The Extreme Light Infrastructure

User Meeting

ELI-NP status and perspectives

Speaker Name: Călin A. Ur

Director ELI-NP

3 November 2022

ELI-NP Infrastructure

(http://eli-np.ro)

ELI-NP

- Experiment building
- Office building
- Guesthouse
- Canteen
- Access control building

Over 32.000 sqm of built area and 270.000 cubic meter of air to condition

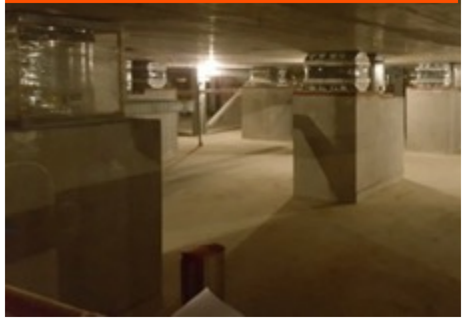
Largest geothermal system in Europe ~ 6 MW

2 x 10 PW High-Power Laser System

Variable Energy Gamma System

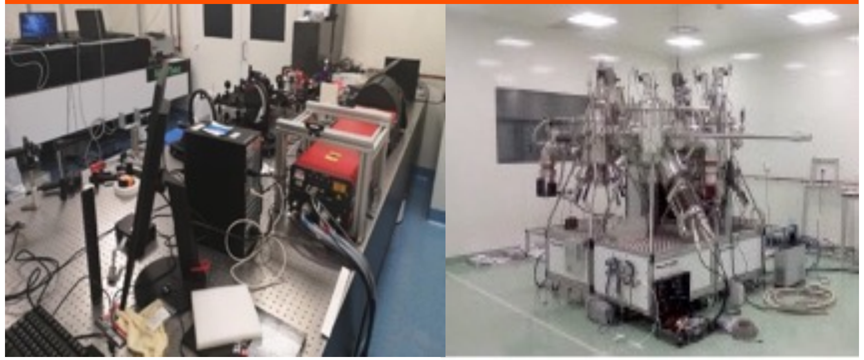
2 x 10 PW + 1 x 1 PW Laser Beam Transport System

120,000 tons antivibration platform



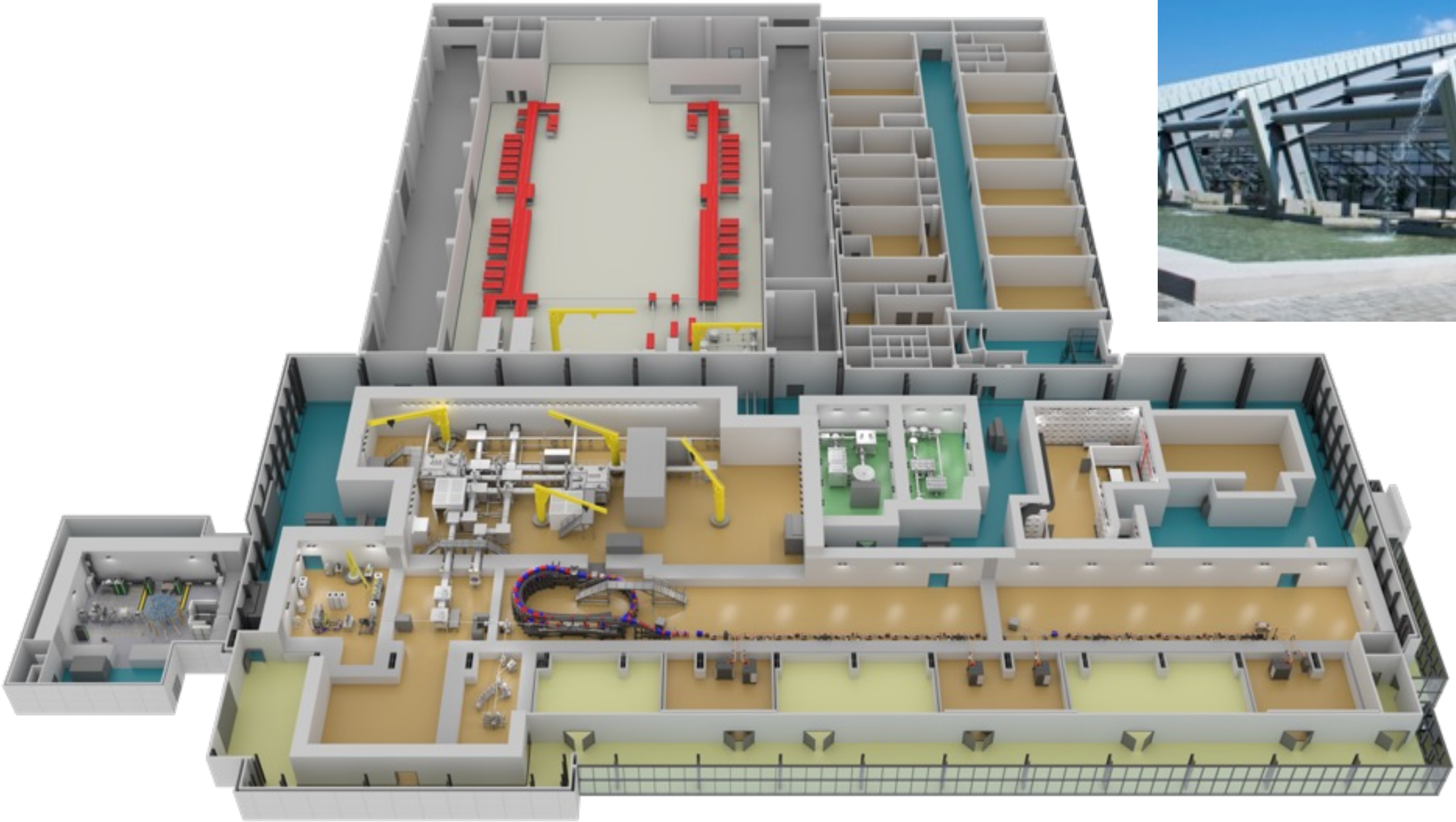
Clean rooms ISO6 - ISO7

Laboratories and workshops

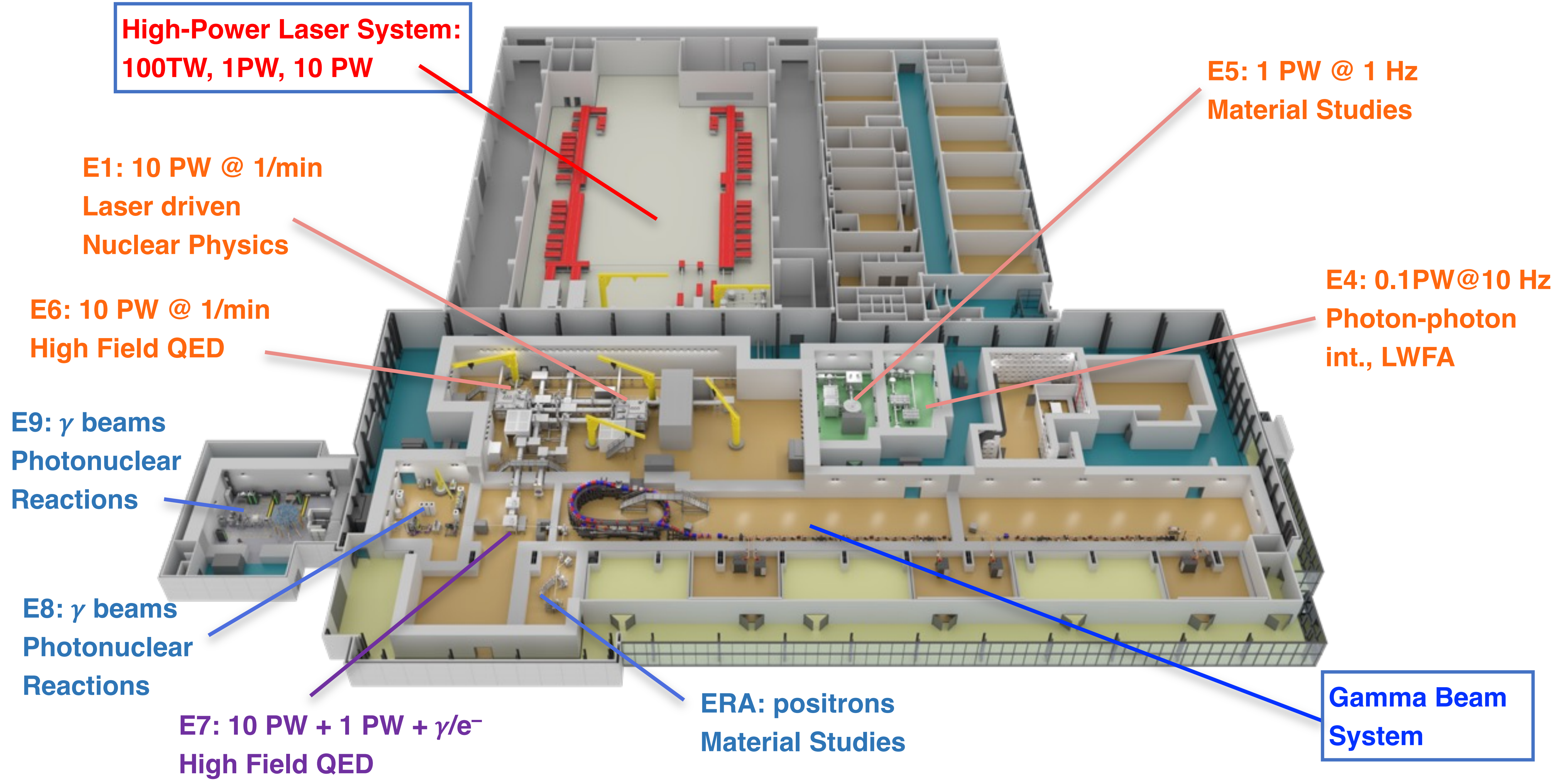


9 Experimental areas

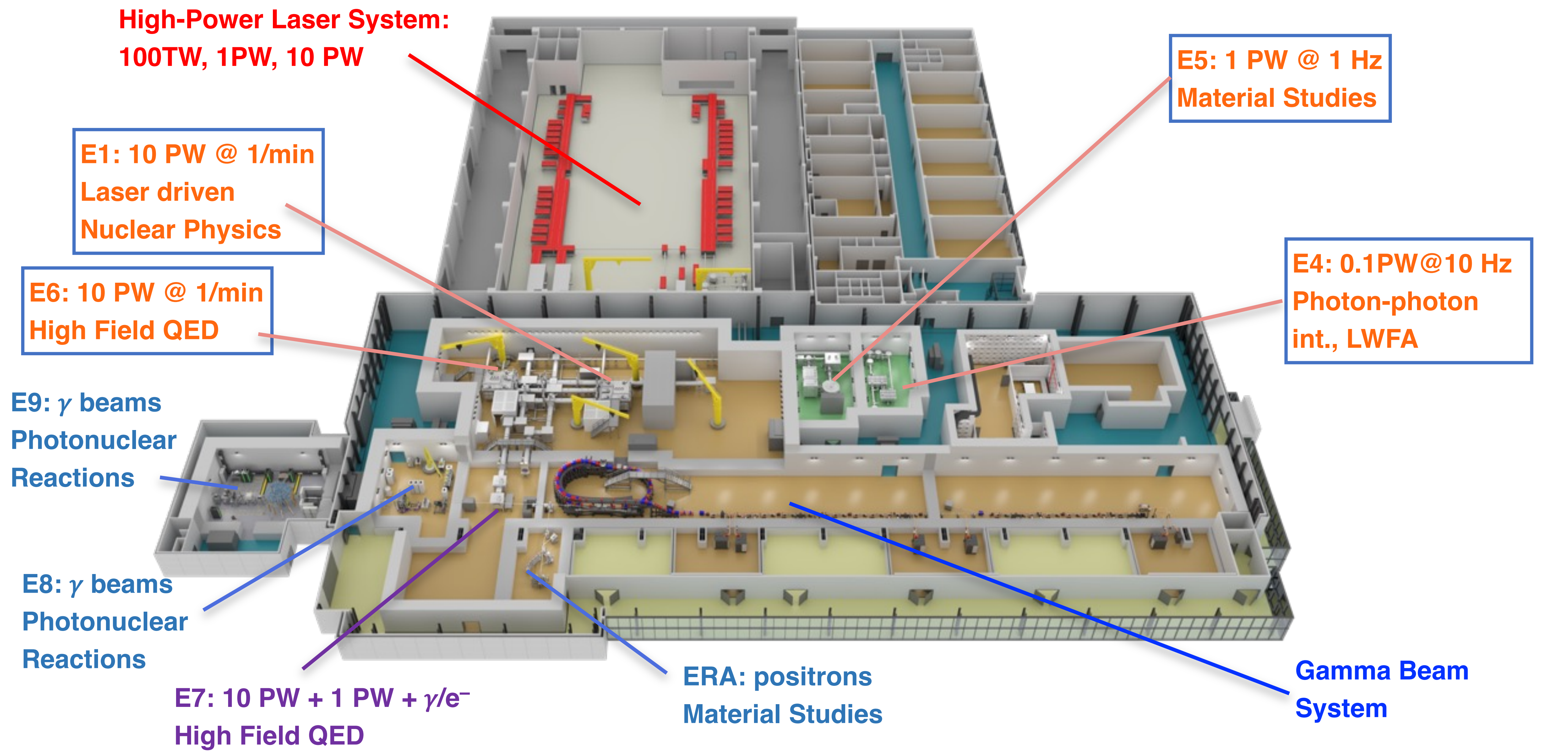
Experimental building



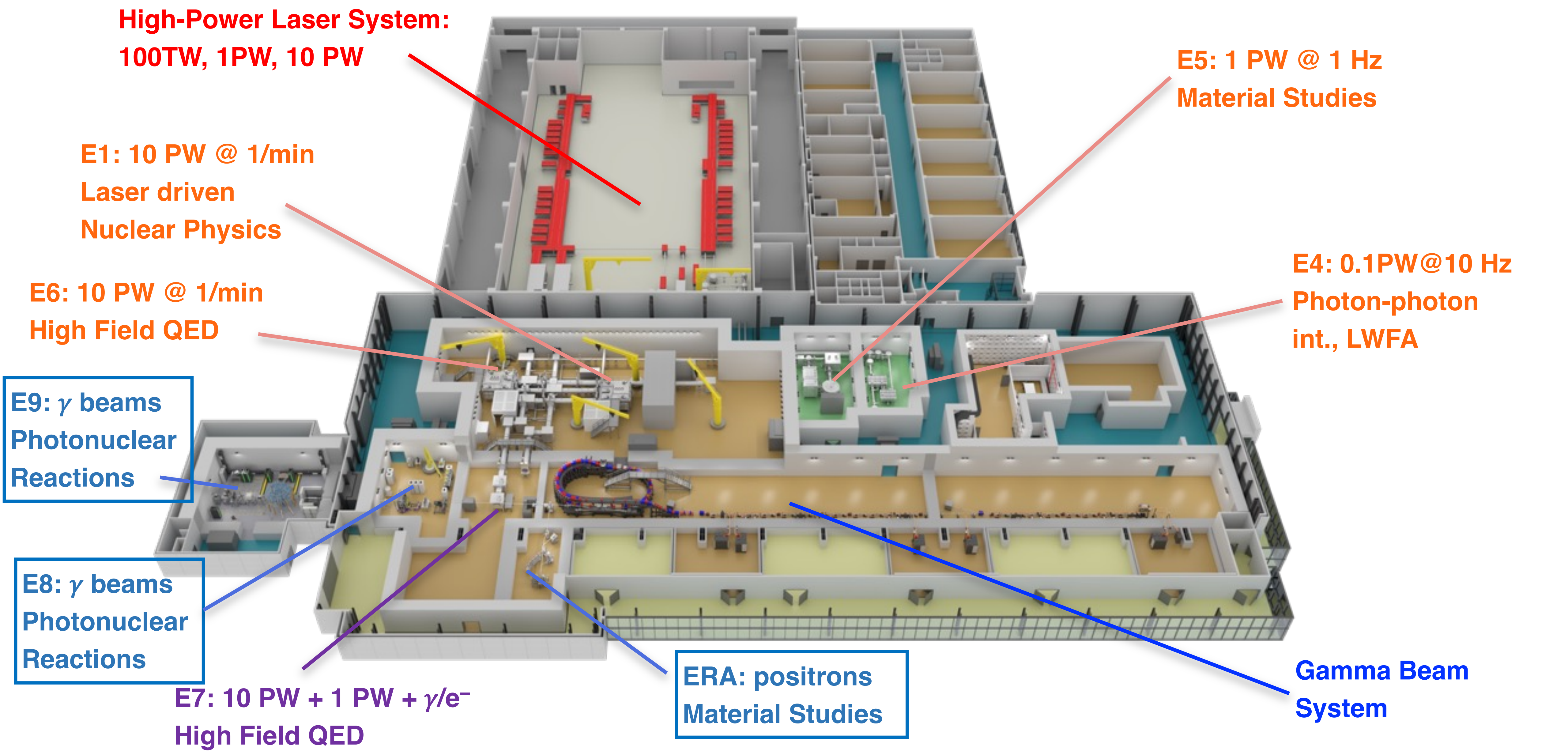
Experimental building: Main Equipment



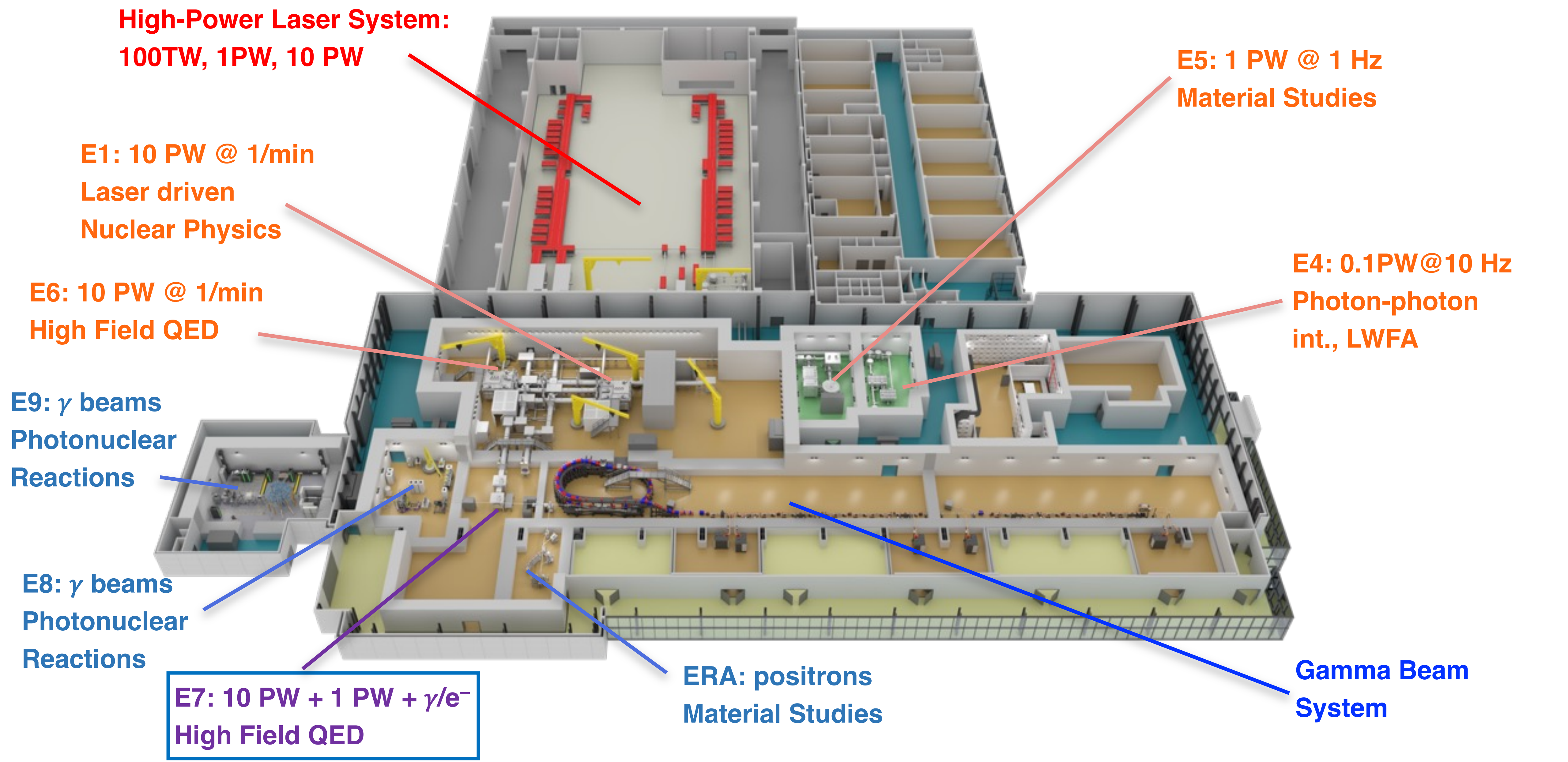
Experimental building: High Power Lasers Experimental Areas



Experimental building: Gamma Beam Experimental Areas



Experimental building: Combined Experiments Area



High Power Laser System

https://users.eli-np.ro/experimental_facilities.php

LSD department (Head of LSD: Ioan Dancus)

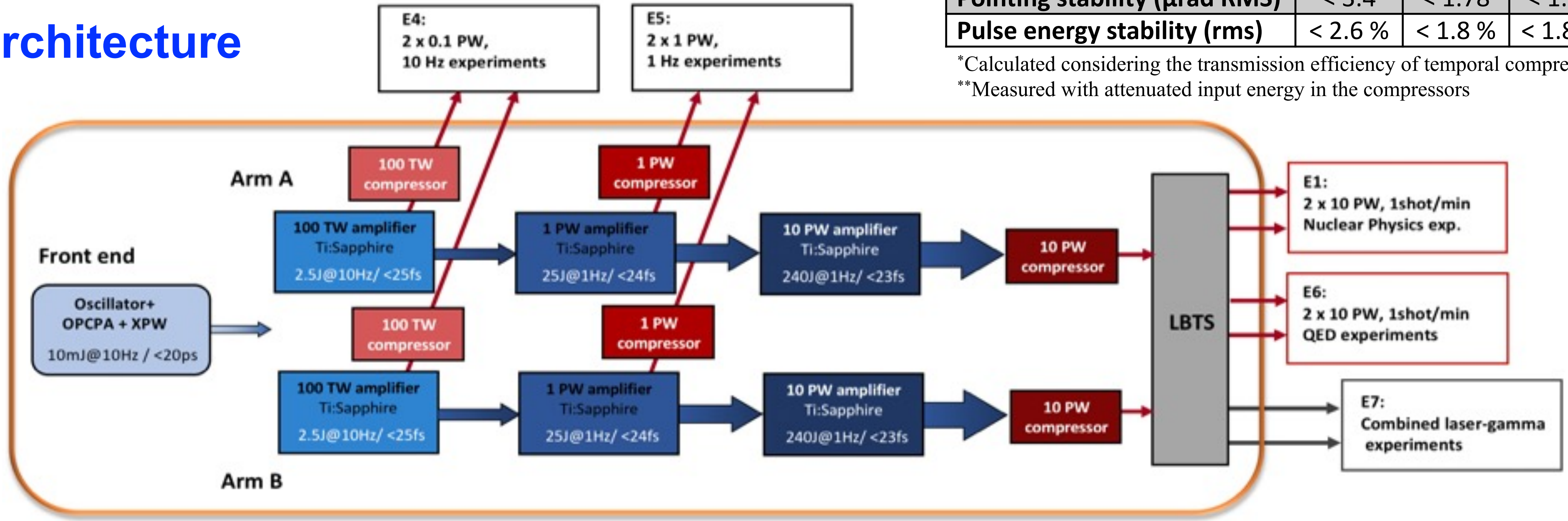
Operational al since 2020

Measured parameters of HPLS

Output type	100 TW	1 PW	10 PW
Pulse energy (J) *	2.5	24	242
Pulse duration (fs) **	< 25	< 24	<23
Repetition rate (Hz)	10	1	1/60
Calculated Strehl ratio from measured wavefront	> 0.9	> 0.9	> 0.9
Pointing stability (μrad RMS)	< 3.4	< 1.78	< 1.27
Pulse energy stability (rms)	< 2.6 %	< 1.8 %	< 1.8 %

*Calculated considering the transmission efficiency of temporal compressors
**Measured with attenuated input energy in the compressors

HPLS architecture



HPLS + LBTS @ 10 PW - Publications

High Power Laser Science and Engineering, (2020), Vol. 8, e43, 15 pages.
doi:10.1017/hpl.2020.41

HIGH POWER LASER SCIENCE AND ENGINEERING

RESEARCH ARTICLE

High-energy hybrid femtosecond laser system demonstrating 2 × 10 PW capability

François Lureau[1], Guillaume Matras[1], Olivier Chalus[1], Christophe Derycke[1], Thomas Morbieu[1], Christophe Radier[1], Olivier Casagrande[1], Sébastien Laux[1], Sandrine Ricaud[1], Gilles Rey[1], Alain Pellegrina[1], Caroline Richard[1], Laurent Boudjemaa[1], Christophe Simon-Boisson[1], Andrei Baleanu[2], Romeo Banici[2], Andrei Gradinariu[2], Constantin Caldararu[2], Bertrand De Boisdeffre[3], Petru Ghenuche[3], Andrei Naziru[3,4], Georgios Kolliopoulos[3], Liviu Neagu[3], Razvan Dabu[3], Ioan Dancus[3], and Daniel Ursescu[3]

[1] *Thales LAS France, 78990 Élancourt, France*
[2] *Thales Systems Romania, 060071 București, Romania*
[3] *Extreme Light Infrastructure – Nuclear Physics, 'Horia Hulubei' National Institute for Physics and Nuclear Engineering, 077125 Bucharest Magurele, Romania*
[4] *University of Bucharest, Faculty of Physics, 077125 Bucharest Magurele, Romania*
(Received 1 August 2020; revised 22 October 2020; accepted 26 October 2020)

Abstract
We report on a two-arm hybrid high-power laser system (HPLS) able to deliver 2 × 10 PW femtosecond pulses, developed at the Bucharest-Magurele Extreme Light Infrastructure Nuclear Physics (ELI-NP) Facility. A hybrid front-end (FE) based on a Ti:sapphire chirped pulse amplifier and a picosecond optical parametric chirped pulse amplifier based on beta barium borate (BBO) crystals, with a cross-polarized wave (XPW) filter in between, has been developed. It delivers 10 mJ laser pulses, at 10 Hz repetition rate, with more than 70 nm spectral bandwidth and high-intensity contrast, in the range of 10^{13}:1. The high-energy Ti:sapphire amplifier stages of both arms were seeded from this common FE. The final high-energy amplifier, equipped with a 200 mm diameter Ti:sapphire crystal, has been pumped by six 100 J nanosecond frequency doubled Nd:glass lasers, at 1 pulse/min repetition rate. More than 300 J output pulse energy has been obtained by pumping with only 80% of the whole 600 J available pump energy. The compressor has a transmission efficiency of 74% and an output pulse duration of 22.7 fs was measured, thus demonstrating that the dual-arm HPLS has the capacity to generate 10 PW peak power femtosecond pulses. The reported results represent the cornerstone of the ELI-NP 2 × 10 PW femtosecond laser facility, devoted to fundamental and applied nuclear physics research.
Keywords: lasers; high-power laser pulses; ultra-short laser pulses

High Power Laser Science and Engineering, (2022), Vol. 10, e21, 5 pages.
doi:10.1017/hpl.2022.11

HIGH POWER LASER SCIENCE AND ENGINEERING

LETTER

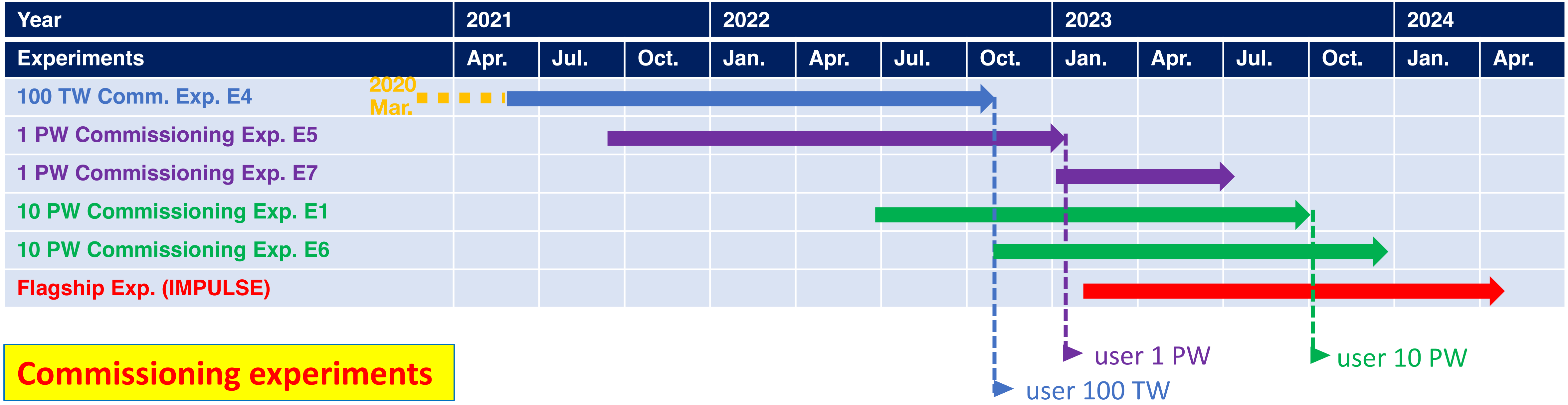
10 PW peak power femtosecond laser pulses at ELI-NP

Christophe Radier[1], Olivier Chalus[1], Mathilde Charbonneau[1], Shanjuhan Thambirajah[1], Guillaume Deschamps[1], Stephane David[1], Julien Barbe[1], Eric Etter[1], Guillaume Matras[1], Sandrine Ricaud[1], Vincent Leroux[1], Caroline Richard[1], François Lureau[1], Andrei Baleanu[2], Romeo Banici[2], Andrei Gradinariu[2], Constantin Caldararu[2], Cristian Capiteanu[2], Andrei Naziru[3,4], Bogdan Diaconescu[3], Vicentiu Iancu[3,4], Razvan Dabu[3], Daniel Ursescu[3,4], Ioan Dancus[3], Calin Alexandru Ur[3], Kazuo A. Tanaka[3,5], and Nicolae Victor Zamfir[3]

[1] *Thales LAS France, 78990 Élancourt, France*
[2] *Thales Systems Romania, 060071 Bucuresti, Romania*
[3] *Extreme Light Infrastructure - Nuclear Physics, IFIN-HH, 077125 Magurele, Romania*
[4] *Physics Doctoral School, Bucharest University, 077125 Magurele, Romania*
[5] *Laser Engineering, Osaka University, Osaka 565-0871, Japan*
(Received 7 March 2022; revised 31 March 2022; accepted 17 May 2022)

Abstract
We report on the generation and delivery of 10.2 PW peak power laser pulses, using the High Power Laser System at the Extreme Laser Infrastructure – Nuclear Physics facility. In this work we demonstrate for the first time, to the best of our knowledge, the compression and propagation of full energy, full aperture, laser pulses that reach a power level of more than 10 PW.
Keywords: high-power laser; ultra-short laser pulses

Implementation ⇒ Operation 2020-2023

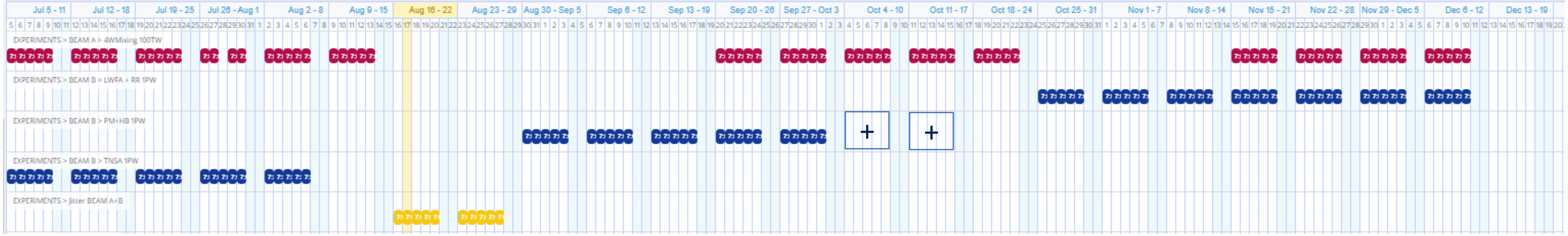


Commissioning experiments

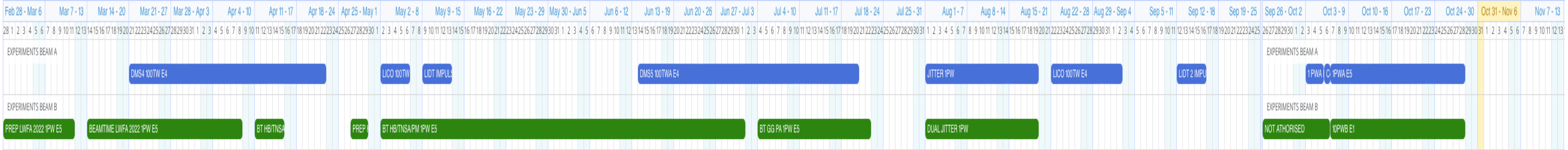
100 TW (E4): 2022	Four-wave mixing in vacuum, in search of dark matter candidates X ray production through betatron emission
1 PW (E5 & E7): 2022-2023	Benchmark TNSA proton acceleration Benchmark LWFA electron acceleration Optimization of high charge, stable electron acceleration
10 PW solid target (E1): 2023	Demonstrate extreme focal intensity through laser-γ conversion ("γ-flash") Demonstrate over 200 MeV proton acceleration (neutron generation add-on) Dense heavy ion beams for nuclear physics
10 PW gas target (E6): 2023	10 PW laser wakefield acceleration of multi GeV electron beams

HPLS Operation 2021&2022

Beam time delivered in 2021
16 weeks @ 100 TW output & 20 weeks @ 1 PW output



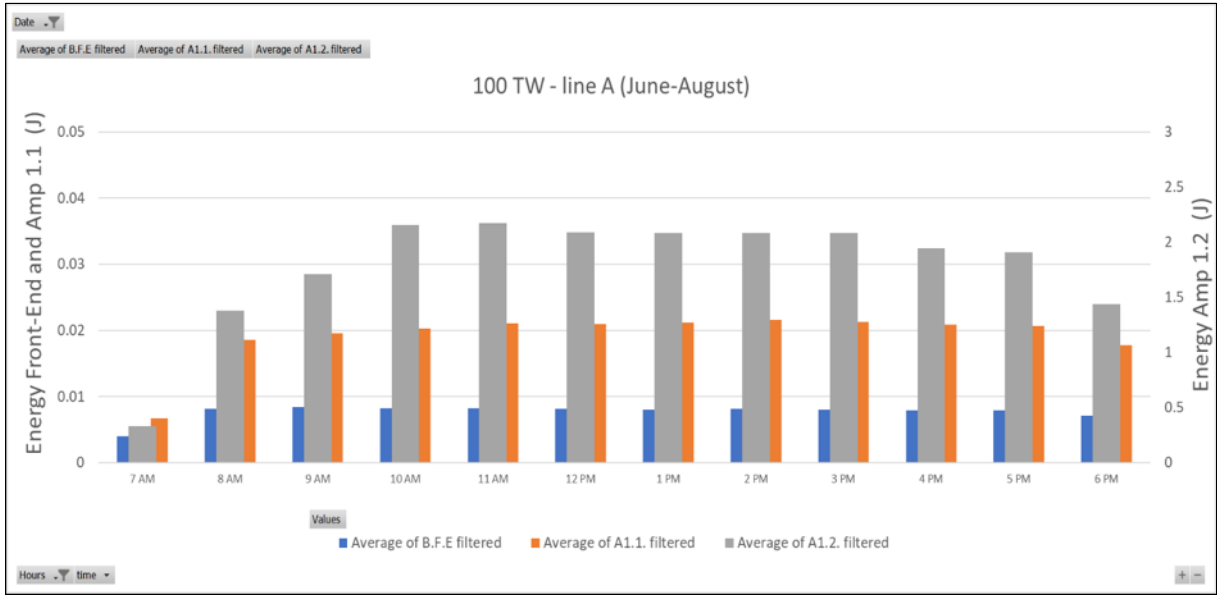
Beam time delivered in 2022
(16 weeks @ 100 TW output & 27 weeks @ 1 PW output & 5 weeks @ 10 PW output



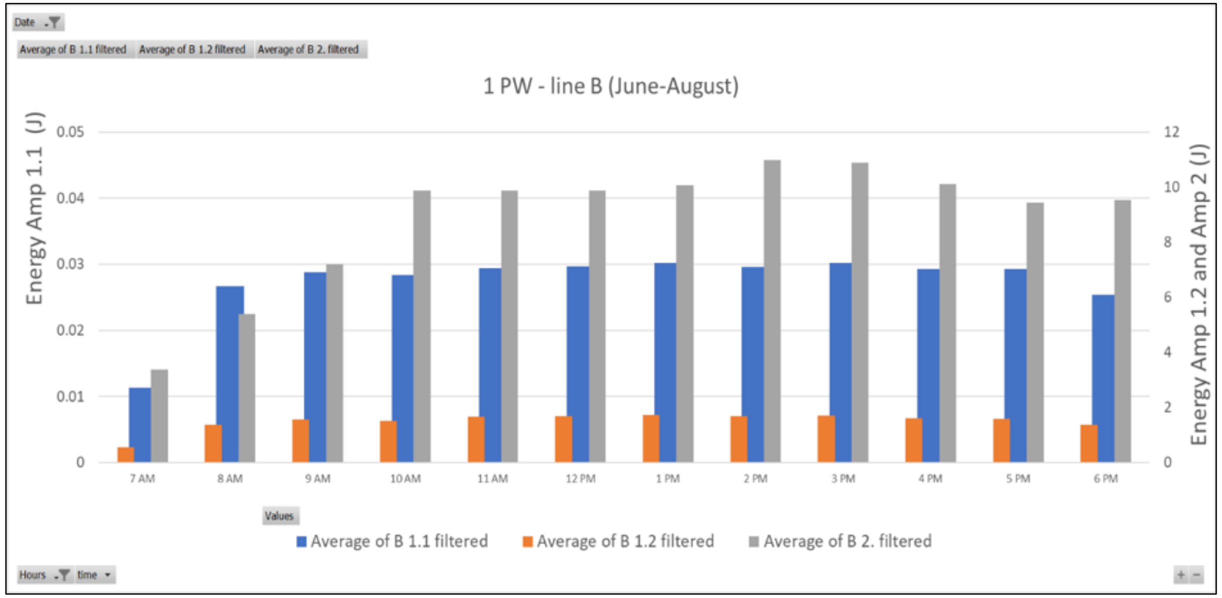
HPLS Operation in 2021

Typical operation day:

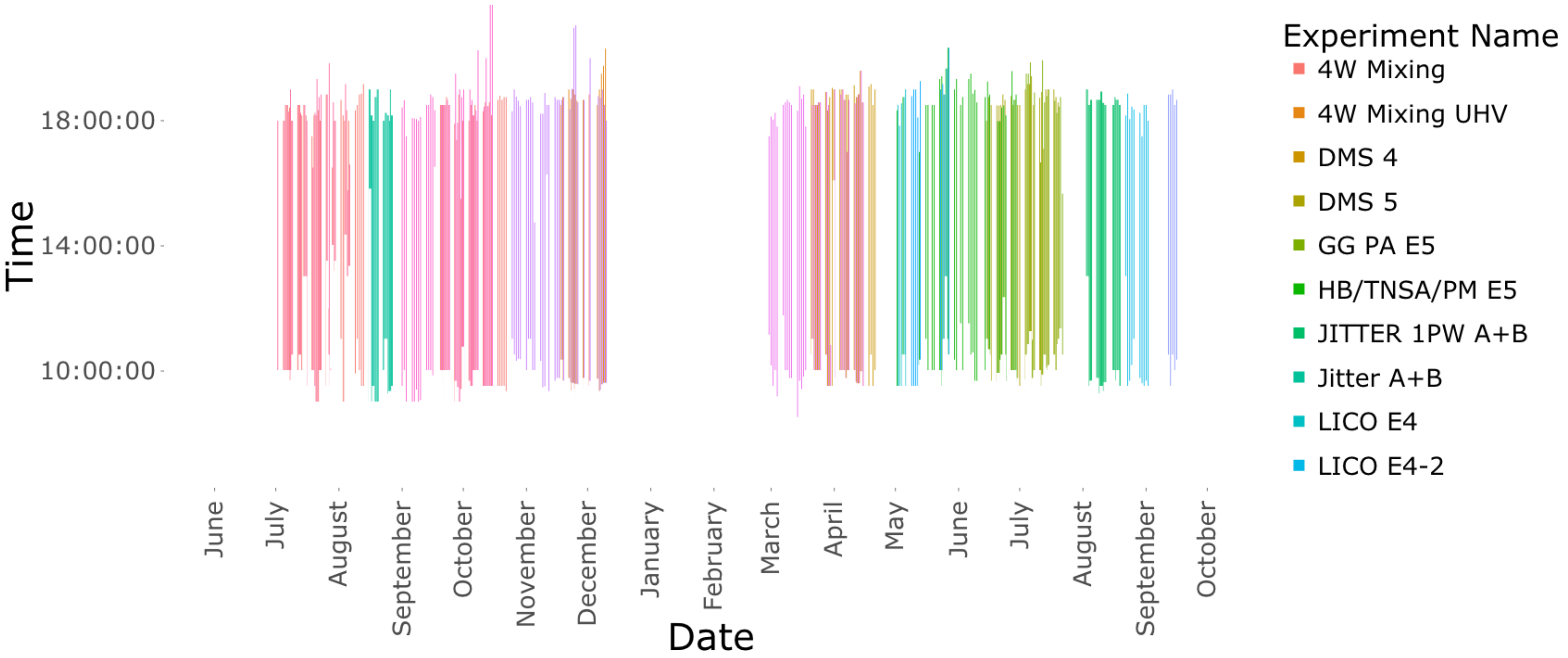
100 TW



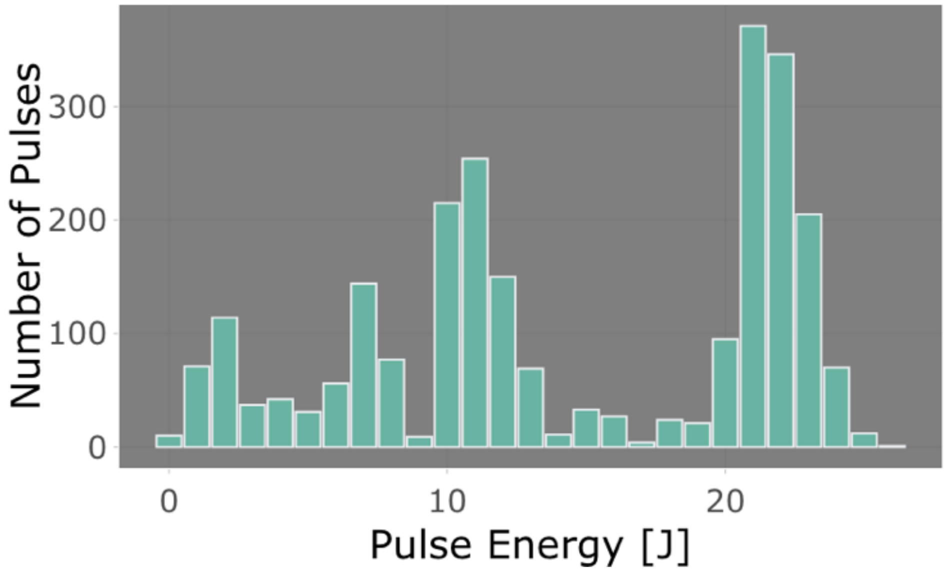
1 PW

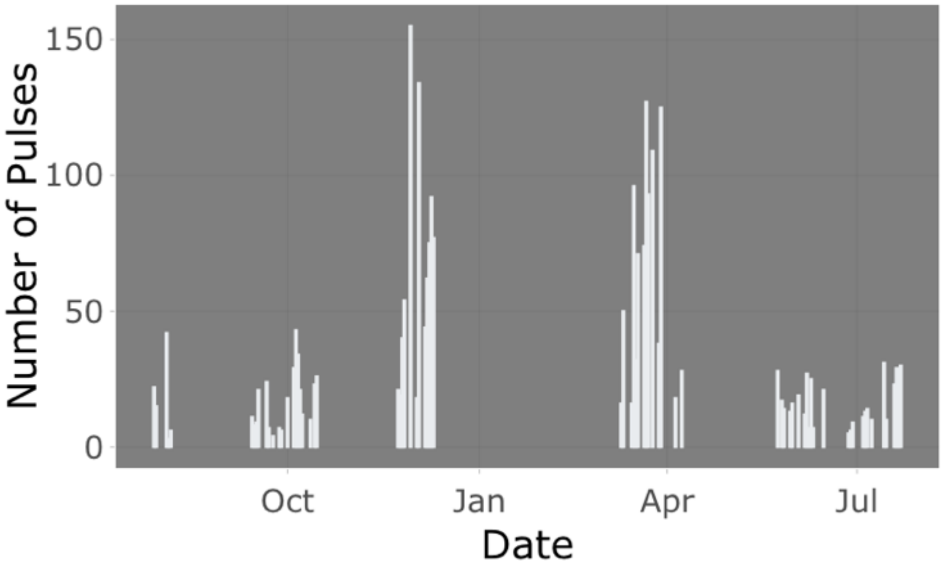


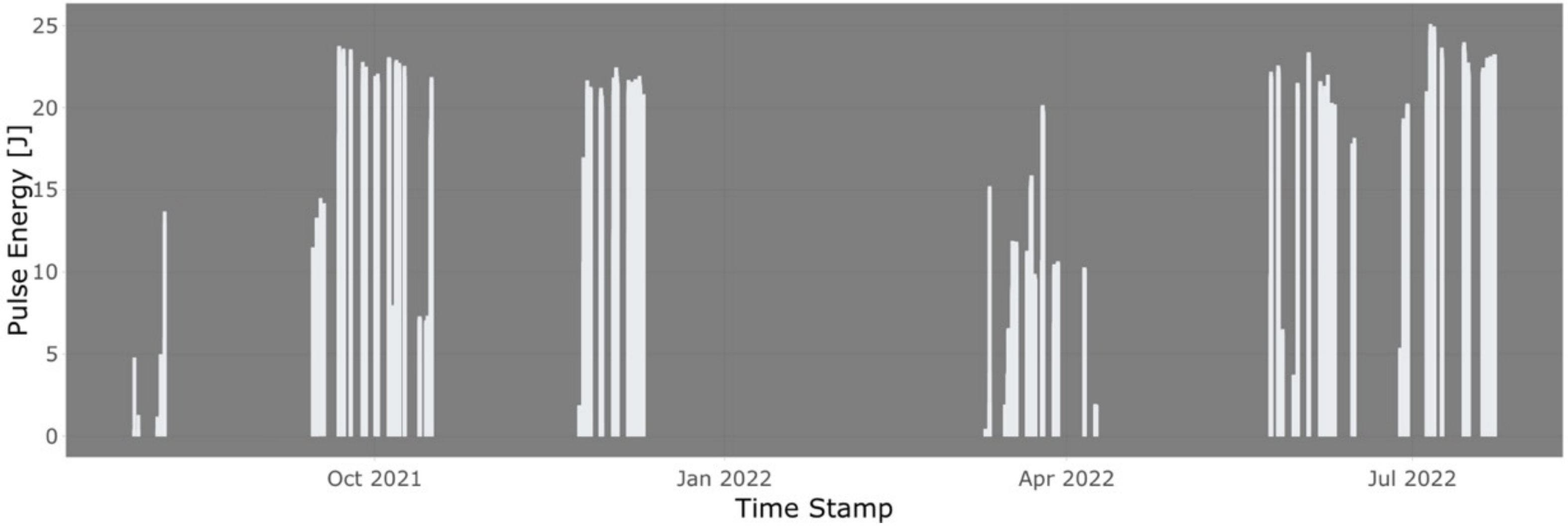
Beam Delivery in 2021&2022 – on both arms



Beam Delivery in 2021&2022 – 1 PW E5







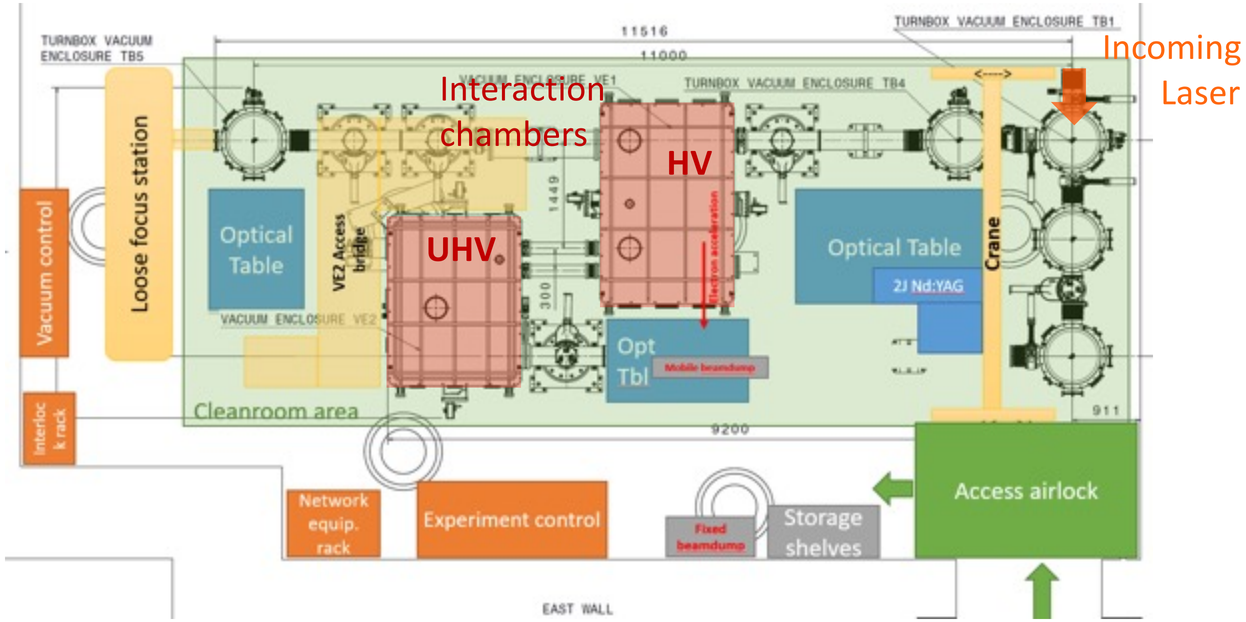
2371 shots

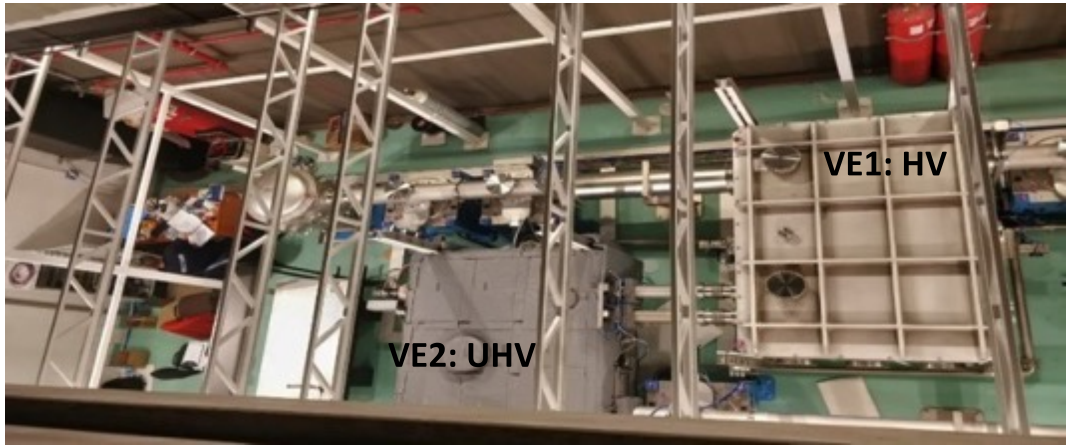
100 TW Experimental area E4

E4: 100 TW

LGED department
(Head of LGED: Ovidiu Tesileanu)

Contact Person: Madalin Rosu
Email: madalin.rosu@eli-np.ro





100 TW area infrastructures

- 2 interaction chambers in stainless steel (**HV – VE1** and **UHV – VE2**)
- 5 turning boxes
- 10 turbomolecular pumps (maglev), 1 cryo-pump
- Integrated control system, automatic / manual modes
- VE1 typical pump time: 60 mins; venting + opening: 45 mins
- Possibility to control the vacuum level up to 10^{-6} mbar
- Large soft-wall cleanroom – equiv. ISO7

Large Optics available

- 6” flat mirrors w/ motorized mounts
- F = 1500mm off-axis parabola, AOI = 6.25°
- F = 520mm off-axis parabola, AOI = 7.5°

Other components for the setup

- movement stages and detectors, optical tables, optical diagnostics available on-site

https://users.eli-np.ro/experimental_facilities.php

100 TW Laser beam features

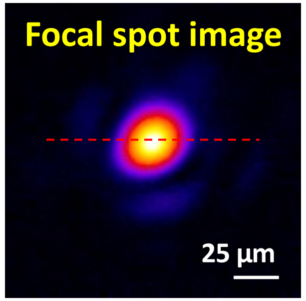
100 TW laser beam features

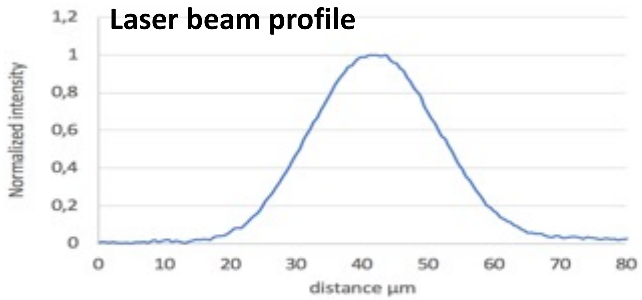
- Energy: < 2.5 J
- Pulse duration: < 25 fs
- Central wavelength: ~ 810 nm
- Beam diameter: ~ 54 mm
- Laser pointing fluctuation on target:
  ~ ±7 μrad
- Energy stability: <2.5%
- Repetition rate: 10 Hz (single shot possible)

For solid target experiments: the angle of incidence on target must be > 1/F# to avoid BR issues.

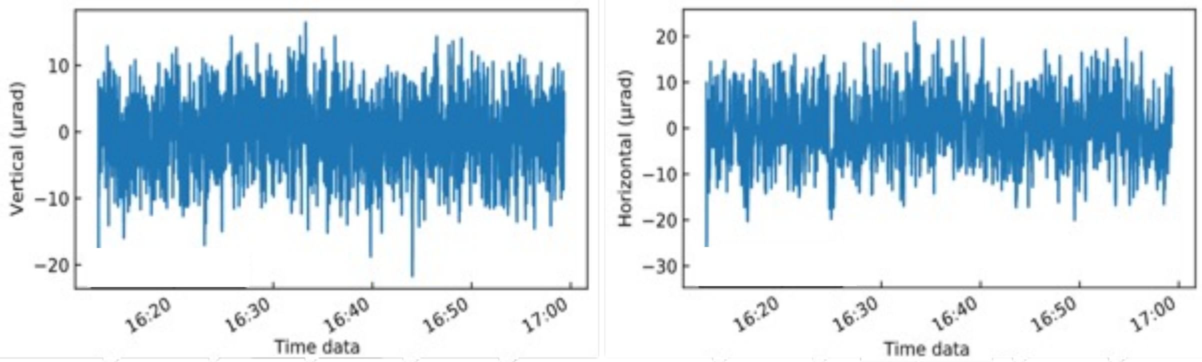
Example of focus properties

- Parabolic mirror: 1.5 m focal length (F# ~28)
- Spot size diameter: ~ 22±2 μm at FWHM
- Encircled energy ~ 70% @ $1/e^2$





- Laser pointing stability



Laser pointing stability representing the laser far-field horizontal and vertical pointing fluctuation as function of time. The r.m.s. of the fluctuations is ±7 μrad.

100 TW Diagnostics

Light detectors

- Energy meters:
  10µJ-2.5mJ: Gentec QE95LP-S-MB-QED-D0,
  1mJ-250J: QE8SP-B-BL-D0
- Wavefront sensor: Phasics SID4-H
- CMOS cameras: Basler acA2440-20gm, daA3840-45uc
- Photomultipliers 300-700 nm:
  Hamamatsu H10721-110, H10721-20
- Fast photodiodes 200-1100 nm:
  Thorlabs DET025A/M, DET10A2, DET08C/M, Alphalas UPD-35-UVIR-P
- Optical Spectrometers in visible and near-infrared: Ocean Optics HR4000 CG-UV and NQ512-1.7
- Optical plasma probe (as a pick-up from the main laser beam): 1w, 1/2'' dia. and up to 100 mJ with pulse duration as the main laser beam, for Interferometry and Shadowgraphy.

Charged particle diagnostics

- Thomson parabola
- Stack detector
- Electron spectrometer
- ICT

Nd:YAG laser available in E4:

- Litron LPY 7864G-10
- Single Longitudinal Mode, 2nd and 3rd harmonic modules available
- Synchronization with HPLS main laser via Stanford Research Systems DG645 delay generator
- Max. 2.75 J, pulse width 12-15 ns

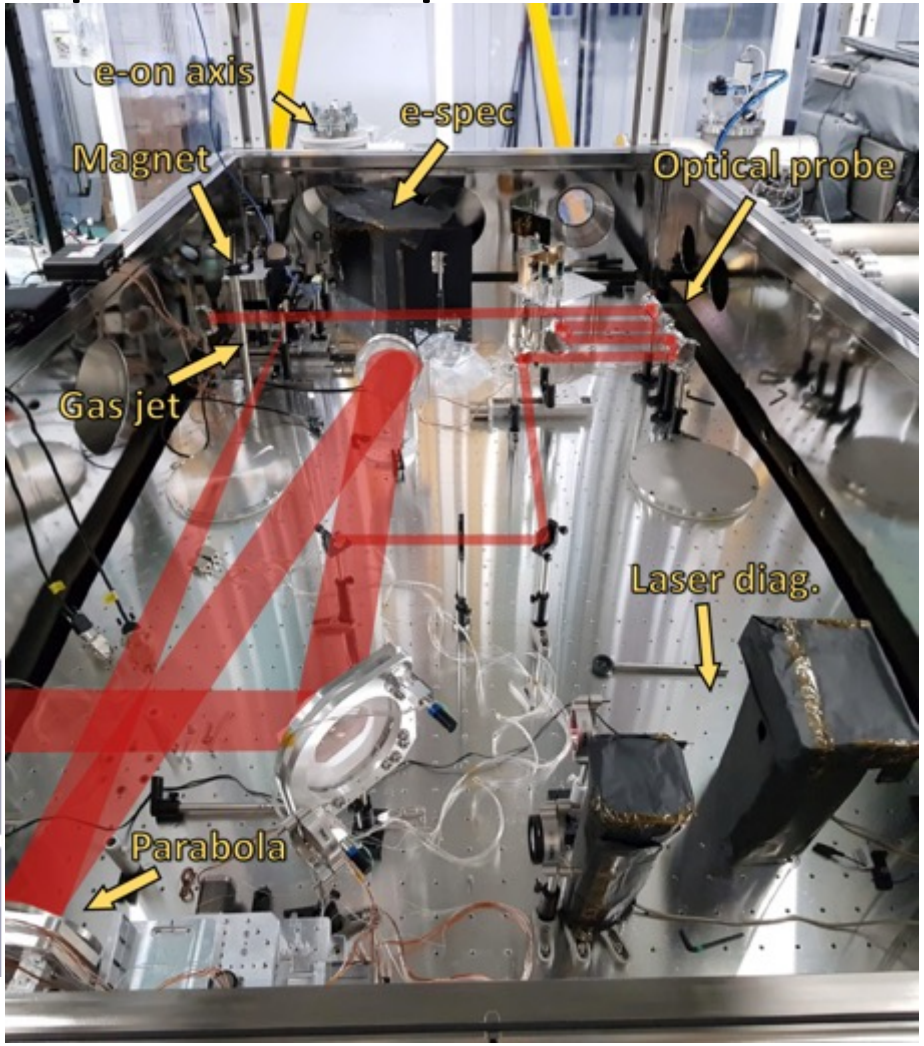
The 100 TW LWFA results

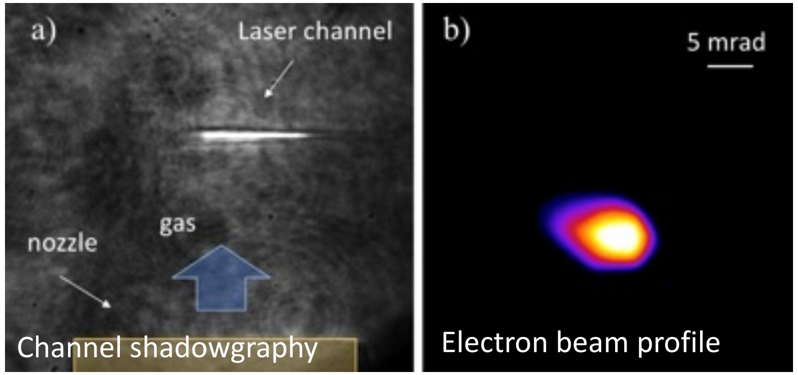
First operation in 2020

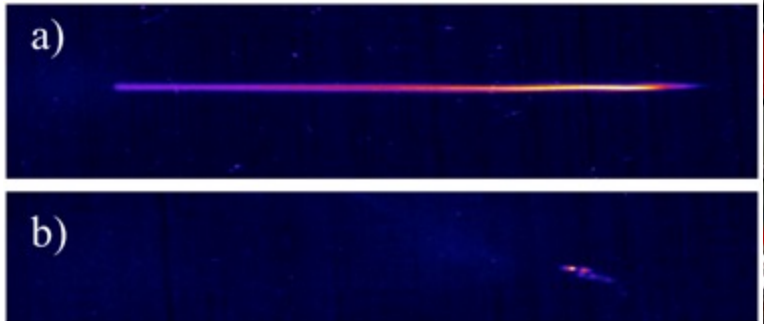
Electron acceleration in gas targets (P.I. D. Doria)

- **Gas jet target 2mm long**
- SourceLab valve with controller SL-Smartshot (fast solenoid valve driver LX-03R and electro-magnetic valve A2-6443)
- **Pure He** and **mixture He +2% N_2** were used
- F=1500mm parabola
- Max. electron energy attained with **Helium gas ≈220 MeV** with an energy spectrum having a certain degree of monochromaticity
- Max. electron energy reached using the **gas mixture ≈ 320 MeV** with a continuum energy spectrum, as expected when using a dopant such as N_2
- **Electron diagnostics:** spectrometer (up to 500 MeV) – 16 cm long dipole magnet with 3 cm gap and ~0.7 T B-field, and a Lanex screen

Experimental setup







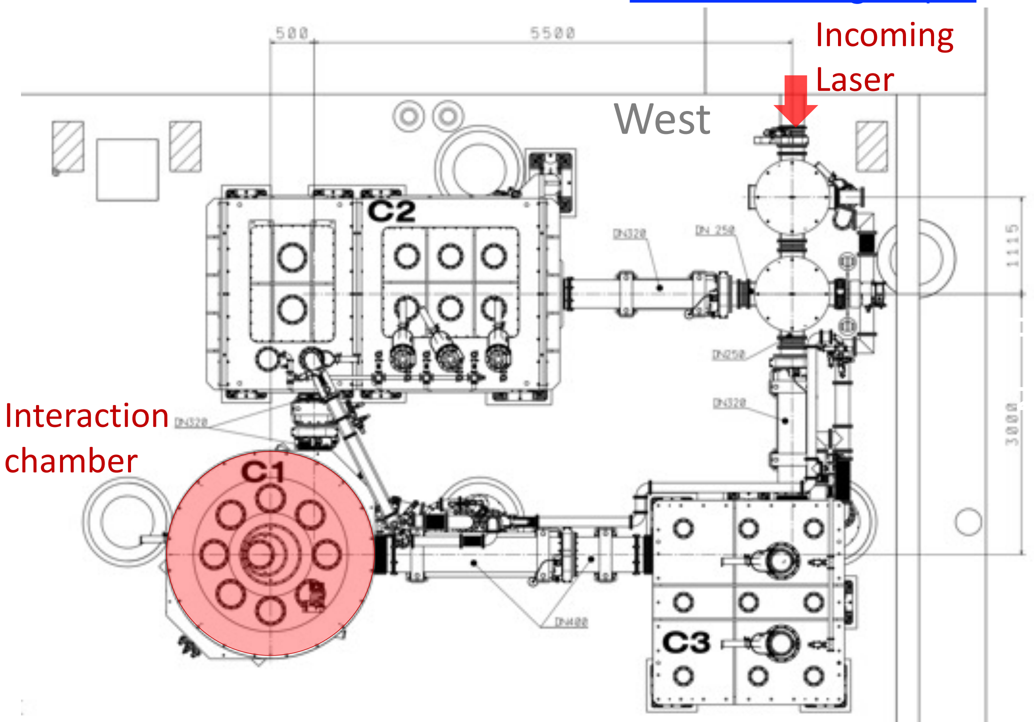
Electron spectrometer raw images: a) signal with admixture, b) with pure He.

1 PW Experimental Area E5

E5: 1 PW

LDED department
(Head of LDED: Domenico Doria)

Contact Person: Mihail Cernaianu
Email: mihail.cernaianu@eli-np.ro



1 PW area infrastructures

- 1 main interaction chamber (**C1**) in Aluminium
- 2 turning boxes + 2 large chambers (**C2, C3**) in stainless steel
- 9 turbomolecular pumps (1 cryo-pump on demand may be possible)
- Integrated control system, automatic /manual modes
- C1 typical pump time: 90 mins; venting + opening: 60 mins
- Vacuum level up to 10^{-6} mbar
- Small soft-wall cleanroom – equiv. ISO7

Large Optics available

- 12”x8’’ rectangular flat mirrors w/ motorized mounts
- F = 5000mm off-axis parabola, AOI = 45°
- F = 707mm off-axis parabola, AOI = 22.5°

Other components for the setup

- movement stages and detectors, optical tables, optical diagnostics available on-site

https://users.eli-np.ro/experimental_facilities.php

1 PW Laser beam features

100 TW laser beam features

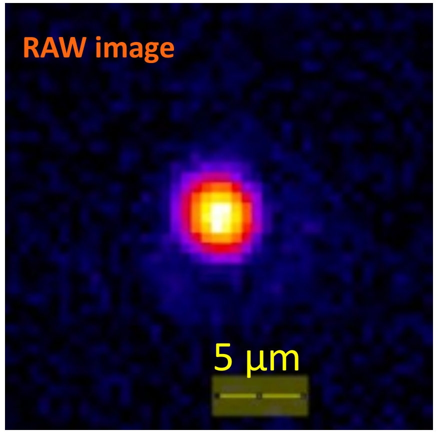
- Energy: < 24 J
- Pulse duration: < 24 fs
- Central wavelength: ~ 810 nm
- Beam diameter: ~ 190 mm
- Laser pointing fluctuation on target: ~ ±1.5 μrad
- Energy stability: <2.5%
- Repetition rate: 1 Hz (single shot possible)

For the 2022-2023 user campaign only experiments with solid target and short focal are offered, SPM can be set on request

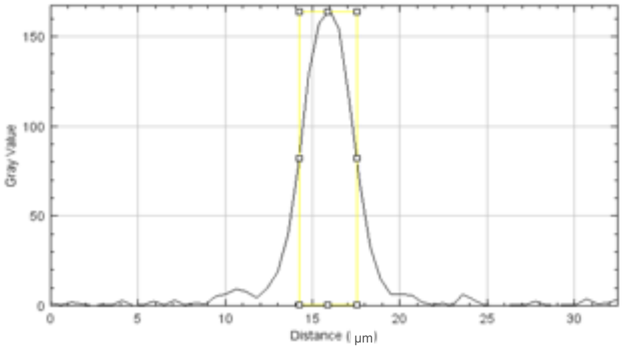
To avoid BR issues, the angle of incidence on target must be > 1/F# (i.e. >22.5˚) w/o PM and > 1/2F# with PM

Example of focus properties

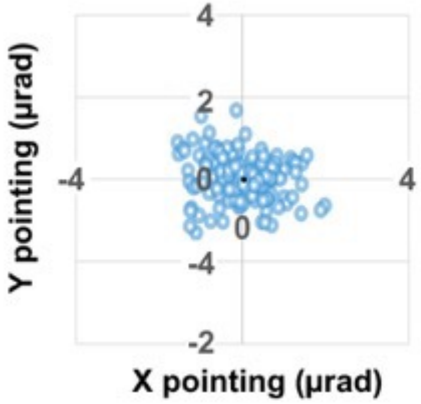
- Parabolic mirror: 707 mm focal length (F# ~3.7)
- Spot size diameter: ~ 3.6 ± 2 μm at FWHM
- Encircled energy ~ 65% @ $1/e^2$



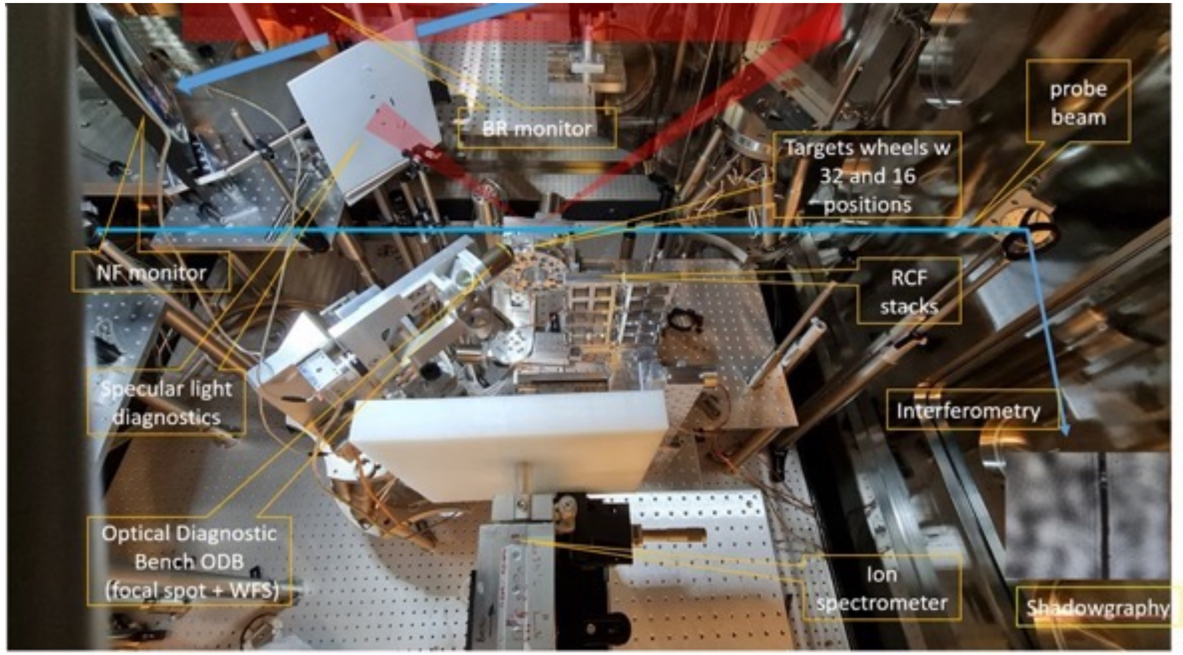
Laser beam profile



- Laser pointing stability

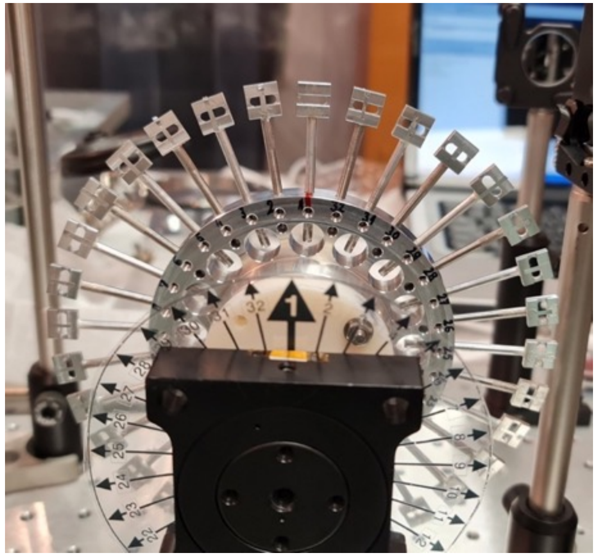


1 PW Solid target experiment diagnostics



Main diagnostics:

- 16 RCF stacks
- TP Ion spectrometer: online Lanex readout or IP plates.
- Laser specular and back reflection energy measurement
- Specular and back reflected laser spectrum
- Laser near field (full aperture), Far field, Energy, Spectrum (pick-up) on-shot
- Plasma probing: Shadowgraphy, Interferometry
- Pulse duration (Laser bay and Experimental area)
- Temporal Contrast measurement



Multi – Target system:

32 targets loaded for a day of shooting

Microscope objective for target alignment and focal spot optimization

1 µm alignment precision

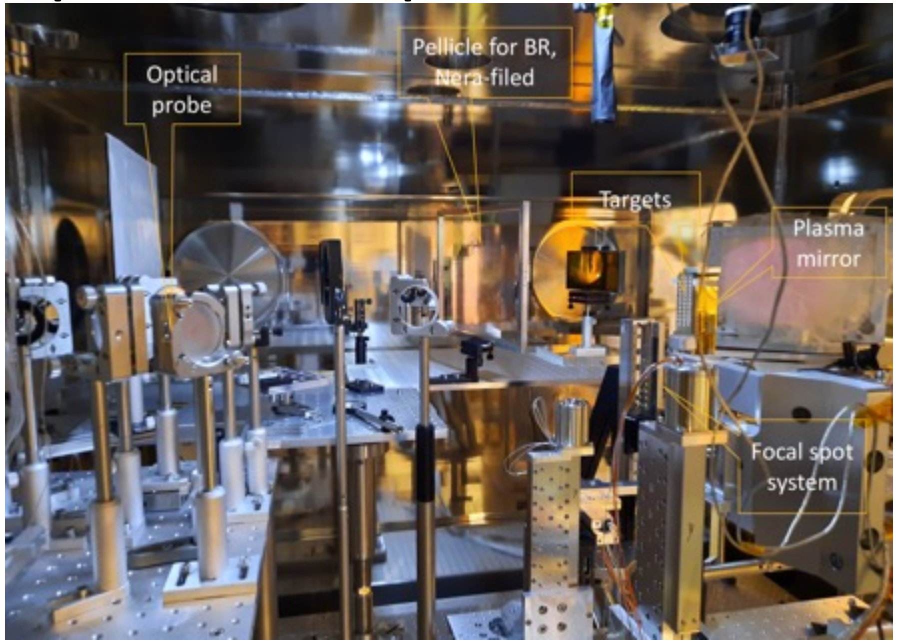
The 1 PW TNSA results

First operation in 2021

Ion acceleration from solid targets (P.I. M. Cernaianu)

- **Thick** and **thin foils** (e.g. Al, CH, DLC)
- F=710mm parabola
- **Max. proton energy** attained of **50 MeV** with SPM
- **Max. ion energy** attained: carbon ion **15 MeV/n** from DLC target by using a SPM

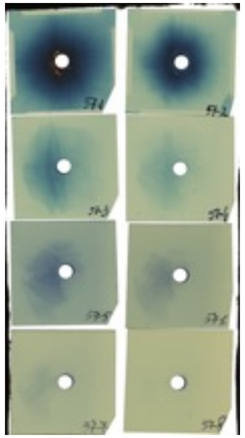
Experimental setup



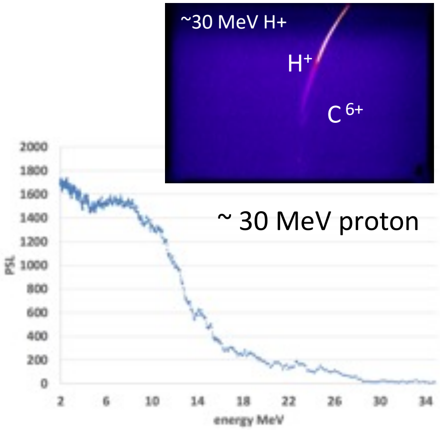
Shot parameters with plasma mirror

Laser beam power:
23.1 J, ~26 fs ➔ 880 TW
Intensity on target: ~ 4 x10^{21} W/cm^2
Target: 1.5 µm Al foil

Radiochromic film stack

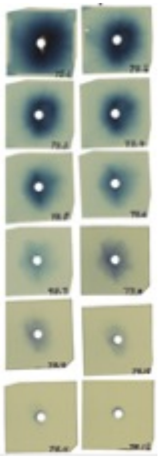


Thomson parabola data

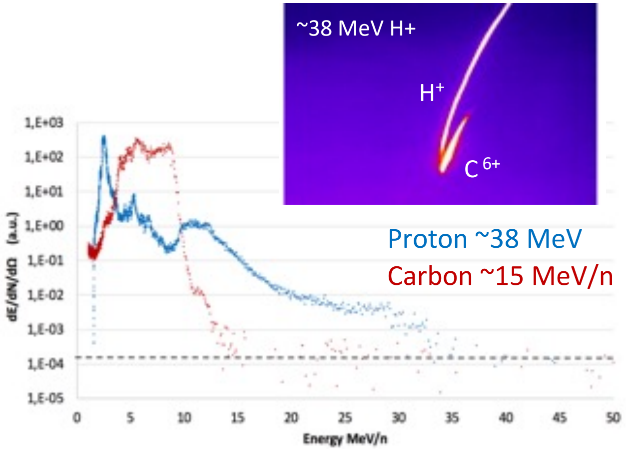


Laser beam power:
19 J, ~75 fs ➔ 250 TW
Intensity on target: ~ 1 x10^{21} W/cm^2
Target: 380nm DLC (built in house)

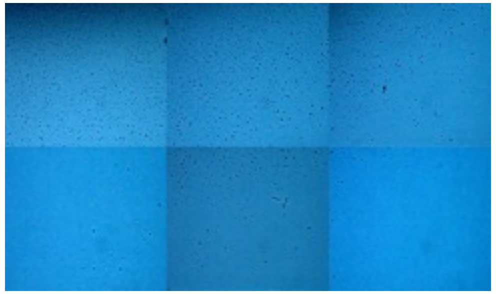
Radiochromic film stack



Thomson parabola



CR-39 show E_p > 50 MeV



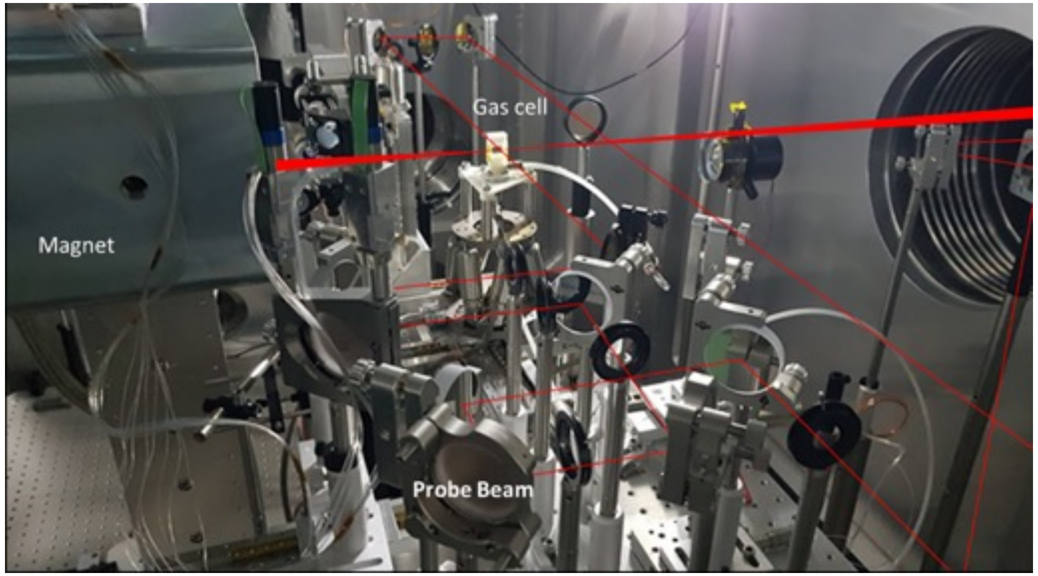
Proton density ~ 10^3 protons /cm^2

The 1 PW LWFA results

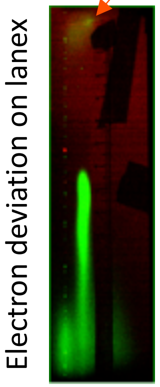
First operation in 2021
Electron acceleration in gas targets (P.I. P. Ghenuche)

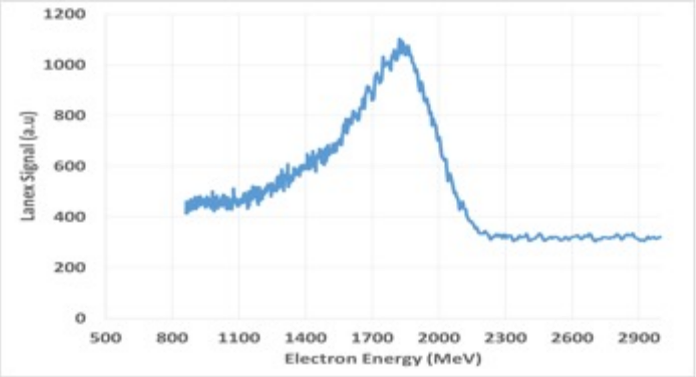
- **Gas jet target** and **gas cell** from **2mm to 2 cm long**
- SourceLab variable metal gas cell, fix 3D printed gas cell, 2 mm metal gas jet
- **Pure He** and mixture **He +2% N_2** were used
- F=5000mm parabola
- Max. electron energy attained with both **Helium gas and admixture of ≈ 2 GeV**
- **Electron diagnostics**: spectrometer (up to 3 GeV) – 30 cm long dipole magnet with 3 cm gap and ~1 T B-field, and a Lanex screen

Experimental setup

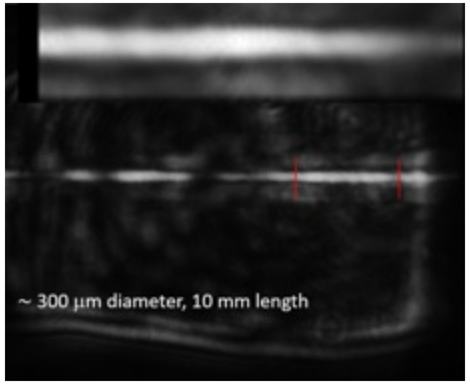


zero point

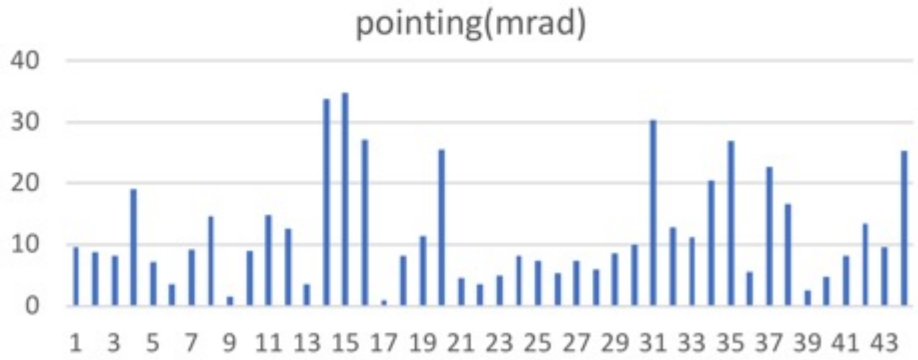




Electron Beam Energy Spectra for pure He

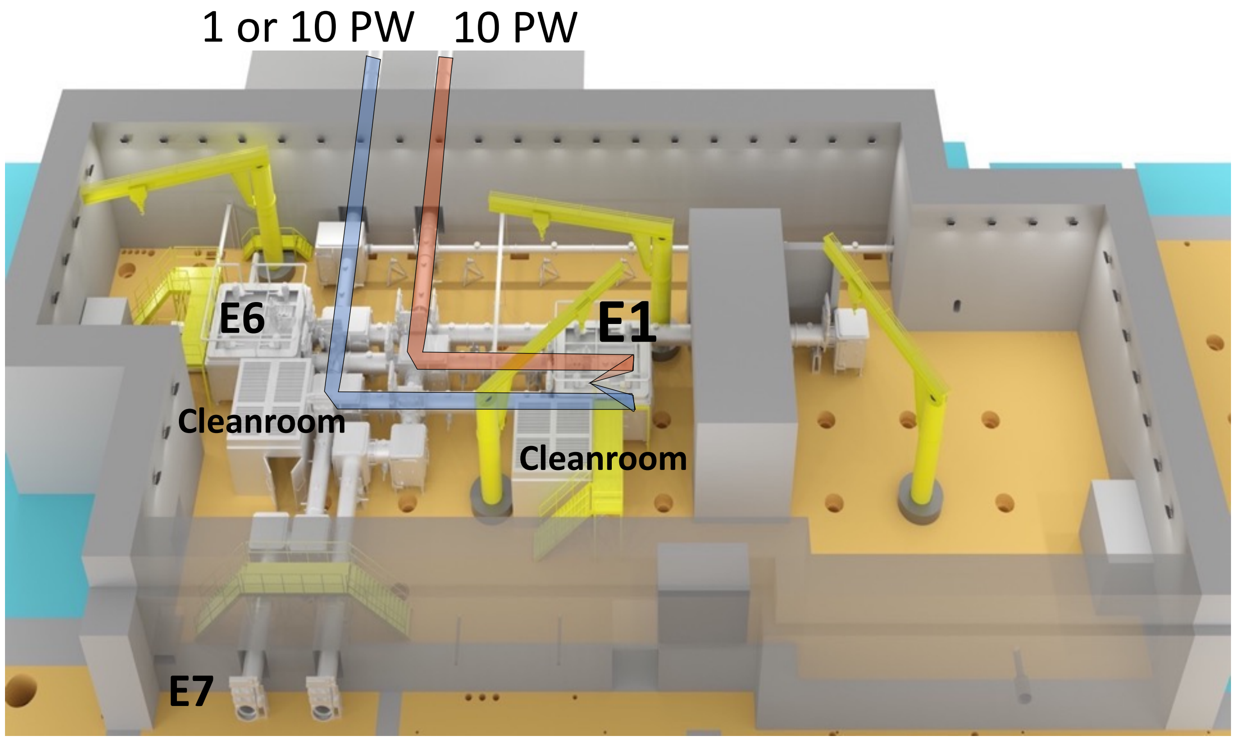


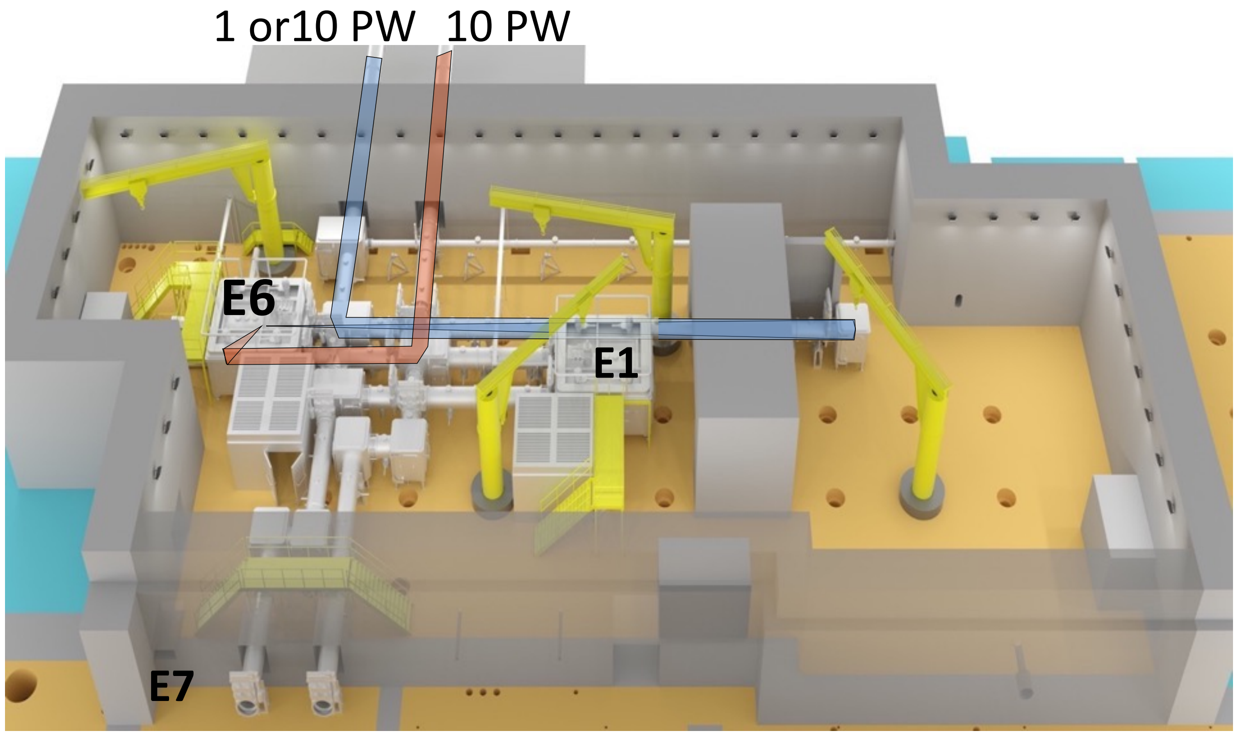
Shadowgraphy and WFS (plasma channel)



Electron Beam Pointing in a typical day from gas admixture

Next: Commissioning of E1 & E6 @ 10 PW and E7 @ 1 PW





E1 target area (solid target) – Nuclear physics

- 2 x 10 PW laser beams: 240 J, 23 fs, 810 nm, ~ 45 cm dia. FWHM (or 10 PW @ 1/60 Hz and 1 PW @ 1 Hz)
- 2 Short focal parabolic mirrors F2.7
- 1 Plasma mirror
- 1 Cleanroom
- Experimental chamber: L x W x H of 400 x 330 x 178 cm^3

E6 target area (gas target) - QED

- 2 x 10 PW laser beams: 240 J, 23 fs, 810 nm, ~ 45 cm dia. FWHM (or 10 PW @ 1/60 Hz and 1 PW @ 1 Hz)
- 1 Short focal - parabolic mirrors F2.7
- 1 Long focal ~30 m - spherical mirror F60 @ 10 PW
- 1 Plasma mirror
- 1 Cleanroom
- Experimental chamber: L x W x H of 400 x 330 x 178 mm^3

Commissioning of 10 PW experiments in E1 and E6

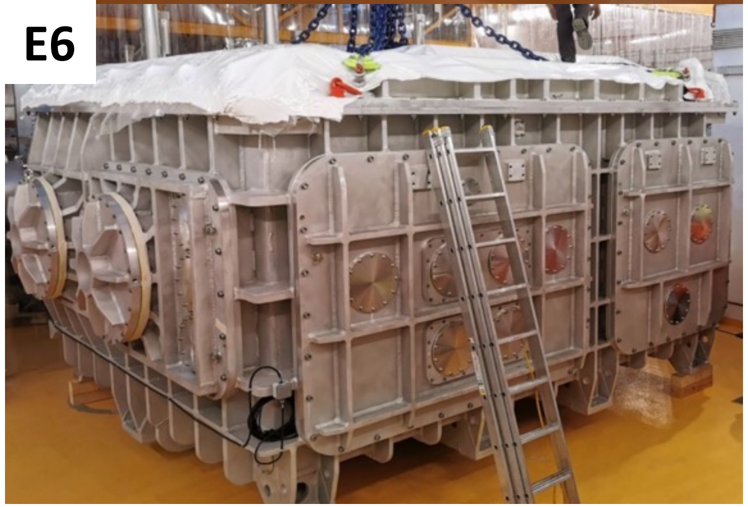
LBTS

E1

Long focal mirror

Overview

E6



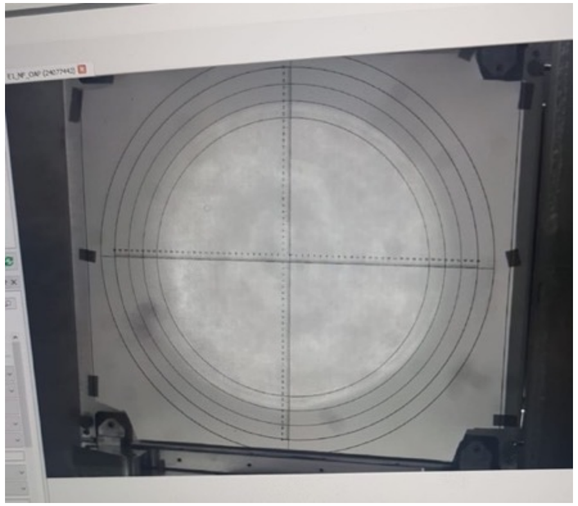
Large Optics - 30 m focal spherical mirror

- 1.5 m short focal off-axis parabolas

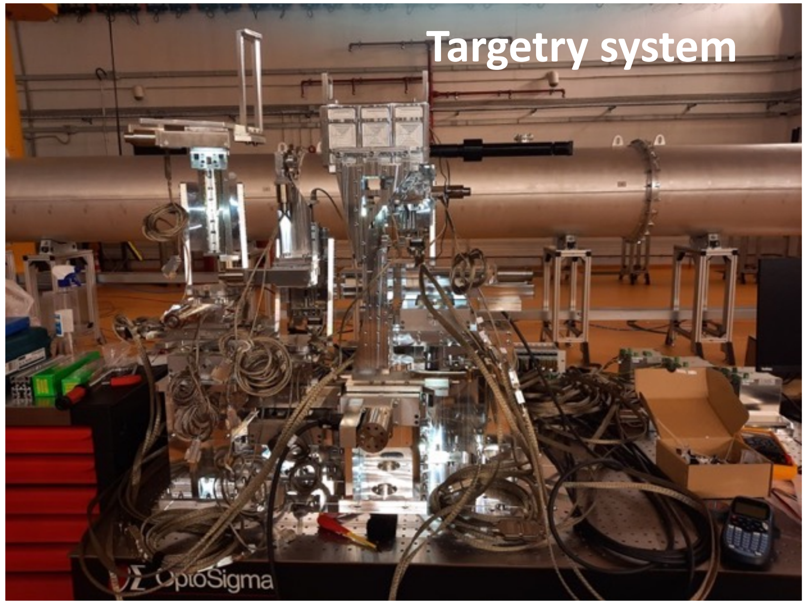
The installation of the short focal mirror in E1 area is done along with full diagnostic benches

Preparation of 10 PW E1 interaction chamber

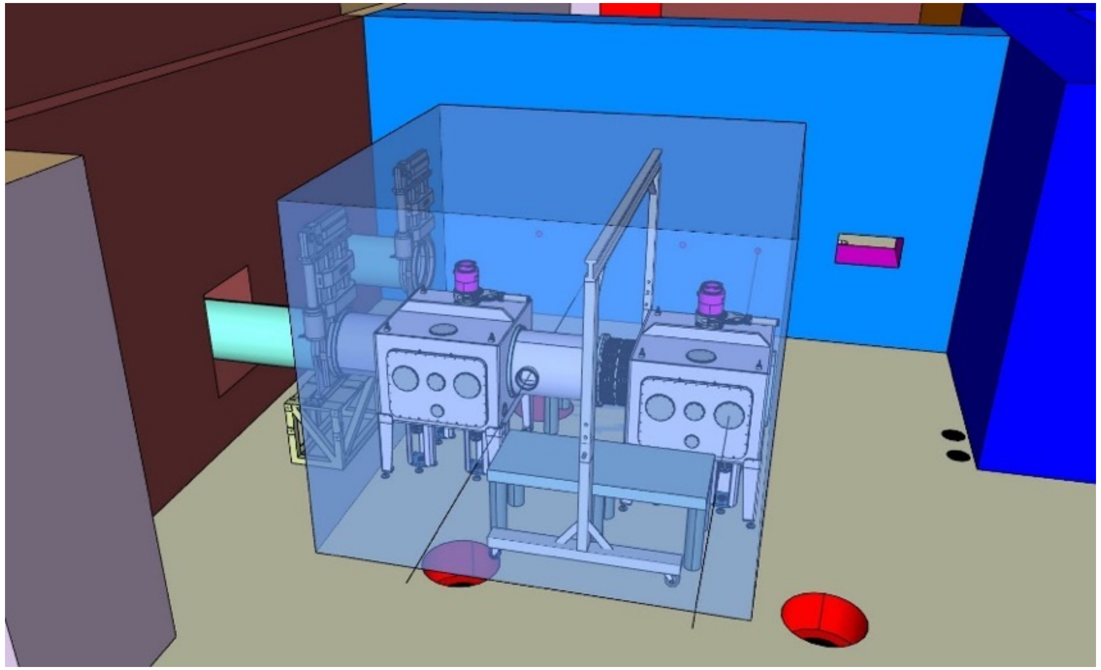
Near-Field on parabola



E1 chamber: short focal mirror



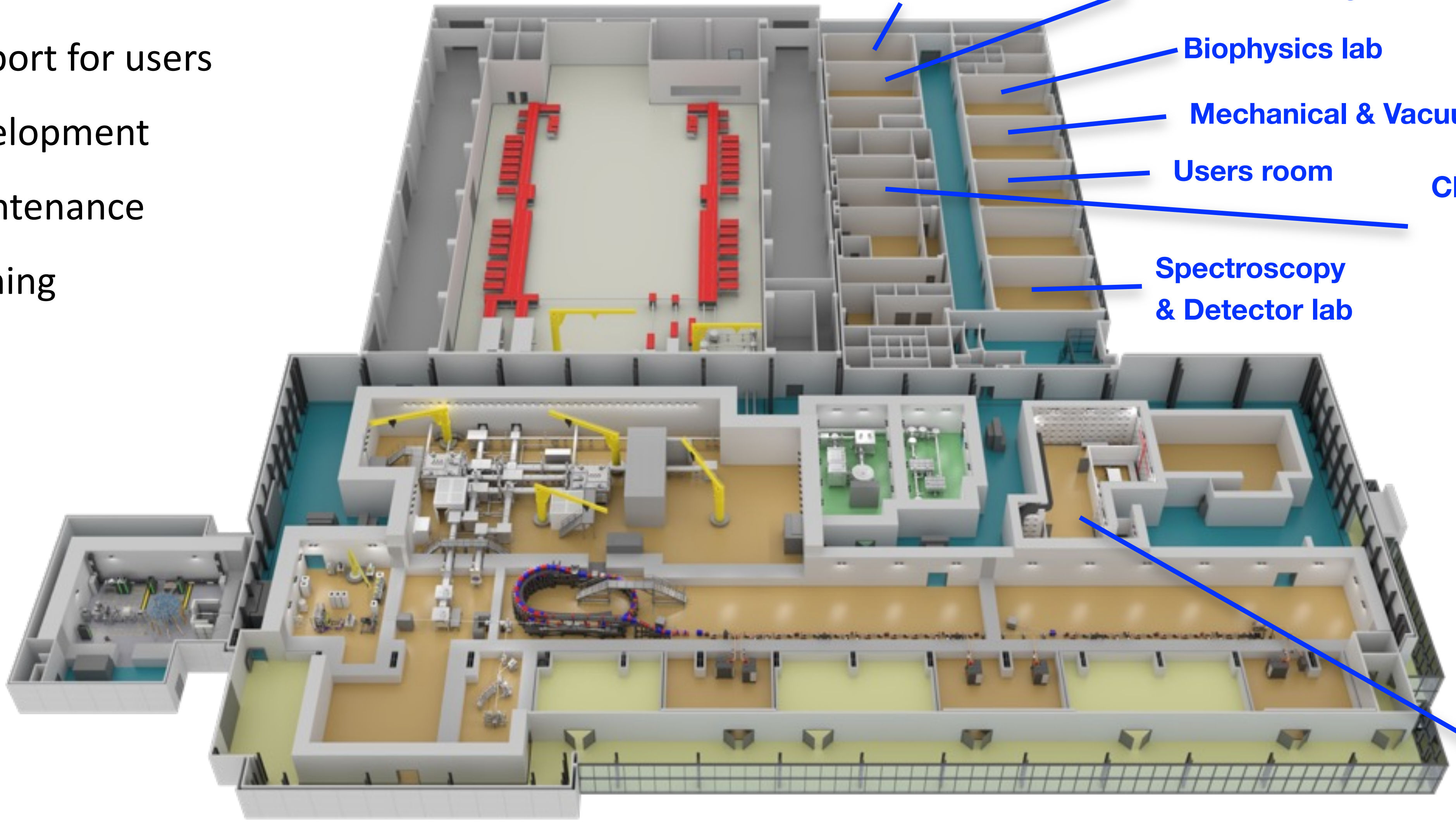
Preparation of E7 interaction chamber



- **First stage: 1 PW pulses @ 1 Hz**
- **Then: Multi-PW pulses + Electrons or gamma pulses from VEGA**
- Commissioning experiment endorsed by ISAB: PPEx – Production and photoexcitation of isomers
- Radiation reaction
- Pair creation in vacuum: ELI-NP whitebook, Prof. Habs
- Vacuum polarization
- All-optical vacuum birefringence: S. Ataman, Phys. Rev. A 97, 063811
- Ability to measure energy and polarization of high-energy gamma photons – the GPC detector (Gamma Polari-Calorimeter)

Experimental building: Laboratories & Workshops

- Support for users
- Development
- Maintenance
- Training



http://www.eli-np.ro/labs.php

Laboratory Support

http://www.eli-np.ro/labs.php

Optics Laboratory (D. Ursescu)

Bio Laboratory (M. Voda)

Laser Experiments Diagnostics Laboratory (V. Nastasa)

A laboratory support for testing and setting up diagnostics, and processing/analyzing detectors/films (e.g., CR39 etching)

LP14 laboratory

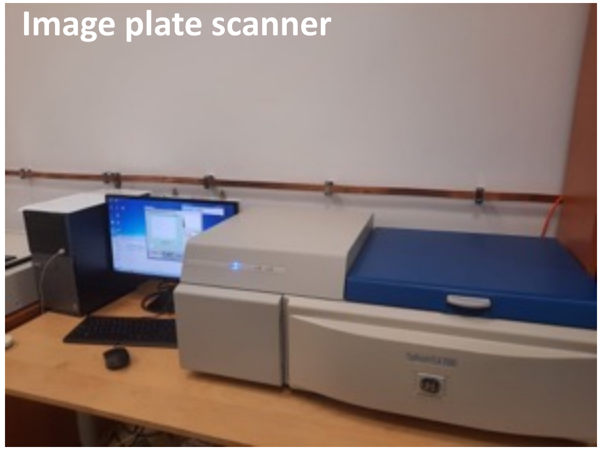
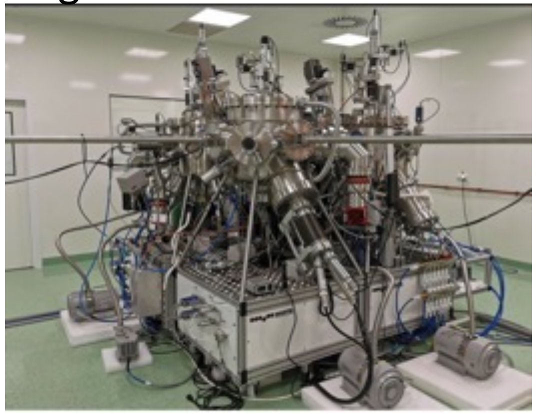


Image plate scanner

Target Laboratory (V. Leca)

A target laboratory support for fabrication and characterisation of solid targets

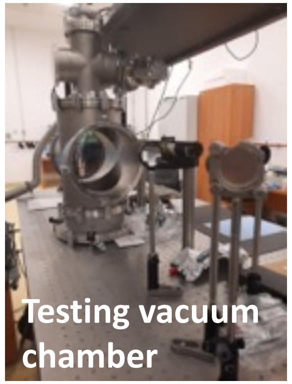


Dosimetry Laboratory (I. Mitu)

Personnel and area dose monitoring

Radioprotection training

Laser cutter machine for RCF and CR39



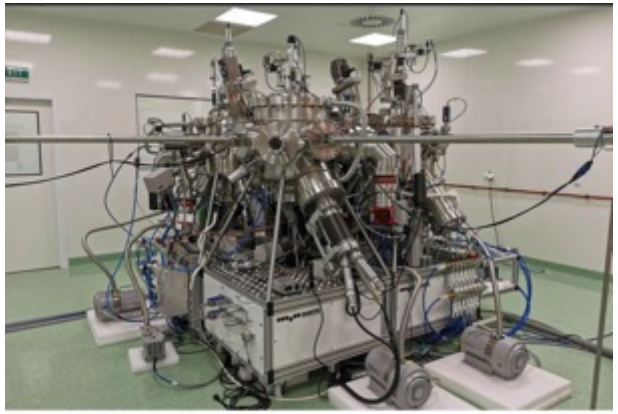
Testing vacuum chamber

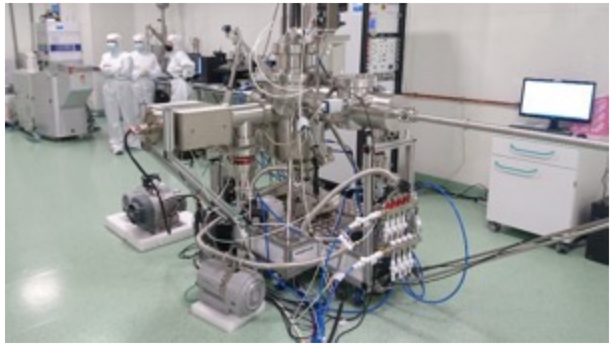
RCF scanner

Target Laboratory Support

http://www.eli-np.ro/target_lab.php

Capabilities:	Tools:
Fabrication of (ultra)thin/thick films (free-standing or supported)	RF/DC sputter deposition, e-beam evaporation, spin-coating, electro-chemical synthesis.
Micro/nano-structuring (gratings, nanoparticles, nano-wires, nano-pillars, low density (porous) materials	Electron-Beam Lithography, photolithography, Reactive Ion Etching, Ar-ion milling, chemical methods
Characterization (Surface characterization, elemental composition, morphology and topography, roughness, interface analysis)	X-ray diffraction, Atomic Force Microscopy, Scanning Electron Microscopy with Energy-Dispersive X-Ray Spectroscopy and Electron Backscatter Diffraction, optical profilometry and microscopy
Surface treatments	Thermal treatments, polishing, surface reconditioning, plasma surface cleaning
Micromechanical and micro assembly	Wafers cutting, targets frames, micromachining





Theory and simulation support

(P. Tomassini, A. Berceanu)

Currently available computational resources include

- 1x128CPU Xeon 8358, 1Tb RAM
- 2x48CPU AMD Ryzen 3960X, 250Gb RAM
- 2x24CPU Xeon 8268, 1.5TB RAM
- 8x16CPU AMD Rome 7282, 256GB
- 2xA100 GPU, 160Gb, Nvlink
- 16xV100 GPU SXM3, 512GB, Nvlink
- 16x10TB SATA, HDD

Available codes include

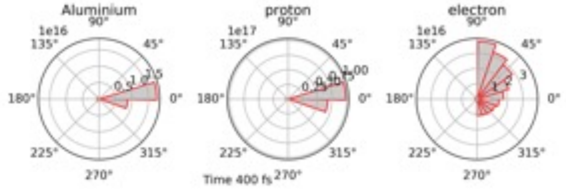
- EPOCH 2D (laser-solid, LWFA)
- Smilei 2D (laser-solid, LWFA)*
- PIConGPU (laser-solid, LWFA)*
- FB-PIC** quasi-3D (laser-solid with normal incidence, LWFA)
- Qfluid 2D cyl (LWFA)
- TSST (Nonlinear Thomson backscattering)
- RelNTS (Nonlinear Thomson Scattering at arbitrary angles and with structured pulses)

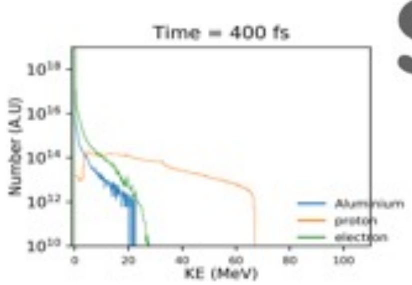
Typical computational time

*2-3 days of computational time for a standard TNSA simulation with 15nm of resolution

**4-6h of computational time for a quasi-3D simulation of LWFA in the bubble regime, 1cm of propagation

Laser solid with standard and structured pulses



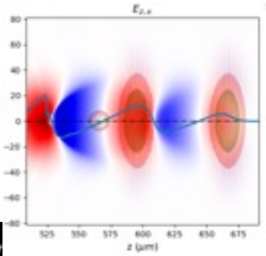


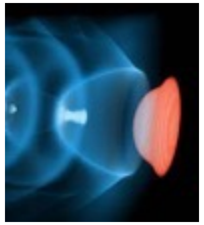
Smilei

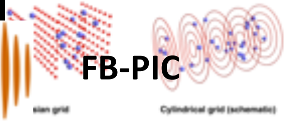
EPOCH

PIConGPU

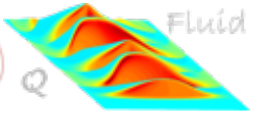
LWFA with standard and structured pulses





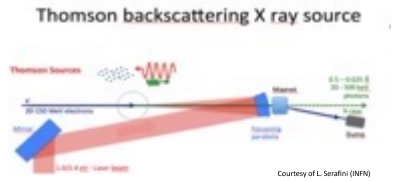


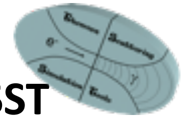
FB-PIC



QFluid

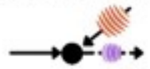
Nonlinear Thomson Scattering with standard and structured pulses





TSST

RelNTS



Hydrodynamical simulations

FLASH CENTER

First User Call

Common with ELI ERIC

Access Agreement / Terms&Conditions
Period: October 2022 – March 2023
ELI-NP 17 proposals: 6 @ 100 TW & 11 @ 1 PW

ELI-NP Program Advisory Committee (PAC)

Meeting: 3-4 October 2022

Peter Thirolf (Chair)	Technische Universität München
Leonida Gizzi	INO-CNR Pisa
Karl Krushelnick	CUOS - University of Michigan
Paul McKenna	University of Strathclyde, Glasgow
Akifumi Yogo	ILE, Osaka University
Victor Malka	Weizmann Institute of Science
Antonino di Piazza	Max-Planck Institut für Kernphysik

ELI-NP PAC Recommendations

Grade A: 1 @ 100 TW, 2 @ 1 PW
Grade A-: 2 @ 100 TW, 4 @ 1 PW
Grade B: 3 @ 100 TW, 5 @ 1 PW

E4 (100 TW beam)	Accent Pro 2000 s.r.l.	Romania
E4 (100 TW beam)	ELI-NP/IFIN-HH	Romania
E4 (100 TW beam)	ELI-NP/IFIN-HH	Romania
E4 (100 TW beam)	Victor Babes National Institute of Pathology	Romania
E4 (100 TW beam)	University of Oxford	UK
E4 (100 TW beam)	Advanced Science and Engineering, Hiroshima University	Japan
E5 (1 PW beam)	AOYAMA GAKUIN UNIVERSITY	Japan
E5 (1 PW beam)	ILE, Osaka University	Japan
E5 (1 PW beam)	CELIA, Talence	France
E5 (1 PW beam)	CLPU, Villamayor	Spain
E5 (1 PW beam)	INRS	Canada
E5 (1 PW beam)	INO-CNR, Pisa	Italy
E5 (1 PW beam)	Moscow Engineering Physics Institute	Russia
E5 (1 PW beam)	Soreq NRC, Yavne	Israel
E5 (1 PW beam)	Tata Institute of Fundamental Research	India
E5 (1 PW beam)	TU Darmstadt, GSI	Germany
E5 (1 PW beam)	Institute of Plasma Physics and Laser Microfusion, Warsaw	Poland

First User Call – Beam time schedule

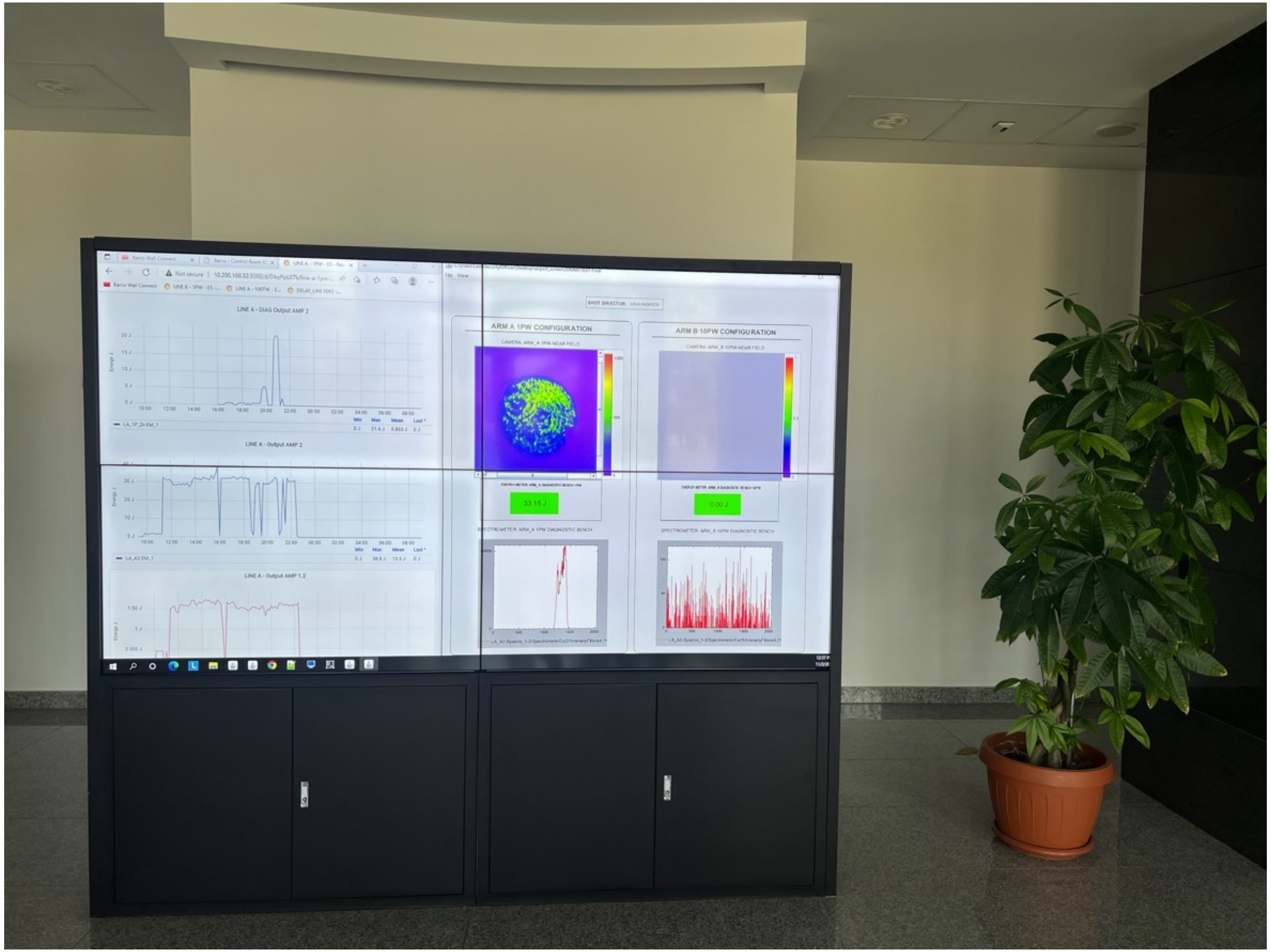
2022

Q4	*October*	39	9.26	10.2		Machine Beam Time	10 PW - Beam time E1	10 PW commissioning
		40	10.3	10.9	Arm A 1 PW commissioning in E5 IC	1 PW - Beam time E5	10 PW - Beam time E1	10 PW commissioning
		41	10.10	10.16	Arm A 1 PW commissioning in E5 IC	1 PW - Beam time E5	10 PW - Beam time E1	10 PW commissioning
		42	10.17	10.23	Arm A 1 PW commissioning in E5 IC	1 PW - Beam time E5	10 PW - Beam time E1	10 PW commissioning
		43	10.24	10.30	Arm A 1 PW commissioning in E5 IC	1 PW - Beam time E5	10 PW - Beam time E1	10 PW commissioning
	November	44	10.31	11.6	Arm A 1 PW commissioning in E5 IC	1 PW - Beam time E5	Maintenance	New stretcher mirrro
		45	11.7	11.13		Maintenance	10 PW - Beam time E1	10 PW commissioning
		46	11.14	11.20	ERIC call	100 TW - Preparation E4	10 PW - Beam time E1	10 PW commissioning
		47	11.21	11.27	ERIC call	100 TW - Preparation E4	10 PW - Beam time E1	10 PW commissioning
	December	48	11.28	12.4	ERIC call	100 TW - Beam time E4	10 PW - Beam time E1	10 PW commissioning
		49	12.5	12.11	ERIC call	100 TW - Beam time E4	10 PW - Beam time E1	10 PW commissioning
		50	12.12	12.18	E4 equipment and vacuum system maintenance	Maintenance	Maintenance	
		51	12.19	12.25		Vacation	Vacation	
		52	12.26	1.1		Vacation	Vacation	

2023

					Beam A		***Beam B***		***Legal Holidays***
A	***Q***	***M***	***W***	***Start***	***End***				
	Q1	*January*	1	1/2	1/8		Vacation	Vacation		
			2	1/9	1/15		Maintenance	Maintenance		
			3	1/16	1/22		Maintenance	Maintenance		
			4	1/23	1/29	ERIC call	100 TW - Preparation E4	1 PW - Beam time E5		24/01 - Tuesday
		February	5	1/30	2/5	ERIC call	100 TW - Beam time E4	1 PW - Beam time E5		
			6	2/6	2/12	ERIC call	100 TW - Beam time E4	1 PW - Beam time E5		
			7	2/13	2/19		Maintenance	Maintenance		
			8	2/20	2/26	ERIC call	1 PW - Beam time E5	10 PW - Beam time E1	Flagship experiment - IMPULSE funding	
		March	9	2/27	3/5	ERIC call	1 PW - Beam time E5	10 PW - Beam time E1	Flagship experiment - IMPULSE funding	
			10	3/6	3/12	ERIC call	1 PW - Beam time E5	10 PW - Beam time E1	Flagship experiment - IMPULSE funding	
			11	3/13	3/19	ERIC call	1 PW - Beam time E5	10 PW - Beam time E1	Flagship experiment - IMPULSE funding	
			12	3/20	3/26	ERIC call	1 PW - Beam time E5	10 PW - Beam time E1	Flagship experiment - IMPULSE funding	
			13	3/27	4/2		Maintenance	Maintenance		

User Facilities



Monitoring Beam conditions

Laser beam delivery information accessible from public areas of the laboratory

User Access

http://users.eli-np.ro/index.php

User Office @ ELI-NP

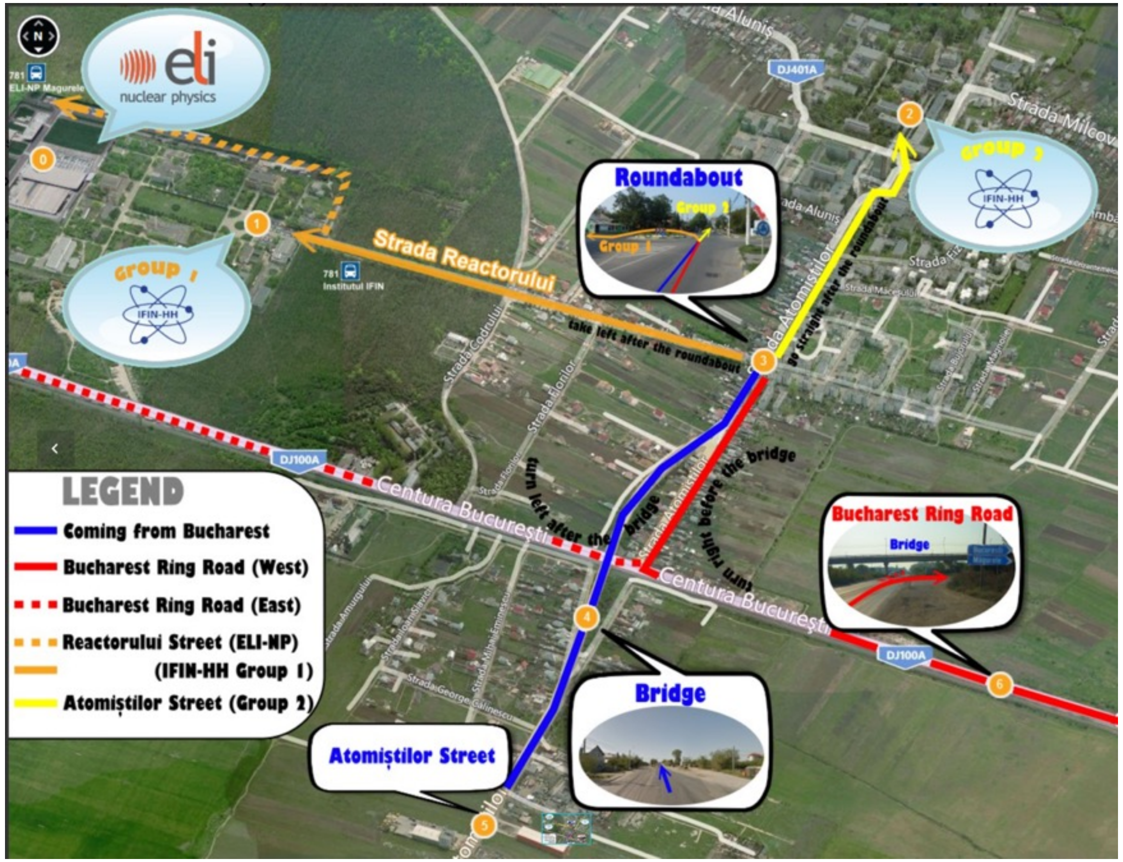
Head of Office: Dr Sophia Chen sophia.chen@eli-np.ro

Access based on the Terms & Conditions of Access
https://up.eli-laser.eu/downloads/Science-Call-TCA.pdf

Registration as user

General training courses on:

- Local access rules
- General Health and Safety
- Laser Safety
- Radioprotection Safety



Long Term Storage of Data

Access to ELI-NP Guesthouse and Canteen

EUROPEAN UNION

GOVERNMENT OF ROMANIA

Structural Instruments 2014-2020

Project co-financed by the European Regional Development Fund through the Competitiveness Operational Programme "Investing in Sustainable Development"

Extreme Light Infrastructure-Nuclear Physics (ELI-NP) - Phase II

eli nuclear physics

Thank you !

www.eli-np.ro

"The content of this document does not necessarily represent the official position of the European Union or of the Government of Romania"
For detailed information regarding the other programmes co-financed by the European Union, please visit

www.fonduri-ue.ro, www.ancs.ro