

WHAT NEXT LNF

On November 10-11 2014, we have had a workshop at LNF to discuss the possible future activities in the field of fundamental physics to be barycentered in the laboratory

<https://agenda.infn.it/conferenceDisplay.py?confId=8563>

The attendance was very good, 147 registered persons, and the discussion rather lively

As reported during the open session, there have been proposals for the use of all of the main facilities of the Lab (DAFNE, BTF, SPARC-Lab) as well as for the construction of new ones

I will make a few considerations on them in the following

Besides the success or failure of the KLOE-2 run, that is matter to be settled in the forecoming months, what to do with DAFNE is a longer term period is probably our main concern. There are two options

1. Run the collider for «nuclear» physics studies (see talks of Zmeskal, Curceanu, Okada). This has the advantage of potentially producing results to be published on journals with a relatively modest luminosity. My main concern is the consistency of the group, in particular the internal one.
2. Transform DAFNE in a training ground for machine physics studies, in collaboration with international institutions, CERN in primis (Zimmermann). This could have the advantage of strenghtening the link of the local accelerator community to the internatinal one. However it is not clear to me the real interest of the AD to this project. Also not using DAFNE for physics would be in principle be a loss.

The LINAC-BTF complex has become recently one of the most successful assets of the Laboratory in terms of beam delivery to users and number of served users (Valente)

There is now the proposal to use it as a machine to make searches for hidden gauge bosons and/or light dark matter. There are at least two possible experiments to be performed: PADME for the dark photon search (Raggi, Kohzhuarov) and BDX for LDM searches (Battaglieri, Celentano)

Some sparse consideration:

- The program is very interesting but the competition is very high. Therefore it needs to be performed rapidly
- The interest of the internal/external community is growing, still a formal collaboration does not exist
- The compatibility of the operations of the LINAC for this program with the one as injector of DAFNE has to be carefully studied.
- The leadership of the BTF is strong and proactive, which is a strong asset for the project

There is a strong interest of the top INFN management to the use of SPARC-Lab as a laboratory for plasma acceleration. Allegedly, the view of the INFN President is that this should be the main mission of LNF

At present this is already been done although with some difficulty. Projects for upgrading the facility have been presented by M. Ferrario

Also a proposal for a EU-funded initiative for a Design Study focussed on this topic, heavily involving LNF, has been issued

With some dose of optimism this could lead LNF to become THE European laboratory for plasma acceleration in the not-too-far future

I think that we should support these initiatives at best

There is also a request from the INFN management to study the possibility to build in Frascati an hub for construction and support of the INFN activities in the Space (Pallavicini). At present this is a rather vague assessment. After the discussion a small committee has been set-up by the Director to better study the issue and come out with a proposal within a few months

Thanks to the long-standing expertise of LNF in the construction of gas particle detectors, a proposal to set up a large infrastructure to make R&D studies for innovative MPGD architectures has been put forward by Bencivenni. This could keep LNF at the real forefront for this technologies. A costing profile is understood. The interested community must be better determined

My opinion is that both proposals are interesting but neither of the two can really solve the problem of giving to LNF a wide future perspective