WP2 Report:
Access to RI for Nuclear Physics

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IFJ PAN Kraków


Photo: Piotr Zielinski

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WP2: access to RI and instrumentation

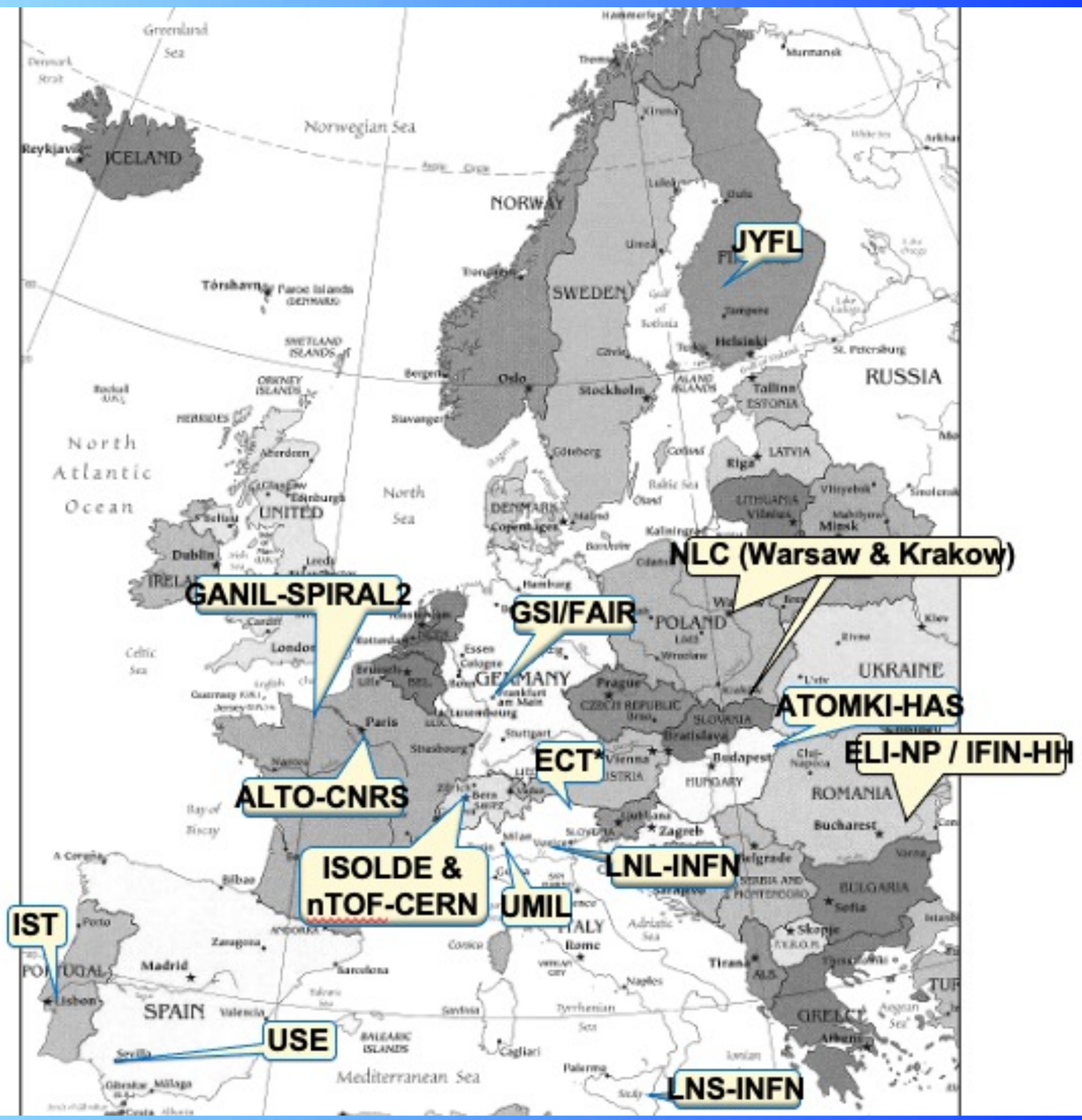
- **Transnational Access to Research Infrastructures in in WP2** - a large portofolio of different types of beams (**stable ions, radioactive ions, neutrons)** ranging from few hundreds of keV to few GeV which are necessary for production of **atomic nuclei at extreme conditions**.
- **All WP2 TA facilities** offer the **state-of-the-art equipment to the users**
- **VA offers access to "Theory4Experiment"** services via dedicated webpages
- **Service improvements for al WP2 facilities are being provided**

WP2: 17 TA/VA facilities in 9 countries

Each of the TA facility has FC (facility coordinator)

16 beneficiaries in 11 countries

Community: 2500-3000 scientists and highly qualified engineers



Goals of WP2

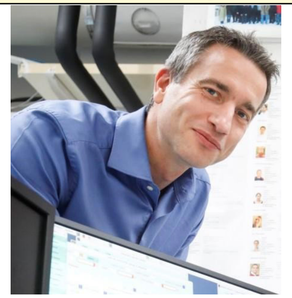
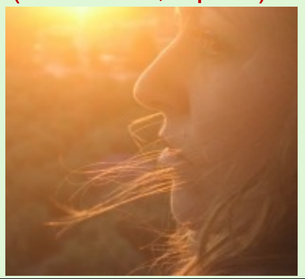
To achieve to the top-class scientific results **a strong collaboration between nuclear physics experimentalists and theorists is a must**. In the WP2 this will be achieved by offering experimentalists and theorists a **Transnational Access (TA)** to the European theoretical facility **ECT*** in Trento, where common workshops and conferences will be organized.

In addition a **Virtual Access (VA)** to a theoretical facility **Theo4Exp** will also be provided, **to access**, via user-friendly web page interface, **model calculations software and data base with nuclear physics data, both for planning and for interpretation of experiments** conducted at the RI facilities.
Theo4Exp has 3 installations: **MeanField4Exp** in Krakow, **Reaction4Exp** in Seville and **Structure4Exp** in Milano.

The proposed, in a bottom-up approach, **service improvements**, from which the users of the RI will benefit in the near future, is also essential for a coordinated development of the facilities.
The chosen services are related to: **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.**

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	• 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)	• ALTO (France) • ISOLDE (CERN) • GSI/FAIR (Germany) • GANIL-SPIRAL2 (France) • LNL-LNS (Italy) • JYFL (Finland)	• n-TOF (CERN) • GANIL-SPIRAL2 (France) • ALTO (France) • LNL-LNS (Italy) • USE-CLEAR (Spain) • ATOMKI-CLEAR (Hungary)	• ECT* (Italy) • VA Theo4Exp: MeanField4Exp (Poland) Reaction4Exp (Spain) Structure4Exp (Italy) **Manuela Rodriguez-Gallardo** (U. Sevilla, Spain) 	• Streamlined procedures + Remote access • Bio medical • Ion source improvements • Target developments • Traveling detectors
	TA	TA	TA	TA/VA	

Task Coordinators

The Task Coordinator should:

1) monitor the work of the facilities or subtasks in their task during the EURO-LABS period:

- ❑ *what type experiments are performed in different facilities, using stable ion beams, RI beams and neutron-beams;*
- ❑ *the number of beam hours given to the users in each of the above category;*
- ❑ *obtained highlights;*
- ❑ *status and achievements of the Theory Support (TA/VA);*
- ❑ *achievements in Service Improvements.*

2) prepare *every 6 month* an internal report for the WP2 coordinator with the condensed information how the task is doing.

3) write official report on the deliverable for his task:

- ❑ *D2.1: Report on access to Stable Ion Beam Facilities – M46;*
- ❑ *D2.2: Report on access to Radioactive-ion Beam Facilities – M46;*
- ❑ *D2.3: Report on access to RI providing neutron beams – M46;*
- ❑ *D2.4: Report on access to the Theory for Experiments facilities – M46;*
- ❑ *D2.5: Report on the Service Improvements – M36.*

Facility Coordinators

The Task Coordinator should:

1) coordinate the delivery of the promised beam units
2) be in constant contact with the Task Coordinator and WP2 coordinator

Facility coordinators		
LNL/LNS		Tommaso Marchi
		Allesia di Pietro
GANIL-SPIRAL2		Emanuel Clement
ALTO		Jon Wilson
GSI/FAIR		Christoph Scheidenberger
ISOLDE@CERN		Sean Freeman
n-TOF@CERN		Alberto Mengoni
JYFL		Paul Greenlees
NLC-SLCJ		Katarzyna Hadyńska-Klęk
NLC_CCB		Maria Kmiecik
IFIN-HH		Alexandru Negret
USE Sevilla		Joaquin Gomez Camacho
ATOMKI Debrecen		Sandor Biri
U. Lisboa		Victoria Corregidor Berdasco
WP2.4.1 ECT*		Gert Aarts
WP2.4.2 Theo4Exp		Manuela Gallardo
		Piotr Bednarczyk
		Jerzy Dudek
		Gianluca Colo

Task: WP2.1 Stable Ion Beam Facilities

Milestone – all facilities have arranged calls for proposals in accordance with the GA**:**

MS2 - Preparation of calls for submission of proposals to stable beam access facilities completed Task 2.1 Status: Achieved (Delivery date: 28/02/2023).

Link to the Milestone Report: https://data.192.135.24.99.myip.cloud.infn.it/s/SlXsIyV6xTHNXlg

- All facilities, except GSI, have executed supported experiments in the first reporting period – GSI will exhaust allocated resources in 2024-2025
- Two facilities have already provided more than 100% of the promised access hours - ALTO (134%) and NLC-SLCJ (117%) – JYU has provided 84%
- Approximately 50% of promised access hours already delivered overall
- More than 50 projects and around 225 visits supported
- Clear that demand and possibility to supply access far greater than **the level promised in the GA**

See talk of Paul Greenless tomorrow morning

Task: WP2.2 Radioactive Ion Beam Facilities

Milestone – all facilities have arranged calls for proposals in accordance with the GA:

MS4 - Preparation of calls for submission of proposals to radioactive beam access facilities completed Task 2.2
Status: Achieved (Delivery date: 28/02/2023). Link to the Milestone Report:
https://data.192.135.24.99.myip.cloud.infn.it/s/t9UXLhdKgAUQCDb

Facility	Access Units provided	Allocated users support (€)	% reimbursed
LNL/LNS	0	0	
GANIL	1540	351 403	15%
ISOLDE	3336	330 000	26.7%
GSI	0	0	
ALTO	0	0	
JYU	2928 *	240 000 *	* - Radioactive and stable beam

LNL/LNS – No RIB running now (under construction)
GSI - No RIB running now (under construction)
ALTO – RIB has been under refurbishing until now

GANIL: RIB campaign on LISE
Transfer reactions (d,p), (p,d), (d,t), (d,3He), (p,3He)

ISOLE: Series of (d,p) reactions with ISOLDE Solenoidal Spectrometer on several beams including
30Mg, 49,50Ca, 68Ni, 92Kr and 108Sn

See talk of Iulian Stephan tomorrow morning

Task: WP2.3 Neutron Beam Facilities

Milestone – all facilities have arranged calls for proposals in accordance with the GA:

MS6 - Preparation of calls for submission of proposals to radioactive beam access facilities completed Task 2.3
Status: Achieved (Delivery date: 28/02/2023). Link to the Milestone Report:
https://data.192.135.24.99.myip.cloud.infn.it/s/t7YfmTCf7t2OxUO

Facility	Activities	Access units [hr]	Budget [%]
HiSPANoS, Sevilla	neutron beam commissioning	64/640	3.5
LENOS, INFN	neutron beam commissioning	-	-
ALTO, ICJLAB, CNRS	^{238}U(n,f) experiment	2184/1860	44.7
NFS, GANIL	Ion Production Studies Gas production In Chromium Deuteron activation of ^{nat}Mo Pygmy dipole resonance in ^{140}Ce	(see report)	(see report)
n_TOF, CERN	^{64}Ni(n,γ) Capture cross sections of Er Neutron-induce fission on ^{243}Am	225/504	49.2

See talk of Alberto Mengoni tomorrow morning

Task: WP2.4.1 Theoretical Support for Experiments: ECT*

EURO-LABS supported workshops:

- EXOTICO: EXOTIc atoms meet nuclear COllisions for a new frontier precision era in low-energy strangeness nuclear physics 17-21/10 2022, 49 participants, 8 participants supported
- Tensor Spin Observables 10-14/7 2023, 24 participants, 4 participants supported
- DTP Ab Initio Methods and Emerging Technologies for Nuclear Structure 10-28/7 2023, 33 participants, 15 participants supported

ECT* Scientific Board is the selection panel

Remarks:

- Only 3 meetings supported so far: preserve financial support until after STRONG-2020 ends (May 2024)
- In 2024: 31 workshop proposals submitted, 22 selected, EURO-LABS assignment to follow

See talk of Manuela Gallardo tomorrow morning

Task: WP2.4.2 Theoretical Support for Experiments: Theo4Exp VA

Theo4Exp Virtual Access

WP2.4: Research infrastructures offering theoretical support for experiments

Manuela Rodríguez Gallardo

- Contracted personnel
  - MeanField4Exp(IFJ PAN): 2-year contract
    - Dr. Abdelghafar Gaamouchi, from 02/2023.
  - Reaction4Exp (U. Sevilla): 2-year contract
    - Carla Muñoz (Master), from 09/2023.
  - Structure4Exp (U. Milano): 1-year contract
    - Dr. Imane Moumene, from 03/2023.
- Users authentication via iam-eurolabs.ijclab.in2p3.fr (by WP5)
- Platforms are being developed with several programs already working: tests are still in order
- Open to the users is expected by the end of 2023
- Webpage: institucional.us.es/theo4exp

Note:
IFJ PAN, U. Sevilla and U. Milano provide additional financial support for the personnel and hardware

See talk Manuela Gallardo tomorrow morning

Task: WP2.5 Service improvements

Task 2.5.1 Streamlined access - coord. Paweł Napiorkowski (Warsaw)
Task 2.5.2 Targets - coord. Manuela Cavallarro (LNS)
Task 2.5.3 FLASH - coord. Marco Durante (GSI)
Task 2.5.4 ERIBS - coord. Hannu Koivisto (JYFL)
Task 2.5.5 INTRANS - coord. Magda Górska (GSI)

All planned in the GA milestones for the 1st year were achieved:

MS12: https://data.192.135.24.99.myip.cloud.infn.it/s/p3WXj00P2cfD1GB

MS13: https://data.192.135.24.99.myip.cloud.infn.it/s/E0qbQ3mk1QyQbTP

MS14:

MS15: https://data.192.135.24.99.myip.cloud.infn.it/s/1ojtdrxBQWHuOOv

MS16:

MS12	Completed database containing selected features of remote-access toolkit	2.5	18	Database validated and web-interface released
MS13	Production of a report to define the state of the art in the field (targets for NP) and collect the requests from the community.	2.5	3	Report complete and available
MS14	Reports on FLASH detectors for different facilities	2.5	18	Report complete and available
MS15	Conceptual plan for online monitoring of long-term operation beam stability	2.5	12	Report of conceptual plan released
MS16	Organisation of hands-on workshops & training schools	2.5	30	Website for training events available

Zrzut ekranu

See talk of Marco Durante tomorrow morning

List of WP2 Milestones

Milestone number	Milestone name	Related work package(s)	Due date (in month)	Means of verification
MS1	Consortium Agreement signed	1.1	1	Final version released
MS2	Preparation of calls for submission of proposals to stable beam access facilities completed.	2.1	6	Survey / questionnaire to stable beam access facilities.
MS3	All provision of access offered completed	2.1	46	Survey / questionnaire to stable beam access facilities.
MS4	Preparation of the call for submission of projects to access each of the RIs providing radioactive-ion beams.	2.2	6	Survey / questionnaire to radioactive-ion beam access facilities.
MS5	Completion of all the experiments proposed	2.2	46	Survey / questionnaire to radioactive-ion beam access facilities.
MS6	Preparation of the call for submission of projects to access each of the RIs providing neutron beams.	2.3	6	Survey / questionnaire to neutron beam access facilities.
MS7	Completion of all the experiments proposed	2.3	46	Survey / questionnaire to neutron beam access facilities.
MS8	Calls for proposals to be hosted at ECT*	2.4	18	ECT* web page
MS9	EURO-LABS-related workshops carried out at ECT*	2.4	42	Workshop programs at ECT* web page
MS10	Contracted personnel for Theo4Exp VA in place and first codes available for users in the virtual facility	2.4	18	Available software validated by the IRP
MS11	All codes installed at Theo4Exp VA and interoperability among different nodes established	2.4	42	All software released and validated by IRP
MS12	Completed database containing selected features of remote-access toolkit	2.5	18	Database validated and web-interface released
MS13	Production of a report to define the state of the art in the field (targets for NP) and collect the requests from the community.	2.5	3	Report complete and available
MS14	Reports on FLASH detectors for different facilities	2.5	18	Report complete and available
MS15	Conceptual plan for online monitoring of long-term operation beam stability	2.5	12	Report of conceptual plan released
MS16	Organisation of hands-on workshops & training schools	2.5	30	Website for training events available

Done

Ongoing

Zrzut ekranu

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

NLC-SLCJ:
Władysław Trzaska (PAC Chair)
Katarzyna Wrzosek-Lipska

NLC-CCB:
Mushin Harakeh (IAC Chair)
Adam Maj

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

IJCLab/ALTO:
Jonathan Wilson
Augusto Machiavelli (PAC Chair)

GSI-FAIR:
Christoph Scheidenberger
Christine Hornung
Marina Petri
Paul Greenlees

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

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. Access has to be asked by submitting a written proposal. User Selection Panels make decision on the founding.
So far the realisations of the TA goes in most of the RIs according to the plan. In 2 facilities the number of delivered in the 1st year Access Units was even larger than promised for 4 years.

In one facility, GSI/FAIR, there was no Access Units of the beam time given in the 1st year, but it will be done in the coming years.

Important: In all cases, the unit access costs charged to the EUROLABS project are a small fraction of the real costs. Around 80% to 90% of the full cost of all fundamental research experiments performed at the various RIs will be covered by their own budget.

Theoretical support in the Task 4 of WP2, offers Transnational Access to ECT* theoretical facility in Trento.

Very soon Virtual Access to Theo4Exp infrastructure, localized in 3 installations: MeanField4Exp in Krakow, Reaction4Exp in Seville, and Structure4Exp in Milano, will be offered. All needed personel was hired, the essential part of the software was implemented, the services are in the testing phase.

WP2: Summary

Task 5 of WP2 will provides important 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 in all WP2.5 subtasks goes accordingly to the plan.

The work of the WP2 isperformed 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).

E.g. in VA Theo4Exp the Authentication Method developed by WP5 will be employed for the access.

More details will be presented by the EURO-LABS WP Task Coordinators during tomorrow's session.

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