

Summary of the round table discussion at the workshop on „Underground nuclear reaction-experiments for astrophysics and applications“

Dresden, 28.-29.04.2010 (chair of round table discussion: Zsolt Fülöp)

Available on workshop web site <http://www.fzd.de/felsenkeller>

The participants agreed that the science case put forward by the four current European underground accelerator projects (Italy-LUNA Megavolt, UK-Boulby, Spain-Canfranc, Germany-Felsenkeller) is very strong. This science case is based on the extraordinary success of the LUNA 400 kV machine and includes, to name just a few, the topics

- Stable and explosive and hydrogen and helium burning
- Stellar neutron sources
- Stellar carbon burning
- Student training

It is recognized that the European nuclear astrophysics community strongly recommends that a new MV scale underground accelerator be installed in Europe. Such a step is deemed essential to preserve European scientific leadership in this field, which is being challenged by competing projects in the US and China. This point should be highlighted in the recommendations of the 2010 Long Range Plan for nuclear physics.

Due to the extensive science programme, the long running time per experiment, and the number of researchers involved (a head count revealed about 20 European groups already active in or interested in accelerator experiments underground), most participants see it necessary to call for at least two European underground facilities to be realized. Since it seems the investment funds would have to come from national sources, the community on the European level should encourage the national efforts and help the projects conform to the exigencies of the national funding agencies. It was stated that the active projects may soon require formal letters of interest from potential collaborators or users.

A consensus emerged that all facilities should be as open as possible to the community, in an ideal case operated as a user facility. It will be important for broader support to strengthen the links to the astrophysics themes. Therefore, the observational and computational astrophysicists should be included at the earliest stage, helping drive and define the science agenda and creating the added value of multidisciplinary. In addition, every effort should be made to broaden the user community in terms of the topics addressed.

The participants agreed that the European community of researchers interested in underground accelerators would be strengthened by improved networking. It is agreed that in the future one should try and apply for a networking grant to cover further development of projects, exchange of students and postdocs, regular meetings, and eventually access to facilities. Nuclear-physics experiments recently initiated through ESF's EuroGenesis program would usefully be complemented by underground facilities, in particular strengthening solar-model and big-bang nucleosynthesis related experiments. In addition, it is agreed that in early 2011 there should be another meeting of the present community. LUNA should host it at Gran Sasso; the subsequent meeting should be hosted by the UK group.