# Minutes

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| *Date* | **LNL, 17-Oct-18 18-Oct-18** |
| *Meeting Topic* | ***LNL Users General Assembly*** |
| *Participants* | |
| *Author(s)* | ***G. Benzoni, T. Marchi*** |

## AGENDA:

**First day, 17-10-2018**

1. Welcome and News from the User Board.
2. News from LNL Director.
3. Status of TAP accelerator complex.
4. Interdisciplinary Physics at LNL and the activity of the USIP committee
5. Report ENASR2 on the way to ENSAR-NEXT
6. News from EURISOL-DF
7. Status of the SPES project
8. General Discussion

**Second day, 18-10-2018**

1. News from the Research Division
2. News from the TAP coordinator. Results of the last PAC
3. Education and outreach using LNL accelerators' complex
4. Report from Service Division
5. Contributions from LNL Users:
    a. Galileo Phase 2: upgrade of the set-up
    b. Set-up for conversion electron measurements at the SPES 1+ beam line
    c. Radiobiology Studies at LNL
    d. https://accounts.google.com/ServiceLogin?service=wise&passive=1209600&continue=https%3A%2F%2Fdrive.google.com%2F%3Ftab%3Dmo%26authuser%3D0%23my-drive&followup=https%3A%2F%2Fdrive.google.com%2F%3Ftab%3Dmo%26authuser%3D0&ltmpl=driveExperiments with light beams in III experimental Hall
    e. Status of installations for non-post accelerated beams of SPES
    f. Using radioactive targets at LNL
6. General discussion.

7. Status of accelerators and experimental program at AN/CN complex.
8. Contributions from LNL Users:
    a. Nuclear physics with small accelerators: results and new ideas
    b. Physics campaigns at the SIRAD facility
    c. Micro and Nanodosimetry at LNL
    d. Dia.Fab. - Diamond Microfabrication with ion beam lithography: from quantum technologie.
    e. Channeling and nanoscale measurements at LNL
    f. Neutron facility at LNL: an update
9. General discussion.

All the material presented at the meeting can be found in the indico page of the event:
https://agenda.infn.it/event/16062/

## Topic 1: (see slides)

**Welcome and News from User Board (UB).**

The Chair of the LNL UB welcomed the LNL Users, reminded the role of the UB committee and introduced the members of the committee. She also updated on the status of the LNL Users and **invited new users to subscribe.**

Meetings with the director and with the head of the LNL divisions were held regularly, with involvement in important decisions (PAC meeting, location of new set-ups).

The Chair of the LNL UB presented a feedback on "End of experiment reports", mainly reporting on Tandem instabilities and Issues about the energy and intensity calibrations of the beams delivered by the AN/CN.

The actual User Board will finish its first mandate in May 2019. **New elections will be called in the beginning of 2019.** The actual members can be elected for a second mandate, in case they are still in activity. The UB wishes for new people to come forward and propose him/herself for the role. Information about election procedures will be circulated in the beginning of 2019.

## Topic 2:

**News from LNL Director**

The situation of the personnel has improved thanks to the conversion of fixed-term contracts into permanent ones for a number of technologists. Technical positions are hard to cover owing to competition with local Veneto industry.

In general, the budget is OK even if there is no space for contingency.

The director then reported on selected topics: situation of SPES, contract with the BEST company for radioisotope production, accelerator technologies and physics campaigns.

**SPES project**: even if there is a delay, which can be at the moment quantified in 6 months, the SPES installation phase is proceeding. The commissioning of radioactive non post-accelerated beams is now expected to start in year 2020, followed by re-accelerated beams in 2021. The director underlined the difficulty in making a time schedule for periods longer than 6 months.

**Radioisotope production**: the contract with the BEST company was approved in July and signed on October 26$^{th}$. Several tasks will need to be completed in order to have the new SPES building operational for the production of radioisotopes, with completion of infrastructure and radioprotection issues. The possible interference with SPES installations and impact on overall schedule under evaluation.

**Accelerator technologies**: IFMIF RFQ are completed and currently operating in Japan, with the first accelerated beam extracted in June 2018. The project is now entering in its phase II.

The production of tank modules (Italian industry) and of the drift tubes (mainly internal INFN) for the Drift Tube Line for ESS is in line with schedule. The assembly will start at Lund under INFN responsibility in Jannuary '19, and INFN will take part to step by step beam commissioning (starting 2020).

**Physics campaigns:** after a brief introduction on the TAP machine operations (detailed in TOPIC 2 by G. Bisoffi), the director reminded that information on beam-time availability for year 2019 will be updated at the next PAC meeting.

The experimental campaign is restarting in these days, with beams delivered by the Tandem at a limited available terminal voltage.

The new PAC members started their activity in July 2018 and the new USIP committee will be formed by the end of the year.

## Topic 3:

**Accelerator Division Report**

G. Bisoffi reported on the status of the TAP accelerator complex and on the operation to prepare the complex for the coming SPES beams.

Hours of beam on target in 2017 is much reduced compared to previous years owing to unscheduled maintenance of the XTU-Tandem. A detailed report of all interventions has been outlined.

The Piave-ALPI complex also underwent maintenance in order to achieve better transmission and reliability.

The successful delivery of 206Pb beams to several experimental set-ups has been underlined as a benchmark of the year.

As for SPES: the ADIGE injector installation has already started, with the placement of dipoles and quadrupoles in exp. Hall III. The installation, which will partly involve also TANDEM operators, is expected to be completed in the third part of 2020.

Issues related to external companies' contract dealing with installations and special maintenance can cause delays.

## Topic 4:

**Interdisciplinary Physics at LNL and the activity of the USIP committee**

The history of the User Selection panel for Interdisciplinary Physics has been presented, stressing the importance of the multidisciplinary activities both at the AN/CN and TAP complex. The actual committee has terminated its mandate and a new board will be appointed by the director. The User Community would like to express its gratitude for the excellent work of the committee in keeping a high-level quality of the physics program performed at LNL in interdisciplinary subjects.

## Topic 5:

**The ENSAR2 program**

LNL is part of the TRANSNATIONAL ACCESS PROGRAM within the ENSAR2 initiative, together with the twin laboratory LNS.

It is reminded that**: eligible research teams need to have a spokesperson and most of the group coming from non-Italian institutions. Extra-European institutions may also apply. The request must be submitted together with the proposal.**

PAC members belonging to the User Selection Panel (ENSAR2) are A.Gargano and C.Fahlander.

The spokespersons are about to prepare the mid-term activity report, while discussions about how to apply for the next call started with a meeting in Catania in the beginning of October. The preparatory work has started and a draft of the projects to be presented is expected for spring 2019.

## Topic 6:

**EURISOL-DF initiative**

Sara Pirrone (EURISOL-DF representative for INFN) reported on the progress of the EURISOL-DF initiative and the importance to prepare strong scientific cases for RIB science and applications, support, upgrade,

optimize and coordinate the involved facilities, foster R&D on RIB production and Instrumentation towards EURISOL, support user driven policy (User Group).

The funding of the MYRRHA facility by the Belgian governments has been announced, strengthens the EURISOL-DF initiative

An overview of the possible scenario for the beam delivery in various RIB facilities in coming years has been presented, showing synergies among the various European facilities.

A project to get EURISOL-DF in ESFRI in 2019 is set up, in order to obtain funds for the period 2021-2022.

## Topic 7:

**Status of the SPES project**

Gianfranco Prete presented the status of the installations in view of SPES. Owing to late arrival of funds in 2018, which prevented bids for beamline elements and infrastructure to be started earlier, the project is expected to be delayed by few months. The new scheduling sees the installation of 1+ periodic beamlines to be completed by 2020, in order to start providing non-post accelerated beams in 2021.
The work to prepare for the post-acceleration is continuing in parallel and the mentioned delay might to affect important part of the project.
The project manager underlined that, with the end of the mandate of the SPES Steering Committee the interface with the community is the User Board itself.

## General Discussion:

The discussion relative to this first session was centered around three main topics:

- **Future scheduling of beamtime and shutdowns:**
  The community insisted in the need for timely decisions about shutdown periods since this strongly affects various aspects, starting from the organization of maintenance and upgrades of experimental arrays down to fund requests. This also strongly affects agreements for travelling instrumentation to be brought to LNL, which need to be defined well in advance in order to prepare requested infrastructure.
  The collaboration from the acceleration division and the director to discuss and organize the future beamtimes in 2019 and 2020 is acknowledge, even if the director strongly stressed the difficulty in predicting exact phasing of beamtime/shutdowns.
- **Delays on the SPES installations**:
  Again, the impact of the expected delays on the experimental programs and agreements for traveling instrumentation has been put forward, with the fear of a loss of appeal of the LNL laboratory if the project is further delayed.
- **Future of the AN/CN complex**:
  The relevance of activities at the AN/CN complex, as underlined by Prof. Ricci in his talk, is put at risk by the aging of accelerators and the lack of personnel. The difficulties in harvesting fundings for an upgrade of the machine has been also stressed. This discussion has been further expanded at the end of second day.

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## Day 2, Morning Session

### Topic 1:

**News from the Research Division:**

The various activities of the research division of LNL have been presented, showing the diversity of experimental programs and reminding the key responsible people in charge of each branch.

### Topic 2:

**News from the TAP coordinator. Results of the last PAC:**

The beamtime coordinator reported on the beam operations in the current year in comparison with past years, both for nuclear physics and applied physics experiments. The beamtime requests and outcome of the last PAC meeting was also outlined, describing the scheduling of experiments between this first part of the current semester and the second part (January-April). It is foreseen that there will be no backlog to recover in the next semester.

### Topic 3:

**Education and outreach using LNL accelerators' complex:**

LNL has a wide program for education and outreach that includes group visits to the premises, stages for undergraduate students and workshops for teachers. In particular students are allowed to work on small real experiments performed using the accelerators at LNL, both at the AN/CN and TAP complex.

### Topic 4:

**Report from Service Division:**

A report on the User Service, under the supervision of the research division, has been presented, underlying the critical situation of the personnel involved in activities that cover the support of experimental set-ups for vacuum and infrastructures, the detector laboratory and the target laboratory. Upgrades in all laboratory are planned and on-going.
The service division started a survey of the status of the resident equipment in each experimental hall.

### Topic 5:

**Contributions from LNL Users:**

As a novelty for this year, large part of the Annual Meeting was devoted to contributions from the LNL Users to address instances, propositions, requests related to the current and future activities at LNL.

Contributions from Users using the TAP complex have been presented, showing upgrades to experimental arrays, such as GALILEO, the ICES and b-DS set-ups, and experimental programs devoted to radiobiology studies. The request for the development of Cadmium and Uranium beams and the request of using radioactive targets for selected experiments have been presented. The need to extend the use of light beams also in the experimental hall III was also discussed.

## General Discussion:

A lively discussion followed the requests outlined by the contributions of the Users.

- **Development of new beams, extension of the use of light beams in experimental halls II and III, use of radioactive targets:**

  The positive potential for such developments is acknowledged by the Users' community. The UB suggests starting a working group on the subject, to define priorities and elucidate on the missing technical and bureaucratic (radioprotection, safety etc.) items that needs to be taken into account.
  A similar working group has been recently appointed by the research division to revise the status of resident set-ups.
  This will be discussed by the UB with the LNL Director.

- The **critical working conditions on the three main experimental halls** have been brought to the attention, highlighting the need for a revision of the air conditioning system and shielding. In particular experimental halls II and III suffer a lot from dust and high levels of humidity, which can damage seriously the equipment.

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## Day 2, Afternoon Session

## Topic 7:

**Status of accelerators and experimental program at AN/CN complex:**

The beamtime coordinator of the AN/CN complex presented a follow up of the talk of the chair of the USIP committee advocating the need for a new low-energy accelerator, intended to substitute the existing ones. A possible layout of the proposed machine has been presented, addressing the possibility to couple the system to the 1+ beamline of SPES in order to expand the scope of the experimental program to be performed at LNL.
The expected budget for both infrastructure and machine has been detailed, amounting to nearly 10 M€.

## Topic 8:

**Contributions from LNL Users:**

The second part of the afternoon was devoted to contributions by Users on selected topics, showing the variety and impact of the program pursued using the AN/CN accelerator complex. The variety of subjects, covering basic research in nuclear physics on aspects related to nuclear astrophysics and neutron cross

section measurements, to applied physics for the characterization of materials and components, to the definition of new treatments for tumors.

## General Discussion:

Having shown the actual and future impact of the research performed using the so-called “small machines”, AN and CN, the discussion focused mainly on the need for a new system that could replace the existing ones, which are no longer reliable owing to aging of components.

Even if the community – and the director- agrees on the need for such an intervention, the amount of money needed for such operation cannot be asked to one single subject (i.e. INFN). A need for a diversification of the requests, applying to various calls, has been stressed.

The works of the Annual Meeting finished at 18:30.