



Users community and access to research infrastructures – the example of EURO-LABS

Second DONES Users Workshop
October 19-20, 2023, Granada



Adam Maj
IFJ PAN Kraków
(on behalf of the EURO-LABS collaboration)



This project has received funding from the European Union's Horizon Europe Research and Innovation programme under Grant Agreement No 101057511.

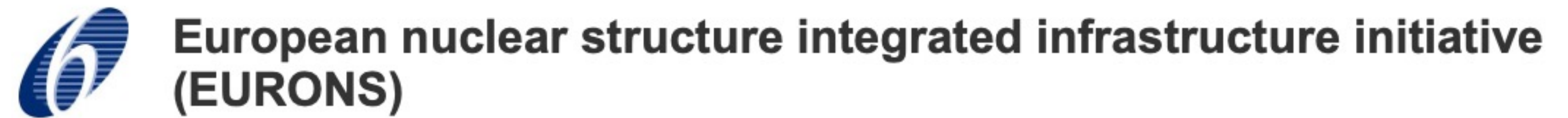
FINUPHY (2000-2005)

coord. Jean Vervier, coord. inst. GSI



EURONS (2005-2008)

coord. Alex Mueller, coord. inst. GSI



ENSAR (2010-2014)

coord. Muhsin Harakeh, deputy Marek Lewitowicz, coord. inst. GANIL



European Nuclear Science and Applications Research

ENSAR2 (2016-2021)

coord. Muhsin Harakeh, deputy Marek Lewitowicz, coord. inst. GANIL



ERINS: European Research Infrastructures for Nuclear Science

ERINS –

coord. Angela Bracco, coord. inst. INFN



3 communities grouped together:

- Nuclear Physics
- HE Accelerators
- HE Detectors

EURO-LABS (2022-2026)

coord. Navin Alahari, deputy Maria Colonna, coord. inst. INFN

What is EURO-LABS?

PROJECT ACRONYM: EURO-LABS – EUROpean Laboratories for Accelerator Based Science

PROGRAMME: Horizon EU (Research infrastructure services to support health research, accelerate the green and digital transformation, and advance frontier knowledge)

DURATION: September 2022- August 2026 (4 years)

TOTAL BUDGET: 14.5 M€

TOTAL EC CONTRIBUTION: 14.2 M€

CONSORTIUM: 33 participants from 18 countries

PROJECT COORDINATOR: Paolo Giacomelli (INFN)

The project brings together, for the first time, the three research communities of nuclear physics, accelerator and detector technologies for high energy physics, in a pioneering super-community of sub-atomic scientists.

It provides effective access to a network of 47 Research Infrastructures (including 3 RIs with Virtual Access) to conduct curiosity-based research, addressing fundamental questions and technological challenges and advancing projects with broad societal impact, fostering knowledge sharing between scientific fields and enhancing Europe's potential for successfully facing future challenges.



Courtesy Google Earth



Scientific coordinator



**A. NAVIN
GANIL**



**Adam Maj, IFJ
WP2**



Management Team



**Maria Borge, CSIC
WP5**



Deputy Scientific coordinator

Deputy Scientific coordinator

Deputy Scientific coordinator

Project office Manager



**M. COLONNA
INFN-LNS (Catania)**



**I. EFTHYMIPOULOS
CERN**



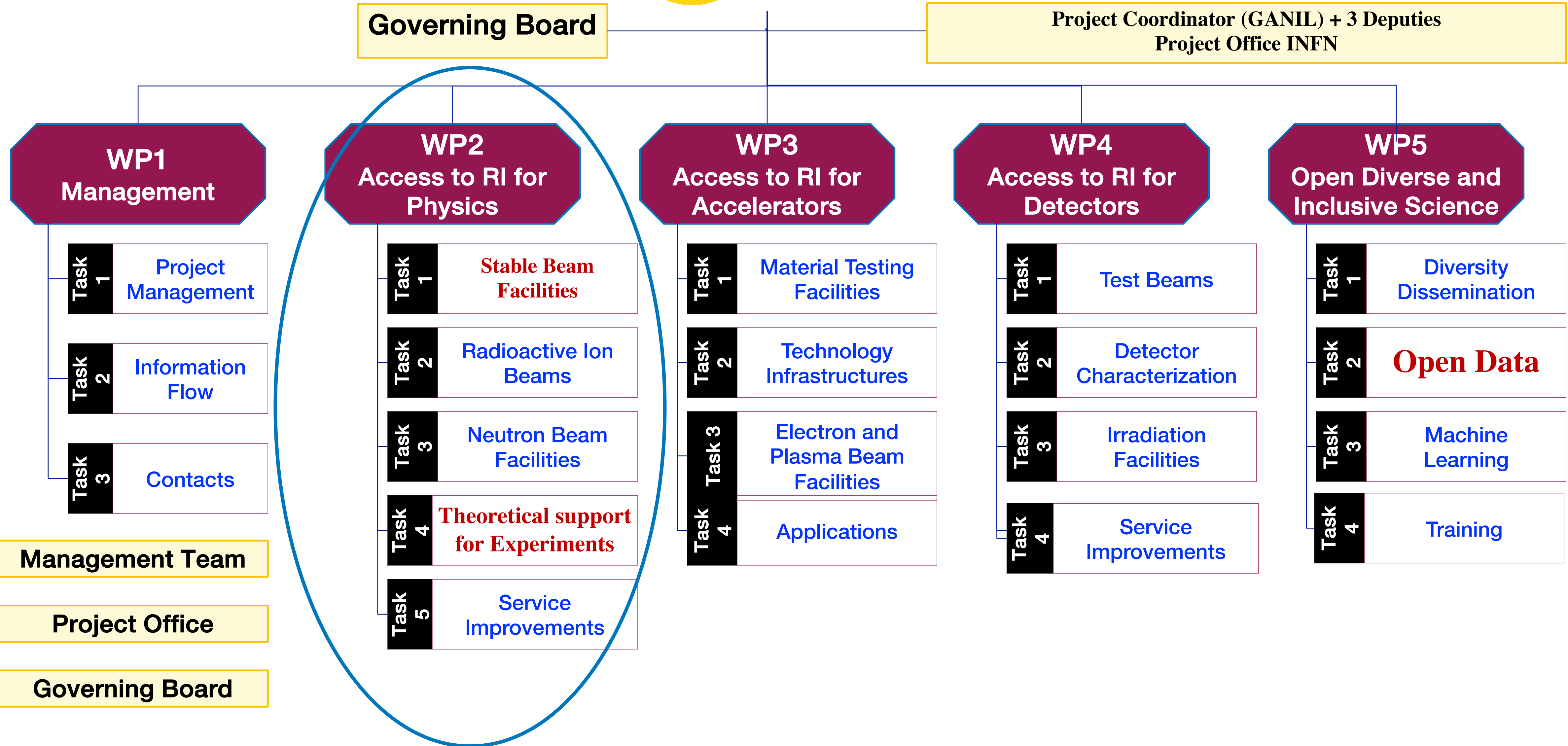
**M. MIKUZ
Univ. Ljubljana**



**PAOLO GIACOMELLI
INFN Bologna**



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



Goals of WP2

The scientific goal of the WP2 is to provide enhanced opportunities for exploring **nuclei under extreme conditions:**

- at high temperatures (T)
- at high angular moment (L)
- at large isospin (N/Z), i.e. nuclei close to the proton or neutron dripline
- with extreme masses (A)

This will be achieved by providing potential users a **Transnational Access to various RIs providing**

a wide portofolio of beams of

- stable ions:** ranging from protons to uranium ions;
- radioactive ions:** unstable nuclei far from the stability valley, developed either by Isotopic Separation On-Line, or by fragmentation induced by fast projectile and then by In-flight separation;

neutrons

at various energies: ranging from few MeV up to 2 GeV.

This will be achieved also by providing potential users a **Virtual Access to Theory4Exp facility, with user friendly codes for theoretical preparation and discussion of experimental project.**

Moreover, the project will provide **service improvements** to all the facilities: streamlining the access to RIs, development of the biomedical applications, improving the ion source and target developments and helping in installations and running traveling detectors.



WP2: access to RI and instrumentation

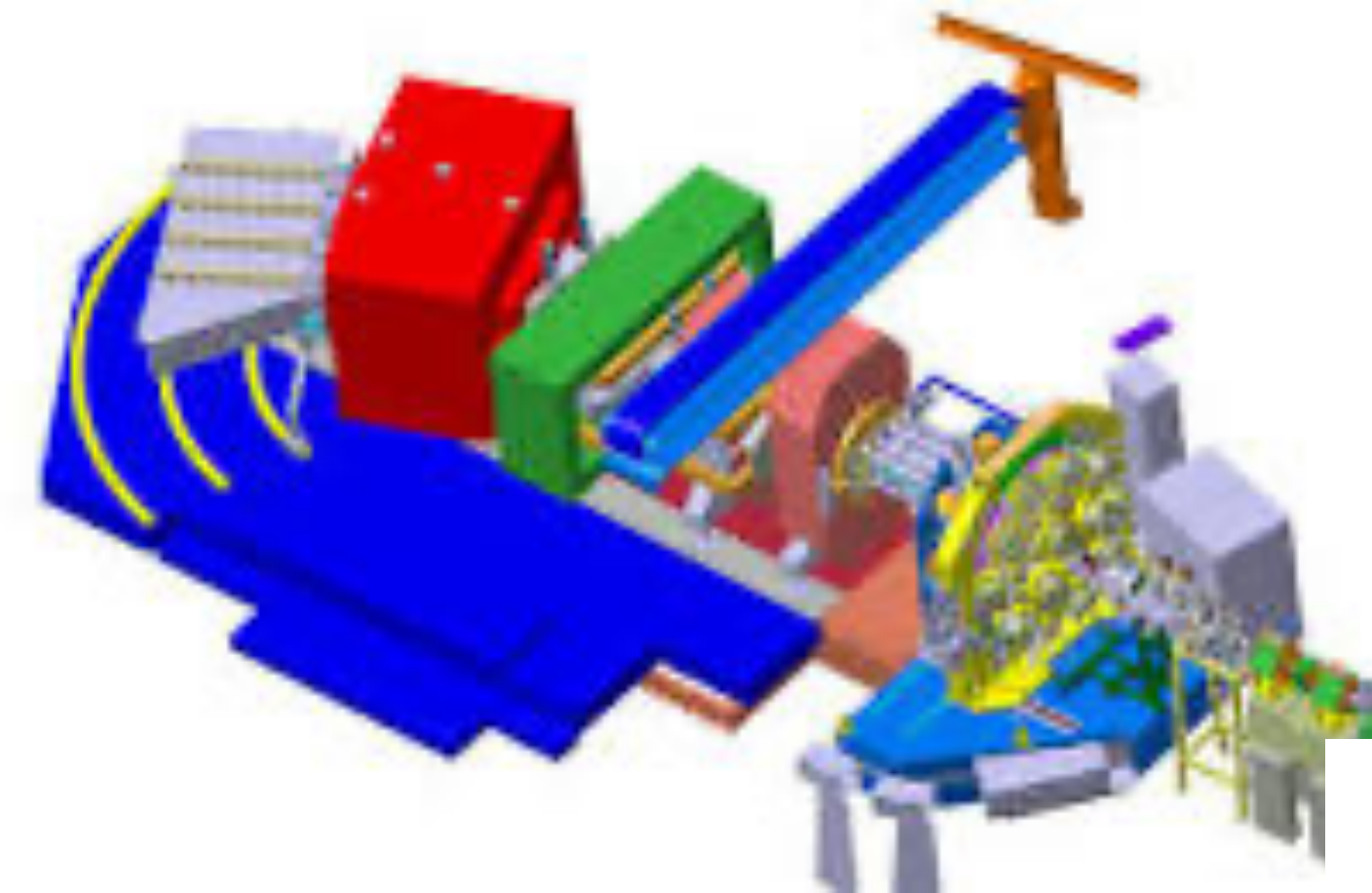
Having **TA to Research Infrastructures** with a large portfolio of different types of beams **is necessary for production of nuclei at extreme conditions**, but **not sufficient** for their studies.

These **facilities must also offer the state-of-the-art equipment:**

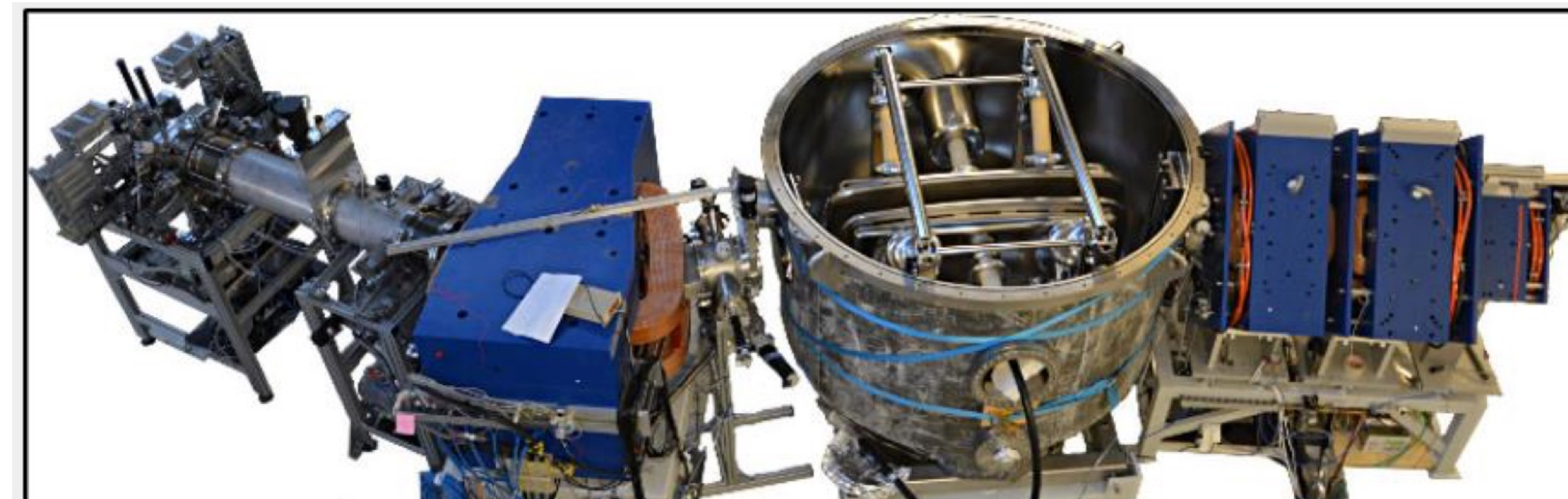
Spectrometers and separators: (Super)-FRS, VAMOS, LISE, PRISMA, RITU, MARA, ...

Examples of large acceptance spectrometers and separators

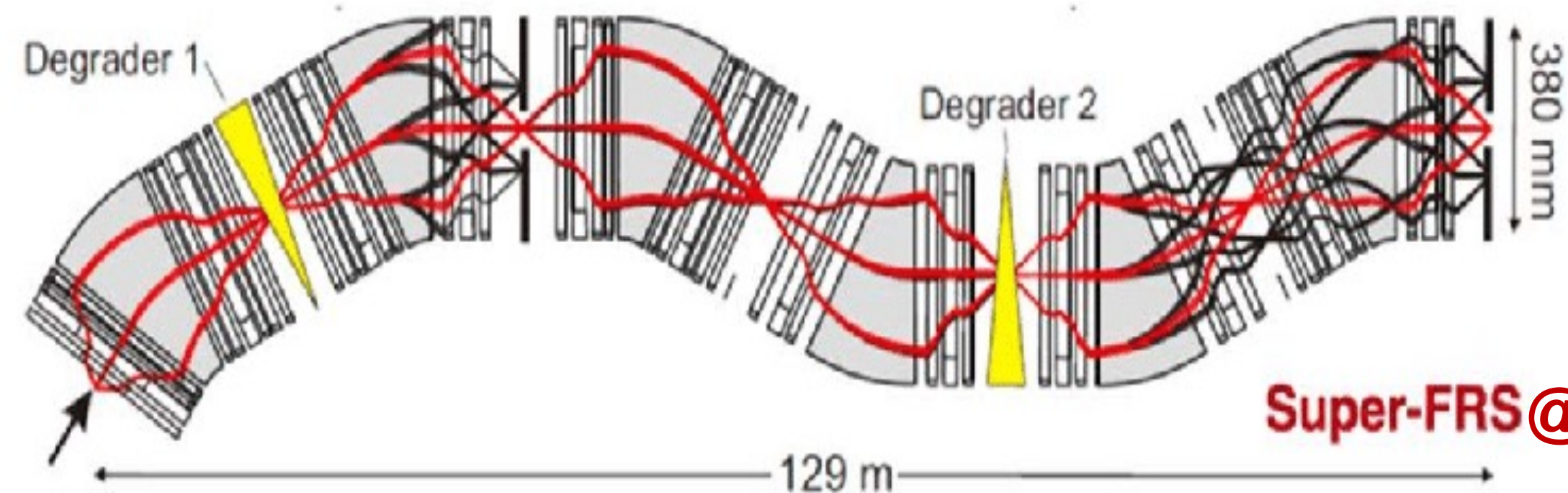
VAMOS@GANIL



MARA@Jyvaskyla



PRISMA@LNL



Super-FRS@GSI/FAIR

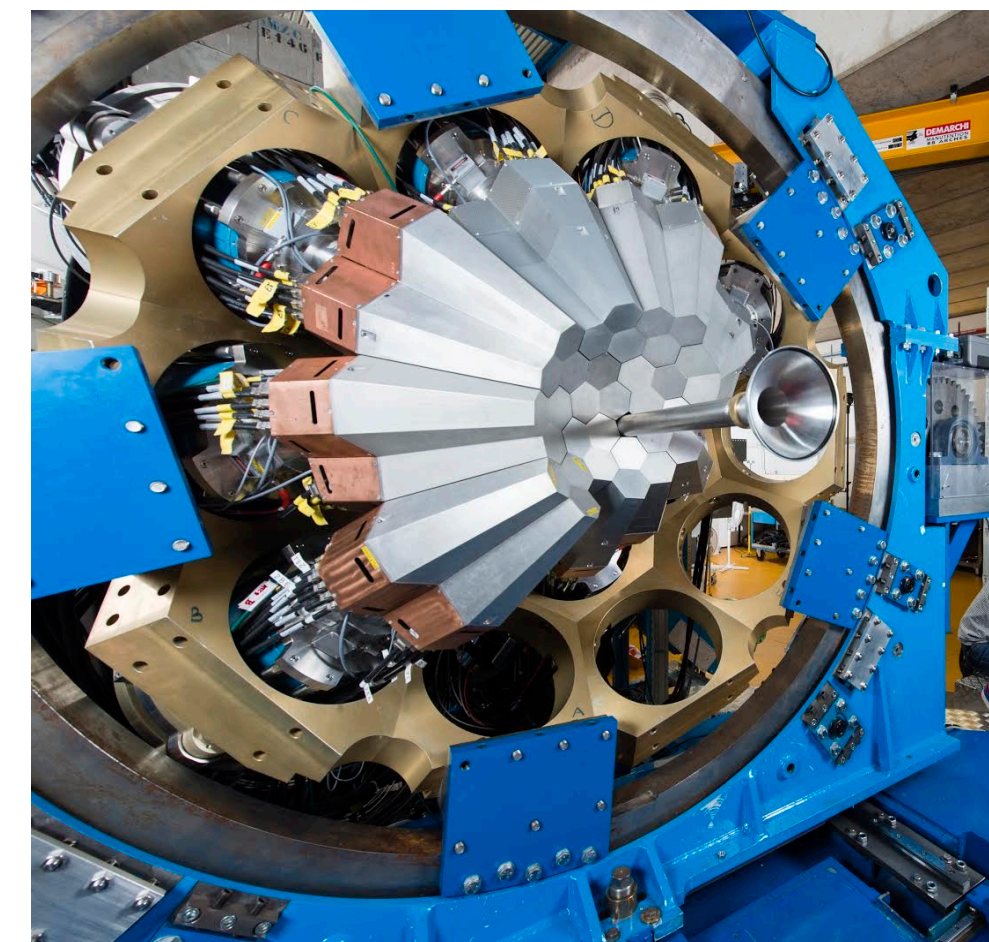
WP2: access to RI and instrumentation

In addition these facilities must offer :

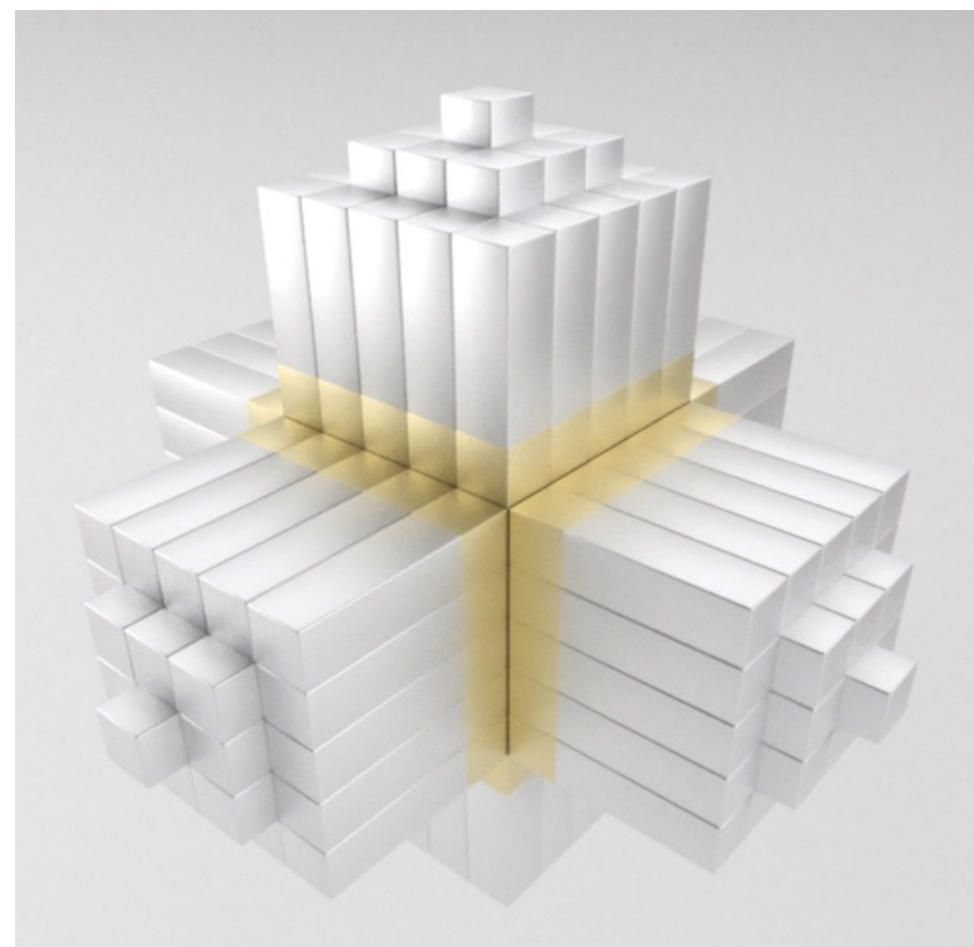
Novel detector setups: AGATA, PARIS, NEDA, FAZIA, MUGAST-GRIT, nu-Ball, R3B, CALIFA, FATIMA, ACTAR TPC, COLLAPSE, T-REX, ROSPHERE, GALILEO, EAGLE, KRATTA, BINA,...

Examples of novel detector setups - some of them *) are travelling detectors

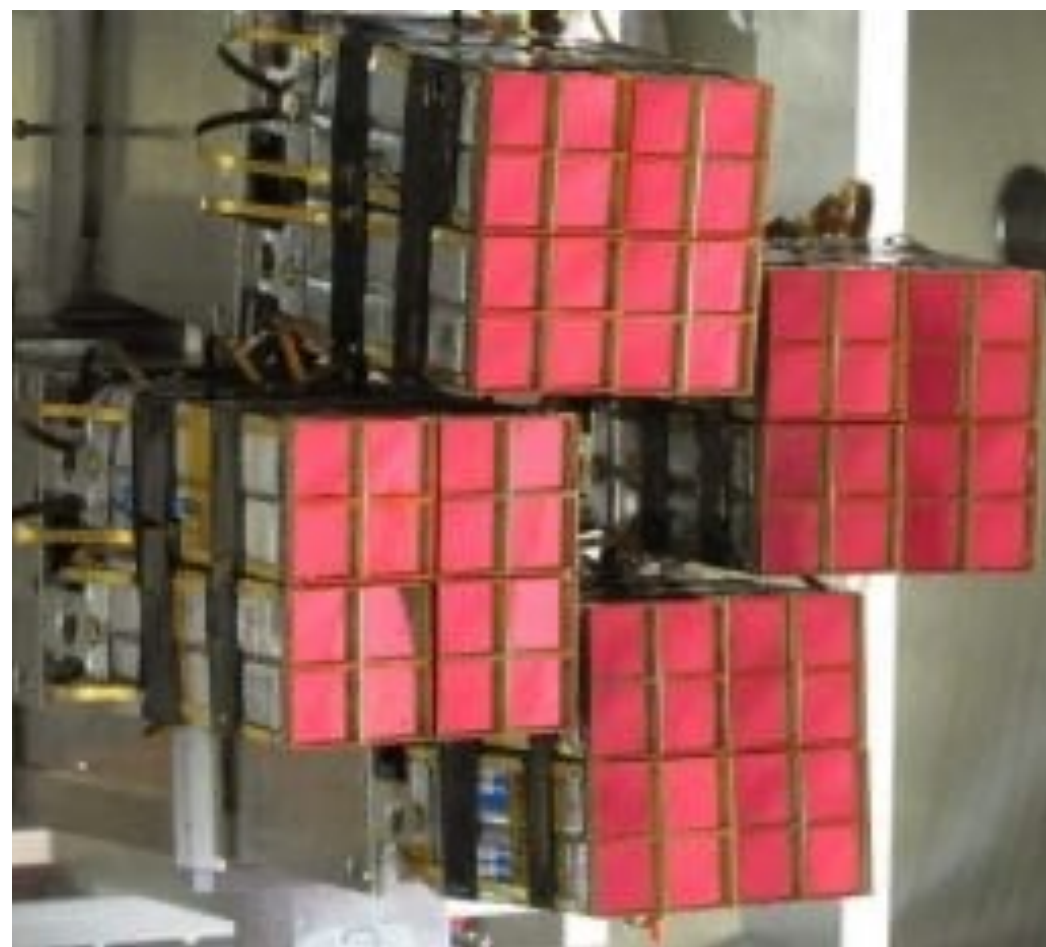
AGATA*



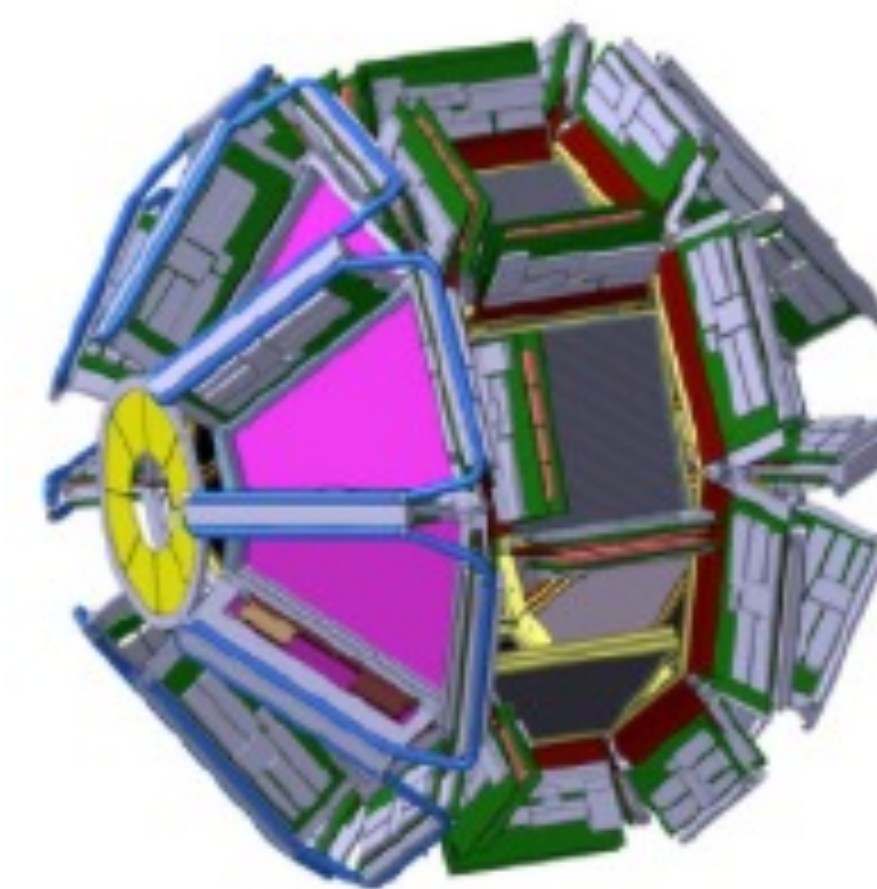
PARIS*



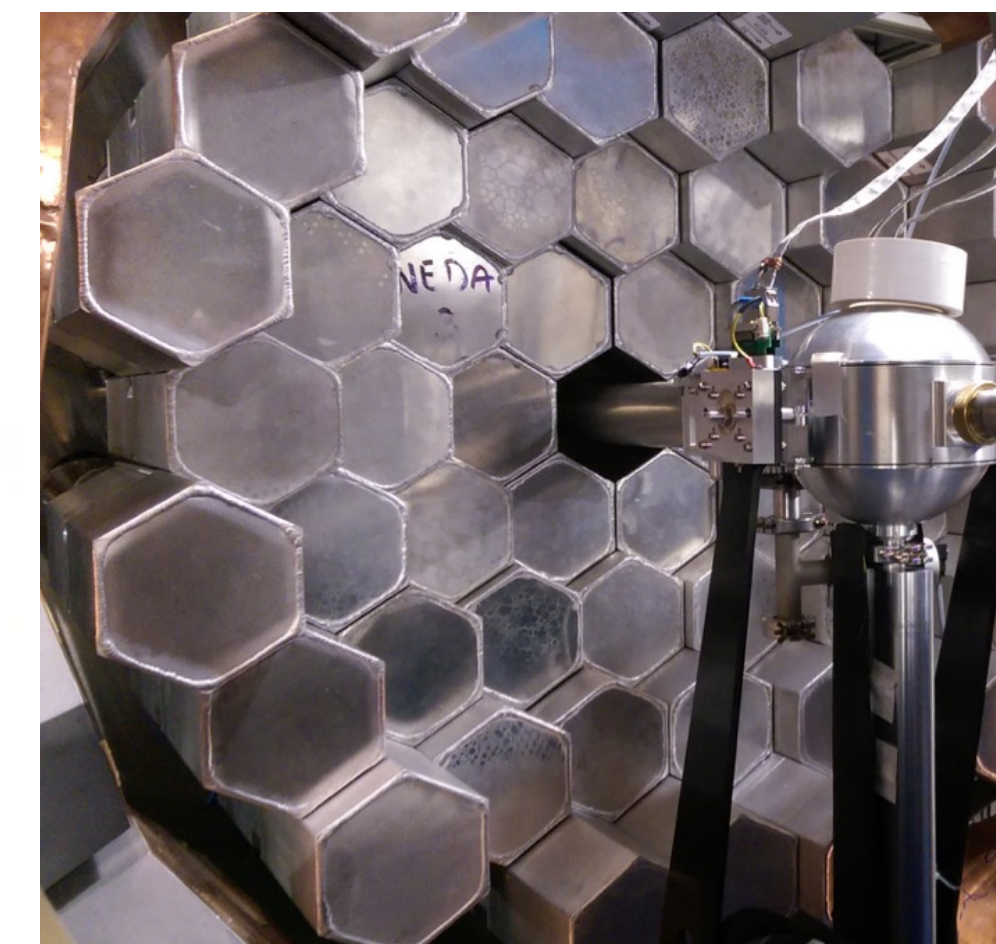
FAZIA*



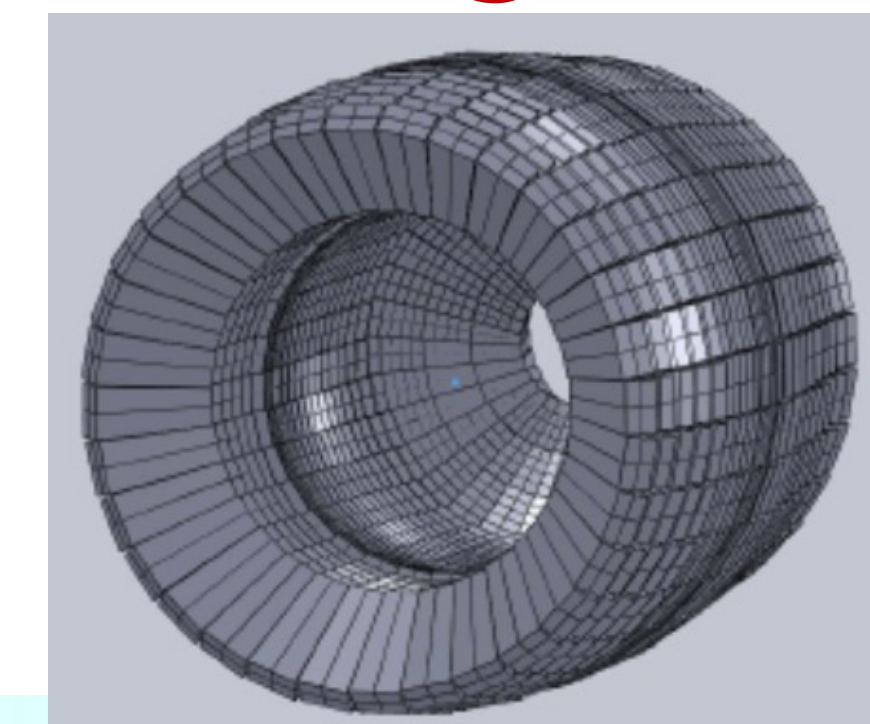
MUGAST-GRIT*



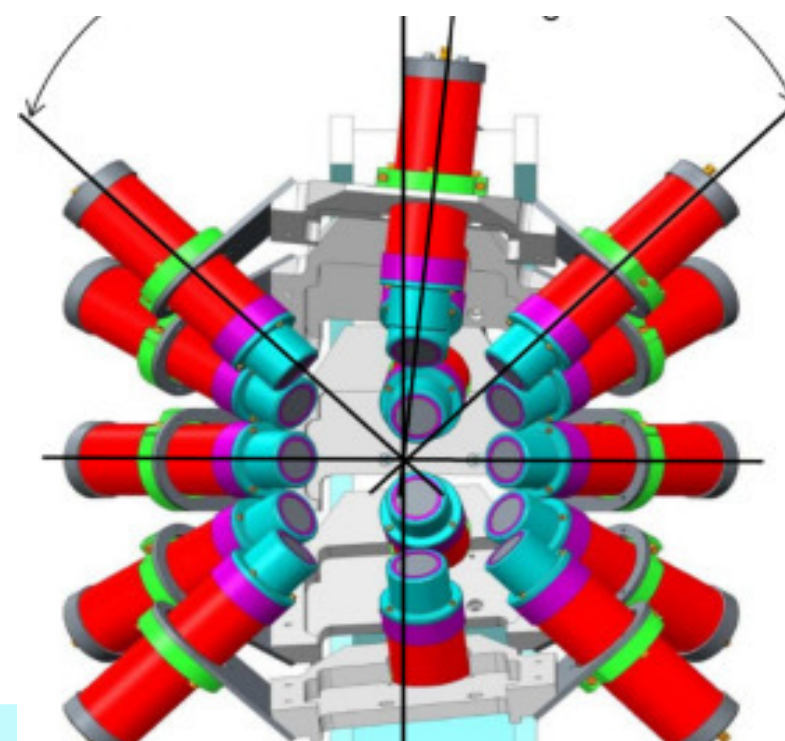
NEDA*



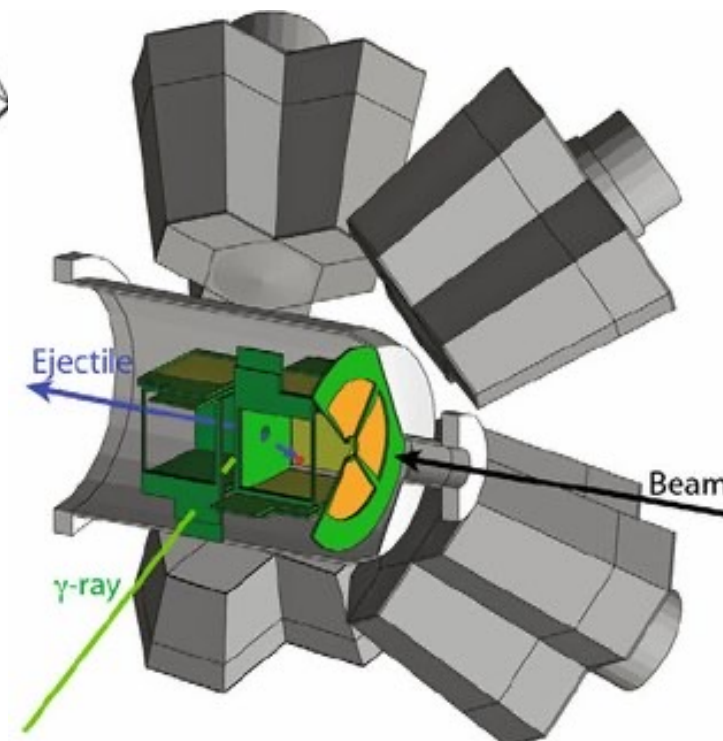
CALIFA@R3B



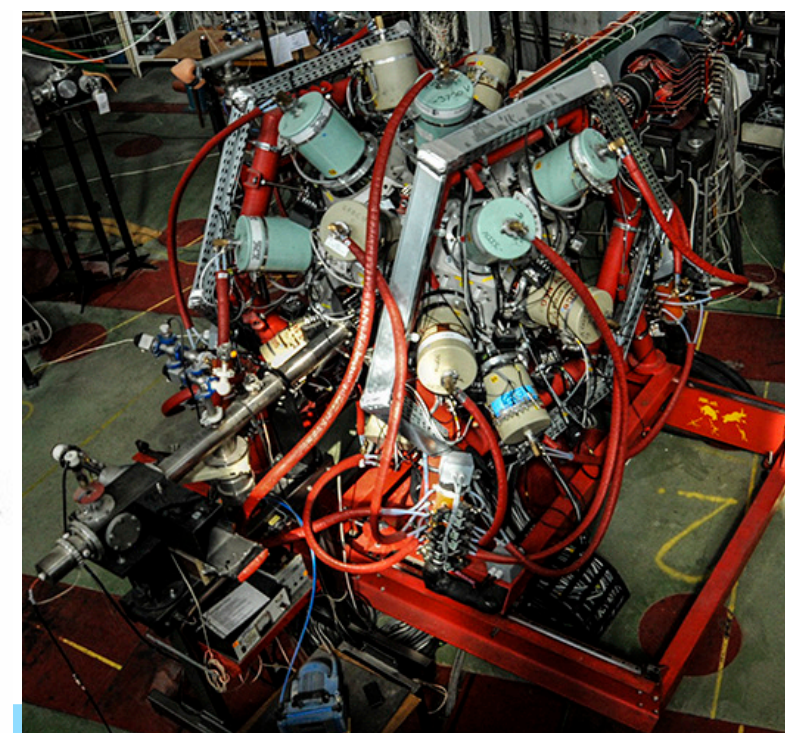
FATIMA*



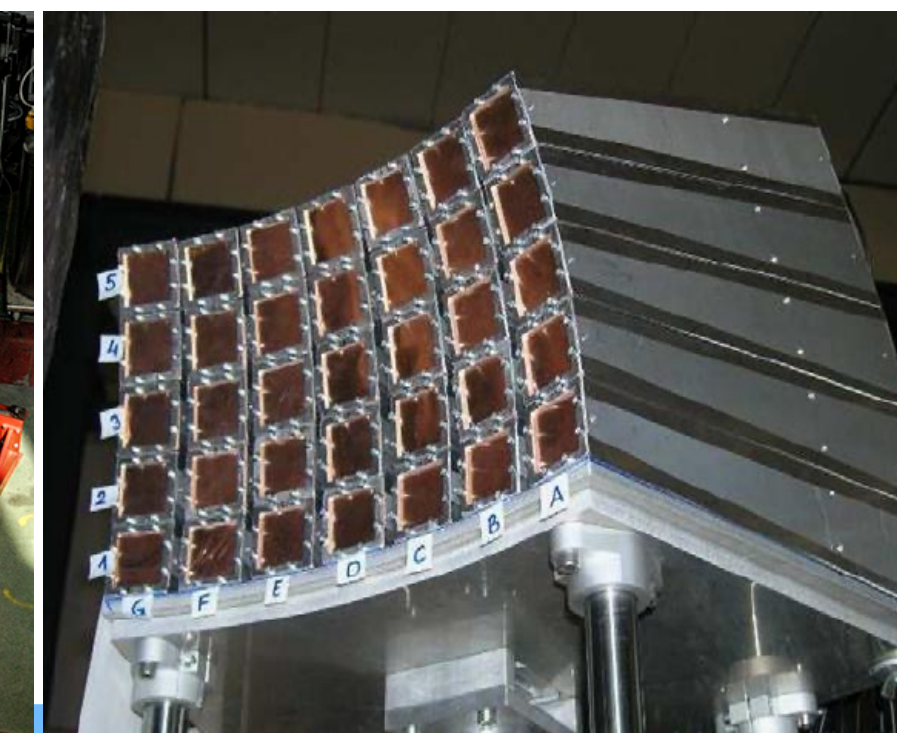
T-REX



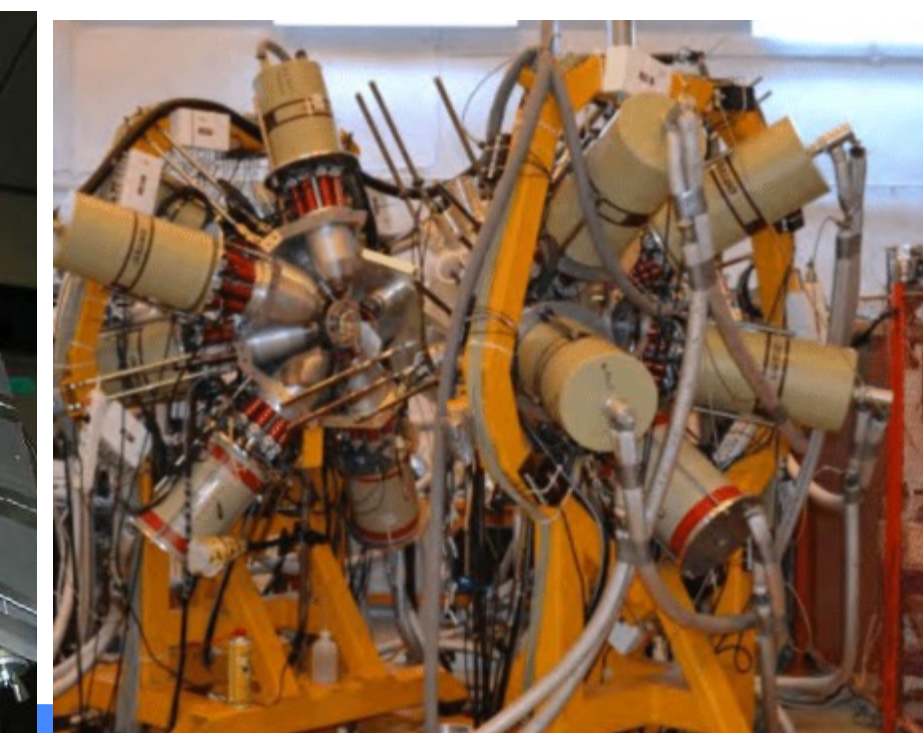
EAGLE



KRATTA*



ROSPHERE



The general approach of WP2 is to offer potential users the transnational and virtual access to those RIs, which in a complementary way span opportunity for investigation of important nuclear physics phenomena that are pertinent to answer **Big Questions** like:

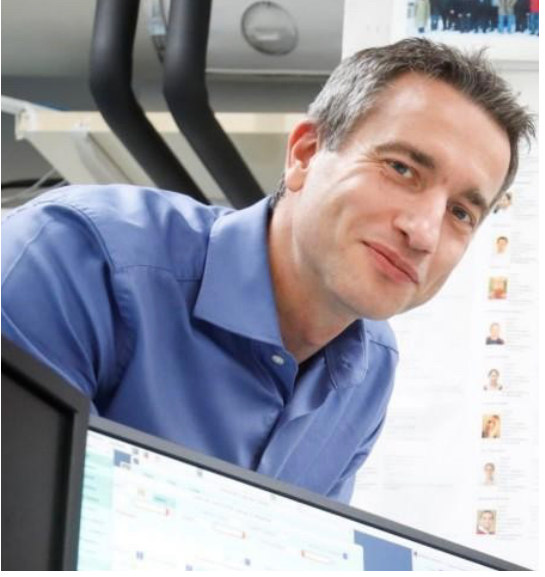




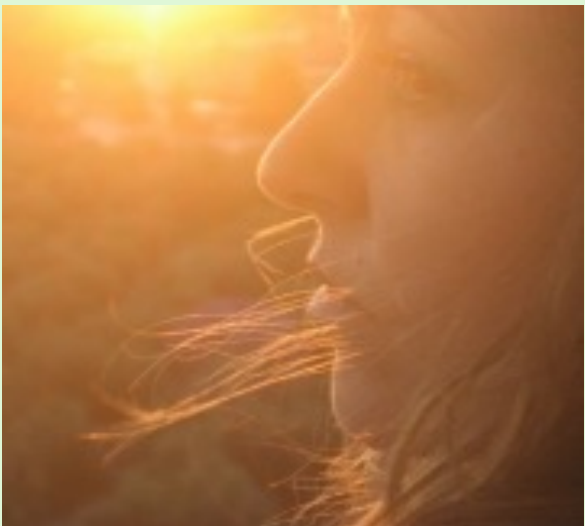
- How does the complexity of nuclear structure arise from the interaction between nucleons?*
- What are the limits of nuclear stability?*
- What governs the dynamics of nuclear collisions*

The RIs included in WP2 provide access to an extremely broad range of installations and services, **focused on delivering excellence in fields including, but not limited to:**

- Fundamental Nuclear Science,**
- Nuclear Astrophysics,**
- Neutron Physics,**
- Physics beyond the Standard Model,**
- Interdisciplinary Research,**
- Applications of Nuclear Science,**
- Atomic Physics,**
- Biophysics,**
- Medical Physics**
- Materials Science**

Organization of WP2

WP2 coordination: **Adam Maj (IFJ PAN Krakow)**

Task	WP2.1 Stable Ion Beam Facilities	WP2.2 Radioactive Ion Beams Facilities	WP2.3 Neutron Beam Facilities	WP2.4 Theoretical Support for Experiments	WP2.5 Service Improvements
Coordinator	Paul Greenlees JYFL Jyvaskyla	Iulian Stefan IJCLab Orsay	Alberto Mengoni CERN	Gert Aarts Swansea Uni & ECT*	Marco Durante GSI
					
RI	<ul style="list-style-type: none"> JYFL (Finland) LNL-LNS (Italy) GANIL-SPIRAL2 (France) ALTO (France) GSI/FAIR (Germany) NCL-SLCJ (Poland) NLC-CCB (Poland) IFIN Tandem (Romania) USE-CLEAR (Spain) ATOMKI-CLEAR (Hungary) IST-CLEAR (Portugal) 	<ul style="list-style-type: none"> ALTO (France) ISOLDE (CERN) GSI/FAIR (Germany) GANIL-SPIRAL2 (France) LNL-LNS (Italy) JYFL (Finland) 	<ul style="list-style-type: none"> n-TOF (CERN) GANIL-SPIRAL2 (France) ALTO (France) LNL-LNS (Italy) USE-CLEAR (Spain) ATOMKI-CLEAR (Hungary) 	<ul style="list-style-type: none"> ECT* (Italy) VA Theo4Exp: MeanField4Exp (Poland) Reaction4Exp (Spain) Structure4Exp (Italy) <p>Manuela Rodriguez-Gallardo (U. Sevilla, Spain)</p> 	<ul style="list-style-type: none"> Streamlined procedures + Remote access Bio medical Ion source improvements Target developments Traveling detectors

Each facility promised certain amount of beam time for the Project.

The costs of this amount of beam time is partially reimbursed (ca.20%) by the project. In addition, the facility receives certain amount of money to cover the costs of travel and staying expenses for the **eligible groups**.

Which user group is eligible?

The majority of the users must work in a country other than the country(ies) where the installation is located.

So if experimental group applied for a beam time for given facility, and if the local PAC approved the beamtime, the **user group may apply for the TA support**.

The support is evaluated by the appropriate **User Selection Panels**

WP2 User Selection Panels (USPs)

LNL/LNS:

Alessia Di Pietro
Tommaso Marchii
Marialuisa Aliotta
Kouichi HAGINO (PAC member)

GANIL:

Patricia Rousell-Chomaz
Emmanuel Clement
Stephan Oberstedt (SPIRAL2 - PAC Chair)
Silvia Leoni (SPIRAL2 - GUEC Chair)

IFIN-HH:

Constantin Mihai
Philippe Dessagne
Peter Thirolf

ISOLDE/CERN:

Sean Freeman
Gerda Neyens
Karsten Riisager
David Sharp

n-TOF/CERN:

Alberto Mengoni
Rosa Vlastou
Rene Reifarth
Nicola Colonna
Enrique Gonzales
Frank Gunsing
Enrico Chiaveri

ECT*:

Gert Aarts
Almudena Arcones
Constantia Alexandrou
David Kaplan
Marek Lewitowicz
Alessandre Obertelli
Barbara Pasquini
Vittorio Somà
Urs Wiedemann

NLC-SLCJ:

Władysław Trzaska (PAC Chair)
Katarzyna Wrzosek-Lipska

NLC-CCB:

Mushin Harakeh (IAC Chair)
Adam Maj

JYI/JYFL

Hans Otto Fynbo (PAC Chair)
Thomas Elias Cocolios
Dolores Cortina Gil
Kathrin Wimmer
Dirk Rudolph (JYU/JYFL)
Tomas Raúl Rodríguez Frutos

IJCLab/ALTO:

Jonathan Wilson
Augusto Machiavelli (PAC Chair)

GSI-FAIR:

Christoph Scheidenberger
Christine Hornung
Marina Petri
Paul Greenlees

CLEAR (USE-IST-ATOMKI):

Adam Maj (CLEAR PAC Chair)
Javier García
Teresa Pinheiro
Ferenc Ditroi

- **The User Selection Panels meet (in-person or online) after submission of TA requests, evaluates them and makes decisions for the support.**
- **As a rule all approved experiments that fulfil the TNA eligibility criteria are supported.**
- **The level of funding is in general in proportion to the number of beam hours and preparation time recommended by the corresponding PAC, with a priority to new users and young researchers.**

WP2: Summary

The RIs contributing to Tasks 1-3 of WP2 are complementary, for the beam offer and the associated instrumentation.

They all offer trans-national access for the international users community.

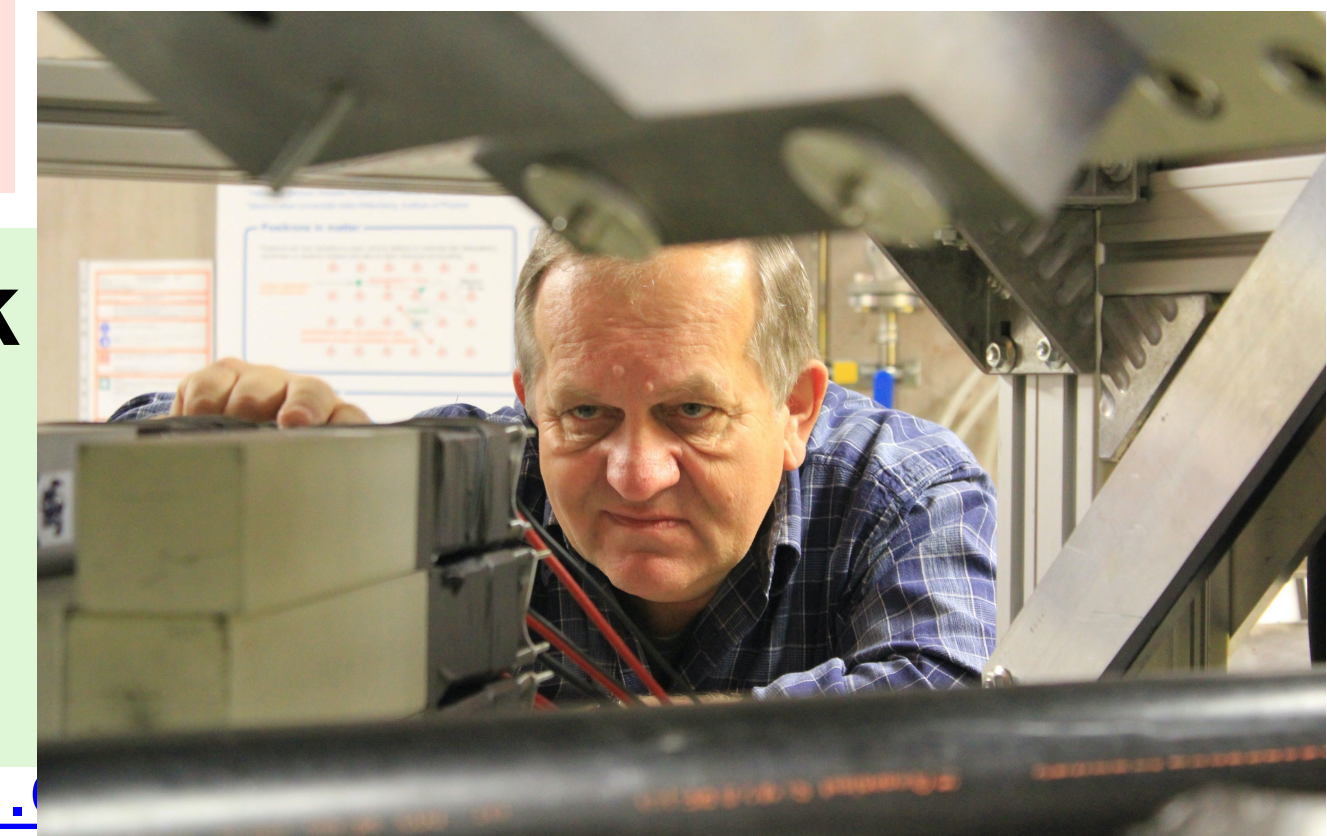
Access has to be asked by submitting a written proposal. An additional application form has to be submitted by the users interested in the TA EURO-LABS support.

Theoretical support in the Task 4 of WP2, offers Transnational Access to ECT* theoretical facility in Trento, and also Virtual Access to Theo4Exp infrastructure, localized in 3 installations: MeanField4Exp in Krakow, Reaction4Exp in Seville, and Structure4Exp in Milano.

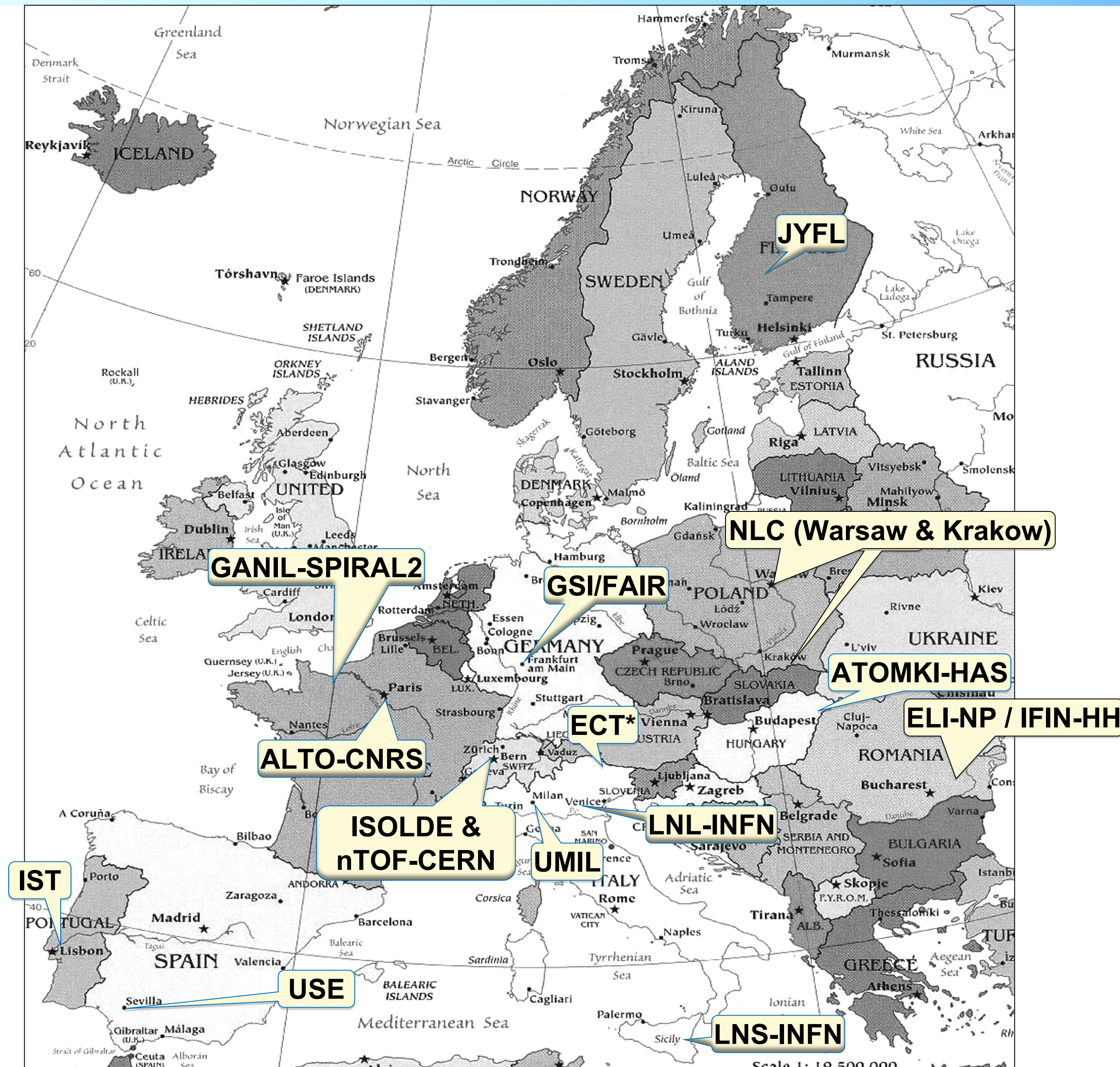
Task 5 of WP2 provide improvements of the services offered by the RIs from the Tasks 1-3. Service improvement is a foremost perk of EURO-LABS, whose goal is indeed to provide advanced, state-of-the-art services to users of the RIs, to make them more attractive and competitive.

The work of the WP2 is performed in a synergy with the 2 other TA work packages: WP3 and WP4, and also profit from the transversal work packages: WP1 (general coordination, web page) and WP5 (Dissemination, Open Data, Machine Learning).

Adam.Maj@itj



Map of Nuclear Physics facilities in WP2



17 TARA facilities
in **9** countries

16 beneficiaries
in **11** countries

Community: **2500-3000**
scientists and highly
qualified engineers

Second Annual Meeting (SAM) of EURO-LABS was held October 9th –11th, 2023 in Kraków (Poland)

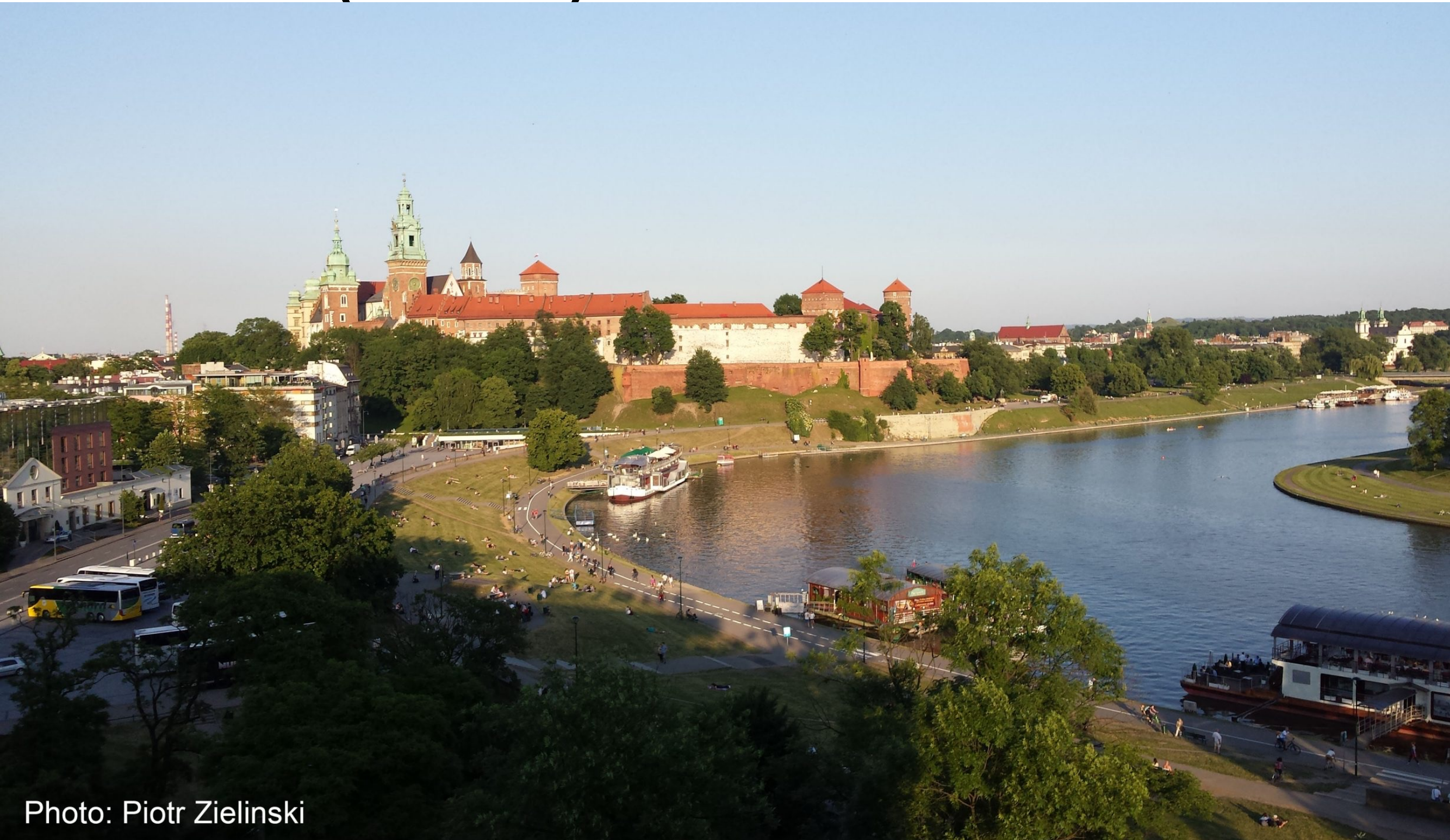


Photo: Piotr Zielinski

IFMIF-DONES, when running, would fit perfectly in such a project and the User Community would get a additional means to access the IFMIF-DONES infrastructure

Facility	% of TA	% of T&S
1 - INFN-LNL/LNS	23%	0%
2 - GANIL/SPIRAL2	47%	16%
3 - CERN/ISOLDE	74%	27%
3 - CERN/nTOF	49%	46%
5 - IFJ PAN-CCB	23%	37%
9 - CNRS-ALTO	117%	45%
12 - UNIWARSAW-SLCJ	134%	38%
13 - GSI/FAIR	0%	0%
14 - IFIN-HH/Tandem	53%	15%
15 - USE/CLEAR	10%	3%
16 - IST/CLEAR	7%	3%
17 - Atomki	11%	1%
18 - JYU	84%	17%
Total	53%	19%