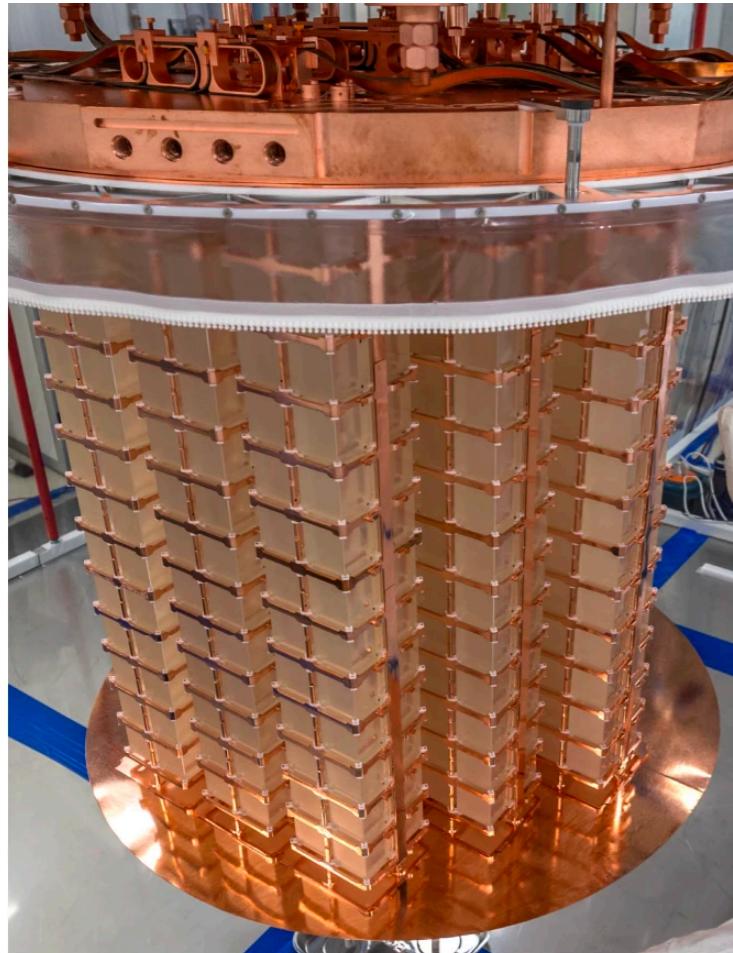


# Latest results from the CUORE experiment

Irene Nutini (on behalf of the CUORE collaboration)  
Università degli Studi Milano Bicocca - INFN Milano Bicocca

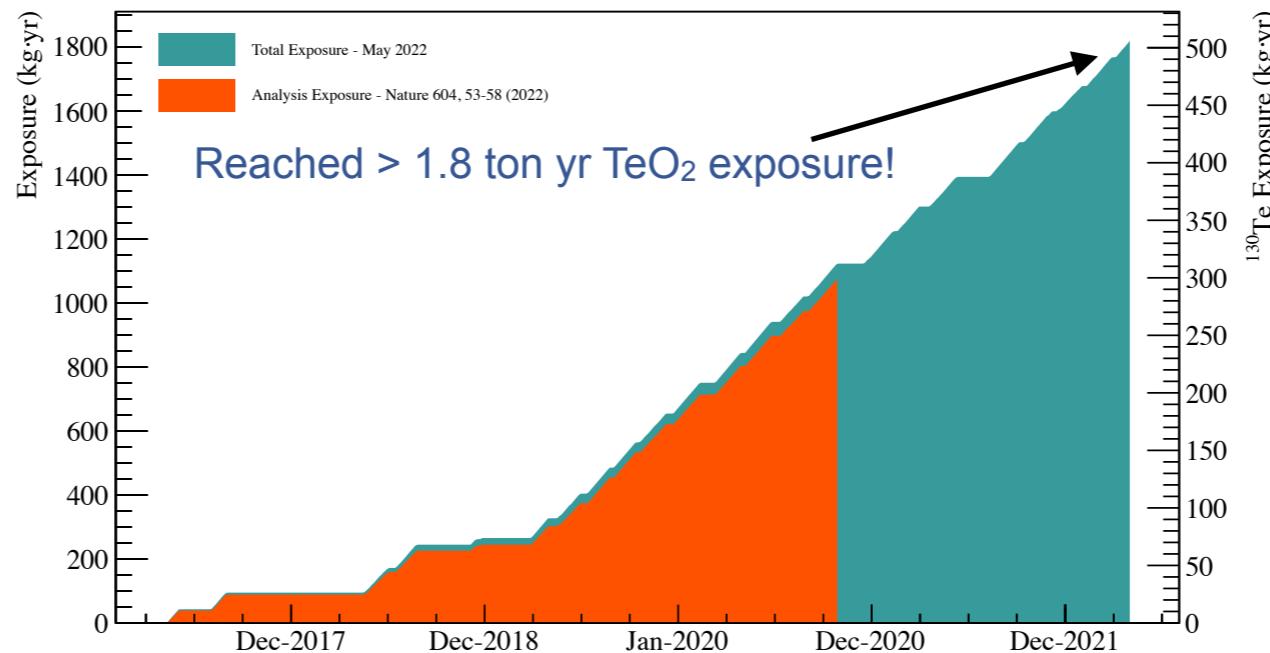


Data analysis

## Physics results

- Search for  ${}^{130}\text{Te}$  0v $\beta\beta$  decay:  $T_{0v}^{1/2}({}^{130}\text{Te}) > 2.2 \times 10^{25} \text{ yr}$  [ $\sim 1 \text{ ton yr TeO}_2 \text{ exposure}$ ]
- Measurement of  ${}^{130}\text{Te}$  2v $\beta\beta$  decay:  $T_{2v}^{1/2}({}^{130}\text{Te}) = [7.71 {}^{+0.08}_{-0.06}(\text{stat}) {}^{+0.12}_{-0.15}(\text{syst})] \times 10^{20} \text{ yr}$
- ${}^{130}\text{Te}$   $\beta\beta$  decay to excited states:  $(T^{1/2})^{0v}_{0+} > 5.9 \times 10^{24} \text{ yr}$ ,  $(T^{1/2})^{2v}_{0+} > 1.3 \times 10^{24} \text{ yr}$
- ${}^{120}\text{Te}$  0v $\beta$ +EC decay:  $T_{0v}^{1/2}({}^{120}\text{Te}) > 2.9 \times 10^{22} \text{ yr}$
- ${}^{128}\text{Te}$  0v $\beta\beta$  decay:  $T_{0v}^{1/2}({}^{128}\text{Te}) > 3.6 \times 10^{24} \text{ yr}$
- Other analysis: thermal model, background model and spectral shape studies, dark matter at low energy, high multiplicity events, ...

**CUORE (Cryogenic Underground Observatory for Rare Events)**  
TeO<sub>2</sub> crystals:  $\beta\beta$  source material, operated as cryogenic calorimeters



- In operation since 2017: optimisation campaigns
- Physics data taking at 11-15 mK since 2019. Data taking rate  $\sim 50 \text{ kg/month}$ . Uptime  $\sim 90\%$

- Optimal Trigger: lower energy thresholds ( $< 10 \text{ keV}$ )
- Denoising of the continuous data, using accelerometers & microphones

