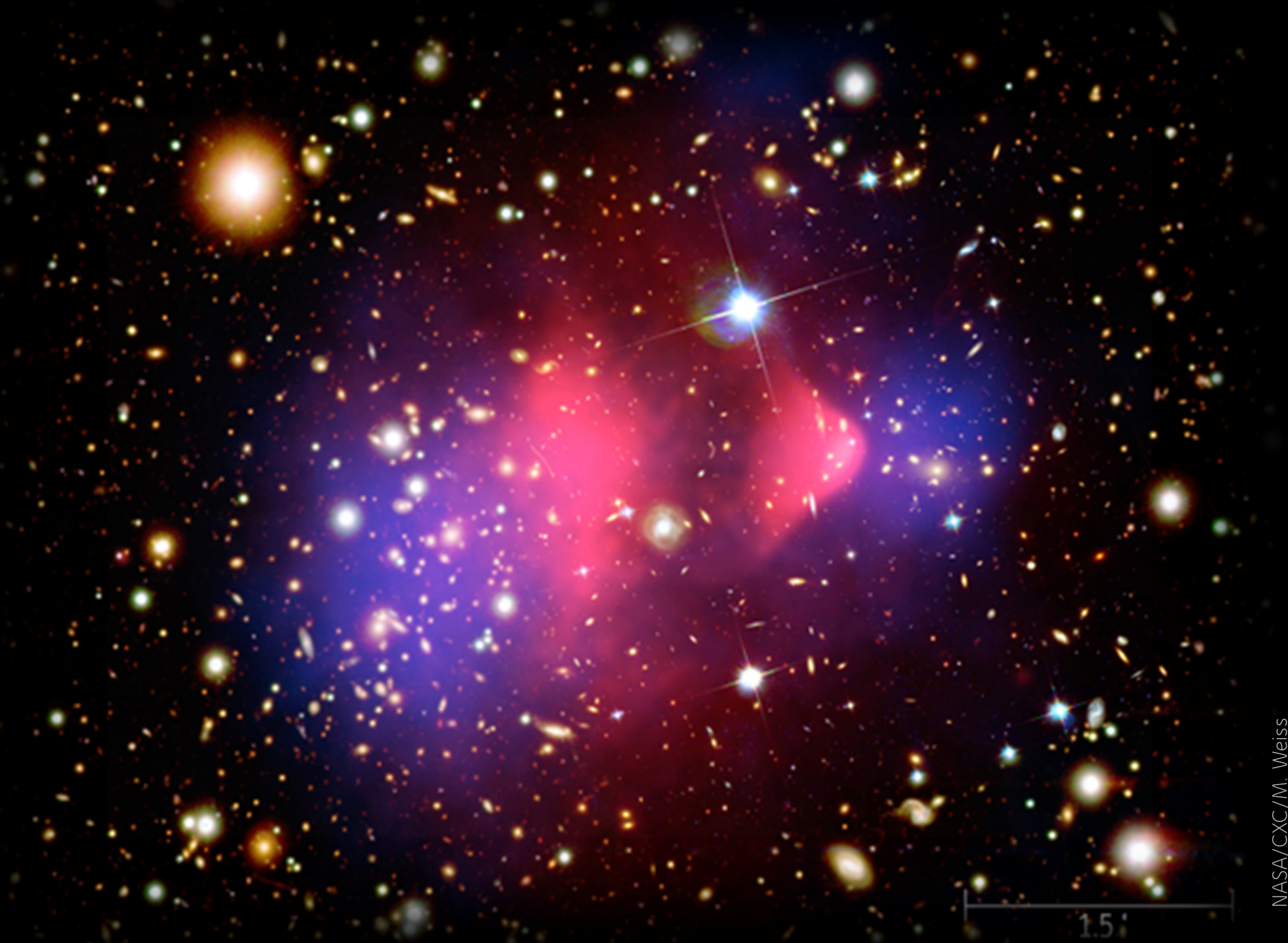
## What is Dark Matter?

We are not sure! But...

We have strong evidence it exists!

We know it is:

- Massive
- Non-relativistic
- Neutral
- Stable
- Weakly-interactive



Most of the matter in the Universe is Dark Matter!

## XENON



### XENONnT

- Located In Italy, under the Gran Sasso mountain
- Searches for direct interaction of Dark Matter with a xenon target
- Contains 5.9 t of liquid xenon in the active target
- Operates at -96 °C
- Built with ultra-pure materials
- **Lowest background level** in the field

The detector is running and taking data...

New results coming soon!

## XENOSCOPE

A full-height DARWIN vertical demonstrator built at UZH



### Main Goals

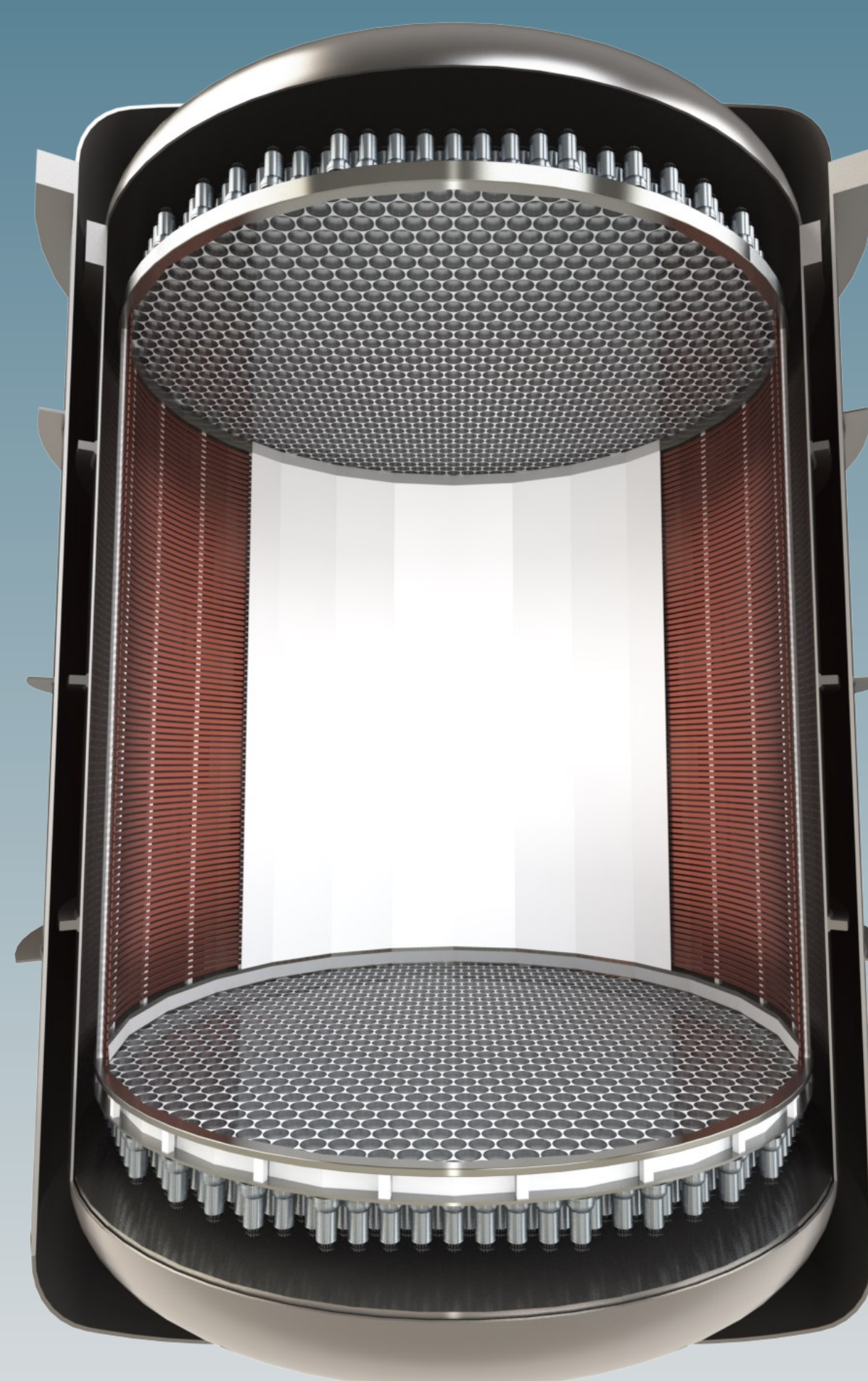
- Demonstrate drift of electrons over 2.6 m
- Operate a DARWIN-height detector with a **large-area SiPM array**
- Measure **diffusion** of electron clouds
- Study xenon **light attenuation properties**

## DARWIN

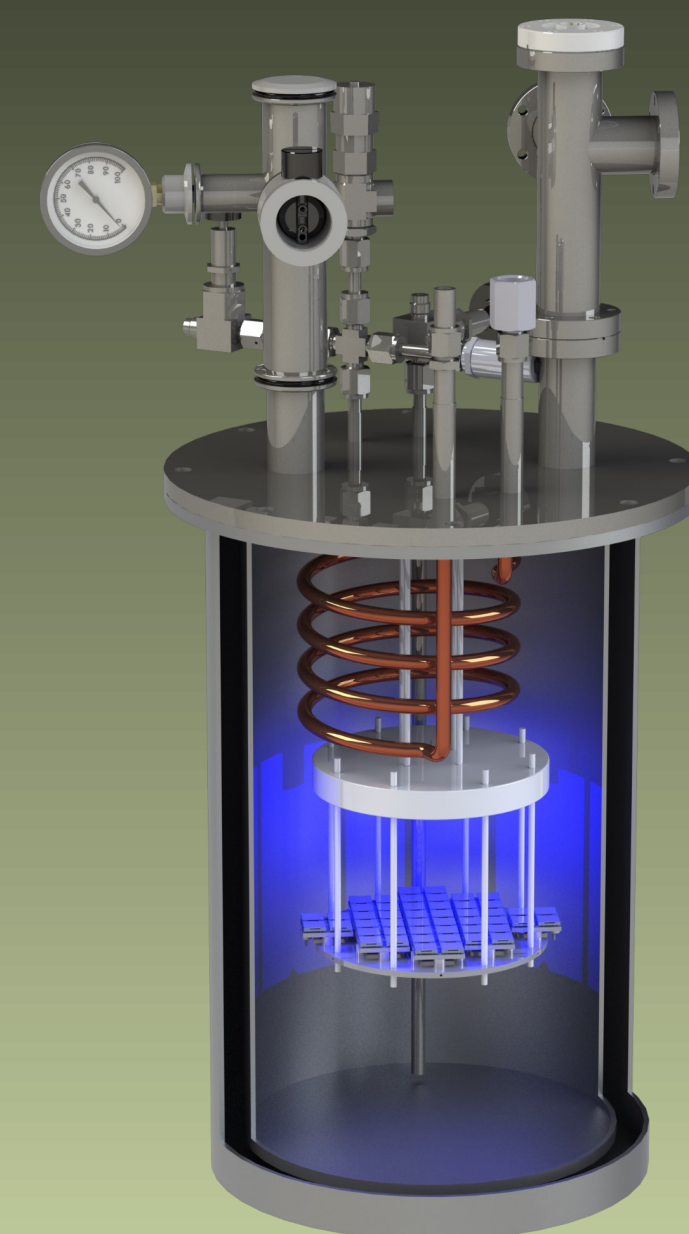
The next-generation Dark Matter detector with liquid xenon

- 40 t: mass of xenon active target
- 2.6 m: height and diameter of the main target of the detector
- 2000: total number of photosensors required for the active target
- >10 yr: expected lifetime of the experiment once operational

DARWIN will also study solar, atmospheric, and supernova neutrinos, and more!

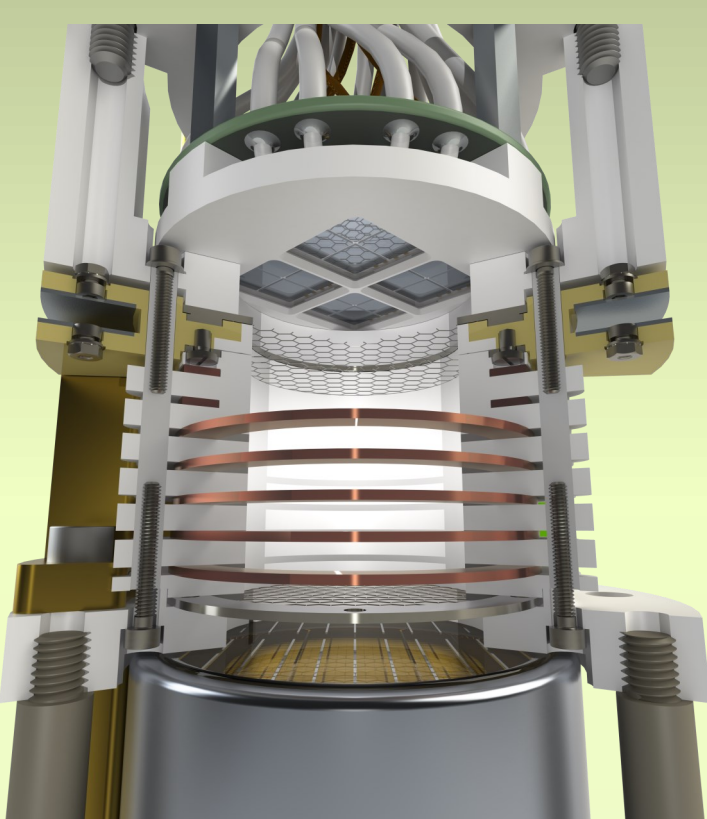


## Local R&D



Photosensor testing and readout development

Measurement of fundamental xenon properties



Next-generation detector technology R&D



Projects available

- ☑ Data analysis
- ☑ Simulation
- ☑ Detector R&D
- ☑ Hardware

Contact us!

