

**Department of Physics**  
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Dear Professor Jason Detwiler,

I recently received word from one of my colleagues of a post-doctoral position opening at CENPA. I would like to apply for the position.

I am currently working as a post-doctoral researcher at the University of California, Los Angeles (UCLA) with the CUORE (Cryogenic Underground Observatory for Rare Events)  $0\nu\beta\beta$  experiment at LNGS (Laboratori Nazionali del Gran Sasso), Italy leading the effort on precision modeling of the alpha background contamination of the detector, and the bolometer thermal signals in a cryogenic environment. I have also been heavily involved in the optimization of the signal processing for the recent upgrade from CUORE-0 to CUORE which increased the detector mass by a factor of almost 20. A paper for our first  $0\nu\beta\beta$  analysis using CUORE data was submitted for publication in late 2017, and is currently under review (<https://arxiv.org/abs/1710.07988>).

Previously, I have also worked on event track reconstruction and particle ID techniques in liquid scintillator at KamLAND (Kamioka Liquid Scintillator Antineutrino Detector) in Kamioka, Japan. This work involved an unprecedented dark matter search by looking for a directional signal of neutrino fluxes from the core of the Sun and Earth. According to my understanding, my work is the first ever physics application of directional neutrino reconstruction in scintillator. A paper for this is currently under preparation.

My interest in the development of novel neutrino detection techniques, as well as experience in the commissioning phase of ultra-low background detectors, makes me a unique candidate for your position.

Please feel free to contact me if you have any questions or need further information. Thank you for your consideration.

Best wishes,

**Michinari Sakai**

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