

Summary of the 2nd meeting of the LSC Scientific Committee Meeting.**Closed session. Madrid. 25 April, 2008. 10.00 – 18.45**

Present: F.T. Avignone (Chair), Y. Declais, A. Gadea, B. Gavela, C-K. Jung and J. Fuster Verdu. L. Baudis joined at 11.00 by teleconference. Also present: A. Bettini (Director) and J. A. Villar (Director adjoint). Absent: Elena Aprile.

Preliminary issues.

The director provided the Committee an update of the LSC concerning political and administrative aspects, and progress in the reconstruction effort of the cavity, under the responsibility of the University of Zaragoza. Unfortunately, the time needed will be substantial.

The director informed the Committee to have submitted to the Consejo Rector the proposal to produce a project of improvement of the infrastructures of the laboratory as well as of increased support to the experiments using part of the funding allocated to LSC, which are not being used due to the closure of the laboratory. The Consejo gave its approval in principle and expects a definite project by the end of the year. The Director is considering, in particular, the excavation and completion of a new hall of about 12m x 20m x 12m, depending on the cost, which is being preliminary evaluated.

The director had requested to the spokespersons of the proposed experiments a document specifying the requested occupancy in the underground facility, the specific technical infrastructures needed, safety and environmental issues, etc. All the documents were received, with the exceptions of BiPo and ArDM, which will be submitted in the near future. The referees will be Juan Fuster and Frank Avignone for the former and Elena Aprile and Yves Declais for the latter.

The received documents had been examined in depth, each by the two corresponding referees.

ANAIS.

Referees: Elena Aprile and Frank Avignone. Report presented by Avignone.

This is a 100-kg array of NaI(Tl) proposed to test the DAMA reported observation of a seasonally modulated dark matter signal. The committee expressed the need for extensive Monte-Carlo computations with all of the planned shielding and other detector components. These should produce a series of sensitivity plots for various levels of purity, for example various levels of ⁴⁰K, Th and U. From this the specifications for the shielding and the levels of purity of the NaI(Tl) will be determined.

The committee also requested that a list of the collaboration be produced with the names associated with the specific tasks. A list of milestones, with times for completion written for each, should also be provided.

The committee recommended approval for a 3-year period from the date that construction could begin underground. Progress and milestones will be periodically reviewed.

ROSEBUD.

Referees: Laura Baudis and Yves Declays. Report presented by Declais.

It is a support facility for the R&D of cryogenic experiments. This facility has existed for many years in the old LSC, and has produced a number of interesting

measurements of scintillating bolometers that allow the separation of recoil events, like those from WIMP scattering, from those of photons interacting via electron scattering. It is proposed to finalize the activity to the EURECA project.

It is presently staffed by 13 people, 4 from IAS, Orsay, and 9 from the University of Zaragoza. Thomas Girard from the University of Lisbon will join, bringing cryogenic equipment. Requests for funding have been submitted to five sources.

The committee requested the collaboration to provide a list of milestones, with times for completion written for each. The list of equipment that Dr. Girard would be bringing should be specified.

The committee generally agreed that ROSEBUD itself would probably not grow into a competitive size Dark Matter search; however, proper simulations of the backgrounds would be valuable.

The committee recommended approval for a period of 3 years starting from the time of the beginning of construction underground. Progress and milestones will be periodically reviewed.

ULTIMA.

Referees: Belen Gavela and Andres Gadea. Review presented by Belen Gavela with interventions of Andres Gadea.

The proposal is fairly complete, including milestones with timelines, a list of personnel, electrical power requirements, space requirements, safety issues, and management and operation plans.

While the committee views the application of this technique to a large mass Dark Matter search as very speculative, there is a very interesting piece of fundamental physics that could well be searched for. The super-fluid phase of the ^3He - ^4He mixture might be observable at these temperatures. The collaboration's proposed milestones to the completion of the investigation of this phenomenon, is 36 months.

The committee recommends approval for a 3-year period starting from the time of the beginning of construction underground. Progress and milestones will be periodically reviewed.

NEXT.

Referees Laura Baudis and Chang-Kee Jung. Review presented by Chang Kee Jung, with interventions of Laura Baudis in teleconference.

This proposed experiment is a ^{136}Xe double-beta decay search using a gas Time-Projection-Chamber of the type described in the 1st Committee meeting by David Nygren.

The collaboration envisions three phases of the project; the first phase is R&D to determine the optimum charge readout, gas mixture and operating pressure etc. This would be a 2-3 years and presumably above ground. This would be followed by the installation of a small (few kg) prototype underground in the LSC. Based on the data from the prototype, the NEXT-100 detector would be built. The time to this point was not specified. Then NEXT-100 would be constructed underground. The projected time to reach the point of operation of NEXT-100 is 3-years from the beginning of its construction.

The committee listed further information needed from the collaboration, which include: (1) clarifications of various statements and requests made in the addendum, (2) more detailed description of the background simulation and rejection, (3) the role of each collaboration member and his/her expertise, and (4) a detailed milestones for the next three years. This list will be sent to the collaboration for their response. The

Committee encourages a larger and international collaboration. The committee recommends approval for a 3-year period starting from the time of the beginning of construction underground. The Committee requests a status report periodically every six months and oral presentations yearly.

Final issues

The Chairman raised the issue of considering the above mentioned possibility of a new excavation for the purpose of accommodating the nuclear astrophysics accelerator project, as described by Carlo Brogini in the 1st meeting of the LSC Scientific Committee on January 25th. It was concluded that it would be necessary to have a formal proposal in hand to seriously consider it further.

The date for the 3rd meeting was not set, but it was agreed that it should occur in October or November. Since the meeting, it was fixed on November 3rd and 4th, 2008, probably in Madrid. The decision whether it would be a 1 or 2 day meeting will depend on the length of the agenda.