THE LATINO PROJECT

AN ITALIAN PERSPECTIVE ON CONNECTING SMEs WITH RESEARCH INFRASTRUCTURES

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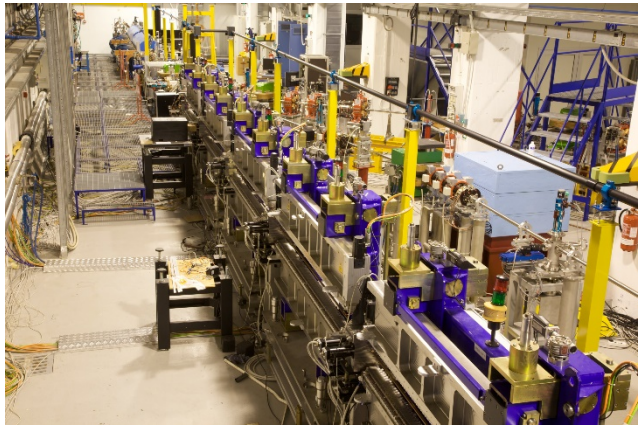
LNF: A LONG TRADITION IN PARTICLE ACCELERATORS

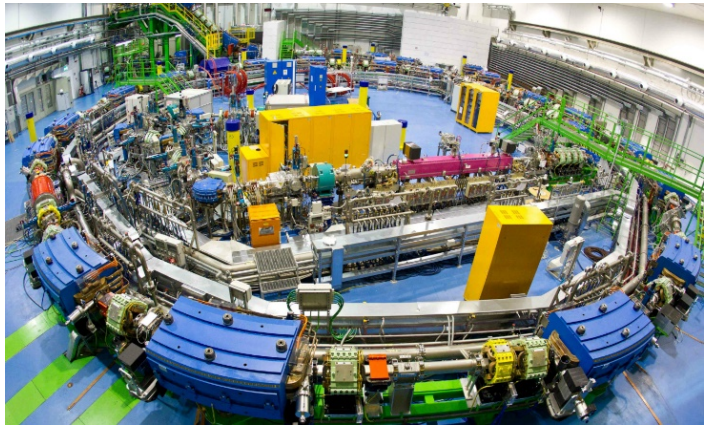
A.D.A. (1961)

ADONE (1969)

DAΦNE (1997)



SPARC_LAB (2005)



CNAO (2010)

ELI-NP GBS

DAFNE

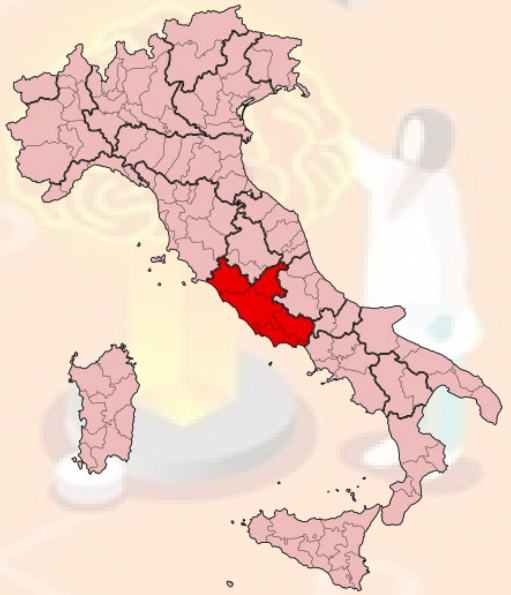
- LINAC
- BTF
- synchrotron light

SPARC

Call:
“OPEN RESEARCH INFRASTRUCTURES” (POR-FESR 2014-2020)

http://www.lazioinnova.it/bandi-post/sostegno-alle-infrastrutture-aperte-la-ricerca

- Main goal: “re-industrialization” of the Region
- Open-access infrastructures
- Overall budget of the call: 10M€
- Timescale:
  - 2 years to set up the infrastructures
  - Beginning of activities
  - 5 years of monitoring



REGIONE LAZIO

FONDO EUROPEO DI SVILUPPO REGIONALE 2014 2020 POR PROGRAMMA OPERATIVO REGIONE LAZIO

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FONDO EUROPEO DI SVILUPPO REGIONALE
2014 2020 POR
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LATINO

a **L**aboratory in **A**dvanced **T**echnologies for **IN**n**O**vation

a Research Infrastructure hosted at LNF open to external users for both research and economic activities

Organized in 4 Laboratories:

- Radio Frequency
- Magnetic Measurements
- Vacuum and Thermal Treatments
- Mechanical Integration

Cofunding: total budget of the project **2.5M€** (1.6 RL + 0.9 INFN)
(to be used for instrumentation and civil engineering)

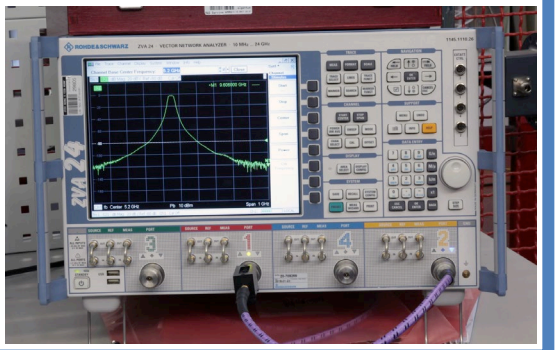
RADIO FREQUENCY (A. GALLO)

X band high power plant to test and characterize accelerating structures and components at 12 GHz

1 µs pulses at peak power of 50MW
100 ns pulses at peak power of 200MW with pulse compressors

A network analyser

to characterize devices and components up to 100 GHz



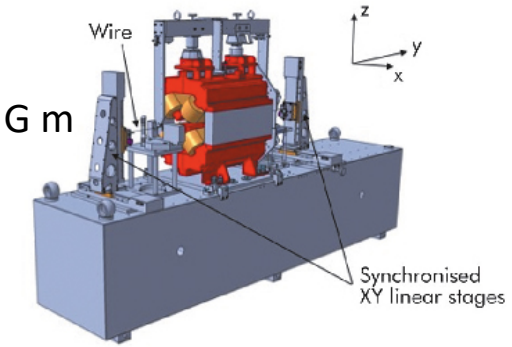
MAGNETIC MEASUREMENTS (L. SABBATINI)

A rotating coil for accurate magnetic field measurements of multipoles

Relative accuracy of integrated main harmonic 3 10^{-4}
Positioning accuracy 30 µm

A stretched wire bench for magnet fiducialization, integrated field measurements

Centering accuracy 2 µm
Integrated field precision 0.2 G m

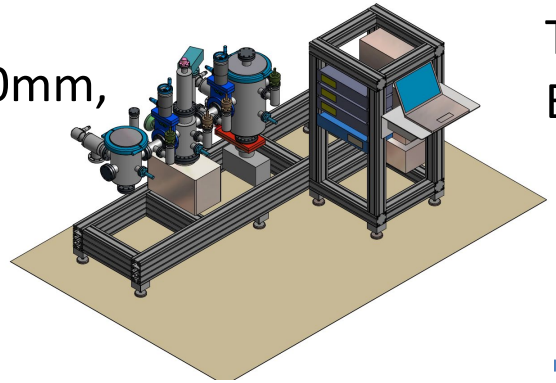


Stretched wire measurement bench

VACUUM AND THERMAL TREATMENTS (D. ALESINI)

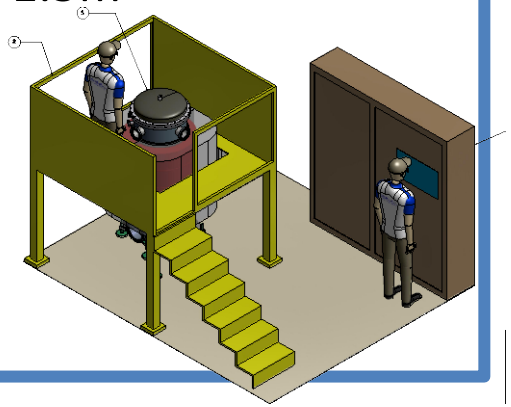
An outgassing measurement system to characterize vacuum materials

UHV, low outgassing: diameter 250mm, height 500mm
HV, high outgassing: diameter 200mm, height 300mm
Residual gas analyzer: 200 amu, sensitivity up to 2 10^{-14} mbar



An ultra-high vacuum furnace for thermal treatments and brazing

Diameter 50cm, length 1.5m
T≈900°C, p≈10^{-7} mbar
External heater



MECHANICAL INTEGRATION (V. PETTINACCI)

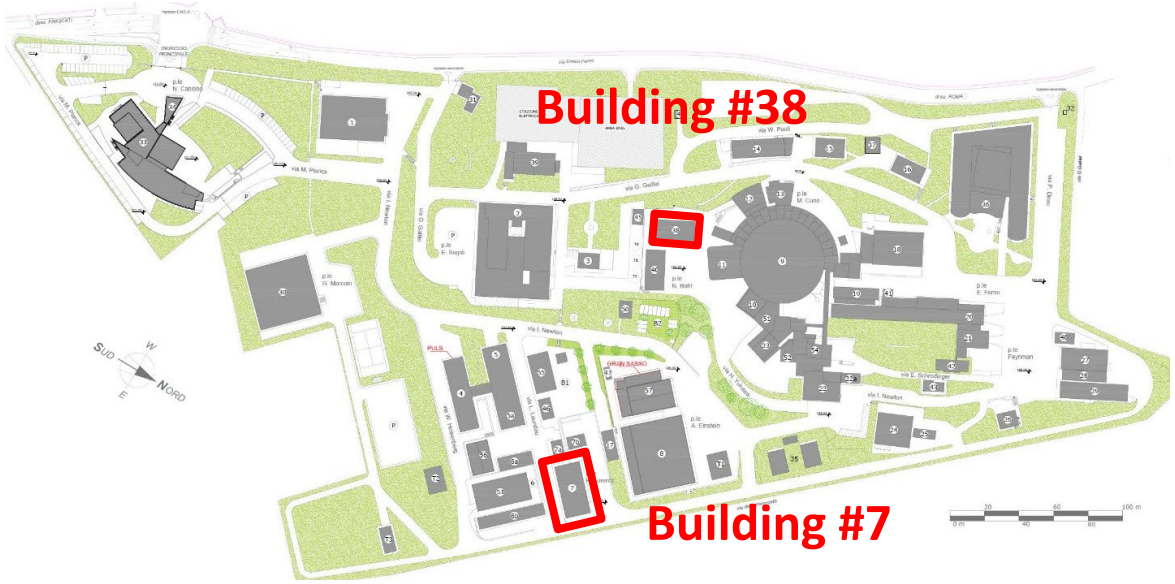
An architectonic laser scanner for environment and plants

Range of measurements >140m
Positioning precision @10m: 1.5 mm

A stereoscopic laser scanner for mechanical components

Cameras with 6Mpixel
Field of view 460mm
Best accuracy <0,05mm

CIVIL ENGINEERING



The LATINO laboratories will be hosted at LNF in buildings #38 and #7.
Budget has been allocated to renovate the infrastructures

Building #38: MAG

new magnet cooling system

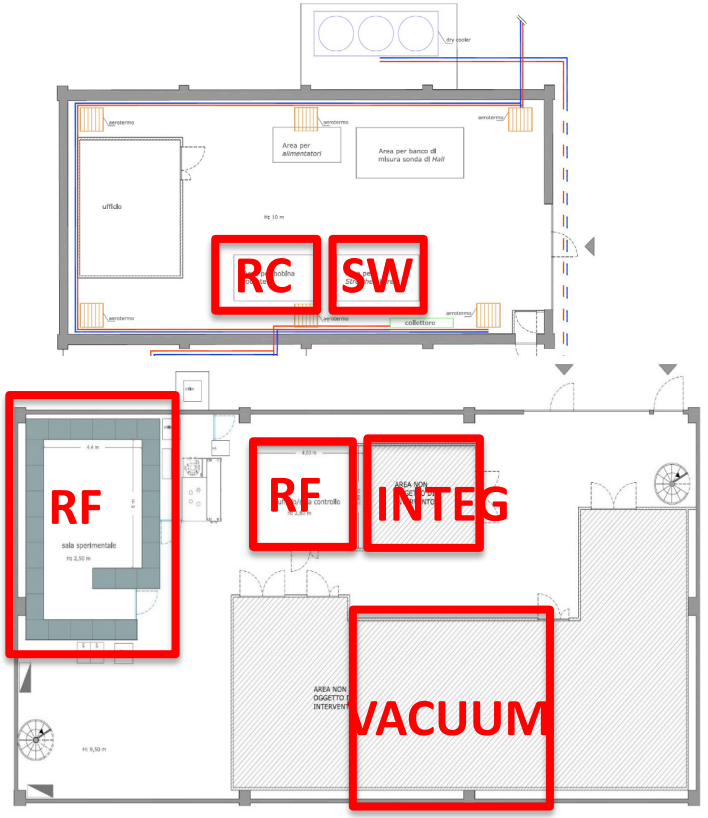
renewal of the floor and main doors

Building #7: RF, VACUUM, INTEGRATION

bunker for X band with ancillary systems

X band cooling system

HVAC for the building



LATINO: SERVICES PROVIDED

Radio Frequency

1. Power testing for accelerating structures and RF components at 12GHz – 200 MW peak
2. Conditioning of accelerating structures and RF components at 12 GHz
3. Frequency response of devices up to 100 GHz at low power
4. Characterization of circuits and signal at low power in time and frequency domain up to 20 GHz

Magnetic Measurements

1. Harmonic analysis of multipolar magnetic fields
2. Hall probe magnetic field mapping
3. Integral measurements of magnetic fields and fiducialization
4. Magnetic design of electromagnets

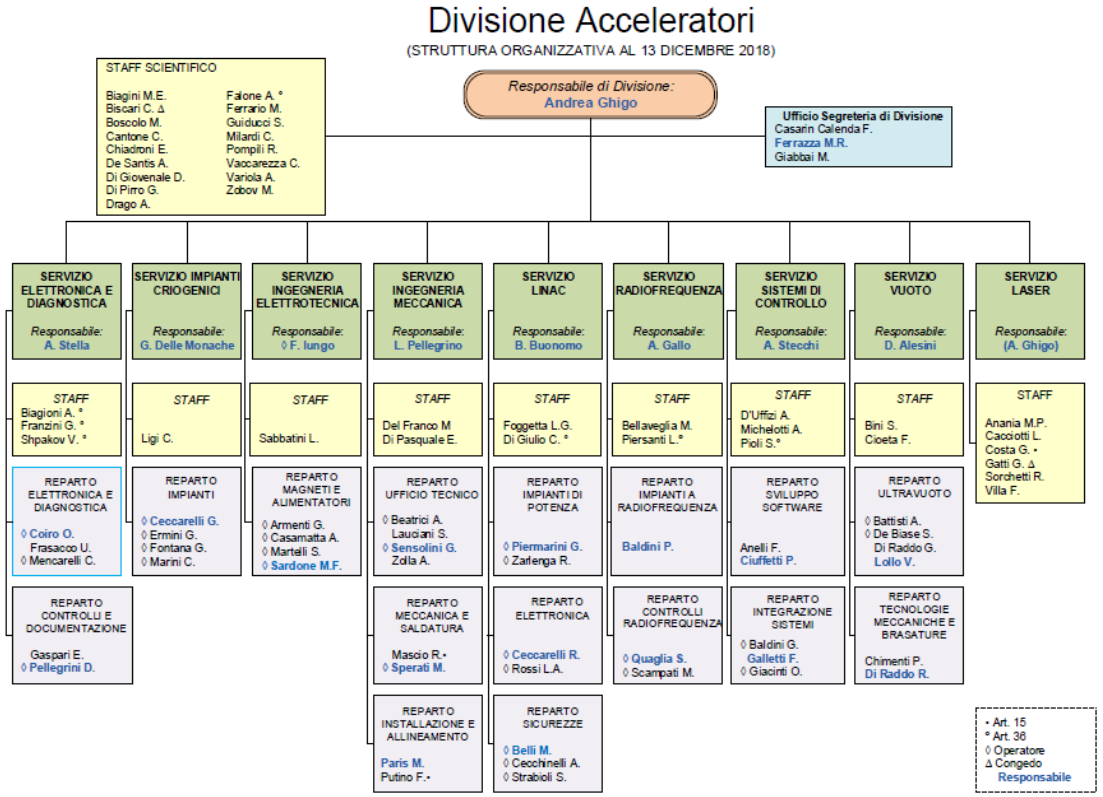
Vacuum and Thermal Treatments

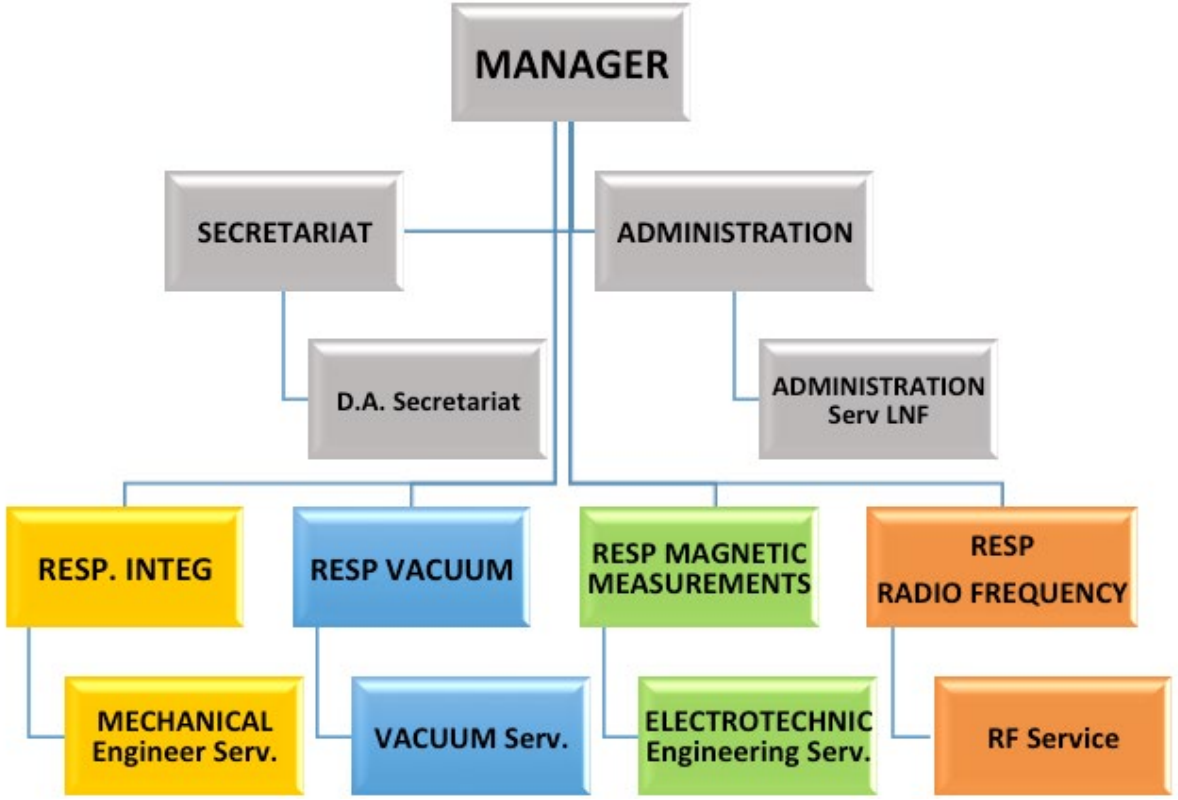
1. Ultra high vacuum or controlled atmosphere thermal treatments
2. Brazing in ultra high vacuum
3. Specific outgassing measurements of samples

Mechanical Integration

1. Buildings and utilities CAD reconstruction for space management and integration analysis
2. Mechanical components quality inspection and dimensional survey
3. Reverse engineering applications

ORGANIZATION CHART





Manager: management, coordination, interaction with Users

Laboratories: led by INFN technologists

Personnel of Accelerator Division **Services** to support the activities

Support for Secretariat and Administration activities

ECONOMIC ACTIVITIES

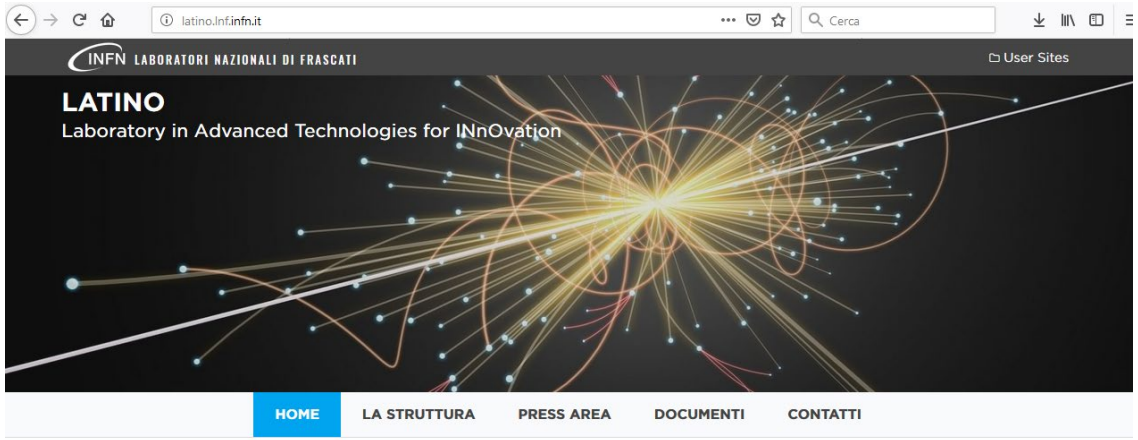
A challenge for Research Institutes…

- ✓ Business plan (with the support of a consultant) to analyze:
  - Industrial areas of applications
  - Target users
  - Market approach
  - Economic feasibility (expected income, sustainability, operational costs)
  - Rules governing the access
- ✓ Contact with similar infrastructures: «lessons learned» approach
- ✓ Letters of interest from Industries – Thanks for supporting us!
  - ASG superconductors, CECOM, COMEB, DG-Technology, Fantini Sud, ITEL, ITELCO, KYMA, MoriMeccanica, National Instruments, Ormet, SIT, TecnoAlarm, TSC, Zanon…
- ✓ Working group on separate accounting system (organized by LNF External Funds Service)

Work in progress…

GET IN TOUCH WITH INDUSTRY…

- 2017: **Open Day** Imprese @ LNF
- **Industrial Seminars** on specific topics (cultural heritage, control systems, THz applications, space technologies. NEXT: 28th May magnets and vacuum)
- **Contributions at conferences and Dissemination:**
  - IPAC 2019: Talk and poster
  - AIV conference (Associazione Italiana di Scienza e Tecnologia)
  - IOD (ILO Industrial Opportunities Days)
  - NanoInnovation 2019
  - AMICI meeting oct. 2019



- **Kickoff meeting** (winter 2020)
- Work in progress on the Website
- Poster: **THPMP009** (Thursday 15:30 MAGPIE)

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LATINO is part of a broader Technology Transfer projects development at LNF

Special thanks to our Administration, Technical Division, Communication Service,…