Minutes from LNL User Community Meeting, February 12th-13th 2026

All the material presented at the meeting can be found in the Indico page of the event: https://agenda.infn.it/event/49993/

Welcome from the User Board

The Chair of the LNL UB welcomed the LNL Users, reminded them of the role of the UB committee and introduced the members of the board and their roles.

Welcome from the Director

The Director welcomed the users and reported on selected topics. He suggested collecting input from users of small machines and proposed the possibility of organizing a dedicated meeting to discuss the future of small machines, with the possibility of replacing the AN2000 and CN accelerators with one machine, if there is interest in using them. A support to research group was established to assist users with the preparation and execution of their experiments. Program Advisory Committee (PAC) should also serve as a Scientific Advisory Committee, supporting future management decisions. PAC includes members with experience in managing large projects and research facilities. New members are Anna Mackova (Nuclear Physics Institute of the Czech Academy of Sciences and University of J. E. Purkyne), Francesco Cappuzzello (INFN-LNS) and Mathis Wiedeking (LBNL).

SPES

- Director - Wrap-up from the "SPES proton workshop" of May 2025: A large number of proposals were presented during the workshop. A proton beam was recognized as very valuable for irradiation studies. One of the main ideas is to use high-intensity beams for flash therapy, which would represent a unique capability at LNL. There is an existing pre-bunker designed to handle very high levels of radioactivity. This vault is technically ready to be equipped for one of these new activities such as flash therapy studies. A second vault will be dedicated to multipurpose activities. Around mid-year, input from users will be needed to define how these vaults should be properly utilized. Regarding SPES, phase 3 is currently ongoing and is expected to be completed by summer 2026. Irradiation of the TiCx and UCx targets is planned by 2027 would be desirable, followed by beam acceleration.

- T. Marchi - News and status of SPES: SPES offers a large and diverse portfolio of beams compared to other facilities and therefore offers something unique. For example,

^{132}Sn beams will have unique purity and intensity. LNL is fully committed to completing the project. Phase 1 was completed two years ago. Phase 2 is completed: ISOL machine is installed, control system is developed in house and compatible with all LNL accelerator control systems. Machines are operational and RIB 28Al was produced. Phase 3 is ongoing – installation is mainly done. ADIGE commissioning started. Work on RFQ is ongoing, and it is in the commissioning phase. The plan is to start transporting stable beams from the ISOL machine to ALPI and users in 2026. Phase 5 is high resolution mode, and this is foreseen for the future.

Work on the infrastructure is ongoing. A problem was identified in the pit of the cyclotron – there is evidence of a crack in the floor and water is coming in. The cause is still under investigation. Two companies are independently evaluating this problem (French and South African). An Italian company will provide a third independent report. They should provide a solution and evaluate risks, and their results are expected by the end of February. Work on SPES will continue in parallel. A laboratory to synthesize UCx targets should be completed by the end of the year. The timeline cannot be better defined due to the issues with the ground and the crack. Setups that can be put in place for the first post-accelerated beams will have to be identified, and those that can easily distinguish and work with very contaminated beams are very welcome.

- G. Pupillo - SPES_MED: Goal of this project is to produce medical radionuclides. Work packages were presented: nuclear cross section measurements for medical radionuclides production, ISOL production yield measurements (and SPES infrastructure Commissioning is planned for 2026).

- N. Marchini - Status and physics opportunities with low-energy SPES beams: Beta-decay station and SLICES to perform internal electron conversion spectroscopy were presented. Geant 4 simulation was done and used for the preparation of the experiments. SLICES was commissioned at CN and two experiments were performed. The next step is to test beta tagging at CN in May. A moving tape to transport nuclei was tested in February. Possible day-one SPES experiments were identified: beta decay of 35K, spectroscopy of high-lying states in 35Ar important for astrophysical reasons, 96Sr shape coexistence study with SLICES.

General

- E. Fagotti - News and status of LNL Accelerators: The accelerator time schedule and the amount of hours of beam on target were presented. Conflict with SPES installation activities in May – July is foreseen with possible cancellation of one month of PA activities in that period. Accelerators performance expectations were presented. 1 pnA beam current of 238U can be guaranteed on FC7. A possible energy increase of 238U beam and its influence on current was discussed. AN2000 and CN maintenance was completed.

- A. Gottardo - Status of the TANDEM-ALPI-PIAVE accelerator complex: Next PAC meeting is expected in Autumn 2026. A change of beam time schedule in the period of May-July is expected. Renovation of the DAQ hall is planned for autumn, and users are

kindly requested to provide feedback by the beginning of March. Experiments can be run in the 3rd hall.

- A. Selva - Status of the AN/CN complex: Less experiments than usual were performed this time. CN users are coming back, and the machine is working as planned after maintenance. The CN community is now very efficient in changing setups at the 0-degree beamline. That beamline is the most used one since it is the only one with a pulsed beam and high current. No need to lower the pressure on that beamline, since it is used efficiently.

- T. Marchi - News from EUROLABS: EUROLABS project is ending in August. All research groups are required to comply with the data management plan and acknowledge the contribution. The amount of beam hours provided by LNL is more than required by the funding agency. The budget is sufficient to cover all the experiments until August. However, users expressed concerns about delays and issues in the reimbursement procedure.

TANDEM-ALPI-PIAVE

- A. Goasduff - The AGATA campaign at LNL: Status of detectors and electronics was presented, as well as preparations for the future. Plans for the zero-degree campaign were outlined. The PrePAC meeting is planned to be held around July, and it will accept letters of intent for both NEDA and PARIS. Strong collaboration is established with a well-documented procedure for data analysis.

- A. Togni - The EXOTIC beam line: Commissioning of the EXOTIC beam line with the AGATA array was presented. Three experiments are planned to be performed by April 2026.

- M. Del Fabbro - Heavy-ion reactions in the PISOLO scattering chamber: Sub-barrier fusion experiments were presented, as well as different detector tests that have been done in the chamber (backscattering test, prototype of the particle identification system for the NUMEN experiment, test of a FAZIA detector). If someone is interested in doing experiments in a non-standard way, they can contact a researcher in charge of the experimental hall.

- L. Silvestrin - The SIRAD irradiation facility: Presented study of radiation effects in electronics that are performed at LNL. Studies are done with TANDEM beams, and the post-acceleration stripper station allows for the use of heavier ALPI beams. The facility was continuously maintained and improved over the years, to increase the flexibility for many types of users and experiments.

AN/CN

- L. Redigolo - Clustering in 12C and 16O: Two experiments were performed at small machines: MORALIS to determine the radiative decay branching ratio of ^{12}C Hoyle state

in a coincidence measurement with two Si detectors (D. Dell'Aquila et al., Scientific Reports 2024) and HELICA to investigate the spectroscopic properties of ^{16}O low-spin high-energy states (L. Redigolo et al., PLB 859 2024). Plans to study cluster states of ^{24}Mg at CN were presented.

- F. Sgarbossa - HCCC experiment: Study and application of the phenomena of channeling and strong-field effects between energetic beams and crystalline materials. Part of Techno CLS European Pathfinder programs and OREO project that aims to construct an ultra-compact crystal-based calorimeter. Using the 60-degree AN and -15-degree CN beamlines.

- M.Fracasso - Fu.S.Ion.I experiment: Experiments were performed at the 60-degree AN beamline. Ion irradiation experiments with superconductors are performed.

- N. Marchini - E0 transition strength via conversion electron measurement: SLICES setup is installed and commissioned at CN. The setup is designed for SPES, it is a large SiLi detector that completely stops electrons up to 2, 2.5 MeV. The aim is to measure E0 transition strengths. It has been tested with a movable target. Two experiments were performed to study shape coexistence in 68Zn and 118Sn. The next experiment is planned for May - commissioning of beta decay tagging that is needed for SPES and the study of shape coexistence in 78Se. A dedicated beamline at CN is not needed, it is an easily transportable device.

General: Perspectives

- A. Gottardo - Future possibilities and perspectives for the TAP complex: Different setups in the experimental halls and possibilities to use or change them were shown. A huge space for large setups may become available in Hall 2 after RMS is dismantled. A 2m large chamber from JYFL might become available for LNL. The TRAP bunker is available. Hall 3 has the GARFIELD setup and SPES post-acceleration setup, but a large space might become available for users in the future. New experimental setups for low energy RIB beams are MR-TOF trap for mass measurements, collinear laser spectroscopy, beta-NMR, neutron array, beta-decay station and SLICES. An international workshop on the future research program with low energy radioactive ions beams is planned for the possible use of 1+ SPES beams. New setups for accelerated beams are Galileo phase 3, PRISMA gas-filled, solenoid, storage ring, microbeam facilities. GALILEO phase 3 is presented in more detail. A small movable gamma array is planned to be used for setups like PRISMA or Si detectors. It is possible to use active targets for SPES, the project is on hold, but once the RIB beams will be available, it should be restarted. The suitability of detectors for high-intensity beams from ADIGE was discussed. A pre-separator for PRISMA was mentioned. There is an interest from the collaboration to use a test bench of ISRS as a linear separator for SPES and this could be used for beams that are not pure. It was reminded that not all the beam lines are equivalent and cannot be used to deliver all the heavy ions.

- A. Selva - Future possibilities and perspectives for the AN/CN complex: AN has 4 operative beam lines, the most used one is a 60-degree beamline with two scattering

chambers for IBA. Micro PIXE for applied physics had a problem of bad resolution of Ge detectors, but the resolution was now improved (this still has to be confirmed). The ASIDI 0-degree beamline is used for ultra-low intensity beams, and it is now being commissioned. The -15-degree line is not used, and it could be reinstalled. The 30-degree beamline is used for X17 boson search. CN has 7 beam lines and 4 are used. The 0-degree line is the most used one, it has a pulsing system. It is an easy interface beamline with lots of different setups. The -15-degree line is used for IBA and has two scattering chambers. The +15-degree line has a thermal neutron source MUNES. Possible future efforts have been identified, especially in connection to a possible new machine.

F. Galtarossa – Closing remarks

The water infiltration issue of SPES and the impact on the SPES timeline was discussed. TAP schedule was discussed by users who expressed a need for advance notification of possible changes in the schedule. The progress of AGATA and the plan to go to a zero-degree campaign in Autumn was discussed. The first RIB from EXOTIC was delivered to AGATA in December 2025. Fundamental and technological research continues in parallel in small machines with great success. Perspectives were presented, and the necessity of coordinating users was emphasized.

Date	The User Board
30/03/2026	Franco Galtarossa Tea Mijatović Rosanna Depalo Agnese Giaz Matteo Campostrini Kasia Hadynska-Klek Rosa Maria Pérez-Vidal