

The European Commission's Joint Research Centre Infrastructure Open Access programme

Joint Research Centre

ENEN/JRC PhD event 2020

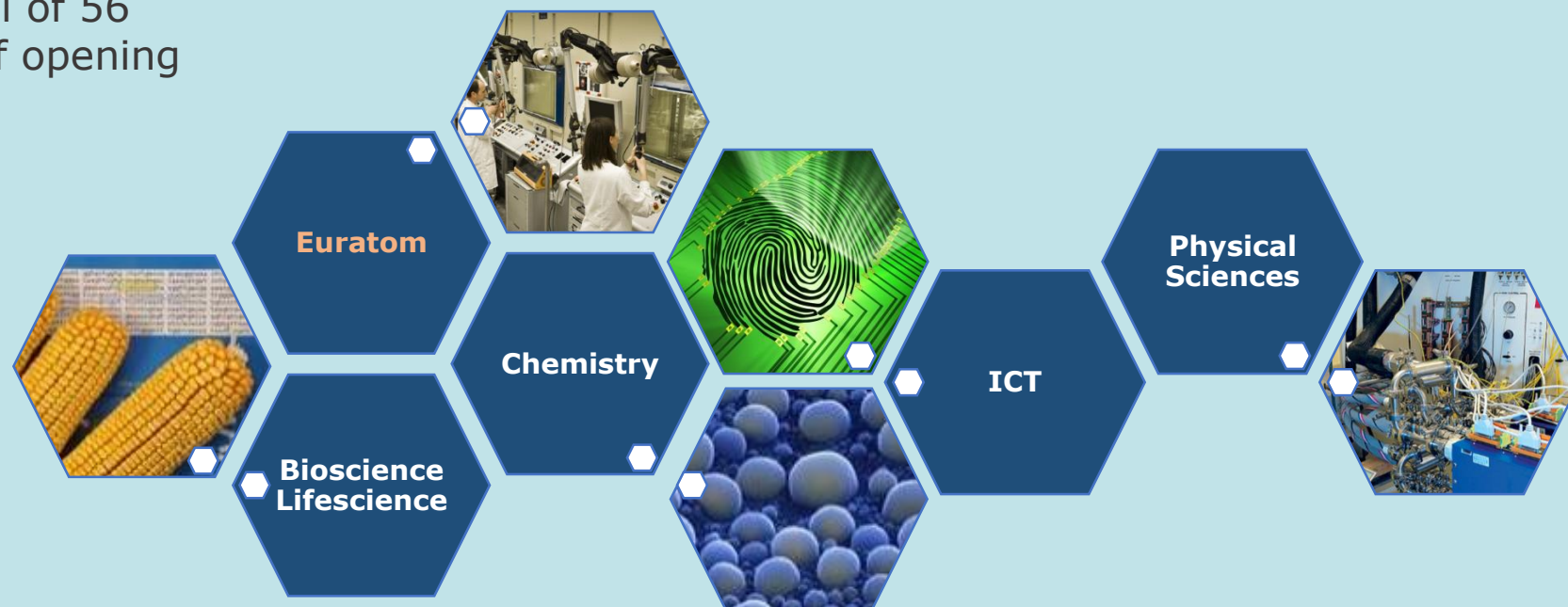
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Landscape of JRC Research Infrastructures

JRC hosts **39 physical research infrastructures** (out of a total of 56 facilities) with the possibility of opening them to external users



Rationale

Opening up access to JRC Research Infrastructures is part of the **JRC Strategy 2030**

Benefits to users and the ERA

- **Fair** and **transparent** method for allocating access
- Make JRC RIs available to external users in view of the **limited resources** in Europe
- Provide **capacity building to Enlargement and Integration countries**
- Bridge the **gap between science and Industry**
- **Dissemination** of knowledge, education and training, foster collaboration in Europe

Benefits to the JRC

- Expand JRC **networking** capabilities
- Enter into **new key areas** of research
- Maintain JRC **scientific excellence**
- Raise the **value and visibility** of JRC RIs

Framework for Access

Based on the **Charter of Access to RIs of DG RTD**

Principles and guidelines when defining Access policies for RIs

Access Modes

- **Relevance-driven**
 - **Peer-review selection following a call for proposals:** Scientific implementation, collaboration and access to new users, strategic relevance to the JRC, strategic importance for Europe
 - Mainly targeted to **academia and research institutions**, as well as to SMEs
 - Users charged the additional costs associated (18% overheads); **nuclear RIs free of charge**
 - Open dissemination after an 18 month period
- **Market-driven**
 - Selection by the JRC
 - Mainly targeted to industry
 - Users charged the full costs
 - Data not disseminated via open schemes



Open to

- ✓ EU Member States
- ✓ Countries associated to Horizon 2020

Dedicated portal at JRC Science Hub

- **All supporting documents:** Framework and related annexes (template for proposals, agreement documents, IP rules, etc.)
- **Eligibility Criteria**
- **Call for proposals per Research Infrastructure**
 - ✓ Estimated total number of Access Units allocated to the call
 - ✓ Average number of Access Units per project
 - ✓ Estimated additional costs per Access Unit
 - ✓ Priority topics of the Research Infrastructure
- **Selected Projects**
- **User Access Report** / link to databases (after embargo period)

<https://ec.europa.eu/jrc/en/research-facility/open-access>



Facilities opening up access

FACILITIES NOW OPENING ACCESS

**European Laboratory for
Structural Assessment
(ELSA) (Ispra, IT)**

Reaction Wall

HopLab

**Consumer Products Safety
(Ispra, IT)**

Nanobiotechnology Laboratory

**Energy Storage Facilities
(Petten, NL)**

BESTEST – Battery Energy Storage
Testing for Safe Electric Transport

FCTEST – Fuel Cells and Electrolyser
Testing facilities

GASTEF – Gas Tank Testing Facility

**Nuclear Reactor Safety and
Emergency Preparedness
(EMMA) (Petten, NL)**

AMALIA – Assessment of nuclear
power plants core internals

LILLA – Liquid Lead Laboratory

MCL – Micro-Characterisation
Laboratory

SMPA – Structural Materials
Performance Assessment Laboratories

**European research infrastructure
for nuclear reaction, radioactivity,
radiation and technology studies
in science and applications
(EUFRAT) (Geel, BE)**

GELINA – Neutron time-of-flight
facility for high-resolution neutron
measurements

HADES – Underground laboratory for
ultra-low level gamma-ray
spectrometry

MONNET – Tandem accelerator based
fast neutron source

RADMET – **Radionuclide Metrology
laboratories**

**Actinide User Laboratory
(ActUsLab) (Karlsruhe, DE)**

PAMEC – Properties of Actinide
Materials under Extreme Conditions

FMR – Fuels and Materials Research



Pilot Project JRC-RTD

- Objectives: to offer third parties free (of charge) access to JRC research facilities promoting training and mobility activities between academic institutions, research centres and industry, as well as support for maintaining multi-disciplinary **nuclear** competences and broaden the availability of suitably qualified nuclear researchers, engineers and employees in the EU.
- Start: 07/02/2020
- Duration: 48 months
- Budget: 750 000 €

Open access to JRC research infrastructure

Goal: Promotion of training and mobility activities in support of maintaining nuclear maintenance through the open access to JRC research facilities.

- 4 years duration
- Two calls by year : 1st call 2020 (now closed)
- **Financial Support** to the user's stay can be offered to the selected projects (travel, accommodation, subsistence)
- Two schemes: short stay users and long stay users (primarily students)



<https://ec.europa.eu/jrc/en/research-facility/open-access>

JRC nuclear research infrastructure

- 📍 **JRC-Geel (Belgium)**

- 1. GELINA: **Neutron time-of-flight** for high resolution neutron measurements
- 2. MONNET: Tandem accelerator based **fast neutron source**
- 3. RADMET: Radionuclide **metrology** laboratories
- 4. HADES: **Underground laboratory** for ultra-low level gamma-ray spectrometry



- 📍 **JRC-Karlsruhe (Germany)**

- 1. PAMEC: Properties of **actinide materials** under extreme conditions
- 2. FMR: **Fuel and materials** research
- 3. HC-KA: **Hot cell**



- 📍 **JRC-Petten (the Netherlands)**

- 1. AMALIA: **Ageing of Materials** under the effect of environmentally assisted stress corrosion cracking
- 2. LILLA: **Liquid lead** Laboratory
- 3. SMPA: **Structural Materials** Performance Assessment Laboratories
- 4. MCL: **Micro-Characterization** Laboratory
- 5. HFR-NB: High Flux Reactor **Neutron Beams** for residual stress measurements



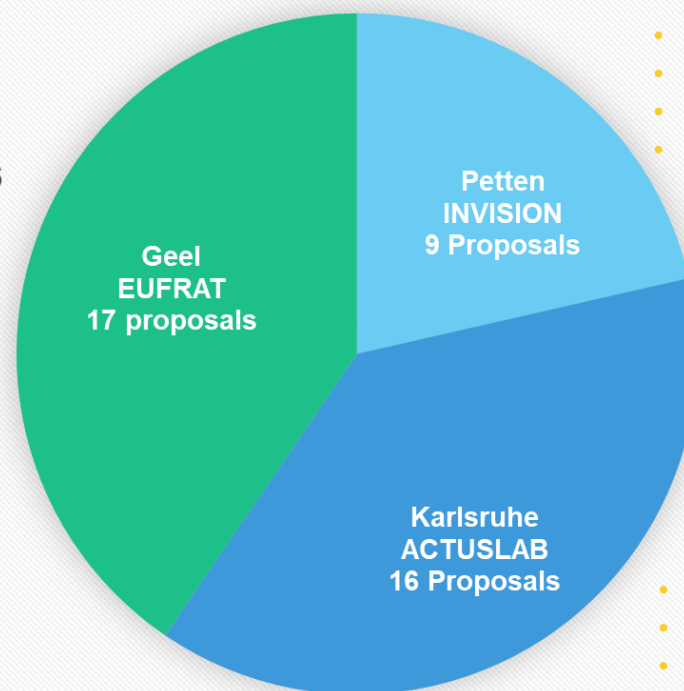
Open Access – Pilot Project

Unique Infrastructure



Open Access - Call 1 : 42 proposals

- GELINA: 8
- MONNET: 6
- HADES: 2
- RADMET: 1



- LILLA : 2
- MCL: 2
- SMPA: 2
- AMALIA: 3

- FMR: 4
- PAMEC 11
- HC: 1

- Deadline for applicants October 15th 2020
- Proposals under evaluation by independent panels

Past Calls for Access / Statistics

GELINA, Neutron time-of-flight facility for high-resolution neutron measurements **Closed**

JUL 27 2018
OCT 15 2018

Geel, Belgium. GELINA is a 150 MeV electron accelerator serving as strong white neutron source for high resolution neutron time-of-flight measurements.

Details of the call #2018-1-RD-EUFRAT-GELINA



HADES, Underground laboratory for ultra-low level gamma-ray spectrometry **Closed**

JUL 27 2018
OCT 15 2018

Geel, Belgium. JRC operates a laboratory for ultralow-level radioactivity measurements inside the 225 m deep underground laboratory HADES, which is located at the premises of the Belgian Nuclear Research Centre. In HADES, the muon flux (secondary cosmic rays) is a factor of 5000 lower compared to above ground and the flux of protons, neutrons and electrons is reduced to an insignificant level.

Details of the call #2018-1-RD-EUFRAT-HADES



MONNET, Tandem accelerator based fast neutron source **Closed**

JUL 27 2018
OCT 15 2018

Geel, Belgium. MONNET is a high-intensity quasi mono-energetic fast neutron source, driven by a vertical 3.5 MV Tandem accelerator producing either continuous or pulsed beams of protons, deuterons or helium ions.

Details of the call #2018-1-RD-EUFRAT-MONNET

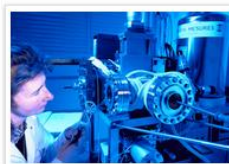


RADMET, Radionuclide Metrology laboratories **Closed**

JUL 27 2018
OCT 15 2018

Geel, Belgium. The Radionuclide Metrology laboratories (RADMET) are equipped with a broad set of instruments used for nuclear decay measurements, determination of related nuclear data and radiological characterisation of samples and materials.

Details of the call #2018-1-RD-EUFRAT-RADMET



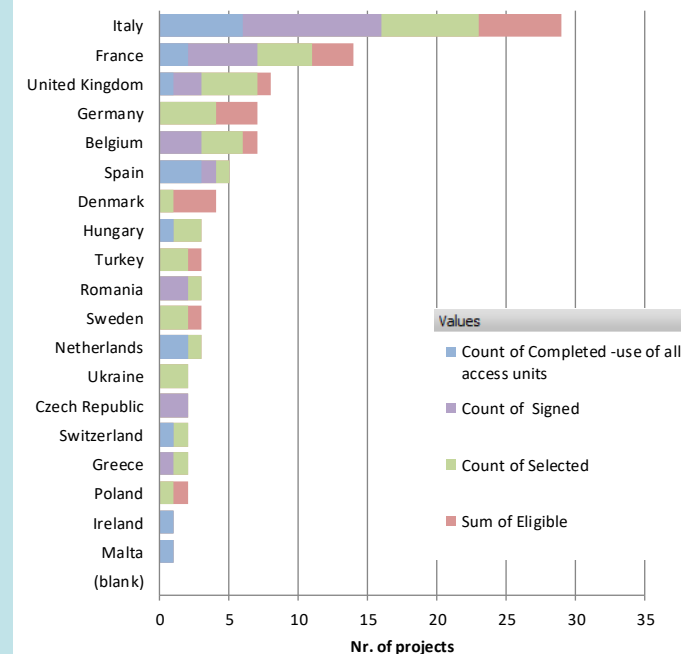
24 calls since June 2017

- ✓ **16** Research Infrastructures
- ✓ **101** Eligible proposals
- ✓ **81** Selected proposals
- ✓ **44** Signed RIAAs
- ✓ **18** Completed Projects
- ✓ **20** Countries (2 / AC H2020)

Users

- ✓ **117** User Institutions (**9** SMEs)
- ✓ **278** Users

Nr. of projects per country (LUI)



ACTUS LAB – Actinides user lab (PAMEC Properties of actinide materials, FMR Fuels & materials research)

- 17 projects accepted in 2017-2019, 380 operating-days
- 15 projects implemented, 7 peer review papers

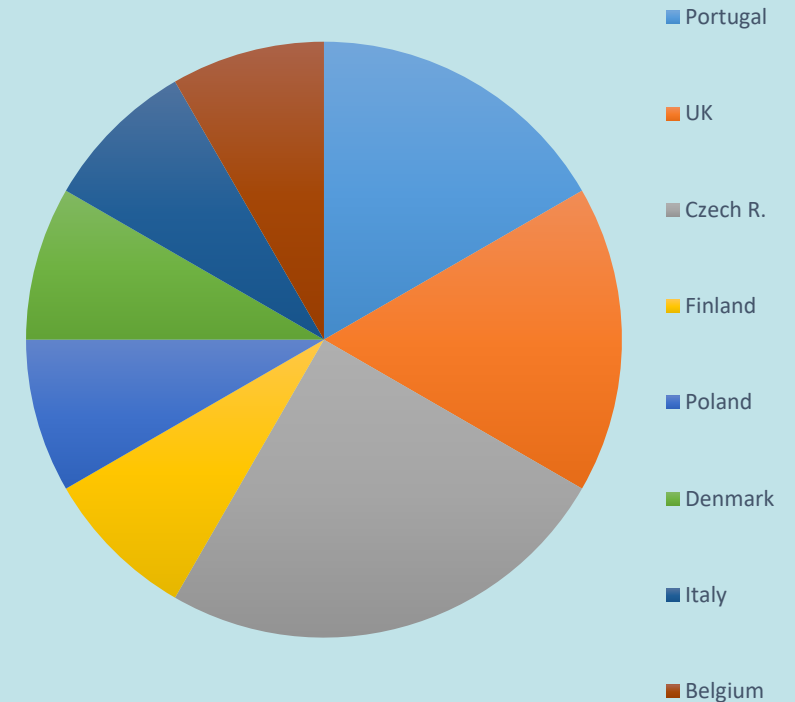
The Actinide User Laboratory since 2002

1404 Access Units (operating days)

158 Users from 14 countries, including 43 PhDs

135 projects addressed (on a total of 212 submitted)

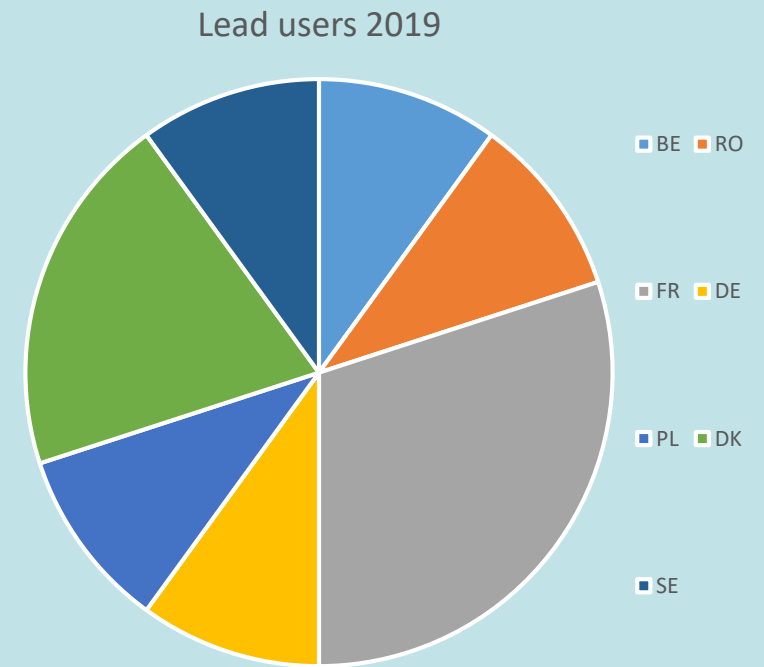
155 publications and proceedings



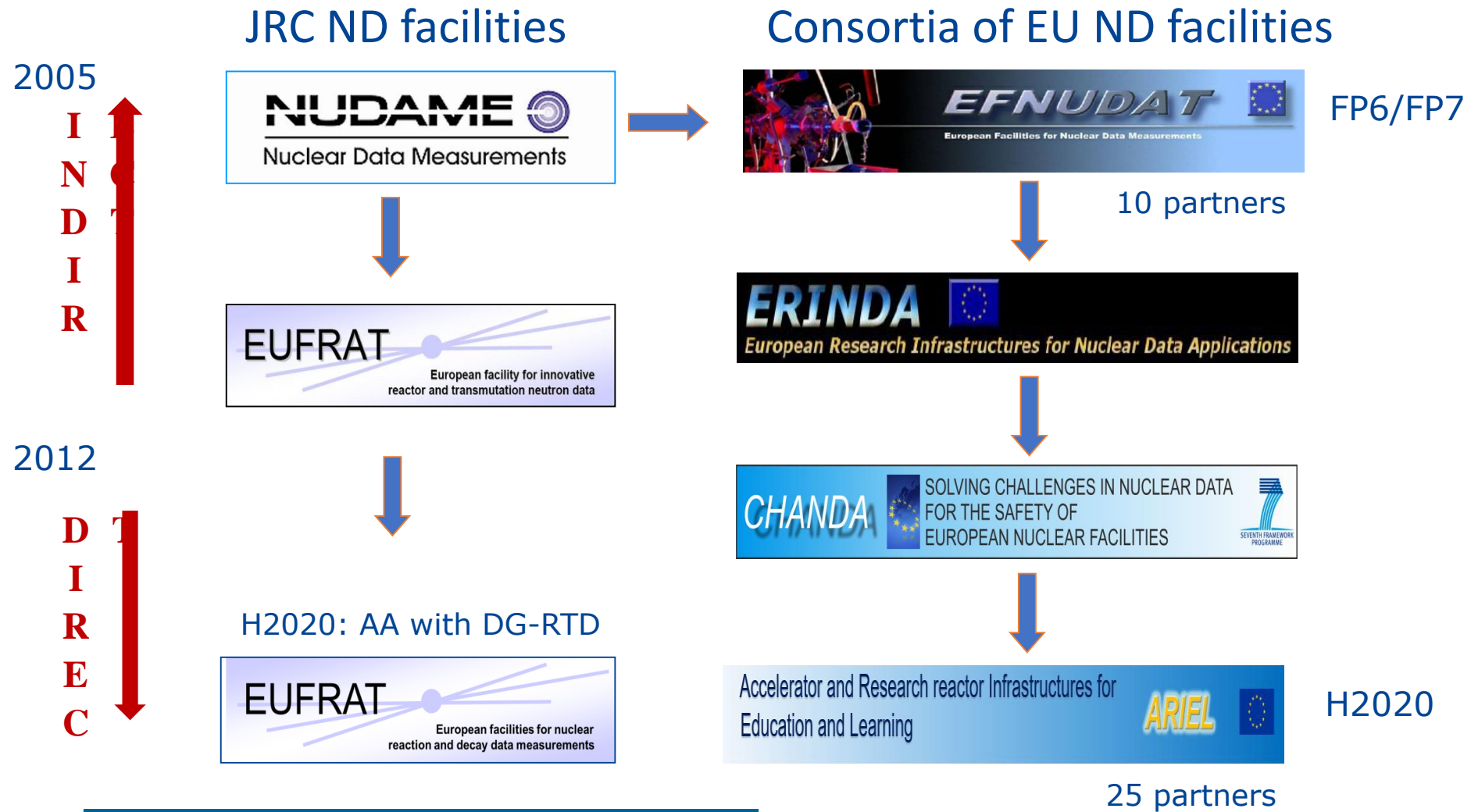
EUFRAT– European facility for nuclear reaction and decay data measurements (GELINA, MONNET, RADMET, HADES)

27 projects in 2017-2018, 211 operation weeks, involving **34 organizations** of **16 MS**

- 10 collaborative projects accepted in 2019.
- In 2017-2019, 26 peer review papers and 7 technical reports published



Integration of Nuclear Data Facilities in Europe



REVIEW ARTICLE

OPEN ACCESS

Nuclear data research supported by EURATOM: CHANDA, ERINDA and EUFRAT

Enrique Miguel Gonzalez^{1,*}, Arnd Rudolf Junghans², Arjan Plompen³, and Peter Schillebeeckx³



Objectives:

- **safe and secure use of nuclear energy and non-power applications of ionizing radiation**, including nuclear safety, security, safeguards, radiation protection, safe spent fuel and radioactive waste management and decommissioning;
- maintain and further develop **expertise and competence** in the Community;
- foster the development of fusion energy and contribute to the implementation of the fusion roadmap;
- support the policy of the Community on nuclear safety, safeguards and security



- *Maintain and further develop expertise and competence in the Union*

- **Education, training and mobility** (1 project)

DANTE	DisseminAtion of Nuclear Training and Education
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- **Knowledge management and dissemination** (3 projects)

NOWMAD	Nuclear knOWledge MAnagement and Dissemination
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NODIS	Nuclear Outreach and Dissemination
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ENDKNO W	The nuclear cycle back-end knowledge management
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- **Access to research infrastructures** (3 projects)

EUFRAT	Open Access to the nuclear research infrastructure at JRC Geel
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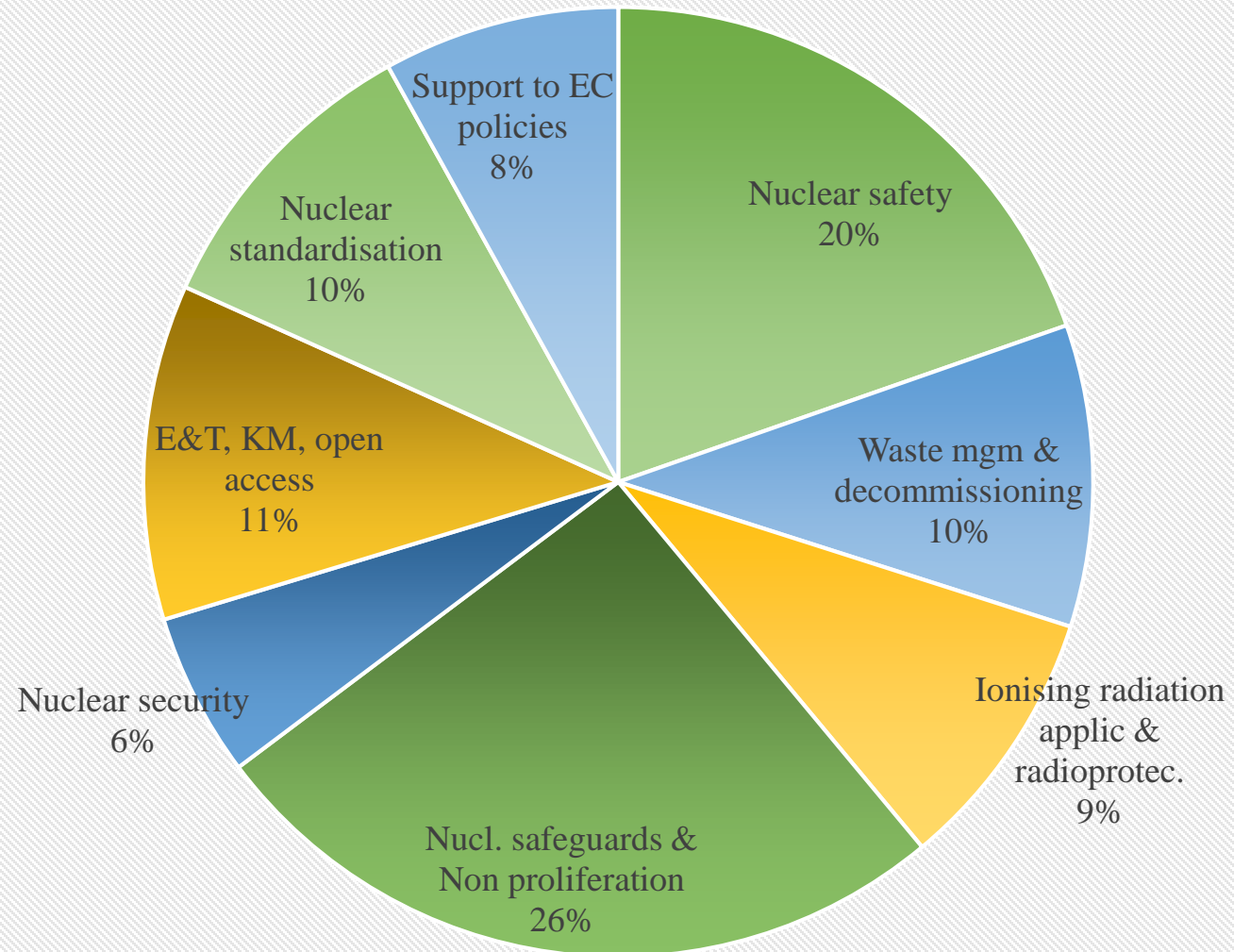
ACTUSLA B	Actinide User Laboratory
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ACCESS	Open Access to JRC Infrastructure for nuclear Safety and Security Research
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- *Maintain and further develop expertise and competence in the Union*
 - **Nuclear science base to support standardisation**
(7 projects)

NuSta4EU	Nuclear Standards for Europe
ANDANTE	Accelerator based nuclear data and associated applications in nuclear technology
ADAM	Advanced analysis methods for the characterisation of complex nuclear materials
TARGET	Production and characterisation of targets for nuclear data measurements
ARMOR	Accurate Reference Measurements of Radioactivity
NUMADIT	Nuclear Materials Data for Innovative Technologies
A-ToF	Exploratory Research - Alpha spectrometry by time-of-flight

Work programme 2021-2022



Conclusions

- **Infrastructure Open Access programme in JRC operational since a few years (nuclear and non-nuclear)**
- **Nuclear infrastructure Open Access available for external users with possibility of full financial support**
- **Continuation of this policy in EURATOM Horizon Europe 2021-2025**