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# Adapting optical crystals production to the needs of Rare Event Physics

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The detection of elusive particles and in general the construction of detectors with high sensitivity for applications in the physics of rare events (REP), requires the use of new high quality crystals with dedicated characteristics. The discovery of improved materials for radiation detectors and the implementation of their production has gained in recent years an increasing interest from scientific and technological point of view.

The current work will make a review of scientific and technological aspects related to the crystal production needed in experiments searching for rare event physics, with a particular focus on the use of enriched isotopes.

The talk will discuss the problems related to the production of such crystals from point of view of a crystal producer and is based on the results obtained in the production of several types of crystals grown for applications in linear and nonlinear optic devices.

## Content

- Introduction: Romania-Magurele Platform centre of Physics. INFN-PLPR, Solid-State Quantum Electronics Laboratory, Crystal Growth and Ceramic Materials Group.
- Crystal growth for linear and non-linear optics (NLO)
- growth techniques and related operations, growth equipment, raw material preparation, doping and co-doping, congruency measurements (DTA), seeds manufacture and processing, post growth treatments and basic equipment
- mechanical processing (cutting, polishing) and orientation (Laue method, conoscopy method)
- analysis and certifications (X-RAY Rietveld, ICP-AES, refractive indexes, dedicated optical setups)
- Crystals for Rare Events Physics (REP)
- fundamental quests
- low temperature detectors
- scintillating crystals
- REP vs NLO
- Conclusions

NOVEMBER 18, 2015 – 2:30 PM  
LNGS - "B. PONTECORVO" ROOM



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