



EC Funded program to promote **Transnational Access to Research Infrastructures**
for

Nuclear and Particle Physics (Accelerators & Detector) R&D

HORIZON-INFRA-2021-SERV-01-07 - Research Infrastructures Services Advancing Frontier Knowledge

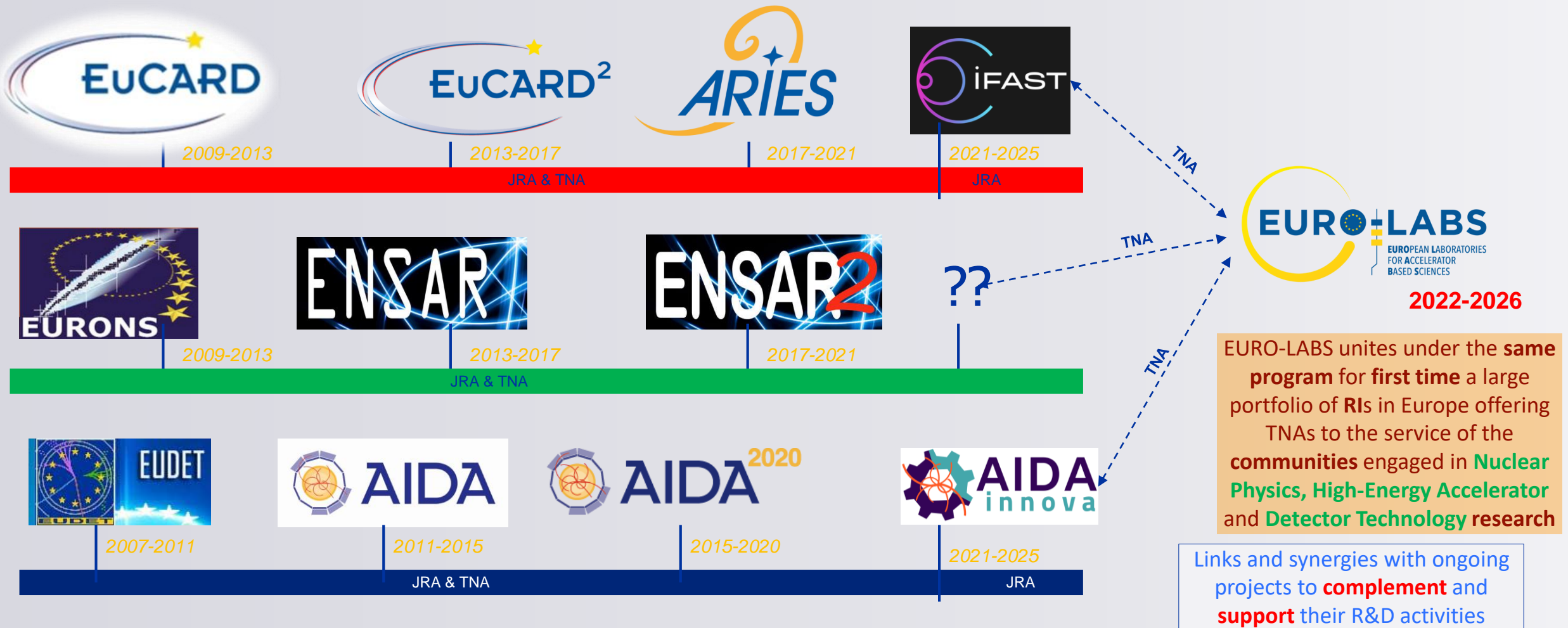
September 1, 2022 – August 31, 2026

I. Efthymiopoulos, EURO-LABS, CERN



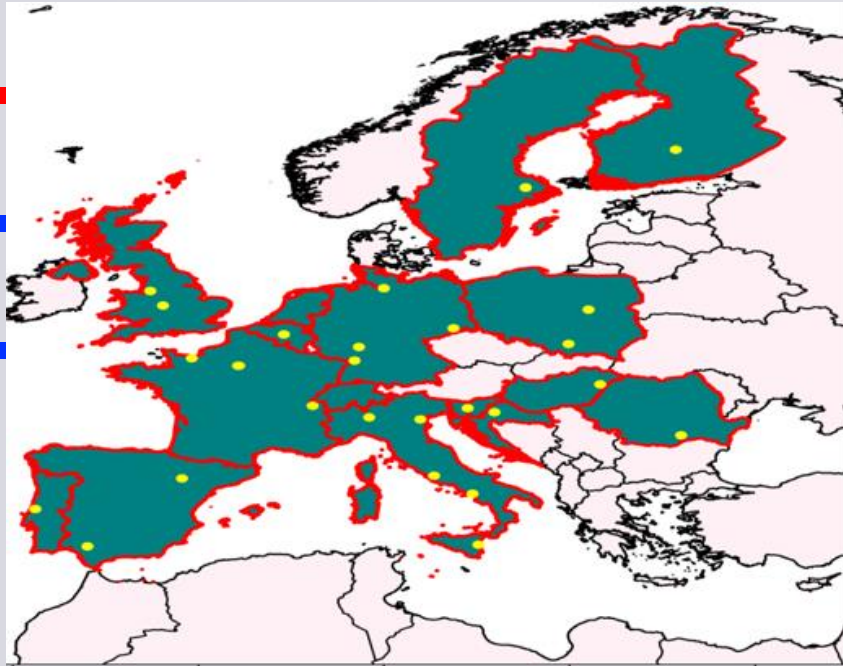
EC - Transnational Access

Long history in parallel programs



EURO-LABS Consortium

Close Look



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e

Coord				
1	INFN	ISTITUTO NAZIONALE DI FISICA NUCLEARE	IT	Beneficiaries
2	GANIL	GRAND ACCELERATEUR NATIONAL D'IONS LOURDS	FR	
3	CERN	ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE	CH	
4	JSI	INSTITUT JOZEF STEFAN	SI	
5	IFJ PAN	THE HENRYK NIEWODNICZANSKI INSTITUTE OF NUCLEAR PHYSICS, POLISH ACADEMY OF SCIENCES	PL	
6	DESY	DEUTSCHES ELEKTRONEN-SYNCHROTRON DESY	DE	
7	UCL	UNIVERSITE CATHOLIQUE DE LOUVAIN	BE	
8	RBI	RUDER BOSKOVIC INSTITUTE	HR	
9	CNRS	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	FR	
10	FBK	FONDAZIONE BRUNO KESSLER	IT	
11	ITAINNOVA	INSTITUTO TECNOLOGICO DE ARAGON	ES	
12	UNIWARSAW	UNIwersYTET WARSZAWSKI	PL	
13	GSI	GSI HELMHOLTZZENTRUM FUR SCHWERIONENFORSCHUNG GMBH	DE	
14	IFIN-HH	INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU FIZICA SI INGINERIE NUCLEARA-HORIA HULUBEI	RO	
15	USE	UNIVERSIDAD DE SEVILLA	ES	
16	IST	INSTITUTO SUPERIOR TECNICO	PT	
17	Atomki	ATOMMAGKUTATO INTEZET	HU	
18	JYU	JYVASKYLAN YLIOPISTO	FI	
19	UU	UPPSALA UNIVERSITET	SE	
20	CEA	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	FR	
21	KIT	KARLSRUHER INSTITUT FUER TECHNOLOGIE	DE	
22	UMCG	ACADEMISCH ZIEKENHUIS GRONINGEN	NL	
23	INCT	INSTYTUT CHEMII I TECHNIKI JADROWEJ	PL	
24	CSIC	AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	ES	
25	UMIL	UNIVERSITA DEGLI STUDI DI MILANO	IT	
26	PSI	PAUL SHCERRER INSTITUT	CH	Associated Partners
27	RIKEN	RIKEN THE INSTITUTE OF PHYSICAL AND CHEMICAL RESEARCH	JP	
28	MSU	MICHIGAN STATE UNIVERSITY	US	
29	TUD	TECHNISCHE UNIVERSITAET DRESDEN	DE	
30	LIP	LABORATORIO DE INSTRUMENTACAO E FISICA EXPERIMENTAL DE PARTICULAS LIP	PT	
31	ENEA	AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILLUPPO ECONOMICO SOSTENIBILE	IT	
32	UoB	THE UNIVERSITY OF BIRMINGHAM	UK	
33	UKRI	UNITED KINGDOM RESEARCH AND INNOVATION	UK	

EC-Trans-national Access in Accelerator Research Infrastructures



2 RI
 WP5 – HiRadMat@SPS
 WP6 – MICE@STFC

3 RI
 WP8 – ICTF@STFC
 WP9 – HiRadMat@SPS,
 MagNet@CERN

13 RI
 WP9 – Magnet testing
 WP10 – Material testing
 WP11 – Electron & Proton beam testing
 WP12- Radio Frequency testing
 WP13-13 Plasma beam testing

Project	TNA Budget [Meuros]	%/total
EUCARD	0.282	2
EUCARD2	0.450	5.6
ARIES	2.000	20
EURO-LABS accel RIs	3.270	23

EURO-LABS Project

Goals & Objectives

Provide **efficient trans-national access** to RIs which are part of a network of **leading labs** across Europe

- setup **simplified** and more efficient **access procedures**
- fertilize **synergies** between the research **communities** and applications,
- wider **sharing of information, knowledge** and **technologies** across scientific fields and applications
- provide **expert help** to visiting teams, to optimally plan and exploit the full capabilities of the facilities for cutting-edge research.
- conduct **targeted improvements** for the existing services that will lead to an increase of the scientific and technical opportunities at the RIs

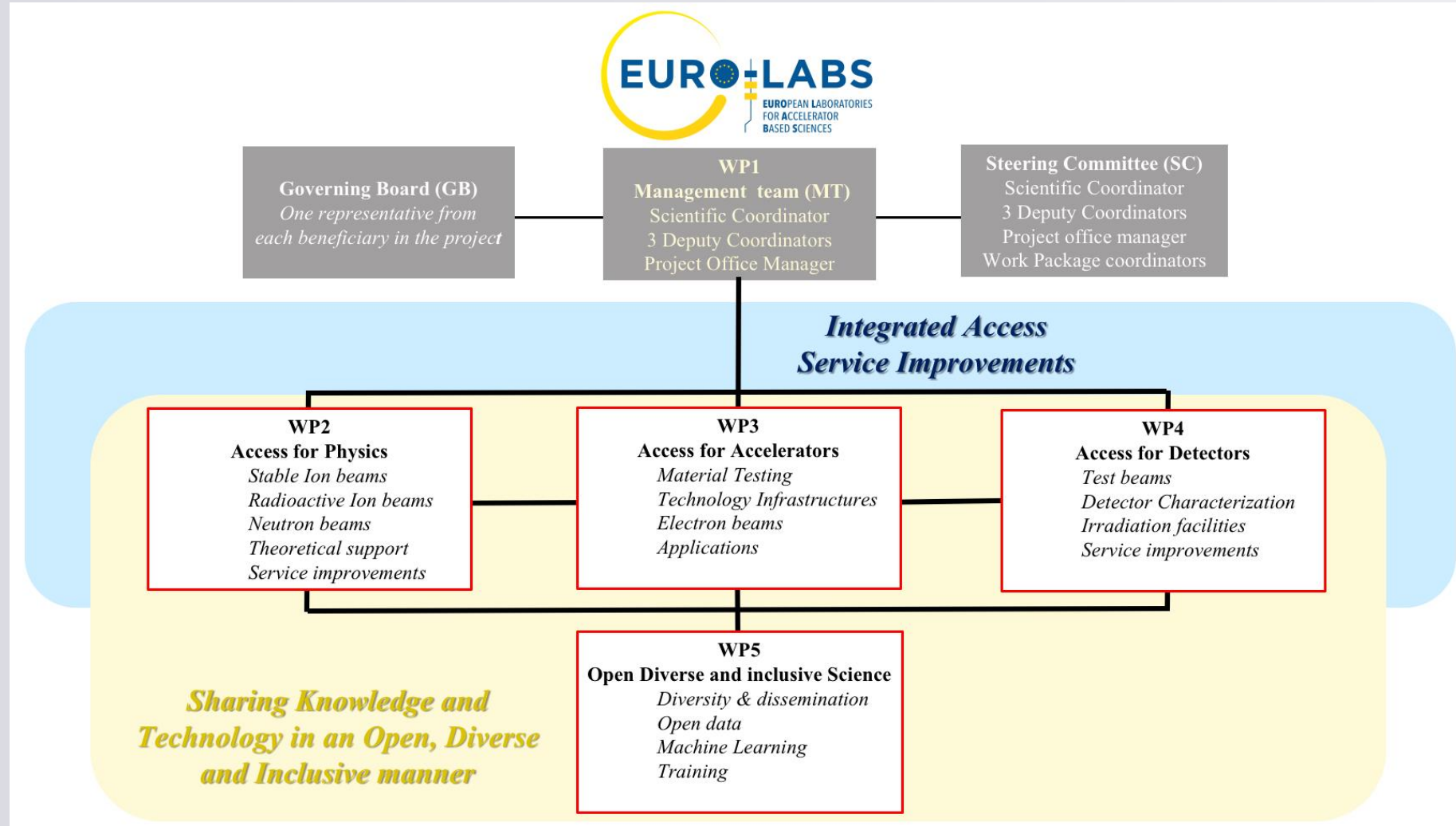
Beyond trans-national access :

- make the results **freely available** to the scientific community and manage the experimental data, when relevant, through a **Data Management Plan (DMP)** in line with the **FAIR principles** (Findable, Accessible, Interoperable, Reusable).
- organize the **training** of the new generation of researchers and young technical staff to best exploit the RIs, through workshops and hands-on experience at specifically chosen RIs.



EURO-LABS Consortium Proposal

Structure



EURO-LABS Consortium Management Team



N. ALAHARI
GANIL 

Scientific Coordinator



P. GIACOMELLI
INFN-BO 



Project Office Manager

The Project Office will be organized by INFN Bologna with the collaboration of CERN

WP2 – Access for Physics

WP3 – Access for Accelerators

WP4 – Access for Detectors

WP5 – Open Diverse and Inclusive Science



M. COLONNA
INFN-LNS

Deputy Scientific Coordinator



A. MAJ
IFJ 



I. EFTHYIOPOULOS
CERN 

Deputy Scientific Coordinator



M. MIKUZ
Univ. Ljubljana 

Deputy Scientific Coordinator



M-J. GARCIA BORGE
CSIC 

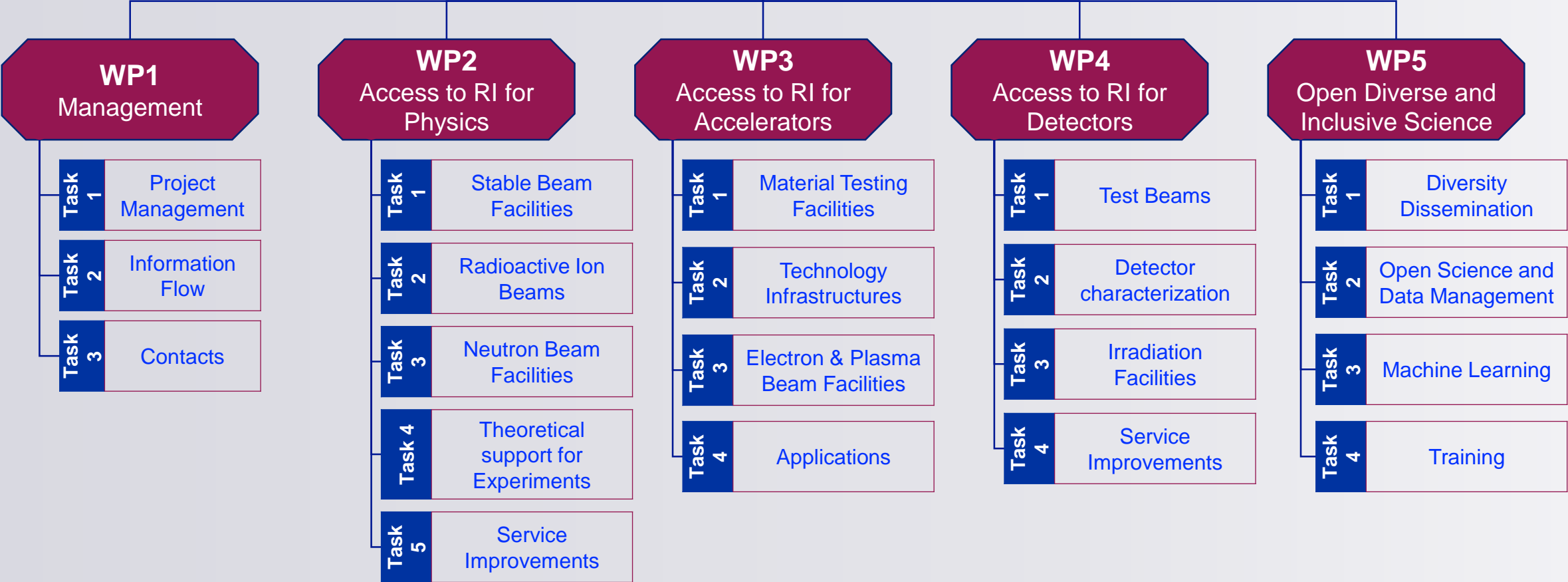
Structure



Governing Board (GB)

Steering Committee (SC)

Management Team (MT)



Accelerator RIs



WP3 Access to RI for Accelerators

WP Coordinator: **I. Efthymiopoulos**

Task 1
N. Charitonidis - CERN

Material Testing Facilities

HiRadMat@SPS^(*)

Task 2
Sylvie Leray - CEA

Technology Infrastructures

FREIA^(*)
(Univ. Uppsala)

INFN –LASA^(*)
(Milano)

INFN-THOR^(*)
(Univ Salerno)

IJCLAB SUPRATECH

CEA Ifu-Synergium^(*)

XBOX CERN

Task 3
Alessandro Gallo- INFN

Electron Beam Facilities

KIT-ALFA (ANKA+FLUTE)^(*)

VELA/CLARA
(Univ. Daresbury)

INFN – BTF Frascati

INFN – SPARC Frascati

CEA LiDyl LPA-UH100^(*)

Task 4
Urszula Gryczka - INTC

Applications

INTC –RAPID
(Warsaw)

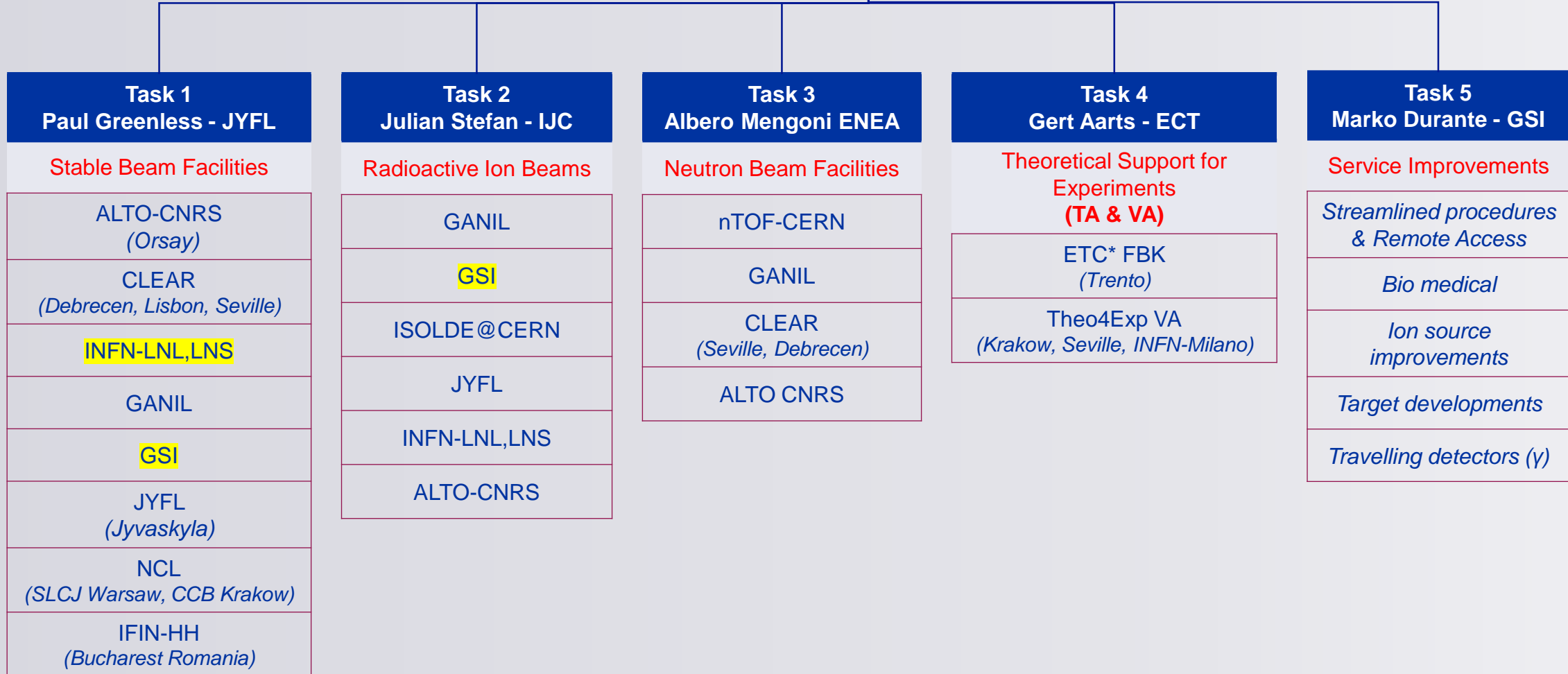
CLEAR CERN

- ^(*) budget for service improvements assigned
- new in TA program

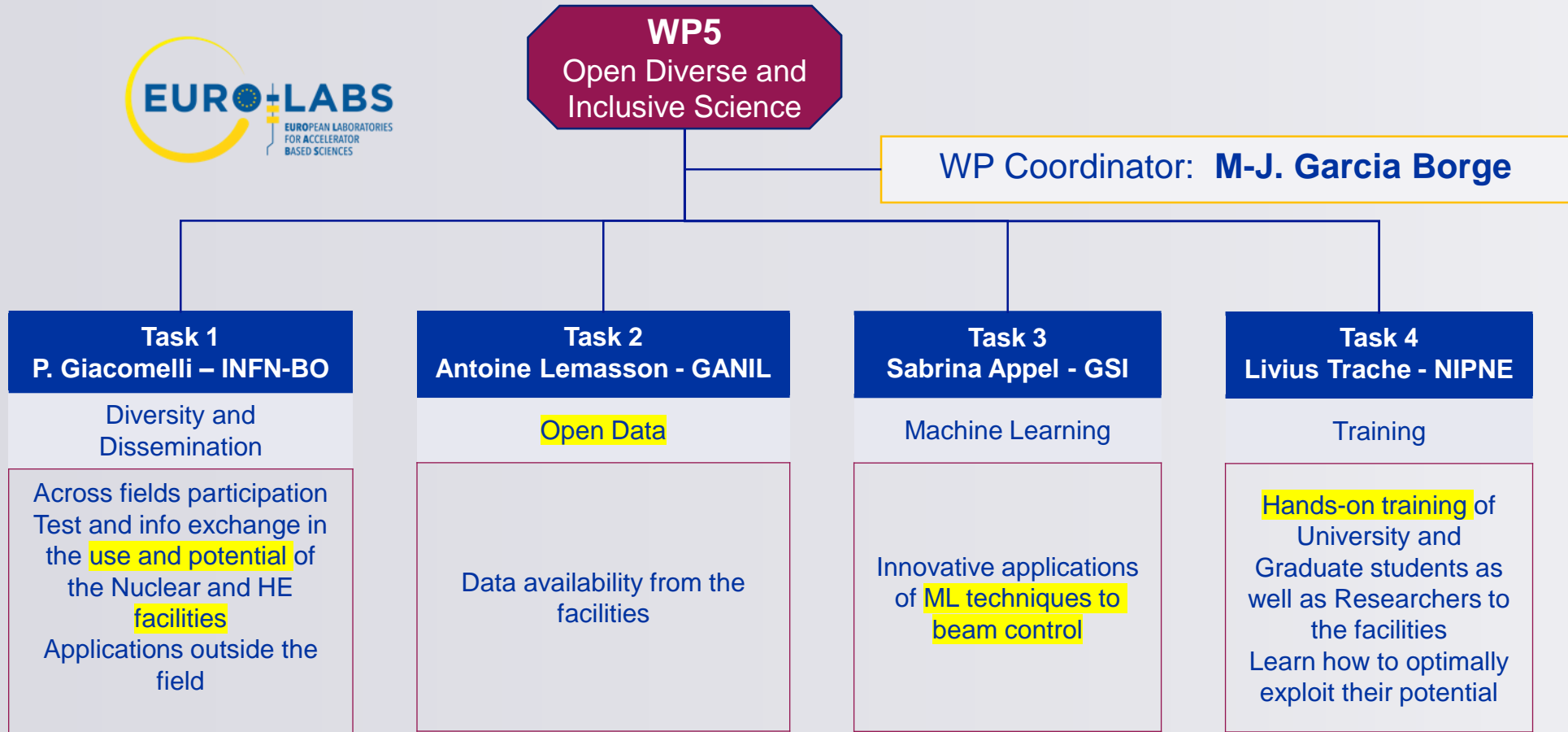
Nuclear Physics

WP2 Access to RI for Physics

WP Coordinators: **M. Colonna, A. Maj**

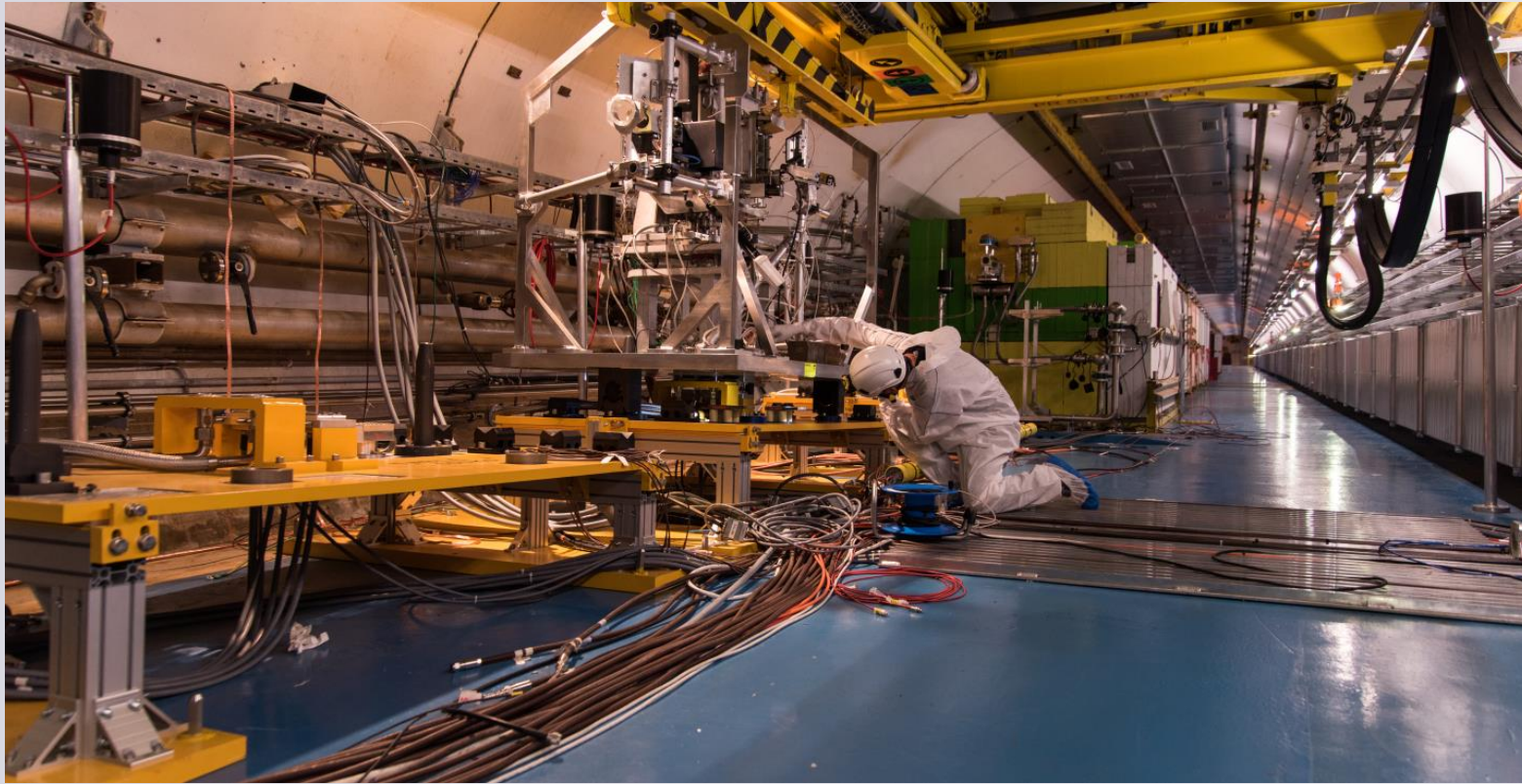


Beyond TNAs



WP3 – RI for Accelerators

Material Testing Facilities



HiRadMat@CERN

High-intensity pulsed beam from CERN SPS
proton and ions beams

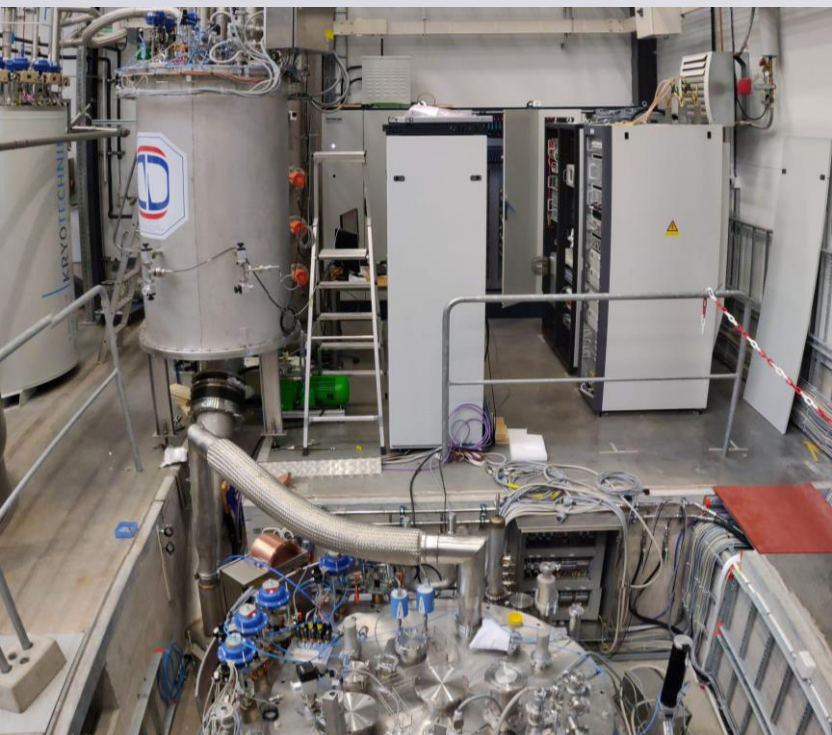
R&D on material testing at beam impact –
near beam devices (collimators)- beam windows,

...

Other facilities for material testing R&D in
WP2, as well as irradiation facilities in both
WP2 and WP4

WP3 – RI for Accelerators

Technology Infrastructures – AMICI



FREIA @ UU

Hnoss – Gersemi – Cryo Test Stand
facility for testing RF cavities and SC magnets,
V & H cryostats

LASA @ INFN-MI
facility for testing RF cavities and SC magnets
V cryostats



THOR & INFN – USalerno

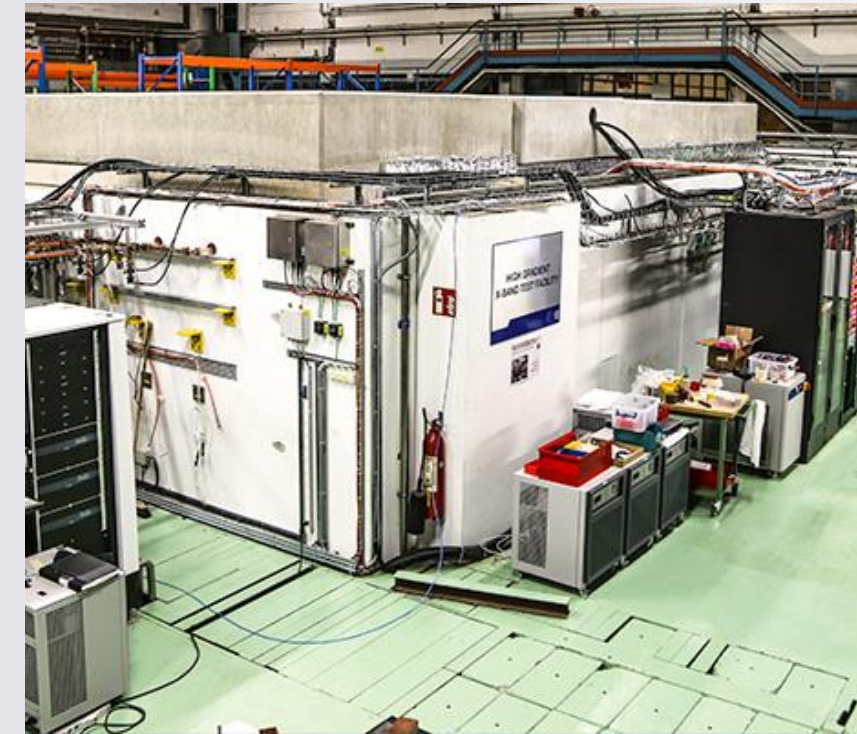
facility for testing SC magnets
H cryostat

WP3 – RI for Accelerators

Technology Infrastructures – AMICI



LRFU-Synergium @ CEA-Saclay
DACM facility for **characterization of materials** used in SRF, material samples at low temperature, mechanical test lab

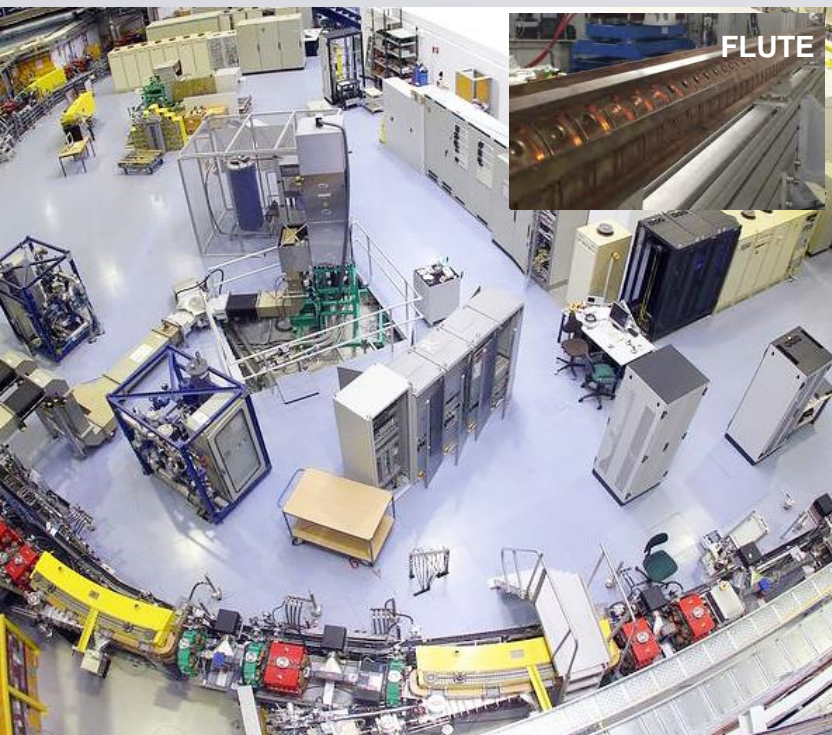


XBOX @ CERN
Klystron **X-band test stands** (11.994GHz – 50MW/1.5 μ s/50Hz and 6MW/5 μ s/400Hz) klystrons

IJCLab SUPRATECH @ CNRS Orsay
facility for testing **RF cavities, cryomodules,**
V & H cryostats

WP3 – RI for Accelerators

Electron Beams



ANKA-FLUTE @ KIT-ALFA

Test facility with **electron and photon beams** (0.5-2.5 GeV) variable bunch lengths (50ps to few ps) – test facility with **THz radiation**



FLUTE

CLARA @ UKRI-Daresbury

Facility offering **electron beam** (up to 40MeV/c) and variable bunch length, down to 0.3ps_{upgrade}

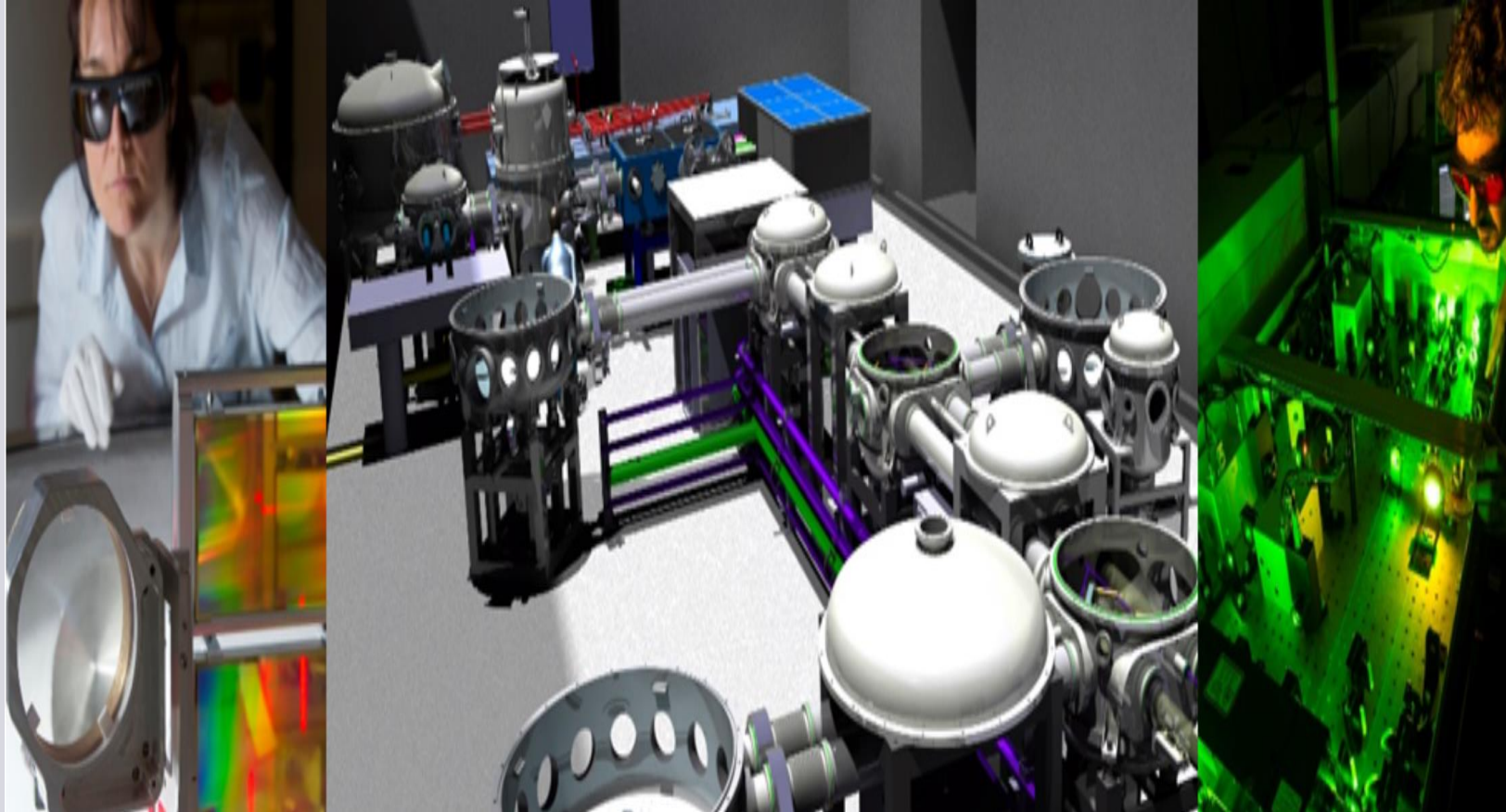


BTF2 - SPARC @ INFN-LNF

Pulsed **high-intensity electron/positron beam** (up to 500/700 MeV, 10^6 e/s) for BTF – **short electron pulses** 10-500pC e-bunches, 20fs-5ps rms, 80-140 MeV for SPARC

WP3 – RI for Accelerators

Electron Beams

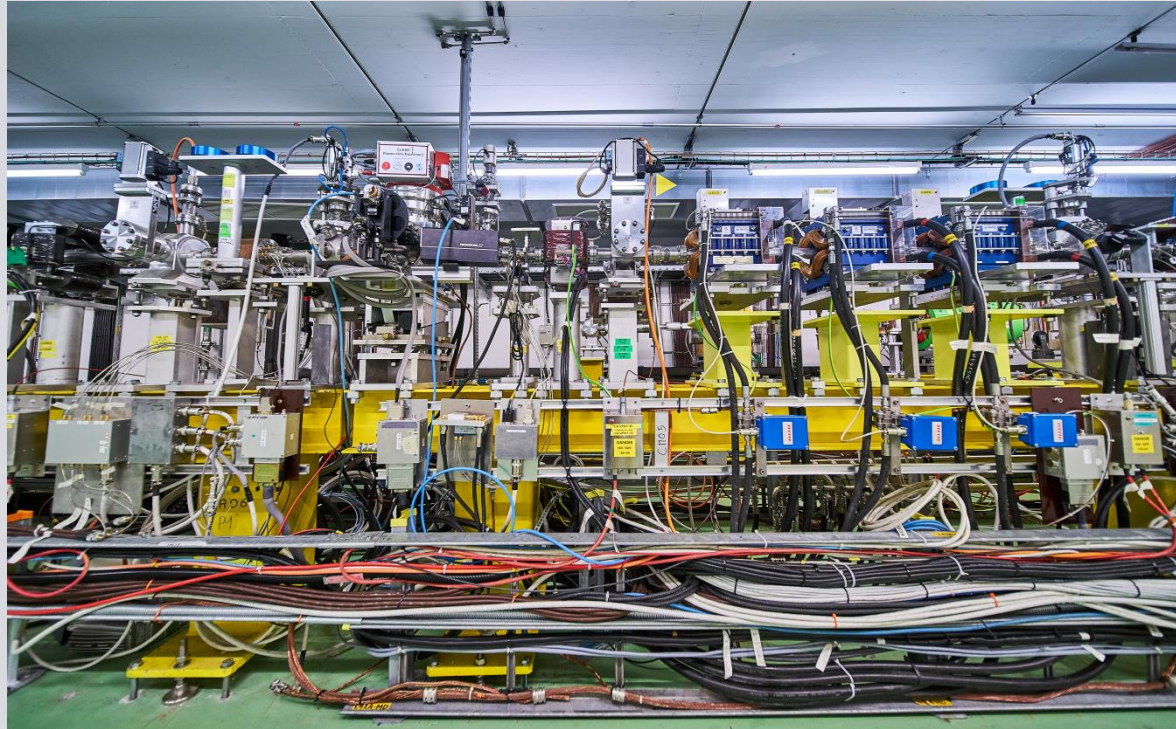


LPA-UHI100 @ CEA-Saclay

Laser-plasma accelerator, UHI 100 (**electron source**), 100TW class laser to produce a 25fs pulse, electron beam up to 150 MeV, 50 pC/shot or 10 MeV over 100 μ m, 10nC/shot – Attosecond source for **beam diagnostics R&D**

Service improvement plan by introducing Machine Learning techniques for beam control

WP3 – RI for Accelerators Applications



CLEAR @ CERN

Test facility with **electron and beams** (60-230 MeV, 0.1-10ps rms, up to 30nC/pulse) – beam diagnostics R&D – medical applications VHEE beams/FLASH

RAPID @ INCT

Facility providing **electron beams** (0.2-10MeV, 0.1-20kW) and **gamma irradiations** (Co60) – 10MeV ns e-pulse for **Radiolysis**



Pilot plant facility ILU 6 0.2-2 MeV, 20 kW INCT, Poland



EURO-LABS Project

Status – next steps

**Project accepted
by EC**

Jan 18, 2022

Project start-up

September 1, 2022

Preparation of
GA, CA, signatures
Feb-May, 2022

Kick-off Meeting

October 3-5, 2022

- Some of the facilities will announce calls for TNA requests even before the startup date
- More info in the project Web page **to be online soon**





Thank you !

WP3 – RI for Accelerators

TNA Research Infrastructure - Facilities

Facility	Location	Coordinator	Description	Expected Users
Task 1 : Material Testing Facilities				
HiRadMat	CERN	N. Charitonidis	Intense pulsed beam from CERN SPS, 2.4MJ/pulse	LHC collimators, Crystals, RADIATE, detectors
Task 2 : Technology Infrastructures				
FREIA/Univ. Uppsala	Uppsala, Sweden	A. Miyazaki	Test stand for SC magnets and RF, vertical (GERSEMI) and horizontal (HNOSS) cryostat	ESS, CERN, MYRRHA/MINERVA, ITER/DONES, and PIP II at Fermilab, US)
INFN-LASA	Milano Italy	D. Giove	Test stand for SC magnets and RF cavities, complex UHV system for growing photocathodes, laser applications for cavities	LAL Orsay, Saclay
INFN-THOR	Salerno, Italy	U. Gambardella	Horizontal test stand for SC magnets	GSI
IJCLab SUPRATECH	CNRS Orsay, France	W. Kaabi	Test stand for SC RF cavities	US teams from PIP-II
LRFU-Synergium	CEA Saclay, France	S. Leray, P. Vadrine	Characterization of thin film SC layers for RF cavities and materials at low temperature	Teams from CERN, FermiLab, Jlab, Chicago Univ. possibly industrial firms
XBOX	CERN	R. Corsini	Hgh-power RF testing	

WP3 – RI for Accelerators

TNA Research Infrastructure - Facilities

Facility		Location	Coordinator	Description	Comments, Expected Users	
Tast 3 : Electron Beams						
3	KIT-ALFA	- ANKA - FLUTE	Karlsruhe, Germany	R. Ruprecht	- Intense electron beam 0.5-2.5GeV - Photo-injector with laser, 7-40/50 MeV electrons	- THz radiation experiments
3	STFC(*)	CLARA	Daresbury, UK	A. Gleeson	Versatile electron accelerator, up to 40MeV	
3	INFN-LNF	BTF	Frascati, Italy	A. Gallo	Electron beam from linac, 25-500 MeV	Intensity down to single electron!
		SPARC			10-500pC e-bunches, 20fs-5ps rms, 80-140 MeV	FEL community, material THz radiation, plasma electron studies
3	LiDyl	LPA-UH100	CEA, Saclay, France	S. Dobosz	Laser-plasma accelerator, UHI 100 (electron source), 100TW class laser	New improved facility to operate in spring 2022

(*) UK Labs are not presently allowed to participate as Beneficiaries to EC projects. The colleagues from Daresbury remain as Associated Partners in EURO-LABS and still offer the planned TNA access units.

WP3 – RI for Accelerators

TNA Research Infrastructure - Facilities

Facility	Location	Coordinator	Description	Comments, Expected Users	
Task 4 : Applications					
CLEAR		CERN	R. Corsini	Electron beam, 200 MeV electrons, 10Gy/s dose	VHEE/FLASH, CERN-CHUV collaboration,
INCT	RAPID	Warsaw, Poland	U. Gryczka, A. Schmiewski	Electron beams 0.1-10MeV, 0.1-20kW – 5 electron accelerators, 3 Gamma sources (Co60)	Radiation chemistry, ns-pulse radiolysis