INFN
LEGNARO
Istituto Nazionale di Fisica Nucleare
Laboratori Nazionali di Legnaro

Legnaro National Laboratories

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INFN, LNL, Italy

LNL User Meeting – LNL 21 November 2017

LNL Human Resources

LNL Staff	Total	Permanent	Fixed Term
Technicians	65	47	18
Administrative	16	12	4
Researchers	20	20 (+1)	0
Technologists	40	23	17
TOTAL	141(+1)	102(+1)	39
Post Docs	20		
Fellows	11		
PhD Students	16		

Total staff constant but Fixed Term now > 25 %

New positions to stabilize fixed term ➔ no net increase in total staff in near future

Local industry in Veneto still attracting talented young technicians and engineers: difficult to remain competitive

Key role played by postdocs and PhD students

- Collaboration with other (nearby) INFN units
- Outsourcing

LNL Finances

Divisions, Services, Equipment, General Services (incl electricity)	7800 k€
CSN Funding	1100 k€
External Funds	6700 k€
TOTAL	15300 k€

- Funding level adequate to run lab in ordinary conditions (no contingency)
- Good attractiveness for external funds (Europe, Premium funds, Private)
- Need to strengthen ties with local administration (especially regional)

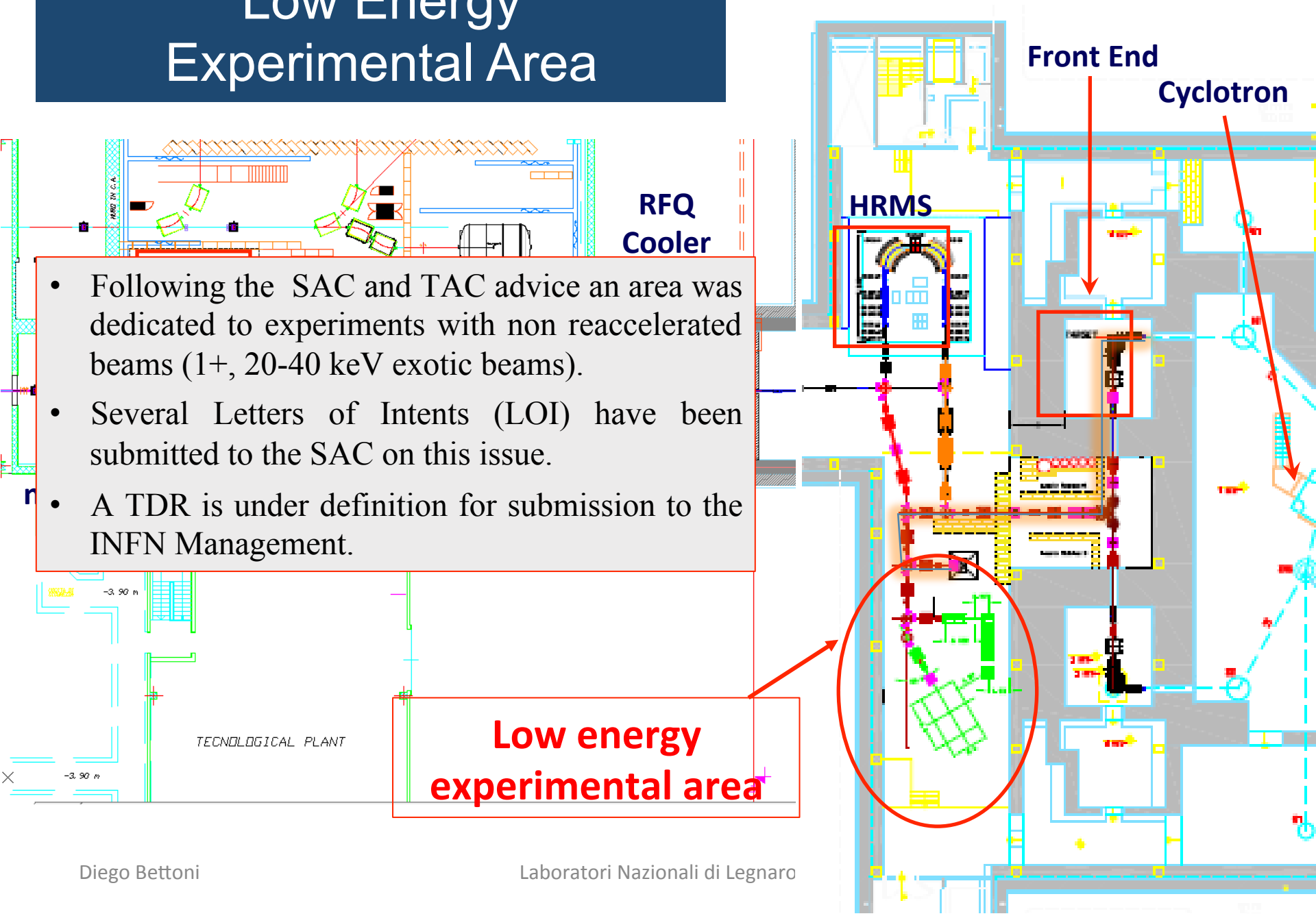
Main Parameters	
Accelerator Type	Cyclotron AVF 4 sectors
Particle	**Protons (H^- accelerated)**
Energy	**Variable within 30-70 MeV**
Max Current Accelerated	**750 μA** (52 kW max beam power)
Available Beams	**2 beams at the same energy** (upgradable to different energies)

Endurance test done (5 days at 200μA, 40 MeV)
SAT completed in June
Training completed in September

Use of cyclotron for tuning and INFN practice up to temporary authorization expiry (end 2017)

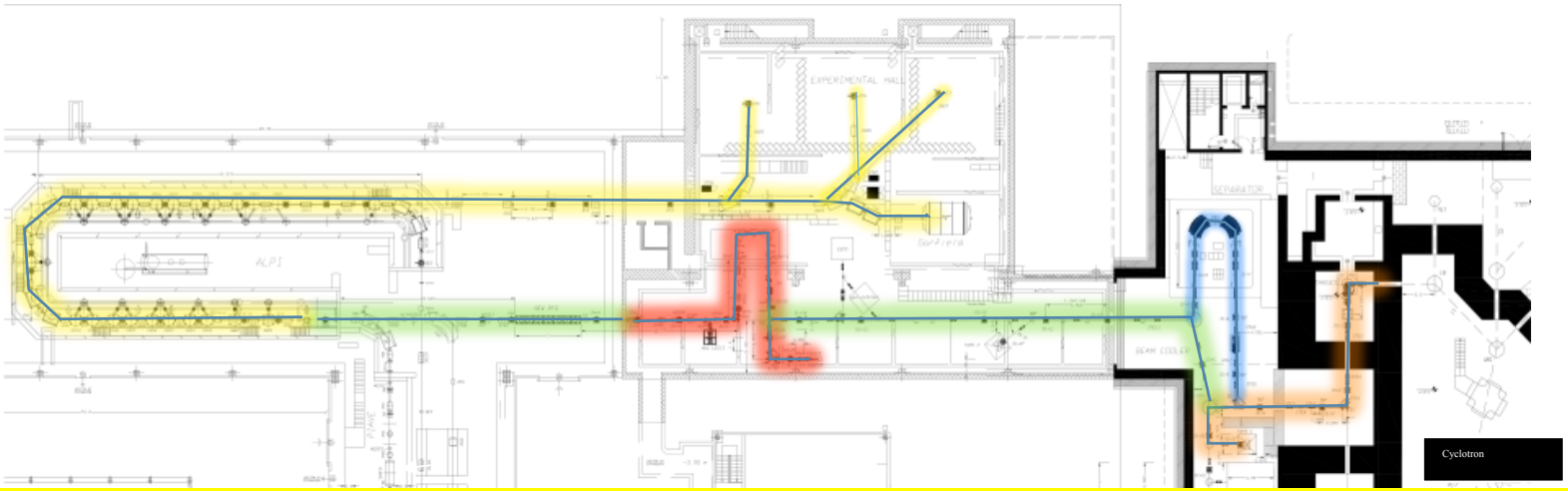
Use of cyclotron to resume late 2018 for radioisotope production

Low Energy Experimental Area



- Following the SAC and TAC advice an area was dedicated to experiments with non reaccelerated beams (1+, 20-40 keV exotic beams).
- Several Letters of Intents (LOI) have been submitted to the SAC on this issue.
- A TDR is under definition for submission to the INFN Management.

Installation phases



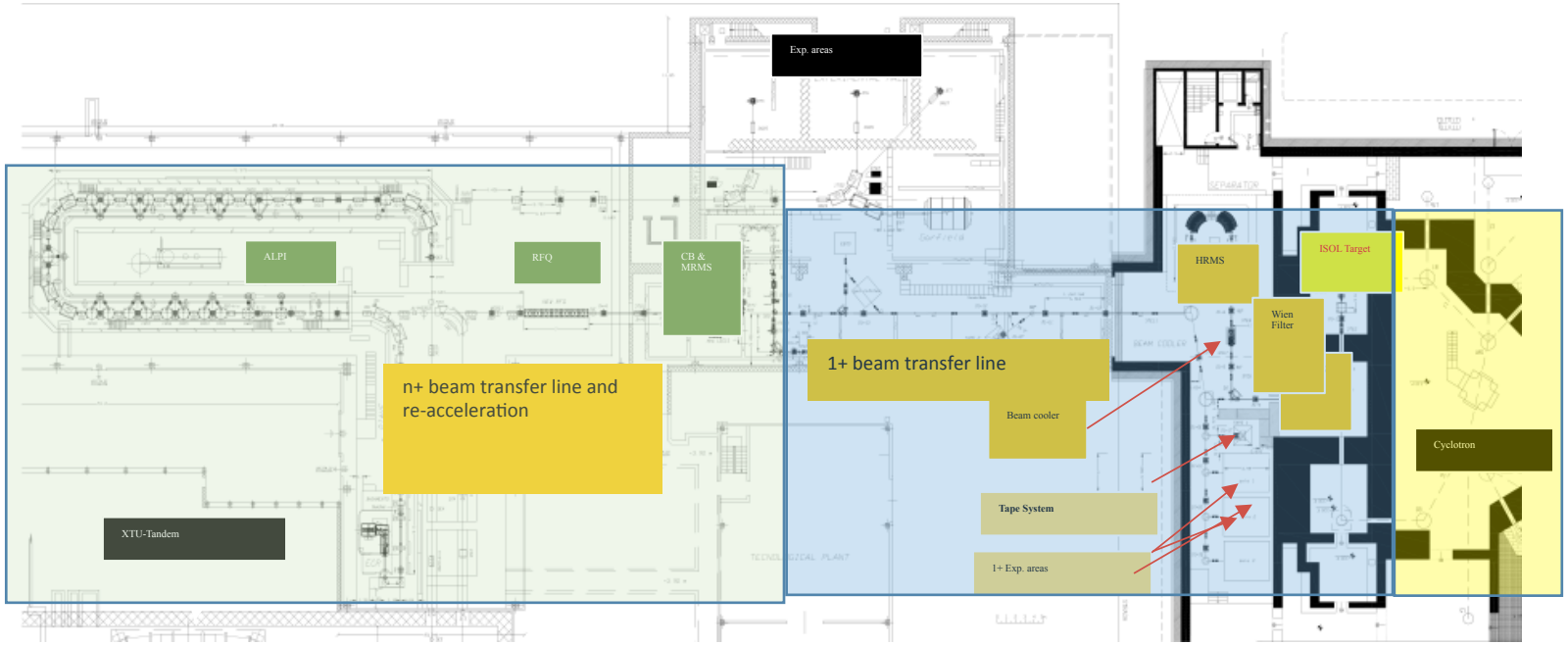
- ✓ installation of Charge Breeder and related mass separator: 2018
- ✓ installation of ISOL and 1+ beam line up to the tape station: 2019
- ✓ Radioactive Low energy beams: (end of 2019, available for expts. 2020)
- ✓ Installation of RFQ and 1+ beam line up to Charge Breeder: 2020
- ✓ Reaccelerated beams: ready in 2021
- ✓ High resolution mass selection: ready in 2022

ISOL facility installation phases

LINAC ALPI building

Main Tasks	2017 Q1	Q2	Q3	Q4	2018 Q1	Q2	Q3	Q4	2019 Q1	Q2	Q3	Q4	2020 Q1	Q2	Q3	Q4	2021 Q1	Q2	Q3	Q4
PHASE 2B: ISOL SYSTEM and wien filter	PRELIMINARY ASSEMBLY				INSTALLATION				HW COM			RIB COM								
PHASE 2B: 1+ beam line operation	PRELIMINARY ASSEMBLY				INSTALLATION				HW COM			RIB COM								
PHASE 2A: ADIGE 1+ source		INSTALL		HW COM		1+ SOURCE COM														
PHASE 2A: CHARGE BREEDER & MRMS		INSTALLATION			HW COMM				CB & MRMS COMM AND OPERATION								RIB COM			
PHASE 3B: Bunchers (tender/construction)	INSTALLATION								COMM with BEAM											
PHASE 3B: RFQ	Construction & installation											HW COMM	COMM with BEAM				RIB COM			
PHASE 3A: 1+ beam line up to Charge Breeder									CONSTRUCTION			INSTALL			HW COMM					
PHASE 3A: BEAM COOLER				CONSTRUCTION								INSTALL		COMM						
PHASE 3A: HRMS					DESIGN				TENDER			CONSTRUCTION								

Installation phase responsibilities



Fabiana Gramegna
Scientific Coordinator
Head of Work Package B1
(Scientific Support).
LNL Research Division leader

Giovanni Bisoffi
Accelerator Coordinator
Head of Work Package B9
(*(RIB Re Accelerator)*
LNL Accelerator Division leader

Alberto Andrighetto
Technical Coordinator *Exotic Beam production and 1+ beams*
Head of Work Package B10
(Mechanics and Engineering)

System Integration Office:

Mario Maggiore: cyclotron
Carlo Roncolato: re-acceleration
Daniele Scarpa: ISOL and 1+ beam lines

INSTALLATION WORKING GROUP:

main competences involved in the installation group:

Mechanical engineer and technician
Beam line positioning and alignment expert
Vacuum systems technician
Electrical engineer and technician
Responsible of specific component
Plant expert
Safety expert
Beam operation expert

Mainly LNL staff personnel (10-15 FTE)

Lab Organization

- The lab is currently organized according to the usual INFN scheme:
  - three divisions (Technical, Accelerator, Research)
  - a number of services directly under the director
- A reorganization is foreseen for next year. Main issues:
  - Health and Safety organization
  - SPES and the SPES building
  - Experimental Halls

SPES Project Organization

The SPES project has been reorganized to better suit the final construction and the installation phases:

- one coordinator (Gianfranco Prete)
- two deputies
- WPs have been reorganized
- two installation coordinators
- integration office
- A Project Board reporting to the director on a by-weekly basis

LNL Committees

- The SPES Scientific Advisory Committee (SAC) played a major role in defininining the SPES Physics Case by analyzing and selecting the many LOIs presented
- The SAC is now merged with the Legnaro Program Advisory Committee (PAC). A new PAC will begin its term on 11/25
  - Claes Fahlander (chair) (Lund University, S)
  - Giuseppe Cardella (INFN Catania, I)
  - Bogdan Fornal (IFJ PAN, Krakow, PL)
  - Angela Gargano (INFN Napoli, I)
  - Kouichi Hagino (Tohoku U, JP)
  - Bertram Blank (CEN Bordeaux, F)
  - Wilton Catford (University of Surrey, UK)
- USIP (interdisciplinary – mostly AN and CN) extended by one year waiting for a final decision. Merge with PAC ?

Summary

- LNL has a very solid programme for the near and mid term future
- The main project for the future of the lab is SPES, in which the dual role of the lab as a center for both fundamental and applied research is very clear
- SPES is proceeding according to schedule
  - physics with low energy non reaccelerated beams in 2019-20
  - physics with RIBs in 2021-22
  - production of radioisotopes for nuclear medicine late 2018
- IFMIF and ESS are proceeding well and according to schedule
- Other core activities of the lab continue to be supported
- The SPES project was reorganized
- A Lab re-organization is planned for next year