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Archaeological Lead purification for RES-NOVA

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RES-NOVA is a newly funded project for the investigation of astrophysical neutrino sources with archaeological PbWO4 cryogenic detectors. RES-NOVA will exploit Coherent Elastic neutrino-Nucleus Scattering (CEvNS) as detection channel, thus it will be equally sensitive to all neutrino flavors produced by Supernovae. In order to achieve the goal sensitivity, the crystal must be grown from highly radio-pure precursors. In this contribution, we will present an innovative atomization technique, mediated from the 3D printing technology, for the production of lead with impurity levels in fulfillment to the RES-NOVA requirements. After the successful production of 1 kg of atomized lead, RES-NOVA plans to scale the technology and produce 100 kg of atomized lead within the next year.

Such technique could be profitable for the production of other atomized materials for crystal growth, as well as for the purification of relatively large amounts of lead for the innermost shielding layers for low-background gamma spectroscopy.

Primary author: BENATO, Giovanni (Gran Sasso Science Institute)

Co-authors: PUIU, Andrei (INFN); CORTIS, Daniele (INFN); ORLANDI, Donato (LNGS); PAGNANINI, Lorenzo (GSSI); PATTAVINA, Luca (UniMIB); CLEMENZA, Massimiliano (UniMIB); LAUBENSTEIN, Matthias (LNGS); NISI, Stefano (LNGS)

Presenter: BENATO, Giovanni (Gran Sasso Science Institute)

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