

## **Progress and prospects on large volume TPCs for rare event searches and its application to axion and neutrino searches**

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The use of large volume gaseous TPCs for rare event searches is gaining interest. Recently, efforts have been dedicated to the construction of gaseous TPCs made of radiopure materials. Micropatterned charge-readouts with good spatial and energy resolution capabilities can be entirely built of very clean materials, as copper and kapton. The main potential of using a gaseous TPC for rare event searches resides on its capability of measuring accurately the topology of the event inside the chamber, allowing to exploit a particular event signature for background reduction. The flexibility of a TPC for operation at different pressures and gas mixtures offers great versatility showing potential for different physics cases, as WIMPS, neutrino-less double beta decay searches, and axions.

I will show the milestones reached during the last years, and the prospects on future developments. I will focus on the impact of these experimental techniques on the search for axions, and neutrinoless double beta decay. I will give special attention to neutrino-less double beta decay searches and axion helioscopes. Providing additional details on a new axion helioscope detection technique that could be developed as a consequence of the advances reached in gaseous TPCs.