



Contribution ID: 1352

Type: **Parallel Talk**

## The SuperChooz Pathfinder Exploration

*Saturday, 9 July 2022 17:00 (15 minutes)*

A new opportunity for a possible neutrino flagship experiment in Europe opens by exploiting a unique opportunity that has long been hidden in the Chooz site —Europe’s historical and most powerful reactor neutrino science site. The “SuperChooz” project benefits by the existence of 2 caverns, formerly hosting the Chooz-A nuclear reactor complex, built in the 60’s. The Chooz-A caverns are becoming vacant upon its dismantling completion. They hold a total volume of up to  $50\,000\text{m}^3$ , thus directly comparable to the size of SuperKamiokande detector (Japan). Its potential use for fundamental science is therefore under active discussion with EDF, thus starting the pathfinder exploration era. The SuperChooz caverns combined with the existing  $\sim 1\text{km}$  baseline of the most powerful  $2 \times \text{N4}$  Chooz PWR nuclear reactors make this site a unique asset world-wide. Experimentally, the remaining challenge is the poor overburden (order 100m of rock underground). However, the novel LiquidO technology, born as a byproduct of Double Chooz experiment in the same site, heralds the potential for unprecedented active background rejection of up to 2 orders of magnitude, thus providing feasibility potential ground for the considering of a hypothetical SuperChooz experiment. The rationale of the experiment will be highlighted in the talk for the first time —first official released. The project is aimed to address some of the most fundamental symmetries (studies under completion) behind the Standard Model, including a design that may open for key synergies that may boost the sensitivities of other neutrino flagship experiments such as DUNE (US), JUNO (China) and HyperKamiokande (Japan).

### In-person participation

No

**Primary author:** CABRERA, Anatael (IJCLab / CNRS-IN2P3)**Presenter:** CABRERA, Anatael (IJCLab / CNRS-IN2P3)**Session Classification:** Neutrino Physics**Track Classification:** Neutrino Physics