

FOREWORD

Laboratori Nazionali di Frascati-Frascati National Laboratories (LNF) Present and Future

Many important steps have been taken during 2012 that will influence the future of the LNF. The DAFNE collider, running at record luminosities at these center of mass energies, in the second half of the year has been subject to an intensive machine study that will enable, after the long shutdown period during which new detectors will be installed in the KLOE detector, a long period of stable data taking. At the end of the KLOE run it is expected that the SIDDHARTA-2 experiment will take over conducting experiments on kaonic atoms that only the DAFNE kaon beams can enable. DAFNE, besides working as a collider, also brings with it the BTF (Beam Test Facility), a state of the art testing area capable of pretty unconventional beams, and the Synchrotron Beam Lines, that attract users from all over Europe.

A great deal of work has been put on the SuperB flagship project; on one side the experimental groups worked to the preparation of the TDR that is due for summer 2013. On the machine side a complete costing and resource loaded schedule has been prepared by the central team and submitted to the ministerial review. The review committee acknowledged the details presented but unfortunately the project was considered too expensive with respect to the resources that the Italian Research Minister could provide in the expected amount of time and SuperB has been hence terminated. At that point LNF, and INFN at large, are faced to understand in which direction its future will go when DAFNE will have completed its scientific life. On one hand a luminosity tau-charm factory, still based on the crab-waist scheme and capable of luminosities in excess of $10^{35} \text{ cm}^{-2}\text{s}^{-1}$ with polarized beams is being studied as a backup for SuperB in order to understand whether, with a dedicated design, the project could fit in the available budget. On the other end a new project, IRIDE (for **I**nterdisciplinary **R**esearch **I**nfrastructure with **D**ual **E**lectron linacs) has been recently proposed; this project, based on the existing know-how in LNF on FEL's and state-of-the-art accelerators, is based on two superconducting linacs, about 1.5 GeV each, working in Continuous Wave mode (thus allowing high beam intensities), that can be coupled in various ways in order to have low energy electron-(electron)positron collisions, to feed a competitive FEL, to interact with high power lasers in order to produce gammas for nuclear photonic studies or for new generation, low emittance, polarized positron sources and to produce intense neutron beam. Also low energy gamma-gamma and electron-gamma experiments are foreseeable. This intriguing project is at this moment being detailed by the interested groups and a White Book with all details of IRIDE is foreseen by

summer 2013. A decision from INFN on which direction to go is hopefully to be expected before the end 2013.

The other on-site facilities, like the SPARC-LAB FEL, the NAUTILUS Gravitational Antenna, the SCF-LAB for space applications and X-LAB for manipulation of X-rays with capillaries lenses, as well as all other collaborations worked at full steam in 2012 albeit suffering, as all other facilities, of the difficult personnel situation that INFN at large, and LNF in particular due to the time profile of its staff, are living: experienced staff retiring represent a loss in competences that is not even numerically compensated by hiring new personnel. This situation is possibly dramatic and represents a real threat to the very existence of LNF as an efficient lab and must be tackled vigorously by INFN management.

Finally 2012 has been the year of the Higgs boson discovery at the LHC collider at Cern and LNF has been a good collaborator in all four major LHC experiments, with contributions that are well recognized also inside these gigantic scientific enterprises: a demonstration of the level of quality of our staff, a resource that our Country MUST defend.

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