Neutrinoless double beta decay

The energy of an interacting particle is converted into:
- Heat
- Light
  - Light fraction depends on particle type
  - Both fractions of energy are measured
- β/α discrimination
- rejection of background events

Metallic magnetic calorimeters (MMC)

Detector Performance
- Energy deposition
- Temperature change
- Change of magnetisation
- Change of magnetic flux

Detectors for rare-event experiments
- Large area absorber
- Segmented sensor
- Thermal link defined by etched trenches
- Easy to mount a large crystal number
- No other contact to crystal holder
- Combined Phonon/Photon Detector
- Crystal is positioned on gold cone by its own weight

Preliminary AMoRE results
- MMC phonon detector
- β/α discrimination in the phonon channel
- Phonon Detector
- Energy resolution $\Delta E_{\text{photon}} = 3 - 10$ eV
- Energy threshold $< 50$ eV
- Signal rise time $\tau < 50$ µs
- Pulse pair resolving time $< 100$ µs

Crystal is positioned on gold cone by its own weight

Heidelberg University