

Technological Facilities for ET Beampipe R&D @ INFN-Frascati

(A. Liedl – R. Cimino)

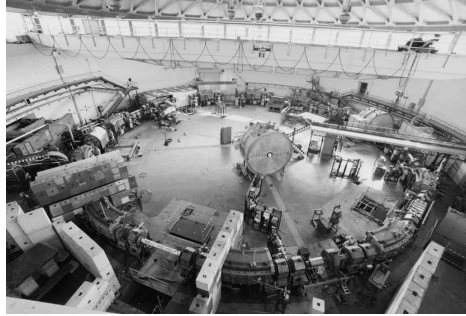
1959

1961

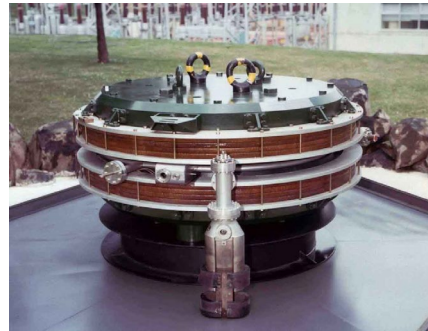
1969

1999

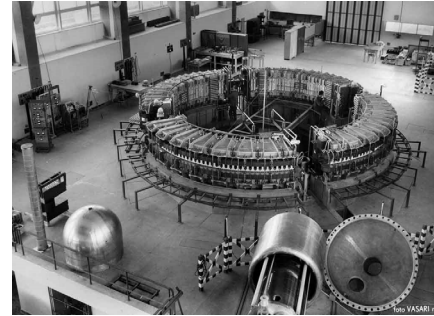
2009



Elettrosincrotrone
(1959 – 1975)



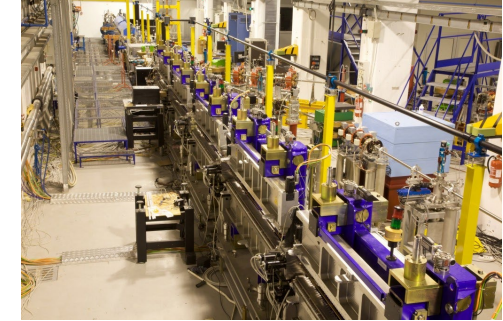
AdA
(1961 – 1964)



Adone
(1969– 1993)



DAΦNE
(1999– Today)



SPARC
(2009 – Today)



Compact EU Plasma Accelerator
(Included in ESFRI Roadmap)

...characterization of specific outgassing of different materials



Outgassing Measurement Facility:

- UHV SS316L «Sample Chamber»
internal size (250 x 460)
- Online RGA: Hiden HIDEN HAL/3F
- Triaxial Cold Cathode Gauge

All the chambers are treated by vacuum firing process

LATINO

Laboratory in **A**dvanced **T**echnology for
INn**O**novation

Project cofunded by Regione Lazio and INFN

...Heat Treatment



Vacuum Furnace

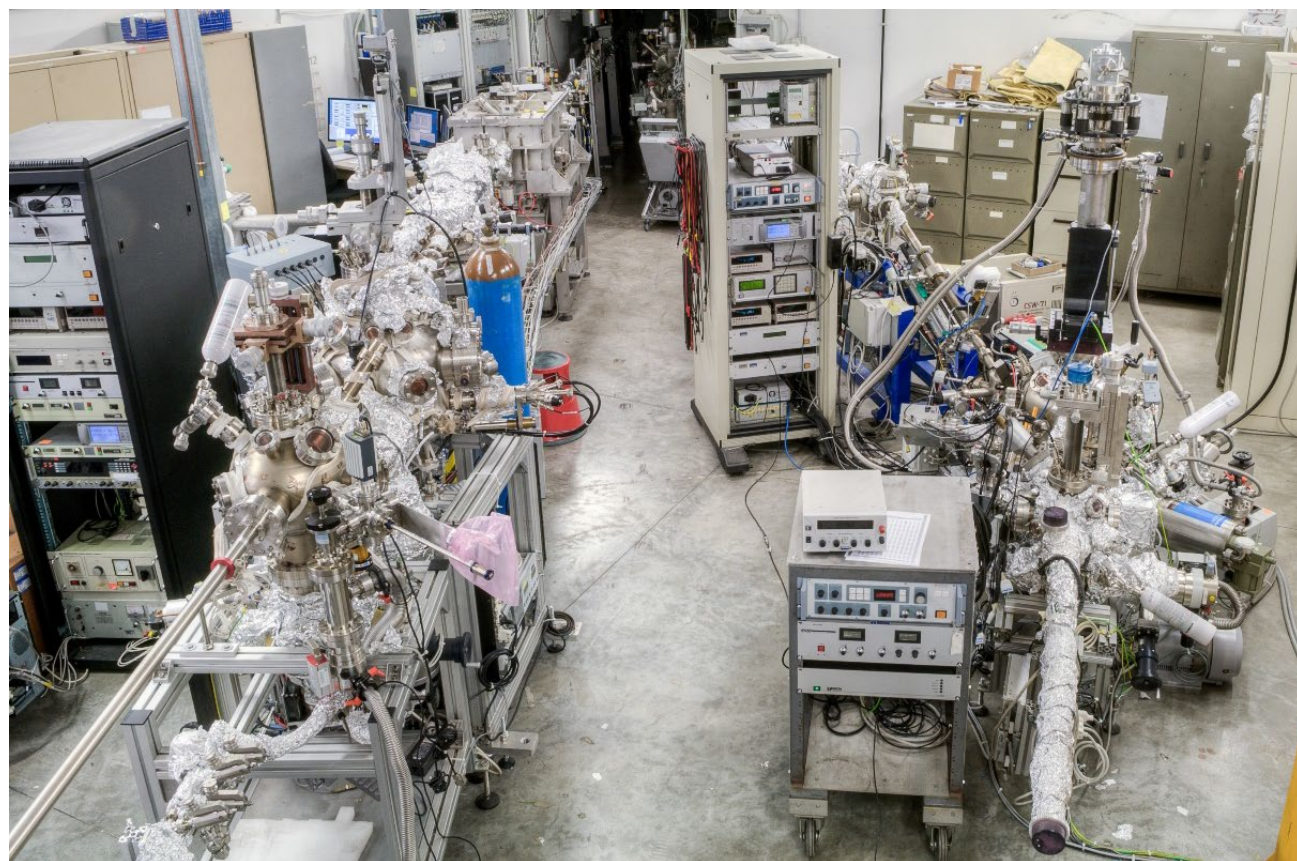
- Internal Heating system: Max T 1200°C
- HV Chamber: Load Volume Size $\phi 400 \times 1300$ mm
- Load Capacity: 200 kg
- Possibility of Controlled Atmosphere Process

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...Surface Analysis



UHV Experimental Chambers:

- Surface Analysis: XPS – UPS
- Electron/Photon/Thermal Induced Desorption Analysis
- Surface Treatments: Ar Sputtering, C-thin film coating
- Synchrotron Light beamlines: 30-150eV and 60-1000eV

Material Science Laboratory

INFN-LNF Dafne Light



...FTE and Resources

Total FTE for BeamPipe R&D: ~ 2.0 (3.5)

Frascati **proposed** FTE for ET R&D activity
(INFN Gr. 5, Gr. 2, PRIN)

Andrea Liedl	40%	Marco Angelucci	40%
David Alesini	10%	Luisa Spallino	40%
Simone Bini	10%	Roberto Cimino	40%
Fara Cioeta	10%	Giovanni Delle Monache	40%
Valerio Lollo	10%	Post. Doc.	100%
Lucia Sabbadini	10%	Post. Doc.	100%

**Beampipe
&
Cryogenic Mirror**

- > 50k/years for additional dedicated instrumentation, test samples and travel

Still Under Evaluation...Expected to be available in February/March 2022

...Invitation to Gravitational Waves Vacuum Workshop



First Gravitational Wave Detector Vacuum Workshop

Chairs: R. Cimino & S. Grohmann

28 – 30 September 2022
La Biodola, Isola d'Elba - Italy

All of You will be invited to act in the IAC!!

During the first day, **28 September 2022:**

Accelerators meet GWD Vacuum: Shared meeting with the

Particle Accelerator Community at



GWD
Vac'22

FIRST GRAVITATIONAL WAVE DETECTOR VACUUM WORKSHOP
28 - 30 September 2022 - La Biodola, Isola d'Elba - Italy

This workshop will discuss the technological challenges offered by the construction of third generation Gravitational Wave Detectors in Vacuum and Cryogenics research areas.

Chairs: Roberto Cimino & Steffen Grohmann

Since the first GW observation a number of projects have been proposed to improve the sensitivity of the technique, presenting unprecedented technological challenges. One is represented by the Vacuum performances of a very large in diameter (about 1 meter) and very long (about 10 – 40 km per interferometer arm) vacuum vessel. One other challenge is represented by the request to operate the suspended test mass at very low temperatures (between 10 to 130 K) to reduce thermally induced noise to the optics.

The two-days workshop GWDVac'22 will be preceded by a joint session – “GWD vacuum meets accelerator vacuum”- shared with the E-CLOUD'22 workshop. The session, which will be held the afternoon of the 28th September, will discuss vacuum and material science issues and potential R&D programs of common interest to both the Accelerator's and Gravitational Wave Detectors vacuum communities. Accelerator Vacuum experts are also invited to participate to GWDVac'22 to contribute, with the expertise of this community, to the new vacuum and cryogenic challenges the GWD community will soon have to face.

Accelerators' meets GWD Vacuum
Shared meeting with:
e-CLOUD'22

Organizing Committee
Marco Angelucci (INFN-LNF)
Roberto Cimino (INFN-LNF) Chair
Maria Rita Ferrazza (INFN-LNF)
Lucia Lilli (INFN-PISA)
Luisa Spallino (INFN-LNF)
Giulia Vinicola (INFN-LNF)

<https://agenda.infn.it/event/28336/> contacts: ecloudgwdvac22@lists.infn.it
Image credit: R. Williams (STScI)