The NDS Infrastructure for FAIR Data

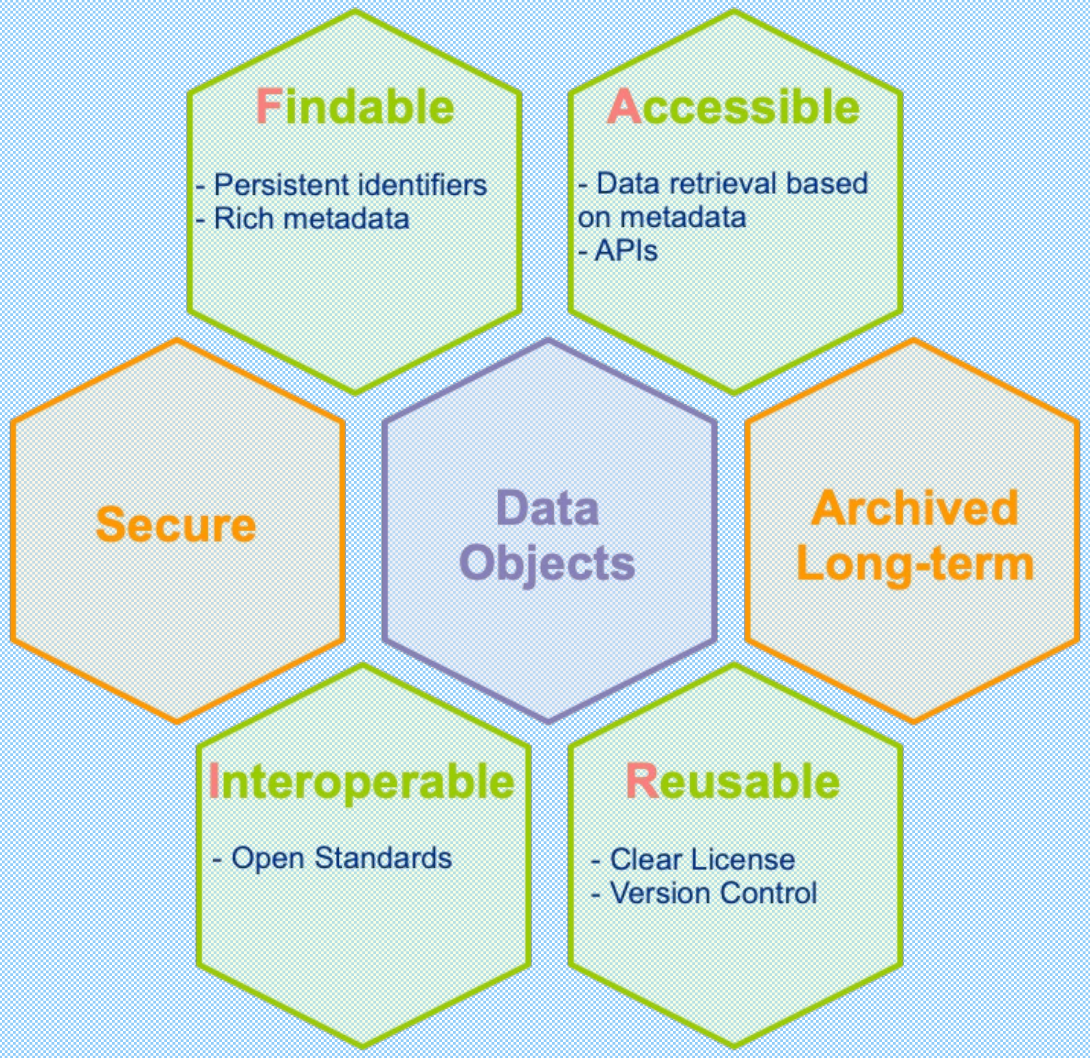
Ludmila Marian, Scientific Data Manager @ NDS

TM on Nuclear Data Retrieval, Dissemination and Data Portals

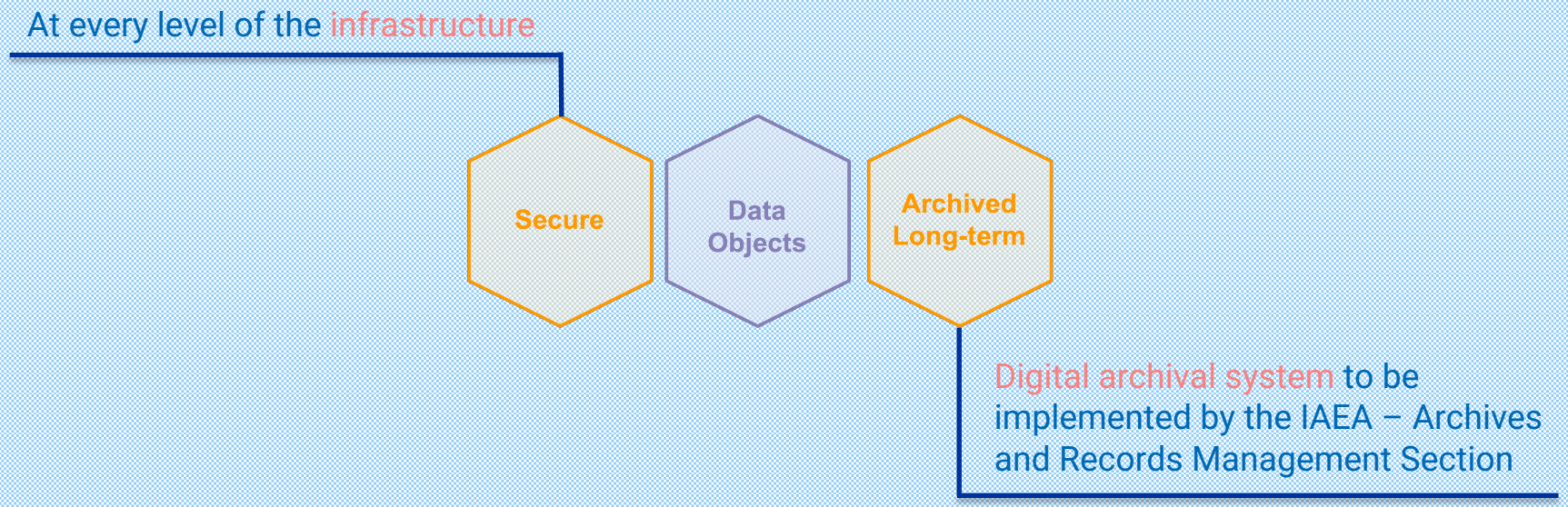
12th of November, 2024

FAIR principles

Infrastructure for FAIR Data



Infrastructure for FAIR Data



Infrastructure for FAIR Data

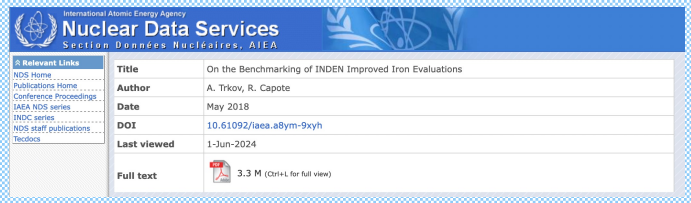
Findable

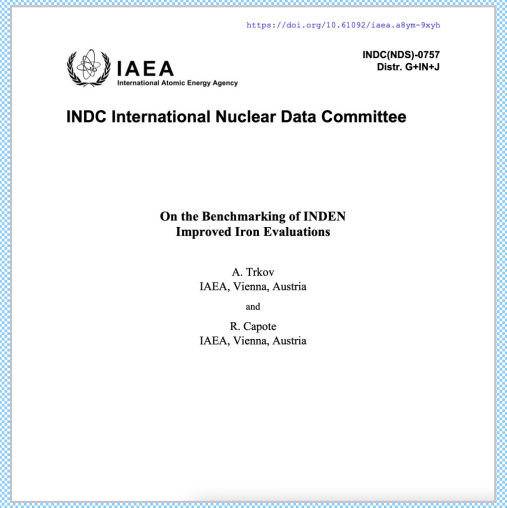
- Persistent identifiers
- Rich metadata

Data Objects

- **DOI Assignment**
  - **Started with INDC Reports**
    - **172 DOIs assigned so far, on-going for the backlog.**
  - **EXFOR Master File**
    - **9 DOIs assigned for current and past yearly versions.**

Crossref





Infrastructure for FAIR Data

Findable

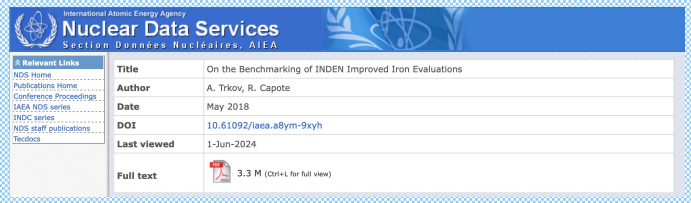
- Persistent identifiers
- Rich metadata

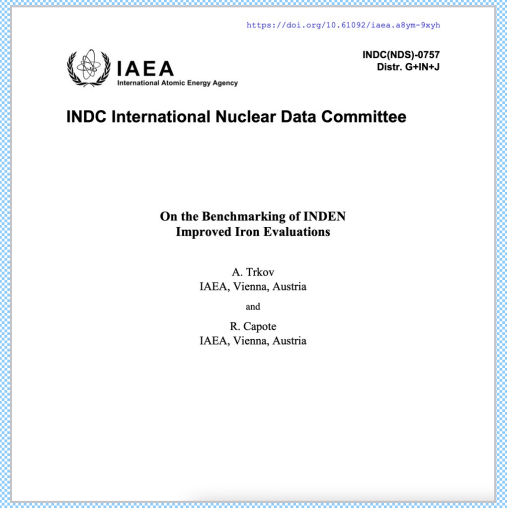
Data Objects

New website

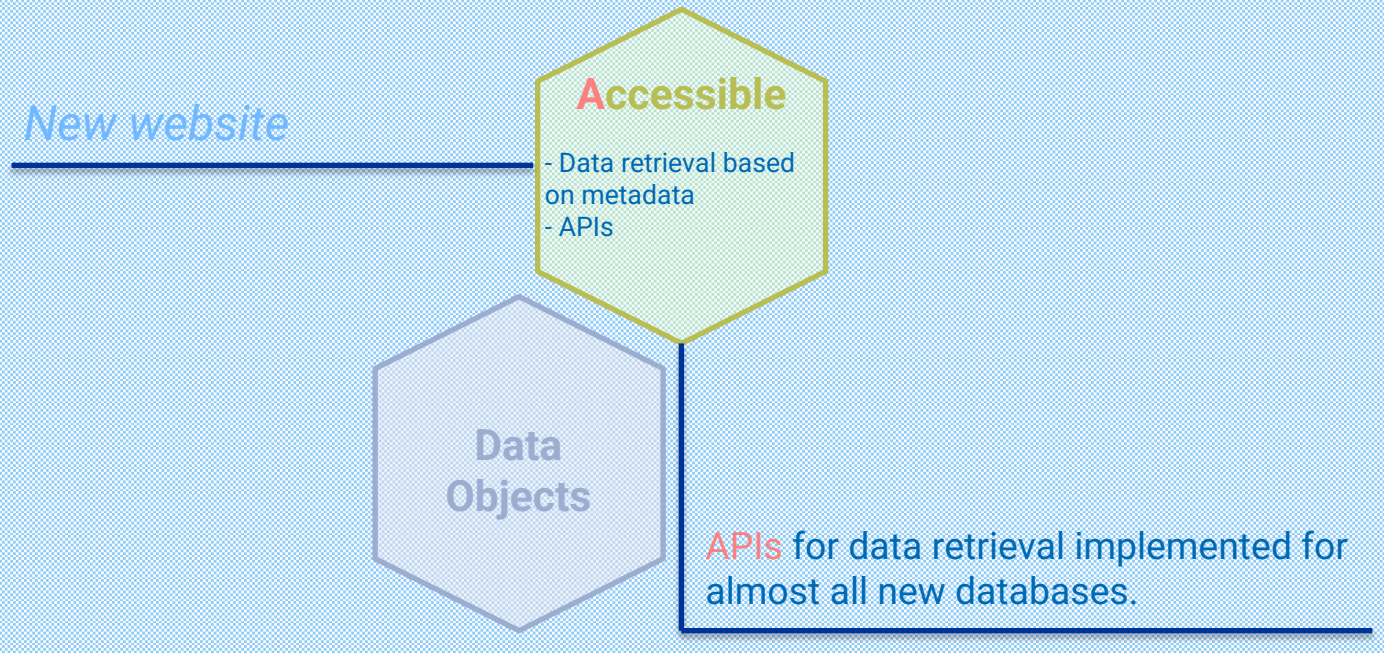
- **DOI Assignment**
  - **Started with INDC Reports**
    - **172 DOIs assigned so far, on-going for the backlog.**
  - **EXFOR Master File**
    - **9 DOIs assigned for current and past yearly versions.**

Crossref

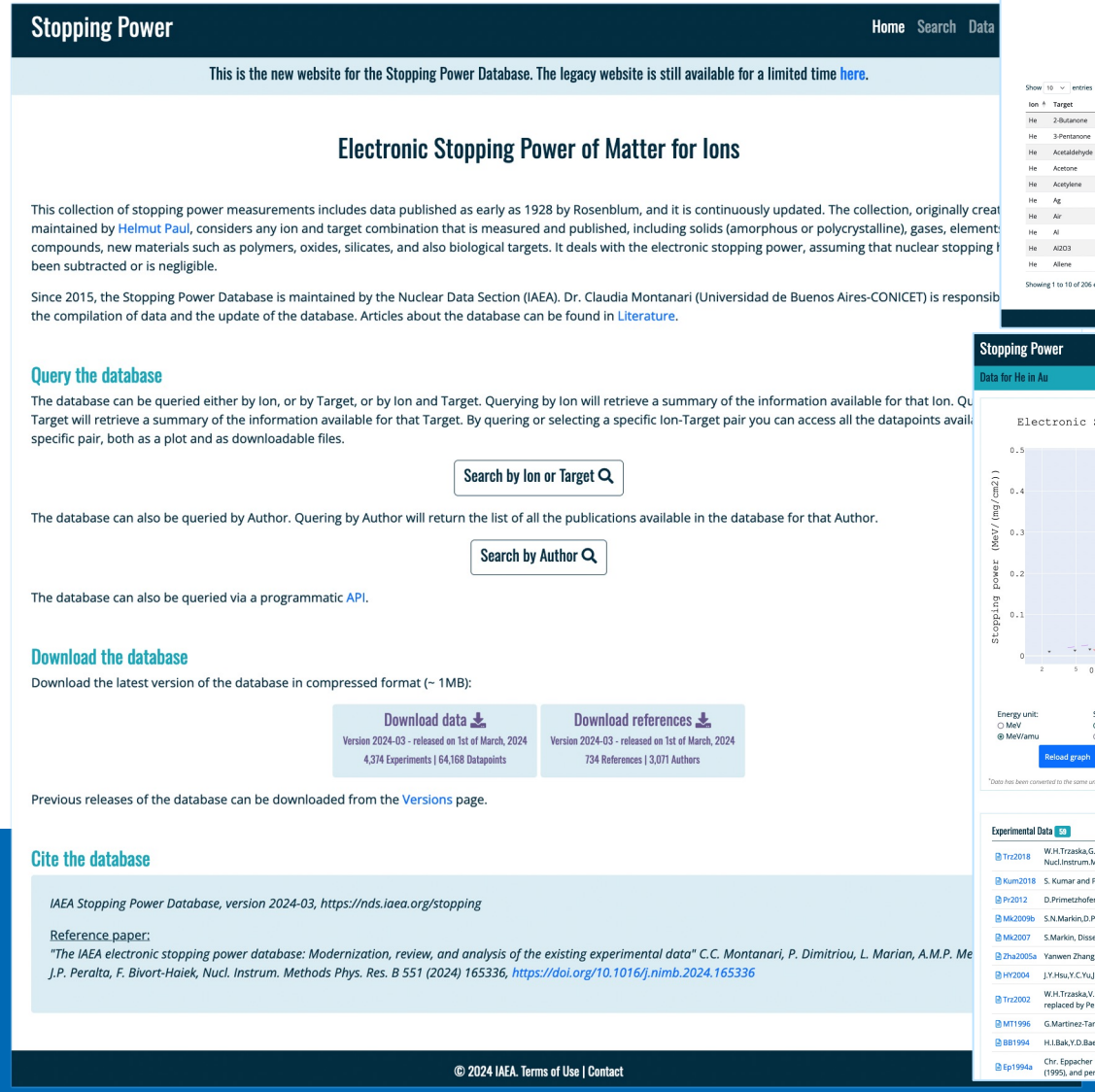


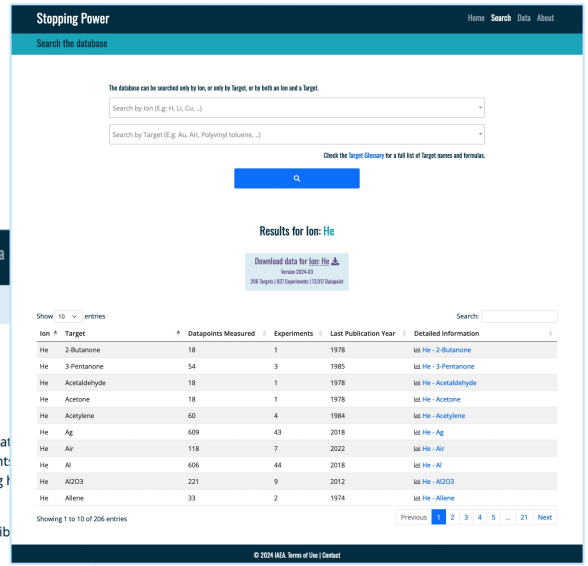


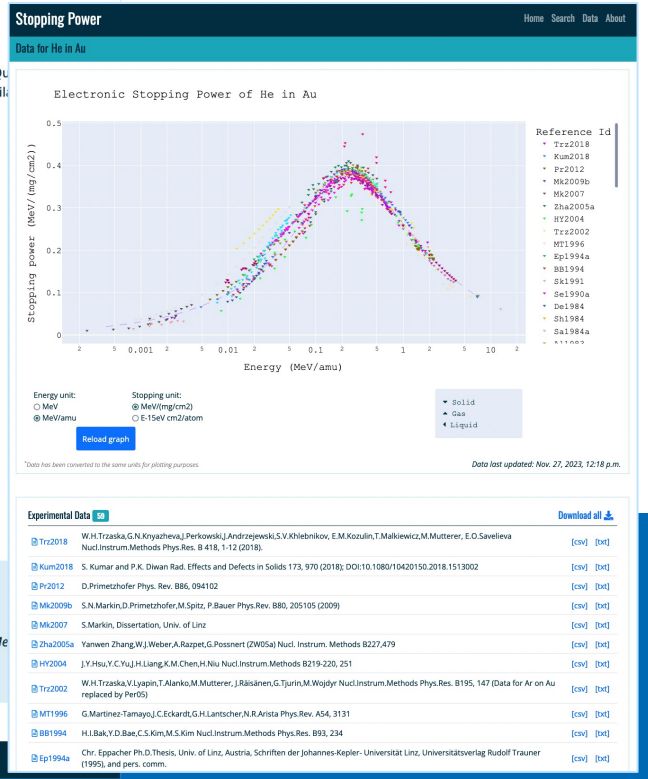
Infrastructure for FAIR Data

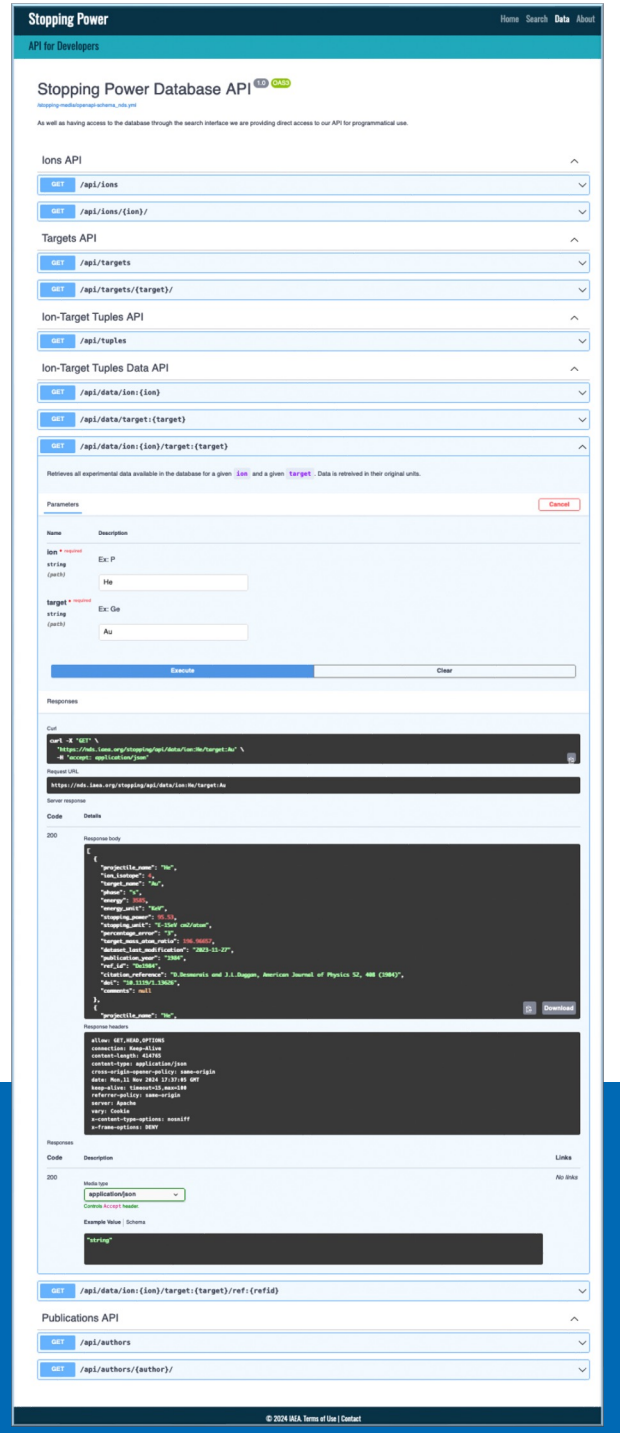


APIs - examples



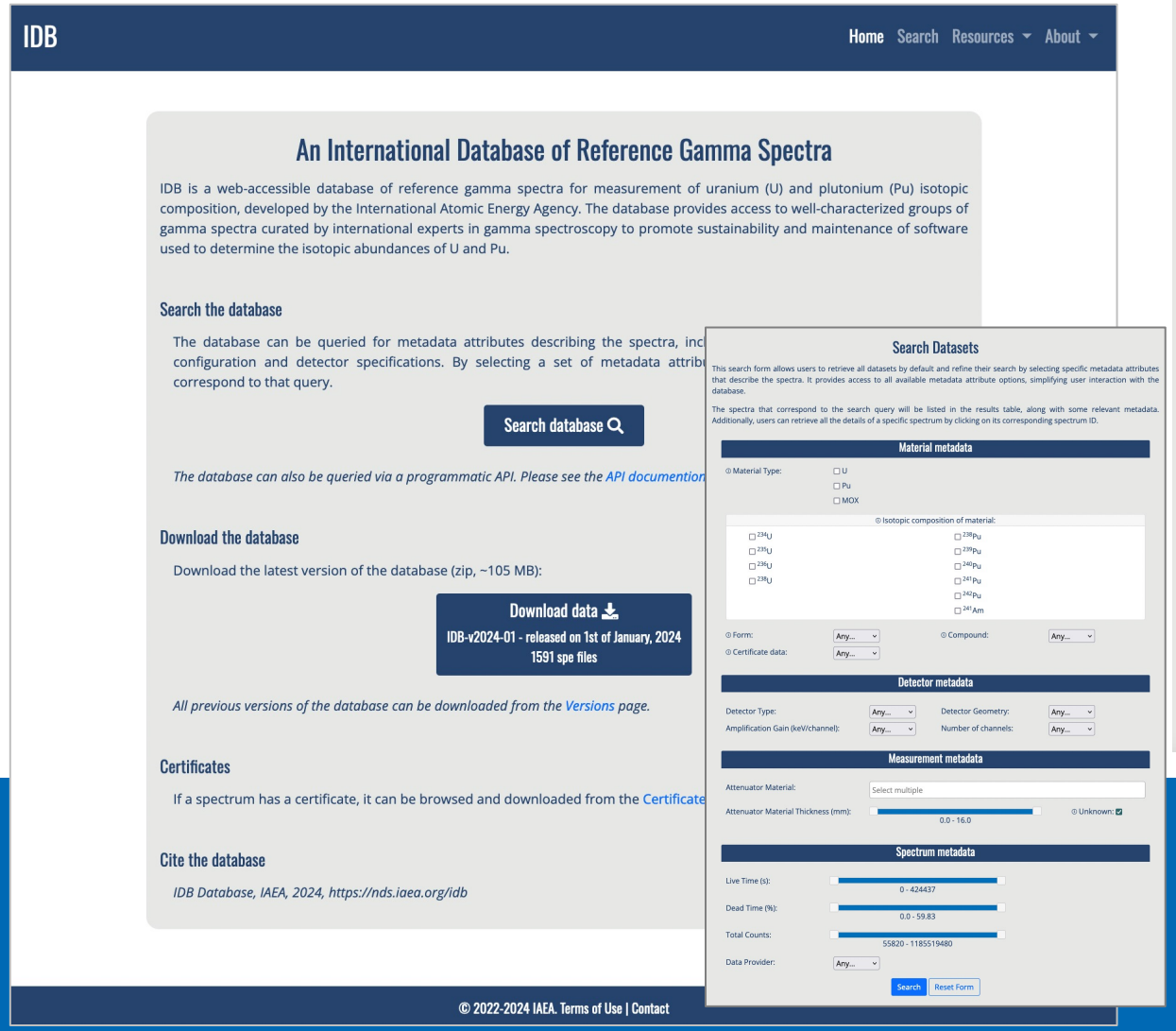


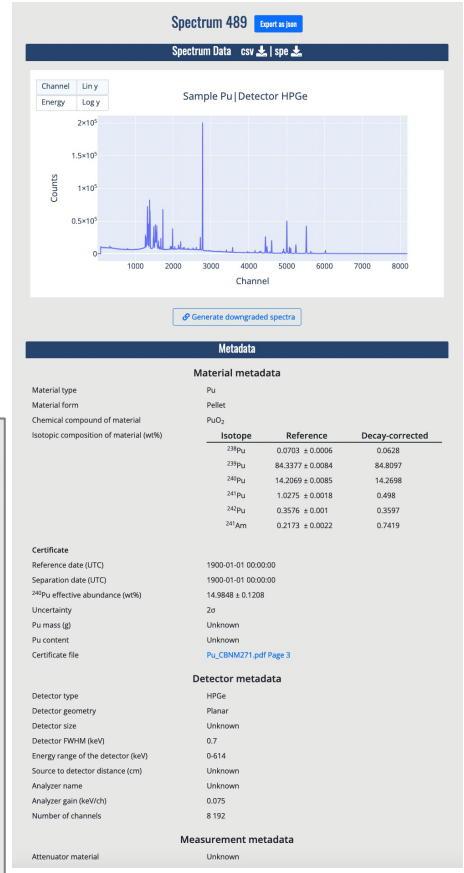




https://nds.iaea.org/stopping

APIs - examples





IDB API Reference

The IDB Application Programming Interface (API) extends the capabilities of the user interface (UI) to retrieve and access the data.

Spectrum Details by REST API

To view the spectrum details through the UI, identify it with a unique integer (id) at URL:

`https://nds.iaea.org/idb/spectra/<int:id>`

To access the spectrum via the REST API, add api before spectra in the above URL:

`https://nds.iaea.org/idb/api/spectra/<int:id>`

By default, the API endpoint returns the response in JSON format, which can also be specified explicitly by adding format suffixes like format=json in the above URL.

Example:

`https://nds.iaea.org/idb/api/spectra/12?format=json`

Response consists of the spectrum id along the spectral information and its associated metadata stored as key/value pairs, as described below:

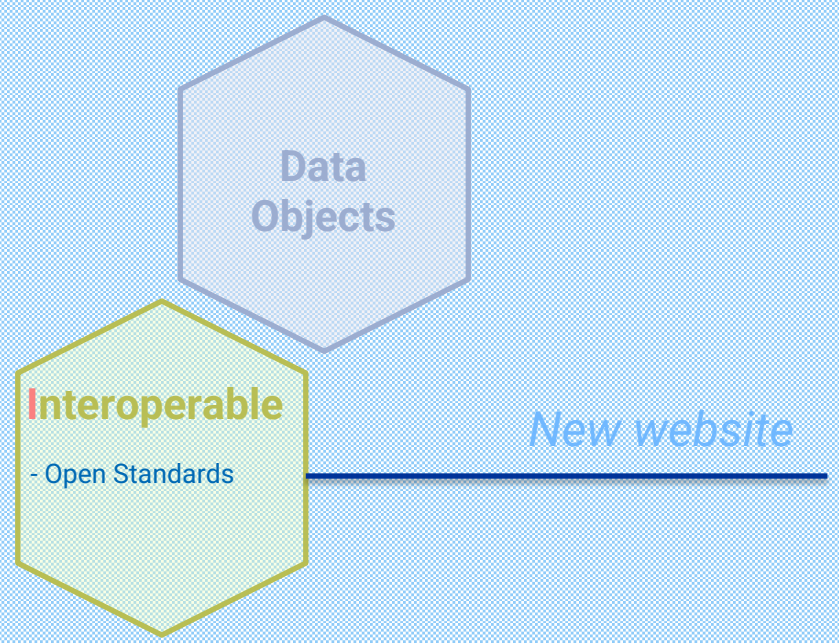
- id: A unique integer value identifying this spectrum.
- metadata: A JSON object contains information about the source material used for the measurement, including its composition at the time of acquisition (decay-corrected mass fractions from certificate values) and measurement configuration, e.g., detector setup, analyzer, and other electronics used, etc. It also includes metadata on spectrum such as spectrum acquisition date, live time, real time, count rate, etc., which are unique to each spectrum.
- data: A JSON array consisting of counts per channel for this spectrum.

Example:

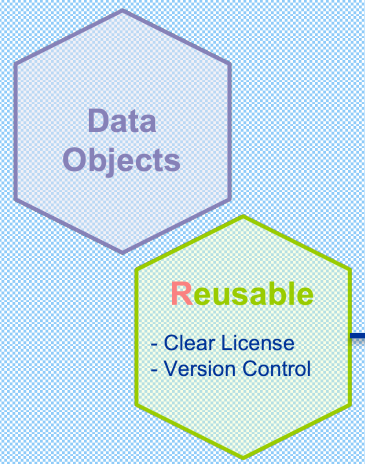

```
{
    "id": 918,
    "metadata": {
        "Material type": "Pu",
        "Material form": "Pellet",
        "Chemical compound of material": "PuO2",
        "Decay corrected mass fractions (wt%)": [
            {
             "238Pu": 0.114
            },
            {
             "239Pu": 77.004
            },
              ...
        ],
        "Detector type": "HPGe",
        "Detector geometry": "Planar",
        "Detector size": "ORTEC SGD",
        "Detector FWHM (keV)": 0.8,
        "Energy range of the detector (keV)": "0-1260",
        "Source to detector distance (cm)": "Unknown",
        "Analyzer name": "DSPEC Plus",
        "Analyzer gain (keV/ch)": 0.075,
        "Number of channels": 16384,
```


https://nds.iaea.org/idb

Infrastructure for FAIR Data



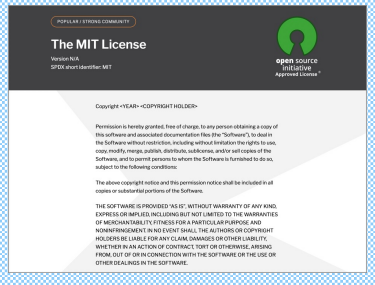
Infrastructure for FAIR Data



- **Open Source Licenses**
  - For data libraries released as open data:
    CC-BY-4.0 International License

https://creativecommons.org/licenses/by/4.0/

  - For software released as open source:
    MIT License + disclaimer* *(for now)*



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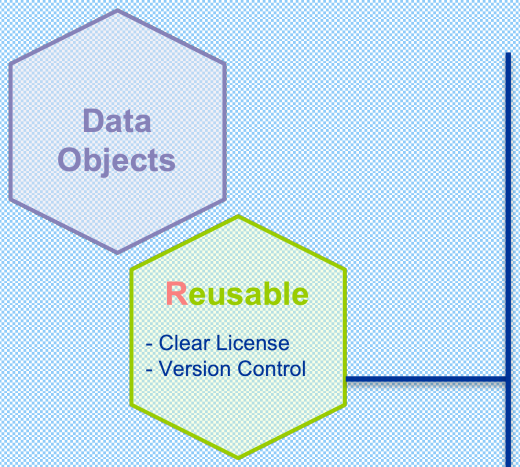
Infrastructure for FAIR Data



For software: Git-based Services

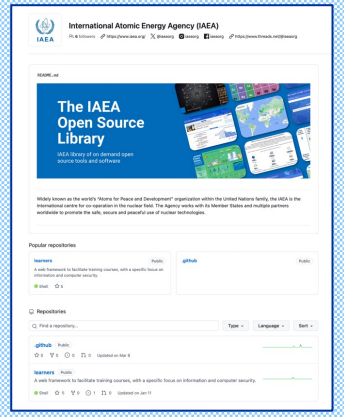
GitHub

https://github.com/IAEA-NDS

- IAEA-NDS contains:
  - 35 public repositories
  - 34 private repositories

- Newly created **IAEAorg** on GitHub

(will contain a subset of NDS repositories)



GitLab

- Restricted GitLab instance contains:
  - 20 internal repositories

IAEA

Modernizing the NDS Website

Requirements

- Powerful **Search Engine**
- Robust and Flexible **Data Model**
- Clear **Access Management**
- Out-of-the-box support for **FAIR** principles (**Open Science** enabler)
- **Open Source**

Requirements

- Powerful **Search Engine**
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- **Digital Repository Platforms**
  - CKAN
  - DSpace
  - Dataverse
  - **Invenio RDM**

RDM

The turn-key research data management repository

🚀 August 1, 2024: InvenioRDM v12.0 LTS released

Status

Follow the latest project status.

Roadmap

See our next major milestones

Demo

Demo of InvenioRDM showing latest development state.

Forum

Join our project forum and collaborate.

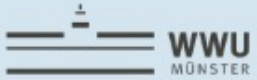
Chat

Find all the partners in our official chatroom.

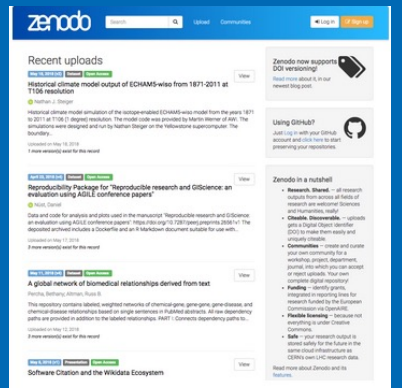
Code

Have a look at InvenioRDM code evolution.

Brought to you by



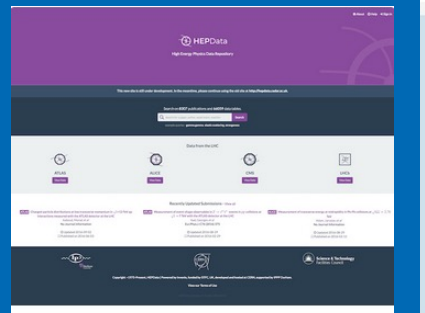
World-wide instances



Zenodo

Zenodo is an open home for the long-tail of science, enabling researchers to share and preserve any research outputs.

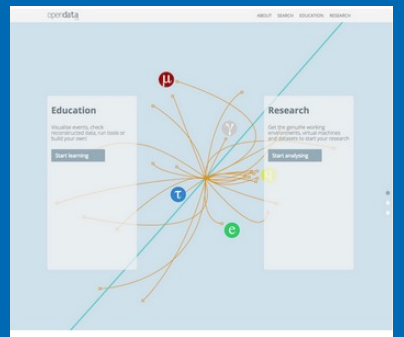
Data



HEPData

The Durham High Energy Physics Database (HEPData) has been built up over the past four decades as a unique open-access repository for scattering data from experimental particle physics. It currently comprises the data points from plots and tables related to several thousand publications including those from the Large Hadron Collider (LHC).

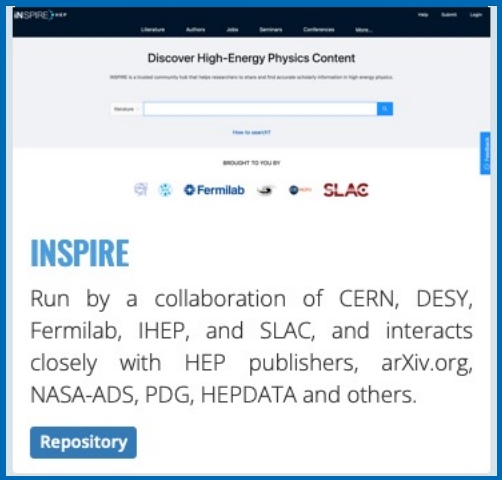
Data



CERN Open Data

Discover open Research datasets and software of LHC experiments. Visualise events and run and your own analysis.

Data



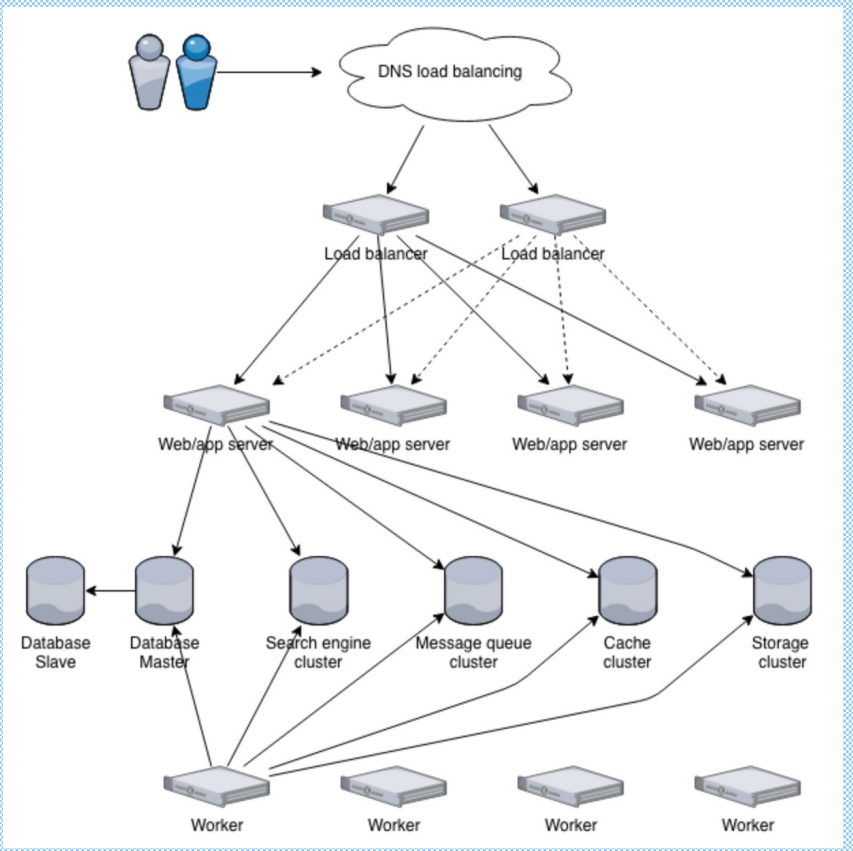
INSPIRE

Run by a collaboration of CERN, DESY, Fermilab, IHEP, and SLAC, and interacts closely with HEP publishers, arXiv.org, NASA-ADS, PDG, HEPDATA and others.

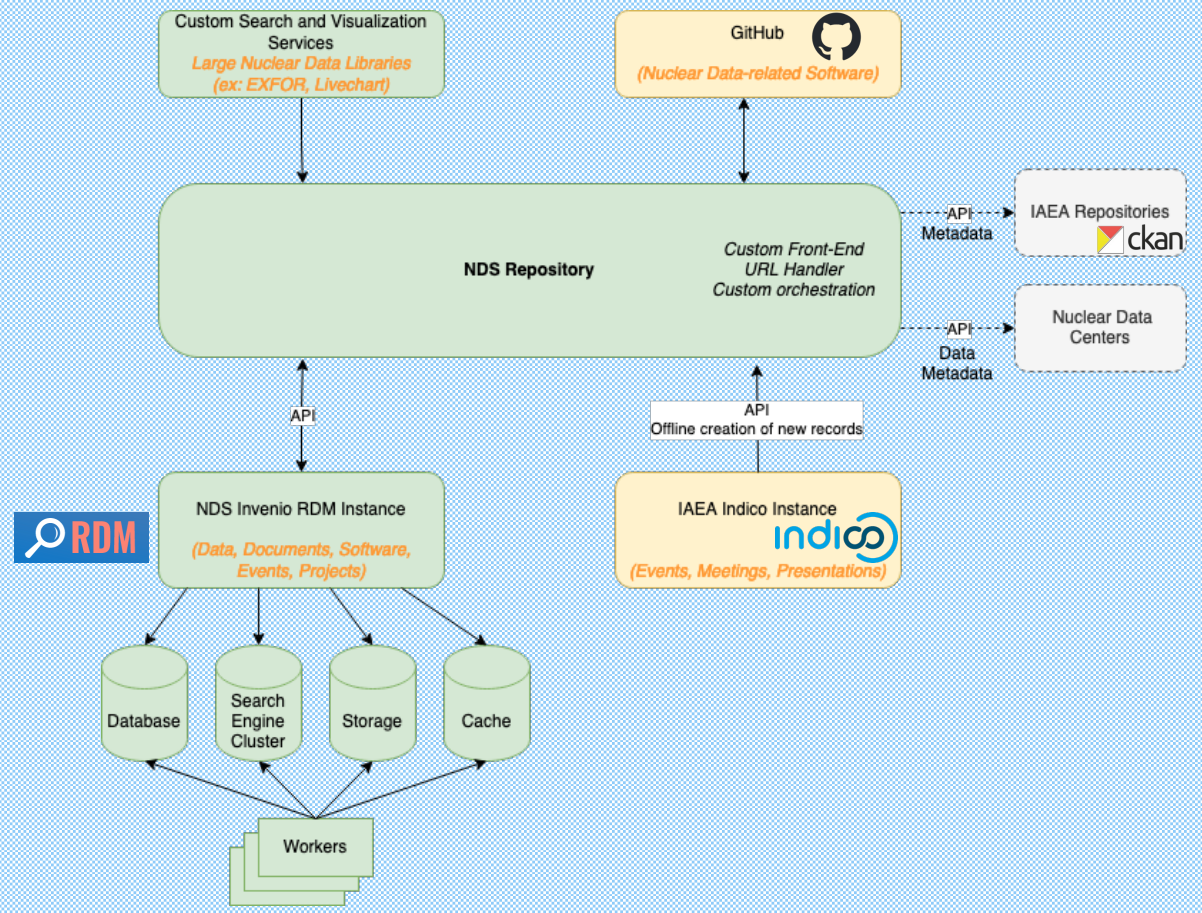
Repository

Invenio Architecture

- **Load balancers:** HAProxy, Nginx or others.
- **Web servers:** Nginx, Apache or others.
- **Application servers:** UWSGI, Gunicorn or mod_wsgi.
- **Distributed task queue:** Celery
- **Database:** PostgreSQL, MySQL or SQLite.
- **Search engine:** OpenSearch (v1 and v2).
- **Message queue:** RabbitMQ, Redis or Amazon SQS.
- **Cache system:** Redis or Memcache.
- **Storage system:** Local, S3, XRootD, WebDAV and more.



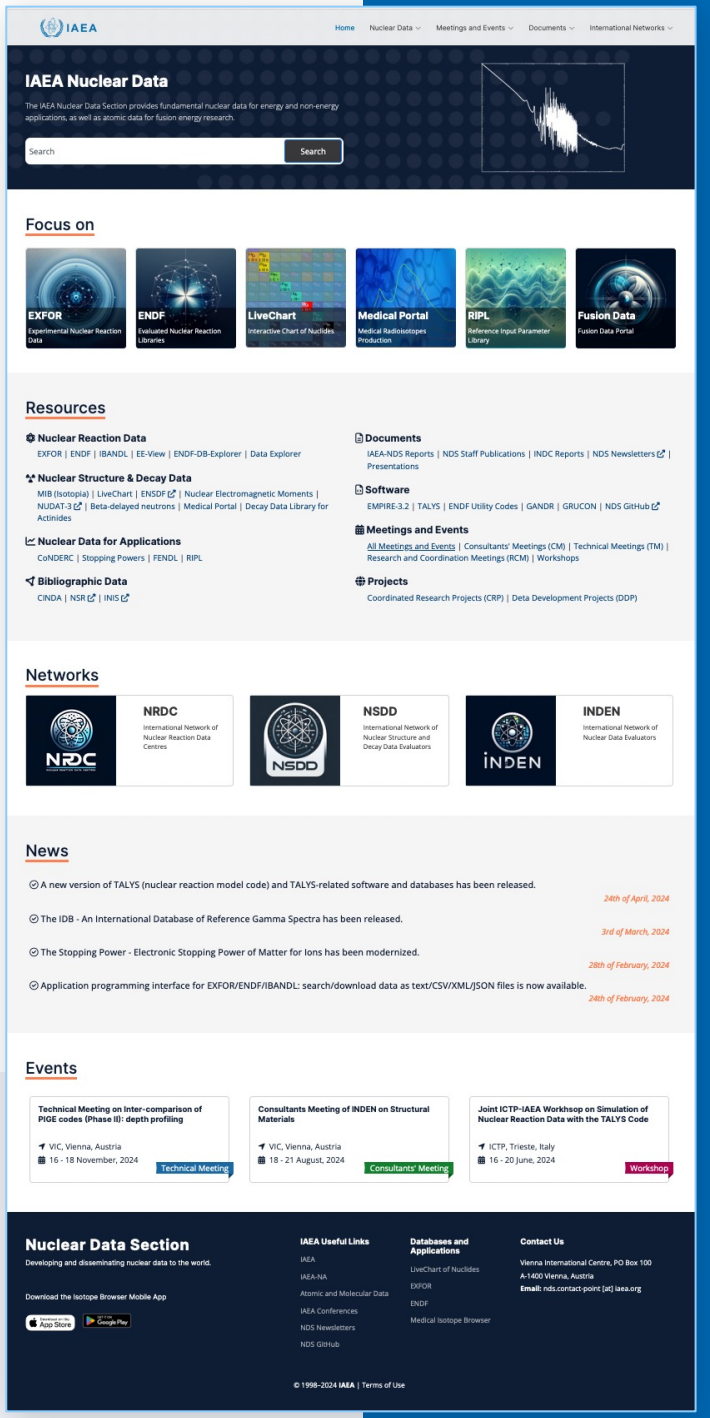
NDS Arhitecture



Work in progress

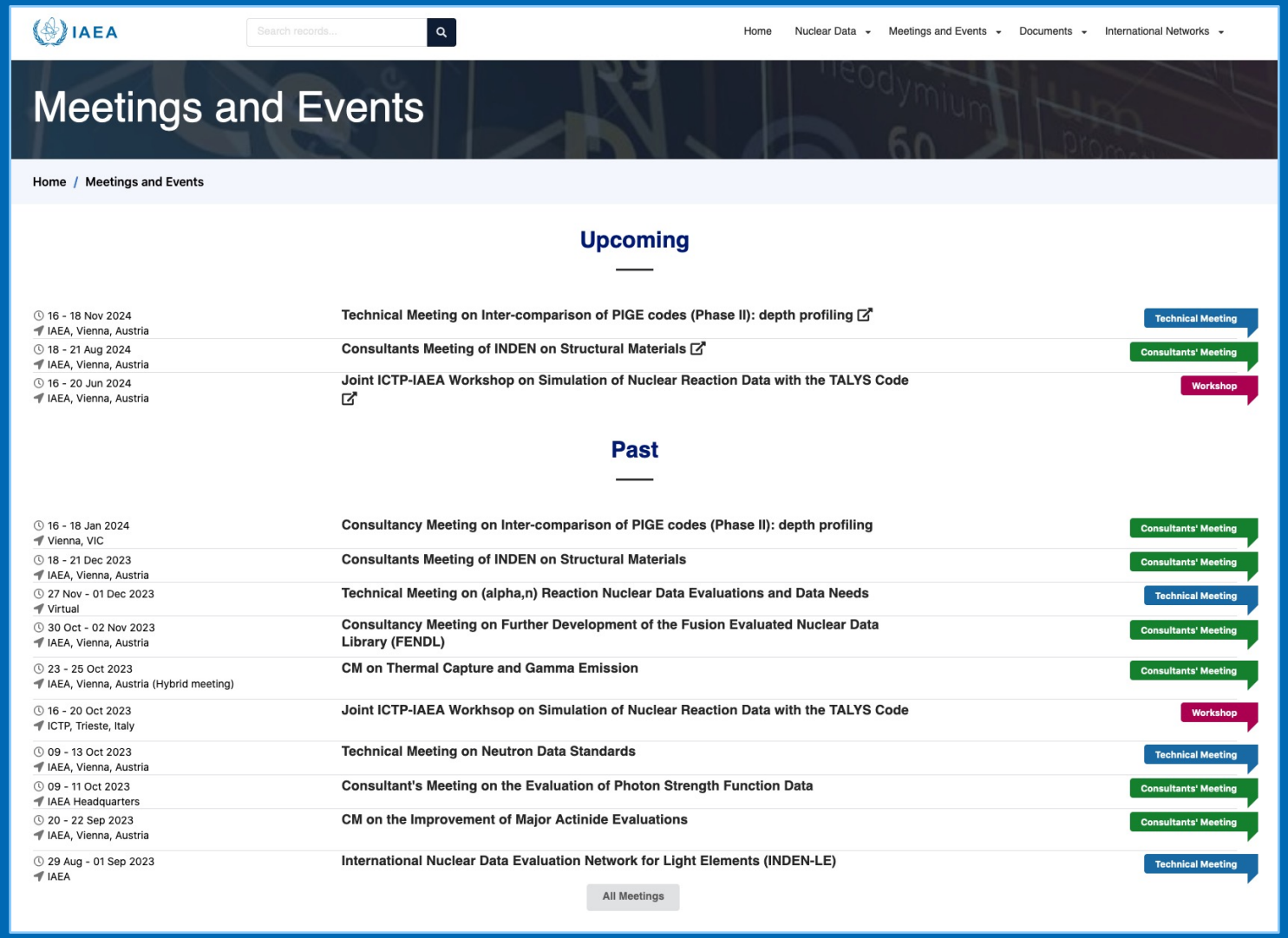
Home Page Prototype

- Repository search *(all records described using the DataCite data model)*
- Focus on: flagship databases and services
- Resources: all categories of records
- Networks
- News
- Upcoming events



4’839 records migrated (Documents, Meetings, Presentations)

Meetings

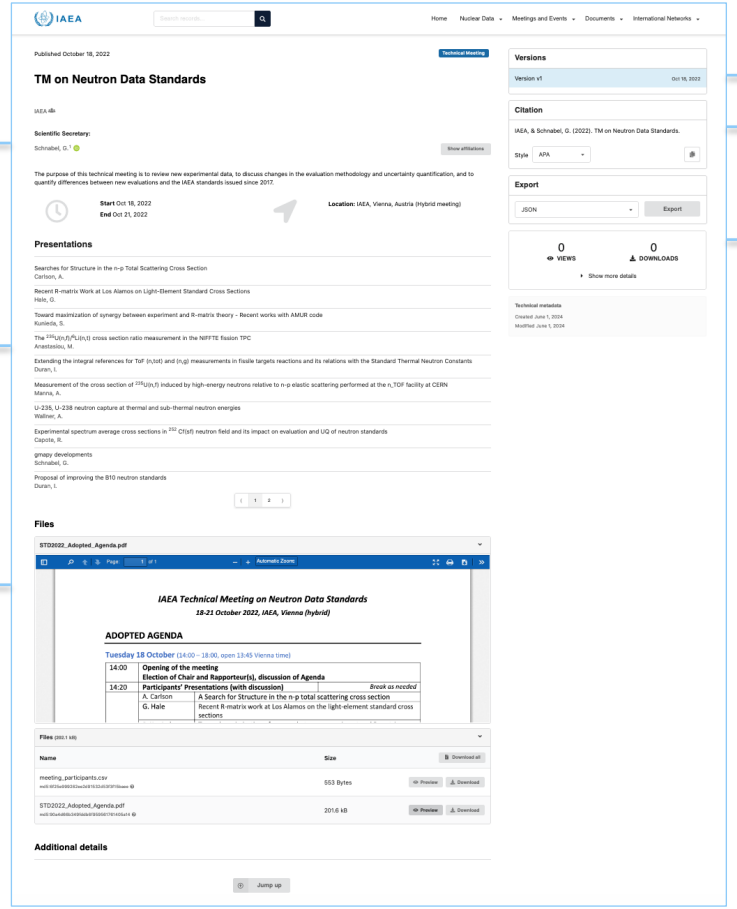

IAEA
Search records...
Home
Nuclear Data
Meetings and Events
Documents
International Networks
Meetings and Events
Home / Meetings and Events
Upcoming
16 - 18 Nov 2024
IAEA, Vienna, Austria
Technical Meeting on Inter-comparison of PIGE codes (Phase II): depth profiling
Technical Meeting
18 - 21 Aug 2024
IAEA, Vienna, Austria
Consultants Meeting of INDEN on Structural Materials
Consultants' Meeting
16 - 20 Jun 2024
IAEA, Vienna, Austria
Joint ICTP-IAEA Workshop on Simulation of Nuclear Reaction Data with the TALYS Code
Workshop
Past
16 - 18 Jan 2024
Vienna, VIC
Consultancy Meeting on Inter-comparison of PIGE codes (Phase II): depth profiling
Consultants' Meeting
18 - 21 Dec 2023
IAEA, Vienna, Austria
Consultants Meeting of INDEN on Structural Materials
Consultants' Meeting
27 Nov - 01 Dec 2023
Virtual
Technical Meeting on (alpha,n) Reaction Nuclear Data Evaluations and Data Needs
Technical Meeting
30 Oct - 02 Nov 2023
IAEA, Vienna, Austria
Consultancy Meeting on Further Development of the Fusion Evaluated Nuclear Data Library (FENDL)
Consultants' Meeting
23 - 25 Oct 2023
IAEA, Vienna, Austria (Hybrid meeting)
CM on Thermal Capture and Gamma Emission
Consultants' Meeting
16 - 20 Oct 2023
ICTP, Trieste, Italy
Joint ICTP-IAEA Workhsop on Simulation of Nuclear Reaction Data with the TALYS Code
Workshop
09 - 13 Oct 2023
IAEA, Vienna, Austria
Technical Meeting on Neutron Data Standards
Technical Meeting
09 - 11 Oct 2023
IAEA Headquarters
Consultant's Meeting on the Evaluation of Photon Strength Function Data
Consultants' Meeting
20 - 22 Sep 2023
IAEA, Vienna, Austria
CM on the Improvement of Major Actinide Evaluations
Consultants' Meeting
29 Aug - 01 Sep 2023
IAEA
International Nuclear Data Evaluation Network for Light Elements (INDEN-LE)
Technical Meeting
All Meetings

Meetings

- Metadata model
- ORCID

- List of all presentations

- Agenda
- List of participants
- Download | Preview

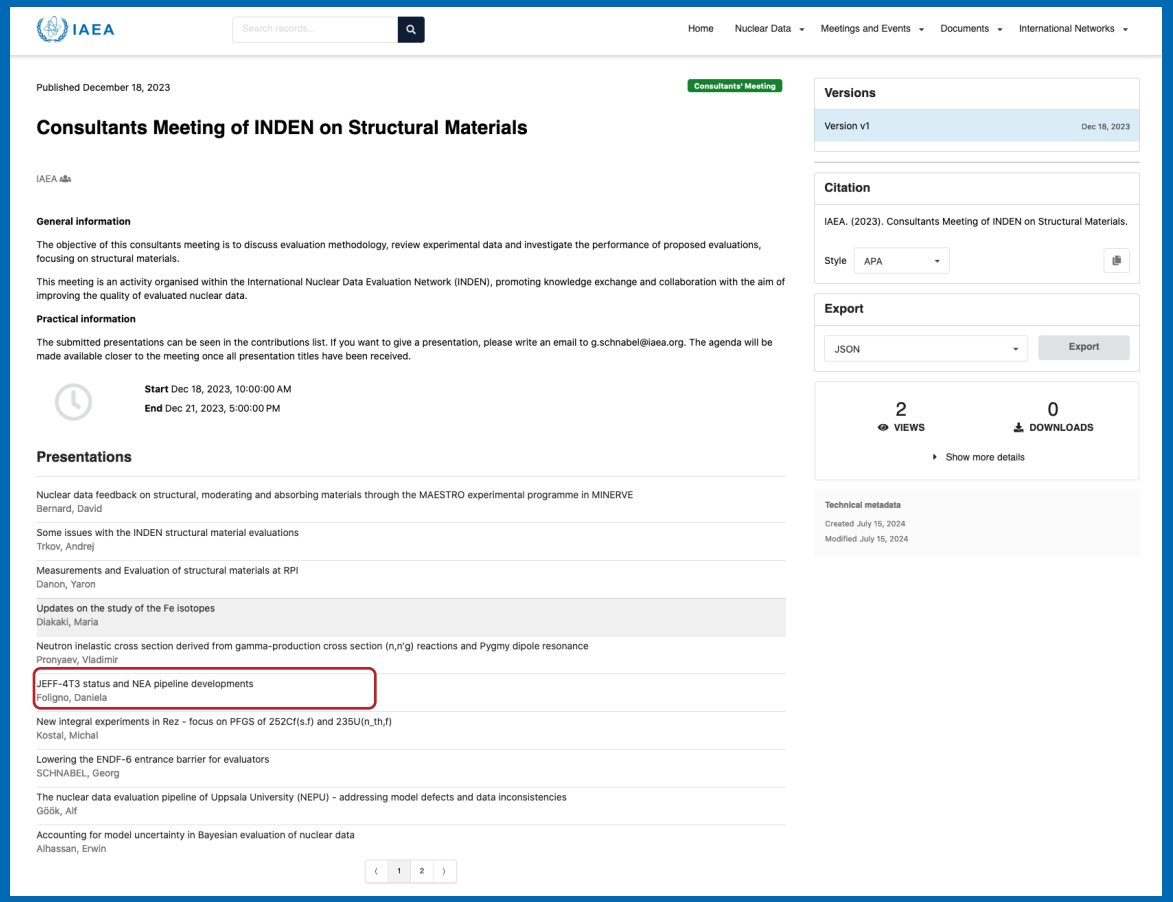


Strong versioning

General citation options

Integrated statistics

Meetings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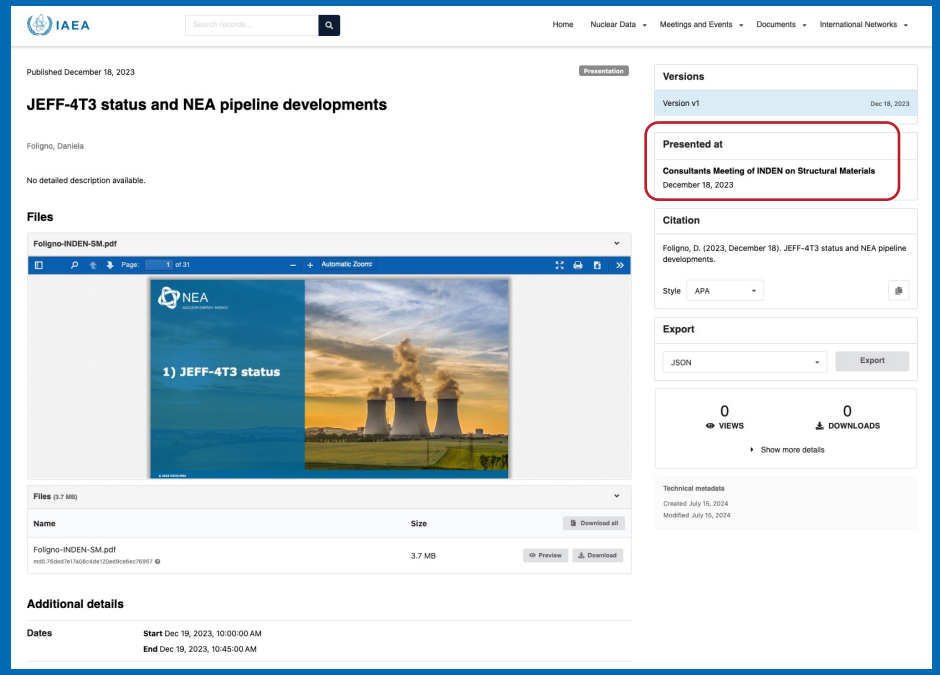
Published December 18, 2023
Consultants' Meeting
Consultants Meeting of INDEN on Structural Materials
IAEA
General information
The objective of this consultants meeting is to discuss evaluation methodology, review experimental data and investigate the performance of proposed evaluations, focusing on structural materials.
This meeting is an activity organised within the International Nuclear Data Evaluation Network (INDEN), promoting knowledge exchange and collaboration with the aim of improving the quality of evaluated nuclear data.
Practical information
The submitted presentations can be seen in the contributions list. If you want to give a presentation, please write an email to g.schnabel@iaea.org. The agenda will be made available closer to the meeting once all presentation titles have been received.
Start Dec 18, 2023, 10:00:00 AM
End Dec 21, 2023, 5:00:00 PM
Presentations
Nuclear data feedback on structural, moderating and absorbing materials through the MAESTRO experimental programme in MINERVE
Bernard, David
Some issues with the INDEN structural material evaluations
Trkov, Andrej
Measurements and Evaluation of structural materials at RPI
Danon, Yaron
Updates on the study of the Fe isotopes
Diakaki, Maria
Neutron inelastic cross section derived from gamma-production cross section (n,n'g) reactions and Pygmy dipole resonance
Pronyaev, Vladimir
JEFF-4T3 status and NEA pipeline developments
Foligno, Daniela
New integral experiments in Rez - focus on PFGS of 252Cf(s.f) and 235U(n_th,f)
Kostal, Michal
Lowering the ENDF-6 entrance barrier for evaluators
SCHNABEL, Georg
The nuclear data evaluation pipeline of Uppsala University (NEPU) - addressing model defects and data inconsistencies
Göök, Alf
Accounting for model uncertainty in Bayesian evaluation of nuclear data
Alhassan, Erwin
Versions
Version v1
Dec 18, 2023
Citation
IAEA. (2023). Consultants Meeting of INDEN on Structural Materials.
Style
APA
Export
JSON
Export
2
VIEWS
0
DOWNLOADS
Show more details
Technical metadata
Created July 15, 2024
Modified July 15, 2024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International Networks
Published December 18, 2023
Presentation
JEFF-4T3 status and NEA pipeline developments
Foligno, Daniela
No detailed description available.
Files
Foligno-INDEN-SM.pdf
1) JEFF-4T3 status
Files (3.7 MB)
Name
Size
Foligno-INDEN-SM.pdf
3.7 MB
Preview
Download
Additional details
Dates
Start Dec 19, 2023, 10:00:00 AM
End Dec 19, 2023, 10:45:00 AM
Versions
Version v1
Dec 18, 2023
Presented at
Consultants Meeting of INDEN on Structural Materials
December 18, 2023
Citation
Foligno, D. (2023, December 18). JEFF-4T3 status and NEA pipeline developments.
Style
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Export
JSON
Export
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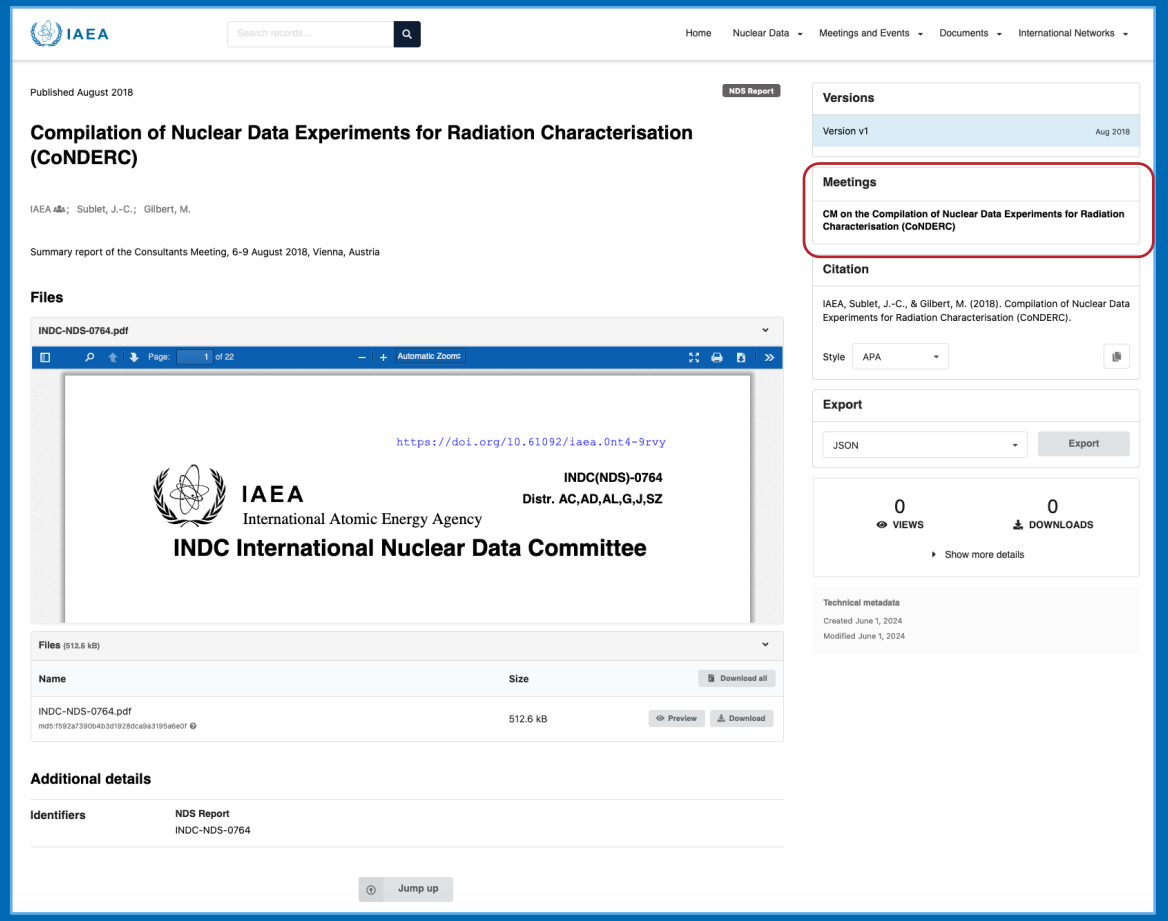
VIEWS
0
DOWNLOADS
Show more details
Technical metadata
Created July 15, 2024
Modified July 15, 2024

Documents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International Networks
Published August 2018
NDS Report
Compilation of Nuclear Data Experiments for Radiation Characterisation (CoNDERC)
IAEA; Sublet, J.-C.; Gilbert, M.
Summary report of the Consultants Meeting, 6-9 August 2018, Vienna, Austria
Files
INDC-NDS-0764.pdf
https://doi.org/10.61092/iaea.0nt4-9rvy
IAEA
International Atomic Energy Agency
INDC(NDS)-0764
Distr. AC,AD,AL,G,J,SZ
INDC International Nuclear Data Committee
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Version v1
Aug 2018
Meetings
CM on the Compilation of Nuclear Data Experiments for Radiation Characterisation (CoNDERC)
Citation
IAEA, Sublet, J.-C., & Gilbert, M. (2018). Compilation of Nuclear Data Experiments for Radiation Characterisation (CoNDERC).
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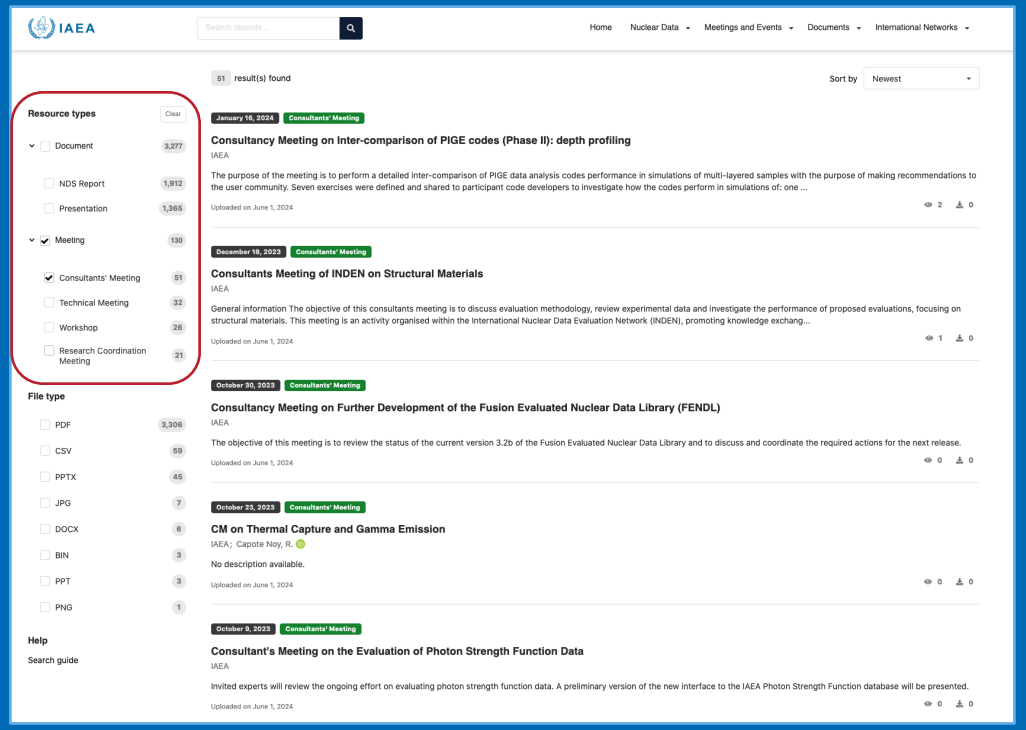
Modified June 1, 2024

Search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51 result(s) found
Sort by
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Clear
Document 3,277
NDS Report 1,912
Presentation 1,365
Meeting 130
Consultants' Meeting 51
Technical Meeting 32
Workshop 26
Research Coordination Meeting 21
File type
PDF 3,306
CSV 59
PPTX 45
JPG 7
DOCX 6
BIN 3
PPT 3
PNG 1
Help
Search guide
January 16, 2024 Consultants' Meeting
Consultancy Meeting on Inter-comparison of PIGE codes (Phase II): depth profiling
IAEA
The purpose of the meeting is to perform a detailed inter-comparison of PIGE data analysis codes performance in simulations of multi-layered samples with the purpose of making recommendations to the user community. Seven exercises were defined and shared to participant code developers to investigate how the codes perform in simulations of: one ...
Uploaded on June 1, 2024
2 0
December 18, 2023 Consultants' Meeting
Consultants Meeting of INDEN on Structural Materials
IAEA
General information The objective of this consultants meeting is to discuss evaluation methodology, review experimental data and investigate the performance of proposed evaluations, focusing on structural materials. This meeting is an activity organised within the International Nuclear Data Evaluation Network (INDEN), promoting knowledge exchang...
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October 30, 2023 Consultants' Meeting
Consultancy Meeting on Further Development of the Fusion Evaluated Nuclear Data Library (FENDL)
IAEA
The objective of this meeting is to review the status of the current version 3.2b of the Fusion Evaluated Nuclear Data Library and to discuss and coordinate the required actions for the next release.
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October 23, 2023 Consultants' Meeting
CM on Thermal Capture and Gamma Emission
IAEA; Capote Noy, R.
No description available.
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October 9, 2023 Consultants' Meeting
Consultant's Meeting on the Evaluation of Photon Strength Function Data
IAEA
Invited experts will review the ongoing effort on evaluating photon strength function data. A preliminary version of the new interface to the IAEA Photon Strength Function database will be presented.
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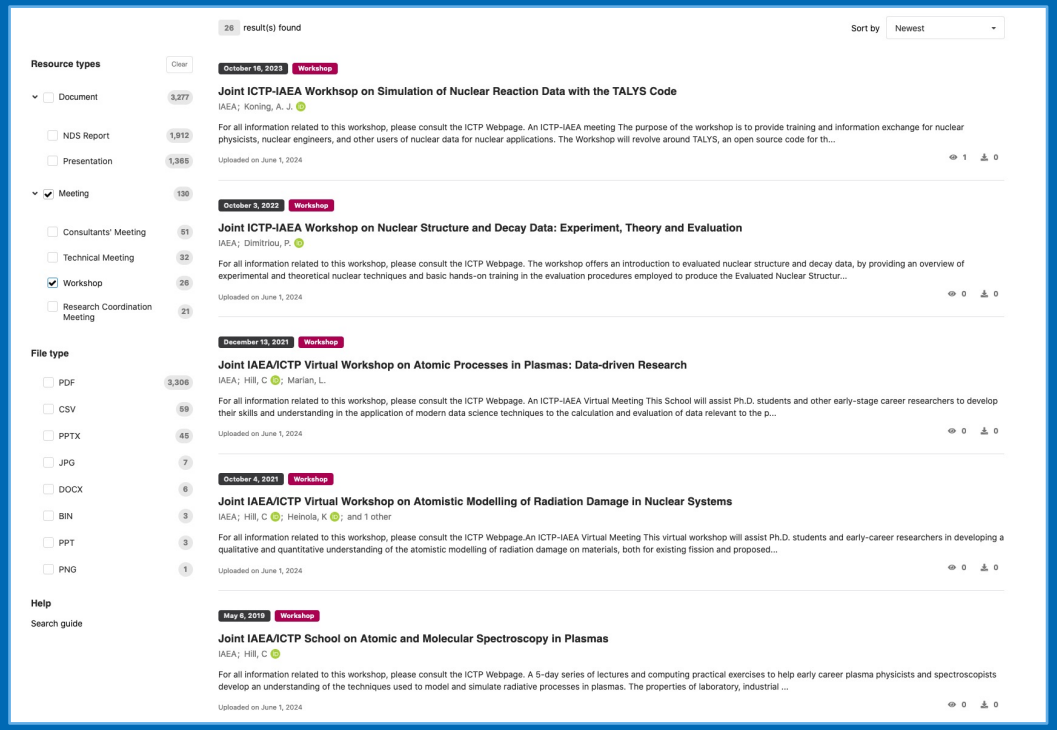
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Research Coordination Meeting 21
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October 16, 2023 Workshop
Joint ICTP-IAEA Workhsop on Simulation of Nuclear Reaction Data with the TALYS Code
IAEA; Koning, A. J.
For all information related to this workshop, please consult the ICTP Webpage. An ICTP-IAEA meeting The purpose of the workshop is to provide training and information exchange for nuclear physicists, nuclear engineers, and other users of nuclear data for nuclear applications. The Workshop will revolve around TALYS, an open source code for th...
Uploaded on June 1, 2024
1 0
October 3, 2022 Workshop
Joint ICTP-IAEA Workshop on Nuclear Structure and Decay Data: Experiment, Theory and Evaluation
IAEA; Dimitriou, P.
For all information related to this workshop, please consult the ICTP Webpage. The workshop offers an introduction to evaluated nuclear structure and decay data, by providing an overview of experimental and theoretical nuclear techniques and basic hands-on training in the evaluation procedures employed to produce the Evaluated Nuclear Structur...
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December 13, 2021 Workshop
Joint IAEA/ICTP Virtual Workshop on Atomic Processes in Plasmas: Data-driven Research
IAEA; Hill, C; Marian, L.
For all information related to this workshop, please consult the ICTP Webpage. An ICTP-IAEA Virtual Meeting This School will assist Ph.D. students and other early-stage career researchers to develop their skills and understanding in the application of modern data science techniques to the calculation and evaluation of data relevant to the p...
Uploaded on June 1, 2024
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October 4, 2021 Workshop
Joint IAEA/ICTP Virtual Workshop on Atomistic Modelling of Radiation Damage in Nuclear Systems
IAEA; Hill, C; Heinola, K; and 1 other
For all information related to this workshop, please consult the ICTP Webpage.An ICTP-IAEA Virtual Meeting This virtual workshop will assist Ph.D. students and early-career researchers in developing a qualitative and quantitative understanding of the atomistic modelling of radiation damage on materials, both for existing fission and proposed...
Uploaded on June 1, 2024
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May 6, 2019 Workshop
Joint IAEA/ICTP School on Atomic and Molecular Spectroscopy in Plasmas
IAEA; Hill, C
For all information related to this workshop, please consult the ICTP Webpage. A 5-day series of lectures and computing practical exercises to help early career plasma physicists and spectroscopists develop an understanding of the techniques used to model and simulate radiative processes in plasmas. The properties of laboratory, industrial ...
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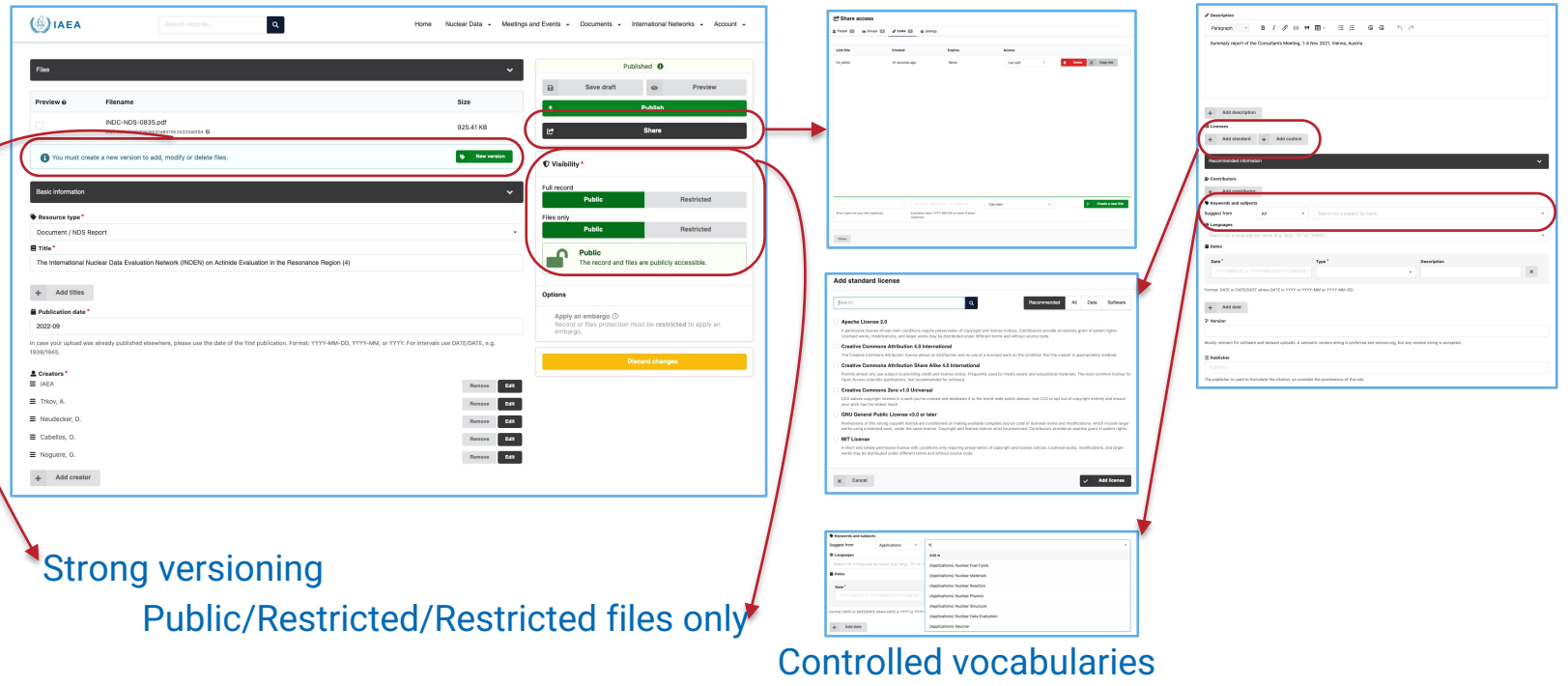

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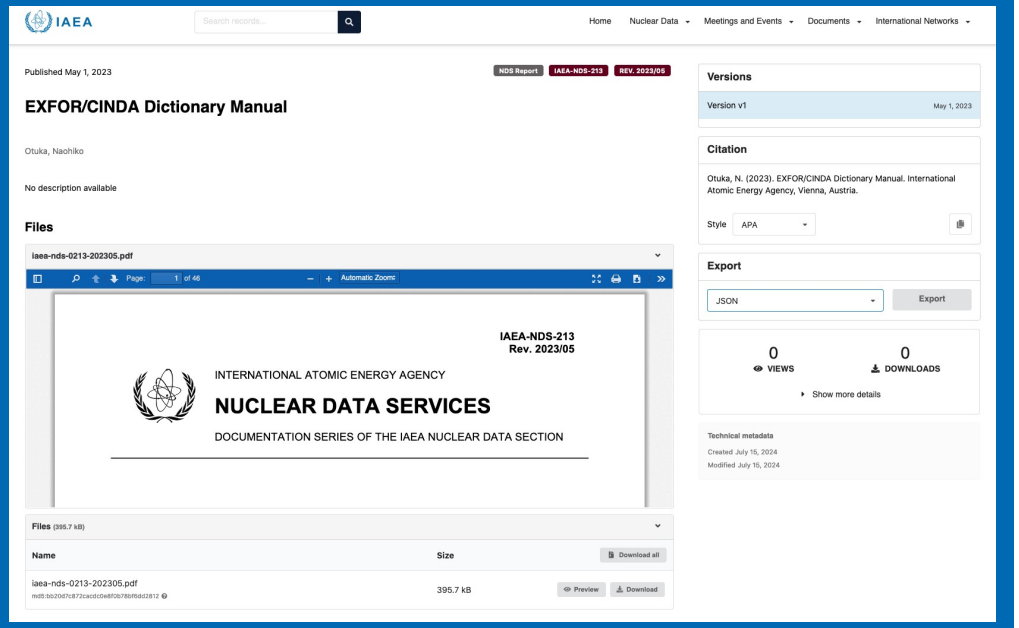


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Thank you!

ludmila.marian@iaea.org