

13<sup>th</sup> May 2015

## **LIP International Advisory Committee**

Meeting of 27<sup>th</sup> April 2015 in Lisbon

Present: C. W. Fabjan, P. G. Innocenti, L. Rolandi.

The LIP International Advisory Committee met in Lisbon on 27<sup>th</sup> April 2015 to review the 2014 results and to discuss the 2015 and long-range programme of work.

The meeting took place under exceptional circumstances, due to the untimely death of José Mariano Gago, President of LIP, on 17<sup>th</sup> April 2015. The Committee pays tribute to Gago for his lasting contributions to the establishment and development of LIP and to the advancement of science both in Portugal and in Europe.

Prior to the meeting, Committee Members had received a written report on the work carried out in 2014 and a description of the activities planned for 2015.

Committee Members heard detailed presentations on the progress of each project; the entire LIP staff attended these presentations. The Committee appreciated the high quality of the presentations and the careful preparation of the meeting.

The LIP groups of ATLAS and CMS continue making very significant contribution. Both teams have continued their involvement in analyses, covering some of the most interesting physics questions, and the preparation for the data-taking at 13 TeV, while fulfilling their responsibilities in the upgrade programme. The experimental LHC programme is complemented by a group addressing important phenomenological issues. The group has been very successful in creating a strong centre at Minho and attracting Ph.D. students.

The LIP group in COMPASS was deeply engaged in the preparation of the run which is just starting and is planning significant contributions to the analyses. The HADES groups maintained the well-functioning TOF-wall and is contributing to an interesting physics analyses.

LIP has a diversified programme in astroparticle and in non-accelerator particle physics. The AMS experiment on the ISS has produced novel results on particle ratios of as yet not understood origin. The LIP uses the RICH detector, for which it has responsibility, for studies of the isotopic composition of Cosmic rays. The Auger experiment has produced intriguing results on the very high energy cosmic rays with the LIP group exploring hadronic physics at the 100 TeV scale. An upgrade is under way to improve muon identification. The LUX experiment is running and improving the world's limits on the detection of dark matter candidates. The LIP group in LUX is a prime mover in the next Liquid Xenon dark matter detector LZ. The commissioning of the SNO+ detector has progressed: LIP has delivered the photomultiplier calibration system. Studies for a high pressure gaseous xenon detector for NEXT, a  $^{136}\text{Xe}$  neutrinoless double beta decay experiment, have progressed; commissioning of phase 1 of the experiment is due to start this summer.

In the prevailing difficult financial situation LIP could maintain a healthy programme on detector research and development thanks principally to the grant Rad4Life obtained in 2013. It covers a broad spectrum of studies on gaseous detectors, neutron detectors, and investigations related to medical imaging. The development in the use of RPCs for a time of

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flight PET (TOF-PET) has continued with tests of the small animal setup, yielding a very encouraging position resolution. Tests of a crude prototype of a full body human PET have also shown good resolution. The two machines delivered to hospitals by Clear-PEM continue to be under clinical tests and are used for studies of tracers. Prototype studies on the use of silicon photomultipliers associated with a more advanced readout chip indicate that a significant improvement of the position resolution is possible by time of flight. Work on detectors and electronics for space applications in collaboration with ESA is progressing very successfully and vigorously.

The research activities rely very heavily on scientific computing. The group responsible has been very successful in attracting EU funds, in consolidating the various IT projects and in developing the Portuguese GRID infrastructure. Members of the group occupy several high level positions in the European GRID and network activities.

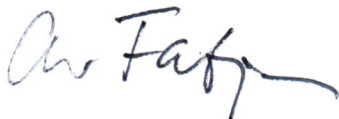
After the open presentations Committee Members met with LIP Management, G. Barreira, R. Marques and M. Pimenta and with the secretaries of the LIP Scientific Council, P. Gonçalves and F. Veloso.

The conclusions of the controversial review of LIP activities, which took place in 2014 were discussed. During the review process, the Committee was regularly informed by the LIP Management and had access to documents exchanged between LIP and the reviewers. Recent events and the nationwide financial consequences of the review were analyzed.

The Committee was informed of the financial difficulties faced in the past year, of their consequence on project delays, on recruitment and of the difficulties arising from the belated call for projects by FCT in the framework of the Fundo CERN.

The Committee proposed to LIP Management some changes, concerning the composition and mode of operation of the Committee itself. It reiterated its view on the desirability to enlarge the membership in order to strengthen the expertise in medical physics and experimental astrophysics. Secondly, it proposed to improve the contact of the Committee with the groups by adding a closed question-and-answer session with the representatives of each project, following the open presentations. Thirdly, it suggested that the activity report sent to the Committee should contain more factual information on the achievements of the year under review, such as was provided by the excellent open presentations.

The Committee wishes to congratulate LIP for its impressive achievements and the very high quality of the work, which has been maintained notwithstanding the financial hardship experienced during 2014 and still continuing in 2015. The programme of research has been maintained with vigour and breath. The message to Society through the training and outreach programmes has been clear and well received.



C. W. Fabjan



P. G. Innocenti.



L. Rolandi