

United States Nuclear Data Program

Annual Report for Fiscal Year 2025

This document describes the activities including related metrics performed by the US Nuclear Data Program members during Fiscal Year 2025.

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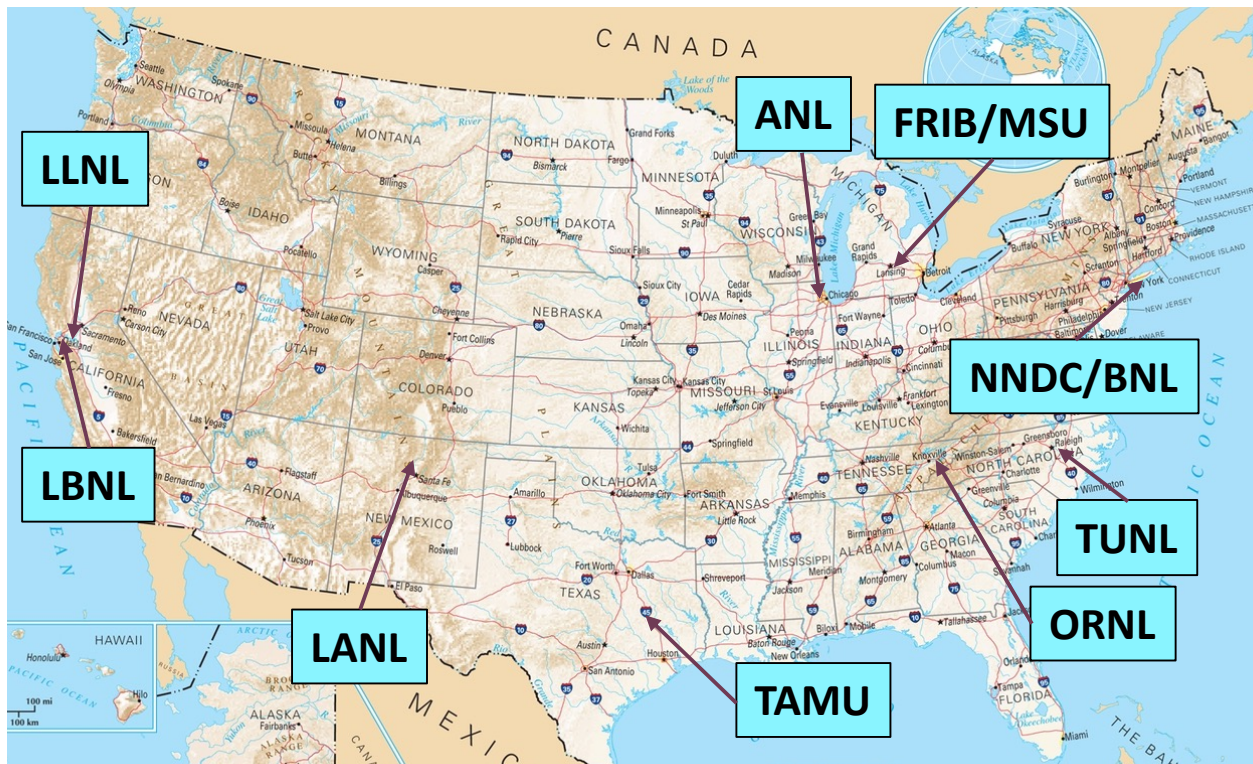
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USNDP Mission

The mission of the United States Nuclear Data Program (USNDP) is to provide current, accurate, authoritative data for workers in pure and applied areas of nuclear science and engineering. This is accomplished primarily through the compilation, evaluation, dissemination, and archiving of extensive nuclear datasets. USNDP also addresses gaps in the data, through targeted experimental studies and the use of theoretical models.



Map courtesy of the USGS (<https://www.usgs.gov/media/images/general-reference-printable-map>).

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I. Introduction

The US Nuclear Data Program (USNDP) Annual Report for Fiscal Year 2025 summarizes the work of USNDP for the period of October 1, 2024 through September 30, 2025, with respect to the Work Plan for FY 2025 that was prepared in 2024. The Work Plan and Final Report for USNDP are prepared for the DOE Office of Science, Office of Nuclear Physics. The support for the nuclear data activity from sources outside the US Nuclear Data Program is summarized in the staffing table and Appendix A. **This leverage amounts to about 22.8 FTE scientific, to be compared with 21.9 FTEs at USNDP units funded by the DOE Office of Science, Office of Nuclear Physics.** Since it is often difficult to separate accomplishments funded by various sources, some of the work reported in the present report was accomplished with nuclear data program support leveraged by other funding.

FY 2025 was the 25th year in which the USNDP has operated under a Work Plan developed by the program participants. The program continued to carry out important work in support of the DOE mission. The work balances the ongoing collecting, analyzing, and archiving of nuclear physics information critical to basic nuclear research and to the development and improvement of nuclear technologies with the electronic distribution of this information to users in a timely and easily accessible manner. The present section of the report consists of activity summaries for the major components of the USNDP. This is followed by an updated staff level assignment table that reflects the final distribution of effort among the tasks carried out during FY 2025. Then, we continue with the detailed status of work performed during FY 2025.

In terms of personnel changes, the USNDP has undergone several changes in FY 2025:

- Dmitro Symochko (contractor) is no longer a contractor of the NNDC
- David Matters joined LBNL as a Scientific Engineer in 2024
- Gregory Potel left LLNL in November 2024 to join the faculty at the University of Seville
- Michael Herman retired from LANL
- Panos Gastis received LANL-LDRD Early Career Award so reduced USNDP effort
- Pierre Nzabahimana joined as a new postdoc
- Lijie Sun joined FRIB in February 2025 as a full-time ENSDF evaluator in the FRIB Data Group
- Augusto Macchiavelli is PI for the USNDP project at ORNL
- Larry Zhang left the group May 31, 2025

Table 1 summarizes the USNDP metrics since 2001. Table 2 shows the breakdown of the metrics by laboratory for the reported fiscal year and comparison with the previous fiscal year. The tables are followed by a definition of each metric and any comments pertaining to the metrics.

Table 1: Summary of the USNDP funding and metrics for the period 2020-present.

Fiscal year	USNDP funding (\$K)	Change (%)	Compilations	Evaluations	Disseminations	Articles	Invited talks
2020	9,344 ^a	+6.2	3,603	159	5,678	63	49
2021	9,435 ^b	+0.99	5,380	273	7,297	71	59
2022	10,290 ^c	+9.06	3,988	292	9,016	71	71
2023	10,933 ^d	+0.7	4,245	181	15,136	71	87
2024	10,245 ^e	-1.8%	3,172	192	13,071	77	70
2025	8564.34 ^f	N/A	3,266	156	13,627	69	59

a: It includes the following (a) FIRE collaboration funding \$100k (LLNL); (b) LAB calls funding: \$354k (ANL), \$619k (BNL), \$120k (LANL), \$75k (LBNL), \$50k (LLNL) and \$375k (ORNL); (c) WANDA organization: \$150k (ORNL) and \$20k (LLNL).

b: It includes the following (a) FIRE collaboration funding \$100k (LLNL); (b) LAB calls funding: \$884k (ANL), \$717k (BNL), and \$173k (ORNL).

c: Includes LAB calls funding: \$825k (ANL), \$693k (BNL), \$702k (LANL), \$61k (LLNL), and \$424k (ORNL).

d: Includes LAB calls funding: \$293k (ANL), \$600k (BNL), \$836k (LANL), \$344k (LBNL), \$64k (LLNL), \$772k (ORNL) and \$113k (PNNL).

e: Includes LAB calls funding: \$176k (ANL), \$602k (BNL), \$821k (LANL), \$344k (LBNL), \$66k (LLNL), \$930k (ORNL) and \$149k (PNNL).

f: Does not include LAB call funding as these values were not available when the report was drafted.

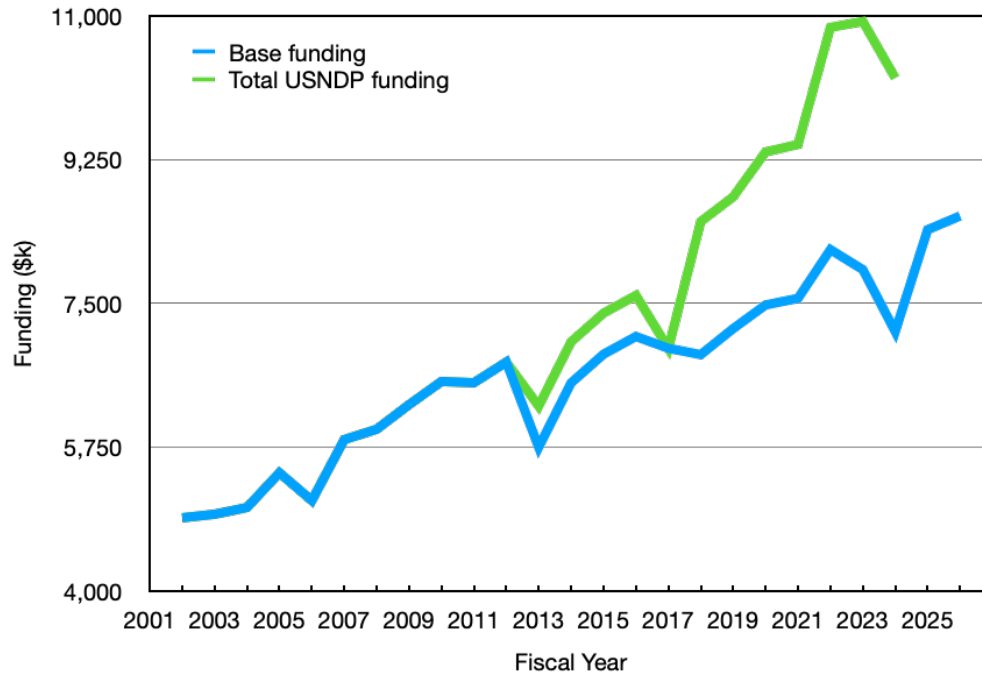


Figure 1: Historical USNDP funding for the years FY 2001-present.

Table 2: USNDP metrics in the last two fiscal years, numbers from the previous fiscal year are shown for comparison.

Laboratory	Compilations		Evaluations		Disseminations (in thousands)		Articles		Invited Talks	
	2024	2025	2024	2025	2024	2025	2024	2025	2024	2025
ANL	2	0	13	11	-	-	18	15	6	5
BNL*	3,091	3,155	76.5	53.6	12,080	11,844	15	19	34	32
LANL	-	-	10.7	0.9	-	-	13	13	14	7
LBNL	0	0	24	18	24	26	16	10	9	15
LLNL	-	0	12	0.2	-	-	2	0	1	0
MSU	34	45	40	42	-	-	7	5	1	0
ORNL	-	-	11	10	867	1,561	3	3	3	0
TAMU	-	0	18	17	-	-	2	3	2	0
TUNL	53	70	3	3	100	196	1	1	0	0
Total	3,185	3,266	208	156	13,071	13,627	77	69	70	59

*: BNL compilations consist of (a) 2,539 NSR articles, including keywords for 1,254 of them and 717 corrections; (b) 84 articles for EXFOR; (c) 532 XUNDL datasets. BNL evaluations consist of (a) 50 nuclides for ENSDF and 3.6 for ENDF/B. For the remaining groups, all compilations are for XUNDL, while all evaluations are either ENSDF (ANL, LBNL, MSU, ORNL and TAMU) or ENDF/B (LANL and LLNL).

Metric definitions and comments:

1. **Compilations:** The sum of the new entries added to the USNDP bibliographic (NSR - articles) and experimental databases (EXFOR - reactions, XUNDL - structure data sets). While compilation activities are experiencing challenges, these databases are updated regularly with newly published material.
2. **Evaluations:** The sum of new evaluations submitted or accepted for inclusion in the USNDP evaluated nuclear databases. For ENSDF, it is the number of evaluated nuclides, while for ENDF, it is the number of evaluated reactions/covariances. There were 151 ENSDF evaluations and 5 ENDF/B evaluations submitted. The number of ENSDF evaluations remains well below the number needed, about 340, to evaluate each of the ENSDF nuclides on average every 10 years.
3. **Dissemination:** The number of electronic data retrievals made from USNDP maintained web sites. Data retrieval is defined as a request for data from any of the databases that receives a result. Total pages accessed is not tallied.
4. **Articles:** The number of articles published in refereed journals. The number of articles per FTE has remained relatively stable in the last few years. A list of all peer reviewed journal articles published in FY25 given in the Appendix C.
5. **Invited talks:** The number of presentations given at the explicit invitation of the organizers of conferences, symposia, workshops, and training courses. The number of invited talks decreased from last year's value.

II. Network Coordination and Data Dissemination

The National Nuclear Data Center (NNDC) continues to serve as the core facility of the U.S. Nuclear Data Program (USNDP). It has the main responsibility for national and international coordination, database maintenance, and data dissemination. However, other program participants are also involved in coordination and dissemination activities.

National and International Coordination

The NNDC serves as the secretariat for the US Nuclear Data Program and has prepared the Work Plan for this fiscal year in cooperation with the members of the Coordinating Committee. The NNDC Head serves as the chair of the USNDP Coordinating Committee, which consists of the Principal Investigators from each of the participating group and chairs the annual meeting. This year, the USNDP Annual Meeting was held at Duke University at the Triangle University Nuclear Laboratory from 1-4 October. A representative from LANL chairs the Nuclear Reaction Data Working Group, and a representative from TUNL chairs the Nuclear Structure Working Group.

In FY25, coinciding with the beginning of the new administration, the USNDP did not hold an annual Budget Briefing.

The NNDC serves as the focal point for U.S. collaboration in international nuclear data activities. This collaboration continued both in nuclear structure and decay data (Network of Nuclear Structure and Decay Data Evaluators, NSDD) and reaction data (NEA Working Party on International Nuclear Data Evaluation, WPEC, and Network of Nuclear Reaction Data Centers, NRDC).

The NNDC also chairs the Cross Section Evaluation Working Group (CSEWG), which produces the ENDF/B evaluated nuclear data library for nuclear science and applied nuclear technology use. The 2024 CSEWG Meeting was hosted by BNL from 4-8 November, 2024. This meeting focused on validation of the ENDF/B-VIII.1 data which was released in the previous FY. The NNDC also hosted the Reactor Graphite Workshop from 8-9 July, 2025, to address issues in reactor graphite ENDF evaluations, important for next several advance reactor concepts.

The USNDP also continues to play a leading role in the annual Workshop for Applied Nuclear Data Activities (WANDA) conference series. The USNDP chaired a full day session on “Data Preservation & Data Workflows” and a half day session on “Nuclear Data Prioritization for Fusion” during the February 2025 WANDA meeting.

USNDP Databases

NNDC maintains the collaboration GitLab collaboration platform (git.ndc.bnl.gov) in order to facilitate data and codes development and keep track of changes. The NNDC maintains seven nuclear physics databases for USNDP, which were updated continuously this fiscal year with new and revised information from efforts of the NNDC, USNDP and international collaborators. Distributions of all or parts of these databases have been made to national and international collaborators as scheduled.

Data Dissemination

There were 13.6 million database retrievals this fiscal year USNDP-wide. The decrease in BNL retrievals represents a change in methodology and a move to Google Analytics. This decrease is somewhat offset by the increase in retrievals at ORNL and LBNL. Most of the retrievals, 87%, were from the NNDC web site, with NuDat as the most popular product.

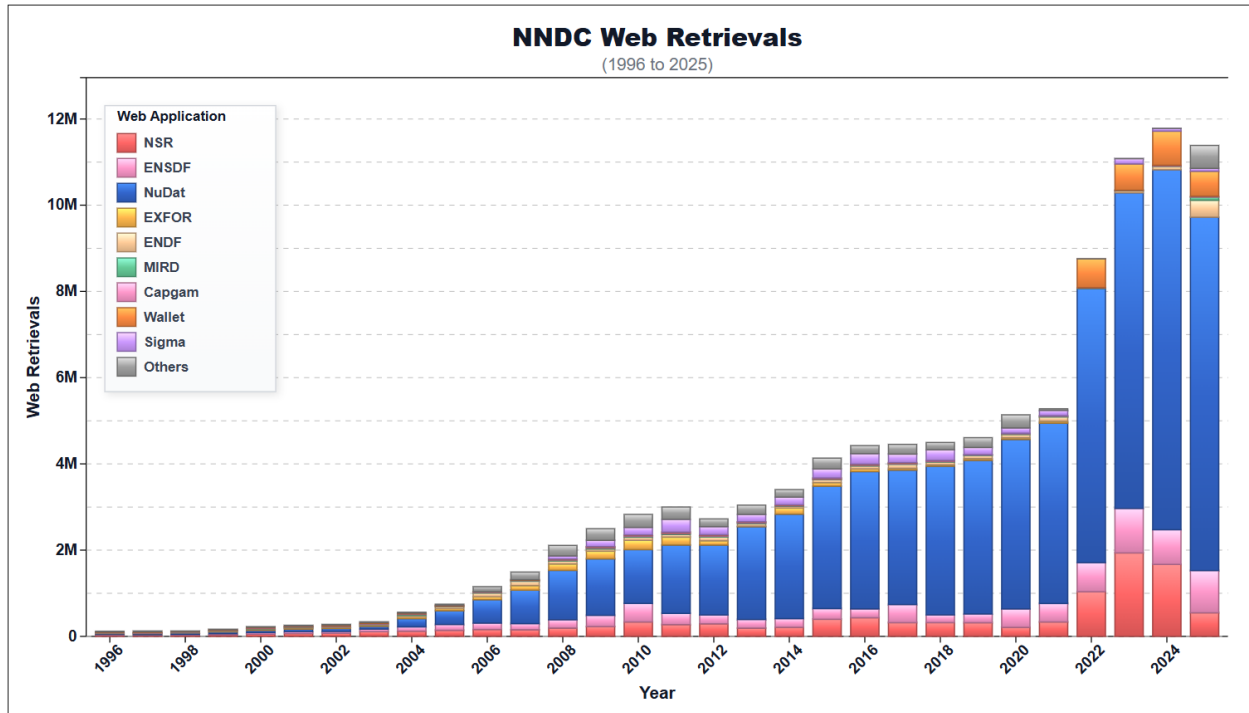


Figure 2: Historical NNDC web retrieval statistics.

Major Publications

The NNDC continues to publish the refereed journal Nuclear Data Sheet with eight issues published in calendar year 2025.

III. Nuclear Structure and Decay Data

The nuclear structure working group emphasizes the evaluation of measured nuclear structure and decay properties for all isotopes. These data are maintained at the NNDC in the Evaluated Nuclear Structure Data File (ENSDF). Production of ENSDF is an international effort operating under the auspices of the IAEA Nuclear Structure Decay Data (NSDD) network. ENSDF is an important source of information for derivative databases and applications, including NuDat, Nuclear Wallet Cards, RIPL, MIRD and ENDF/B. Evaluations are published as peer-reviewed articles in the Nuclear Data Sheets. The Nuclear Science Reference (NSR) and Experimental Unevaluated Nuclear Structure Data List (XUNDL) databases have been kept current. The combination of ENSDF and XUNDL databases represents a nearly complete literature coverage of experimental nuclear structure data, which is a salient feature of these databases.

Status of ENSDF

ENSDF evaluations of 155 nuclides were submitted for inclusion into the database. These evaluations included recommended properties for 10,155 Levels and 16,575 Gammas. 11 mass chains were reviewed by the network for consideration for publication in the Nuclear Data Sheets journal. Three new ENSDF evaluators were trained in FY25, one from MSU and two from LLNL.

Status of XUNDL

Based on regular scanning of nuclear physics journals, the USNDP contributed 640 datasets to XUNDL. The project to compile and carry out physics checks on the data from nuclear structure and decay data manuscripts, as well as some reaction papers, submitted to Phys. Rev. C and European Physical Journal A continues.

Status of NSR

Historically, the NSR project involved contributions from NNDC staff members and external contractors. In FY 2025, the external contractors were eliminated at Brookhaven, and the NSR manager worked to fill this void. Despite these losses, 2,539 articles were added to the NSR database. Combined efforts of R. Arcilla, B. Shu and B. Pritychenko are exploring various automation strategies including Java-based systems for NSR entry preparation for 30 major nuclear physics and engineering journals, webscraping of several other journals, and work on using Large Language Models. USNDP contributions are from B. Pritychenko (manager), C. Dunn, B. Shu, and R. Arcilla (NNDC), with international input from L. Vrapcenjak (IAEA).

Horizontal Evaluations and Other Data Related Activities

A summary list of "Horizontal Evaluations and Other Data Related Activities" involving USNDP structure evaluators includes the following:

- **IAEA-CRP evaluation of fission yields** - A. Sonzogni, A. Mattera, E. Ricard, B. Pritychenko, T. Kawano, F.G. Kondev – continuing.
- **The Atomic Mass Evaluation (AME) and the evaluation of basic nuclear physics properties for ground states and isomers (NUBASE)** - F.G. Kondev – continuing.
- **Modernization of ALPHAD-radD analysis code** - A new Java code AlphaHF was developed and completed to replace the legacy ALPHAD-radD fortran, which uses even-even r0 parameters from 2020Si16 in NDS. Update of r0 parameter to include new papers on even-even alpha decays and to incorporate data in AME2020 is continuing. The updated evaluation of alpha-decay data for even-even nuclei, and anticipated publication of a paper on updated r0 parameters is being done. J. Chen in collaboration with Drs. S. Singh and S. Kumar, Akal University, India – continuing.
- **IAEA-led decay data library for monitoring applications** - J. Chen, F.G. Kondev, J. Tuli – continuing.
- **WalletCraft** - Object-oriented database for ground and long-lived isomeric properties: E. Ricard, B. Shu, D. Mason, C. Morse, S. Ota, J. Wu, A. Mattera - continuing.
- **B(E2) project for first 2+ and 4+ states of all the even-even nuclei** - continuing to compile B(E2) values with a plan to provide a set of evaluated, recommended values. B. Pritychenko - continuing.
- **Gamma-ray transition probabilities for all experimentally known multipolarities for all the nuclei** - update of Endt's work of the 70's. This project started recently and will take two-three years to complete. J. Chen – continuing.
- **Two neutrino double beta decay** - "Two-neutrino mode Double-beta Decay Half-Lives Evaluation: Double-beta decay data for 14 parent nuclei have been reviewed and USNDP FY2023 Report Page 10 recommended T1/2 and nuclear matrix elements were produced." This work is completed and was published in January 2025. B. Pritychenko and V.Tretyak (KINR, Ukraine)
- **The online Berkeley Evaluated Alpha and proton Radioactivity (BEApR) database** - The BEApR database is an online database of all known heavy charged particle emitters (proton, alpha, cluster and fission) from both beta-delayed and direct emitters. The database contains all relevant information on half-lives, spin/parity, branching ratios and individual transitions from 1243 nuclei from Li (Z =3) to Og. This information is taken from physics journals, conference proceedings and dissertations with 3977 individual references. This database is updated monthly as new results are published – continuing.
- **paceENSDF: Python Archive of Coincident Emissions from ENSDF** - The paceENSDF project is a Python package enabling interaction, manipulation, analysis, and visualization of radioactive-decay data and corresponding coincidence γ - γ and γ -X-ray data. The software package is shipped complete with a JSON-formatted database of coincident γ - γ and γ -X-ray data along with the radioactive-decay data from the Evaluated Nuclear Structure Data File (ENSDF) translated into both JSON and RIPL (Reference Input Parameter Library) formats. The project is completely open source and is available on both PyPI and GitHub – continuing.
- **pyEGAF** - The pyEGAF project is an open-source Python library designed to enable interaction, manipulation, analysis and visualization of the thermal (n, γ) data in the Evaluated Gamma-ray Activation File (EGAF). The software package is shipped complete with JSON and RIPL

translations of the original ENSDF-formatted EGAF data sets in addition to the original ENSDF format. This is an open-source project available on both PyPI and GitHub - continuing.

- **Photon Strength Function (PSF) Database** - For the 2025 database update, PSF data for 34 nuclei were assessed, resulting in the creation of 53 new datasets with corresponding README documentation. 528 PSF files from the 2024 release and earlier were reviewed, with formatting corrections applied and file labels standardized; a unified procedure for handling asymmetric and total uncertainties was also implemented – continuing.
- **Nuclear Level Density (NLD) Database** - LBNL has joined a new four-year effort, through a CRP with the International Atomic Energy Agency (IAEA), to establish a modern, comprehensive experimental Nuclear Level Density (NLD) database. As part of this initiative, LBNL leads the collection, compilation, and assessment of experimental NLD data across a broad range of techniques, while also contributing to the benchmarking of theoretical NLD models to be integrated into the database as recommended models – continuing.

Status of ENSDF Codes

The core legacy ENSDF codes used throughout the evaluation workflow have been modernized by Jun Chen of the MSU data center into a suite of Java programs offering enhanced functionality and new features. Under his leadership, the MSU center continues to maintain and improve these existing Java codes while also developing new analysis and utility tools. A recent milestone is the development of the Java-based EvaluationToolkit, which consolidates all ENSDF Java codes into a single, integrated interface to automate and streamline the evaluation workflow.

In addition, a significant new initiative at the MSU data center is exploring the incorporation of Artificial Intelligence and Machine Learning (AI/ML) into the workflow. This project is led by Lijie Sun, a new evaluator at the center. An AI-assisted ENSDF formatting tool has been developed under this initiative and is already in active use for his evaluations, with ongoing improvements. Efforts are being made to make a package of this tool available for and easily used by other evaluators in the near future, in conjunction with the use of existing Java ENSDF codes.

The active code suite includes the McMaster-MSU JAVA-NDS code for producing print-ready documents and ENSDF data retrievals; the ConsistencyCheck toolkit for ensuring evaluation consistency; Java-RULER for calculating transition strengths with an improved Monte Carlo error propagation; GLSC (Gamma to Level Scheme Computation), which replaces legacy codes for fitting gammas and calculating emission probabilities; and the AME-NUBASE viewer for customized retrieval and automatic Q-value updates. Additional essential utilities include KeynumberCheck and FormatCheck for data validation, the Excel2ENSDF converter for data compilation, the RadiationReport and LogftCalculator for decay dataset analysis, and the AlphaHF code for alpha decay calculations.

Efforts to develop new utility and analysis codes are ongoing, focusing on further streamlining, automating, and accelerating the evaluation workflow to enhance overall efficiency and productivity. A complete list and detailed descriptions of these codes are provided in Appendix B – USNDP Data and Code Products.

IV. Nuclear Reaction Data

The nuclear reaction data effort focuses on evaluation of nuclear reaction data and the related measurement and compilation activities. USNDP also makes important contributions to nuclear reaction model code development and improvement of reaction cross-section standards.

Status of ENDF

Following the FY24 release of the ENDF/B-VIII.1 data files, much of ENDF-related work in FY25 was devoted to complementary tasks. Digital Object Identifiers (DOIs) associated with the data in the ENDF/B-VIII.1, for the library as a whole and for each individual sublibrary, were minted pointing to a landing page developed and maintained by the NNDC. The article manuscript documenting and describing the ENDF/B-VIII.1 release was finalized and submitted to the Nuclear Data Sheets journal on December 23, 2024. Referee reports were received August 11, 2025, prompting a quick coordinated effort to address the referees' comments and creating a revised version could be re-submitted on October 21, 2025. Additionally, the ENDF community turned its collective attention to what could, and should, potentially be part of a future ENDF release, likely to be labeled as ENDF/B-IX.O. Among these efforts we can highlight the organization of the 1st Reactor Graphite (ReGra) Workshop, on July 8-9, 2025, aimed to discuss data, modeling and validation associated with the evaluation of thermal neutron scattering law (TSL) on graphite employed in reactor applications. A laboratory report (BNL-229060-2025-INRE) was published documenting the presentations and discussions.



Reaction Theory

FY25 theory development at LANL highlights fully microscopic approaches to neutron-induced reactions, pre-equilibrium processes, and nuclear data evaluation. Key advances include the development of the non-iterative Finite Amplitude Method (FAM) combined with QRPA to calculate neutron inelastic scattering for both discrete and continuum states without adjustable parameters, successfully reproducing experimental data for 208Pb and extending to pre-equilibrium neutron emission. The work also introduces a random-matrix (GOE S-matrix) framework to smoothly connect resolved resonance, unresolved resonance, and Hauser–Feshbach regions, enabling realistic cross-section distributions, along with progress on revisiting GEANIE gamma-ray data and separating reaction and fission contributions. In addition, the LACE (Los Alamos CoH-based Evaluation) framework is presented as an automated, code-driven approach to producing comprehensive evaluated nuclear data libraries, with future perspectives emphasizing improved pre-equilibrium modeling, uncertainty treatment in the URR, and applications to fusion and photonuclear reactions.

LLNL's recent progress emphasizes in neutron cross section evaluation, with a focus on uncertainty quantification, machine-learning methods, and actinide evaluations. Key advances include forward propagation of reaction-model parameter uncertainties to produce activation cross sections with

covariances, validation of the YAHFC reaction code against experimental data, and the development of AI/ML approaches—such as graph neural networks and Gaussian process models—to predict cross sections and associated uncertainties, including extrapolation beyond measured regions. The work also highlights the near-completion of the $n+^{239}\text{Pu}$ evaluation, combining re-fitted optical model parameters, GMAP-based fission analyses incorporating fissionTPC data, Monte Carlo–based covariance generation, and extensive validation against benchmarks, establishing a robust, uncertainty-aware evaluation framework for nuclear data applications.

Reaction Measurements

New cross-section measurements for the $^{68}\text{Zn}(n,p)^{68}\text{Cu}$ and $^{68}\text{Zn}(n,\alpha)^{65}\text{Ni}$ reactions were reported at neutron energies from 4 to 12 MeV, addressing major data gaps and long-standing discrepancies in the existing experimental literature. Using the LENZ detector system at the LANSCE/WNR facility in LANL and pulse-shape discrimination in silicon detectors, differential and total cross sections were deduced with well-quantified uncertainties, providing the first experimental data for the (n,p) channel below 12 MeV and resolving inconsistencies in the (n, α) data in this energy region. The new measurements show significant deviations from evaluated nuclear data libraries, motivating updated Hauser–Feshbach calculations with modified optical model and level-density parameters that achieve improved agreement across elastic, inelastic, capture, and charged-particle emission channels, thereby strengthening the nuclear data foundation for fusion, accelerator-driven systems, and related applications.

Further progress was made in a machine-learning–aided pulse shape discrimination method for particle identification in silicon semiconductor detectors, combining detailed physics-based simulations with supervised learning to overcome the limitations of traditional ΔE – E techniques for low-energy charged particles. Realistic simulations of signal generation—including charge transport, bias-voltage effects, and preamplifier low-pass filtering—successfully reproduce key features of measured proton and α -particle waveforms from the LENZ instrument at LANSCE in LANL. Using derivatives of these simulated waveforms as training data, a Random Forest classifier trained solely on simulations achieves better than 95% accuracy when applied to experimental data, demonstrating that ML-based pulse shape analysis can enhance detection efficiency, recover otherwise discarded events, and provide a robust, scalable approach for analyzing scarce or challenging nuclear reaction data. This effort achieved high particle-identification accuracy, and outlined future plans for radioactive-target development, expanded LANSCE measurements, and broader application of AI/ML techniques to enhance scarce or damaged nuclear data.

The Photon Strength Function (PSF) database at LBNL was updated as part of its annual revision cycle by the end of 2025, incorporating 53 newly assessed data files for 13 nuclei, along with quality indicators for Oslo-method data and outlier analyses to identify problematic data or models. The Nuclear Level Density (NLD) database effort began in 2025 as part of a Coordinated Research Project, with dissemination planned for 2028, and includes LBNL/UCB responsibilities such as compiling and assessing NLD data and comparing models to experimental results. In addition, a four-year funded USNDP

evaluator traineeship has been established to support training in quasi-continuum nuclear data evaluation.

Nuclear Astrophysics

The astrophysical impact was investigated using newly measured $^{56}\text{Ni}(n,p)^{56}\text{Co}$ reaction rates on vp-process nucleosynthesis in proton-rich outflows from core-collapse supernovae, incorporating experimental data from the LENZ program at LANSCE together with updated rates for several other key reactions. By implementing the experimentally constrained $^{56}\text{Ni}(n,p)^{56}\text{Co}$ rate and its uncertainties into network calculations across multiple hydrodynamic trajectories, the study shows that this reaction acts as a major bottleneck, with a higher rate terminating the vp-process earlier and significantly reducing the production of light p-nuclei such as $^{92,94}\text{Mo}$ and $^{96,98}\text{Ru}$. Additional updates to reactions including the triple- α process, $^7\text{Be}(\alpha,\gamma)^{11}\text{C}$, $^{10}\text{B}(\alpha,n)^{13}\text{N}$, $^{10}\text{B}(\alpha,p)^{13}\text{C}$, and $^{59}\text{Cu}(p,\alpha)^{56}\text{Ni}$ further demonstrate how nuclear physics uncertainties propagate into abundance predictions, highlighting the critical need for improved experimental constraints and coordinated advances in both nuclear data and supernova modeling to resolve persistent discrepancies in p-nuclei production.

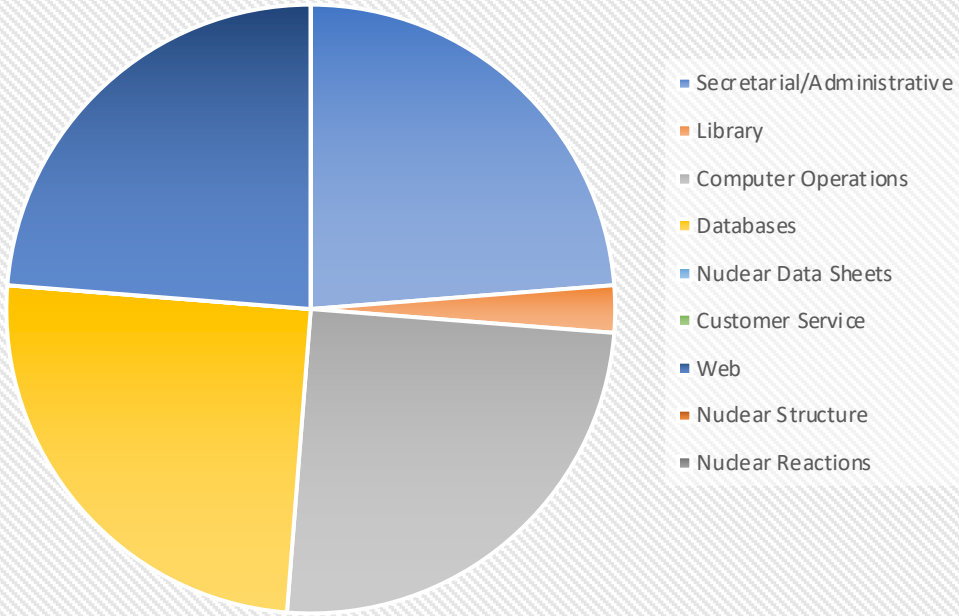
VII. USNDP Staffing

Staffing Table FY 2025

The table below gives the FTE distribution for each USNDP group according to activity. The values in this table and following plots are for the based funding only. In this table, PhD P means PhD Permanent; PhD T means PhD Temporary, which includes post-docs and scientists working under contract; T/A means Technical and Administrative; and GS means Graduate Student.





Activity	ANL		BNL			LANL			LBNL		LLNL	MSU	ORNL			TAMU	TUNL		Totals
	PhD P	PhD T	PhD P	PhD T	T/A	PhD P	PhD T	GS	PhD P	PhD T	PhD P	PhD P	PhD P	T/A	GS	PhD P	PhD P	PhD T	
I. NNDC Facility Operation	0	0	0.05	0	2.05	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1
Management			0.05																0.05
Secretarial/Administrative Support					0.95														0.95
Library					0.1														0.1
Computer Operations					1														1
II. Coordination	0.03	0	0.22	0	0	0.1	0	0	0.75	0	0.05	0	0.1	0	0	0	0.05	0	1.295
National Coordination	0.03		0.2			0.05			0.25		0.05		0.1				0.05		0.725
International Coordination			0.02			0.05			0.5										0.57
III. Nuclear Physics Databases	0	0	0.51	0	1	0	0	0	0.25	0	0	0	0	0	0	0	0	0	1.76
Nuclear Science References, NSR			0.2		0.45														0.65
Exper. Nucl. Structure Data, XUNDL			0.08																0.08
Eval. Nucl. Structure Data, ENSDF			0.08																0.08
Numerical Nuclear Data, NuDat					0.2														0.2
Experimental Reaction Data, CSISRS			0.09																0.09
Evaluated Nuclear Data File, ENDF			0.05																0.05
Database Software Maintenance																			0
Future Database System Develop.			0.01						0.25										0.26
IV. Information Dissemination	0	0	0.15	0	0.9	0	0	0	0	0.1	0	0	0	0.05	0	0	0	0	1.2
Nuclear Data Sheets			0.15																0.15
Customer Services																			0
Web Maintenance & Development					0.9					0.1				0.05					1.05
V. Nuclear Structure Physics	0.95	0	3.3	0.1	0	0	0	0	1.7	0	0	1.65	1	0	0	1	1.7	0.03	11.43
NSR Abstract Preparation			0.2	0.1															0.3
Compilation of Exper. Structure Data			0								0.15						0.2		0.35
Eval. of Masses & Nuclides for ENSDF	0.4		2						0.8		1.15	1				1	1.4	0.03	7.78
Ground & Metastable State Properties	0.4		0.1																0.5
Radioactive Decay Data Evaluation	0.05								0.6		0.05								0.7
Thermal Capture Gamma Data Eval.									0.15										0.15
Nuclear Structure Data Measurement	0.1		1						0.15								0.1		1.35
ENSDF Evaluation Support Codes											0.3								0.3
VI. Nuclear Reaction Physics	0.03	0	1.26	0.2	0	1	0.3	0.2	0.13	0	0.12	0	0	0	0.1	0	0	0	3.33
Experimental Data Compilation			0.75	0.2															0.95
ENDF Manuals and Documentation			0.05																0.05
ENDF Evaluations			0.17			0.2					0.05								0.42
Nuclear Reaction Standards			0.08																0.08
Nuclear Model Development						0.4	0.2				0.02								0.62
Nucl. Reaction Data Measurements						0.4	0.1	0.2	0.13										0.825
Astrophysics Nuclear Data Needs	0.03					0									0.1				0.125
Covariances development										0.05									0.05
Reactor anti-neutrino & decay heat calc.			0.21																0.21
Verification and Validation																			0
DOE-SC Nucl. Data Funded Staff	1	0	5.49	0.3	3.95	1.1	0.3	0.2	2.83	0.1	0.17	1.65	1.1	0.05	0.1	1	1.75	0.03	21.115
Staff Supported by Other Funds	0	1	4.51	2.7	1.13	4.05	1.4	0.8	3.18	4	0.85			0					23.615
TOTAL STAFF	1	1	10	3	5.08	5.15	1.7	1	6	4.1	1.02	1.65	1.1	0.05	0.1	1	1.75	0.03	44.73

Distribution of the 4 Tech/Admin FTEs



VIII. Detailed Status of the Work Plan – Fiscal Year 2025 Report





Each task area in this section is summarized with a status table listing individual tasks and their completion status. Below we present a sample task area table with the meaning of each status indicator.


XNL Planned Activities	Status	Issues/Path Forward
This is the name of the first activity.		This task is on schedule/going well/etc. It is not required to mention anything in the Issues/Path Forward box.
This is the name of the second activity.		This task is complete. Again, it is not required to discuss it.
This is the name of the third activity.		This task is behind schedule. The Issues/Path Forward field will explain/elaborate. There may be an issue HQ can help with.
This is the name of the fourth activity.		A milestone was missed. The Issues/Path Forward field will explain/elaborate. There may be an issue HQ can help with.


I. Operations

A. Management

This task includes planning, budgeting, personnel, interaction with management, and interaction with funding authorities.

BNL Planned Activities	Status	Issues/Path Forward
Prepare and organize USNDP budget briefing.		Due to the change in administration, no budget briefing was held in FY 2025
Prepare USNDP reports and work plans.		
Organize and chair USNDP meeting.		
Host and help organize NDAC meeting.		No NDAC meeting was requested in FY2025

LANL Planned Activities	Status	Issues/Path Forward
Organize and chair Nuclear Reaction Working Group.		


TUNL Planned Activities	Status	Issues/Path Forward
Organize and chair USNDP Nuclear Structure Committee.		

B. Library

NNDC maintains an archival collection of low- and intermediate-energy nuclear physics publications. This library supports the NNDC compilation activities, the U.S. nuclear reaction and nuclear structure data evaluation, and international nuclear structure evaluation effort.





C. Customer Services





This task accounts for the non-electronic services which the USNDP renders to customers. At the scientific staff level, this means direct assistance to users needing advice from nuclear data experts or advice on solving complex queries via electronic access to the database. The NNDC staff allocation at the support level is for maintaining a "help desk" as well as for administrative/clerical support of its customer services.

BNL Planned Activities	Status	Issues/Path Forward
Provide technical support to nuclear data end-users as necessary.		

D. Computer Operation


The NNDC operates several Linux servers to support compilation, evaluation, database maintenance, and information dissemination functions. In addition, each staff member has a desktop computer that supports an interface to these Linux servers and supports administrative functions, such as word processing and email.


BNL Planned Activities	Status	Issues/Path Forward
Provide technical computer support to NNDC staff, visitors, and external collaborators to enable them to effectively and securely use NNDC computing resources as well as procure computer hardware, software and support services to meet NNDC's computing requirements.		
Manage the high performance NNDC/NE cluster.		
Upgrade GitLab server software to provide more powerful and advanced functionalities in the NNDC collaboration services.		
Manage the NNDC Gitlab instance to enable collaboration on various nuclear data computational projects		

In collaboration with ITD, ensure continuous availability of mission-critical Web services through full compliance of NNDC's computers with DOE cyber security requirements.		
Install and configure the new NNDC web/database servers		
Maintain the NNDC Web Services availability on the 99% and higher level.		
Strictly follow all BNL and DOE cybersecurity rules and regulations during the Web application design, development and implementation. Address issues that arise during BNL scans.		

E. Nuclear Data Sheets


The USNDP provides some paper publications as well as electronic access to the nuclear physics databases that it maintains. This includes the Nuclear Data Sheets journal published by Elsevier and various versions of the Nuclear Wallet Cards.

BNL Planned Activities	Status	Issues/Path Forward
Prepare issues of Nuclear Data Sheets for publication.		

MSU Planned Activities	Status	Issues/Path Forward
Continue development of software for Nuclear Data Sheets publication.		

F. Web Site Maintenance

The NNDC provides electronic access to the nuclear physics databases that it maintains on behalf of the USNDP as well as access to other nuclear physics information through its website. Other USNDP members also offer nuclear physics information through their websites. These services require resources to maintain currency and improve performance.

ANL Planned Activities	Status	Issues/Path Forward
Provide access to published and updated versions of the Atomic Mass Evaluation (AME) and the NUBASE library of nuclear physics properties		


Provide access to stand-alone (MacOS and Windows) and mobile (iOS, iPadOS and Android) applications of the AME and NUBASE libraries		
Provide access to Argonne Nuclear Data and Measurements Reports (ANL/NDM)		

BNL Planned Activities	Status	Issues/Path Forward
Solicit user suggestions on enhancements to the ENSDF, NSR, NuDat, and Sigma web interfaces and be responsive to those needs. Expand search and plotting capabilities for ENSDF data.		
Begin developing new web interfaces for ENDF and EXFOR databases.		
Maintain currency of the CSEWG, USNDP and the NNDC websites, proactively respond to users' requests.		
Make progress with modernization of the website, enhancing capabilities and following industry best practices.		
Continue development of mobile applications targeting highly used databases.		
Release ENDF and Nuclear Wallet Card datasets including registering DOIs and creating website landing pages.		

ORNL Planned Activities	Status	Issues/Path Forward
Updating online nuclear astrophysics data information.		

TUNL Planned Activities	Status	Issues/Path Forward
Provide access to present and past evaluations of Energy Levels of Light Nuclei for A=3-20 nuclides, including associated figures and energy-level diagrams and tables.		
Provide access to compiled and evaluated data on light nuclei related to p-, alpha- and n-capture reactions, and ground-state decays.		
Provide access for TUNL dissertations collection.		





LBLN Planned Activities	Status	Issues/Path Forward
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<p>Continued maintenance of the LBNL/UCB Nuclear Data Group Website (https://nucleardata.berkeley.edu/), which attracted 5173 unique visitors in FY24. This website hosts information and outreach pages for the various projects carried out by the Nuclear Data Group, as well as points of contact for each project. It also hosts copies of past graduate student theses from UC Berkeley, a public codebase for tools and code developed in the group, and the WANDA workshop series homepage. This website also hosts community request databases, for identifying needs in nuclear structure data (https://nucleardata.berkeley.edu/nsei/index.html), as well as reaction data for isotope production (https://nucleardata.berkeley.edu/ipndi/), which can be used to guide funding priorities.</p>		
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II. Main Nuclear Physics Databases

A. Nuclear Science References (NSR)

The NNDC is responsible for NSR, the bibliographic database for nuclear physics research. This task includes data compilation, quality control, file update and maintenance, and file distribution to collaborators. Updates are performed on a continuing basis. The preparation of NSR entries is given under Nuclear Structure Physics. The literature search and preparation of KEYWORD abstracts for publications included in NSR require scientific expertise. BNL continues to have the overall responsibility for this database. Similar contributions from other external collaborators are expected. These will be checked and edited by BNL as necessary before being added to the database.





BNL Planned Activities	Status	Issues/Path Forward
Prepare entries for new references and keyword abstracts for 2/3 of them. Provide coverage for 80 major journals, including complete coverage of Physical Review C, Nuclear Physics A, and European Physical Journal A.		The NNDC regularly scans 30 major nuclear physics and engineering journals (including complete coverage of RR/C, EPJ/A, NP/A), plus evaluators request additional articles. Previously, when the NNDC had a librarian on staff, the NNDC scanned a larger number of journals.
Distribute database to collaborators.		
Perform database updates and maintenance.		
Continue joint project with the NRDC network to transfer missing nuclear reaction references to NSR.		


Study in depth the possibilities of using AI and ML techniques in NSR, in collaboration with LBNL.		
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LBNL Planned Activities	Status	Issues/Path Forward
Study in depth the possibilities of using AI and ML techniques in NSR, in collaboration with BNL. This resulted in the production of the NucScholar test database (https://nucscholar.lbl.gov/) which uses Natural Language Processing (NLP) to automatically retrieve, categorize, and recommend nuclear science papers.		
Implement NLP techniques for auto-generation of NSR entries for comparison against human-generated data.		


B. Experimental Nuclear Structure Data (XUNDL)

The NNDC is responsible for maintaining and providing access to the XUNDL database. This database contains compilations (in ENSDF format) of recently published or completed level-structure data for high-spin and low-spin physics. The NNDC coordinates this work and updates the database as new/revised data sets are received from collaborators.

BNL Planned Activities	Status	Issues/Path Forward
Perform weekly updates of the database using input received from compilers.		
Archive and distribute database yearly.		
Compile and review datasets for recently published experimental nuclear structure data for inclusion in the XUNDL database. Interact with the authors for requesting additional experimental data or for further clarification of the published results.		
Review compiled datasets submitted by other data centers prior to inclusion in the XUNDL database. Work with PRC and EPJA to check and compile data prior to publication.		





MSU Planned Activities	Status	Issues/Path Forward
Compile and review datasets for recently published experimental nuclear structure data		

for inclusion in the XUNDL database. Interact with the authors for requesting additional experimental data or for further clarification of the published results.		
Work with PRC and EPJA to check and compile data prior to publication.		
Train a new ENSDF evaluator hired at FRIB in FY25 for XUNDL compilation		

TUNL Planned Activities	Status	Issues/Path Forward
Compile and review datasets for recently published experimental nuclear structure data for inclusion in the XUNDL database. Interact with the authors to request additional experimental data or for further clarification of the published results.		


C. Evaluated Nuclear Structure Data File (ENSDF)

The NNDC is responsible for ENSDF, a database of evaluated experimental nuclear structure and decay data. The NNDC is responsible for the format and content checking, preparation of the manuscript, and quality control (review) of evaluations submitted for inclusion. The NNDC maintains the database, which includes database updates and distribution to collaborators. Corrections are implemented on a continuous basis.

BNL Planned Activities	Status	Issues/Path Forward
Maintain ENSDF database, includes continuous updating.		
Process evaluations received from ENSDF evaluators.		
Archive and distribute ENSDF database on a monthly basis.		
Proceed with the ENSDF modernization project.		





D. Numerical Nuclear Data (NuDat)

The NNDC is responsible for NuDat, which consists of a database and a suite of codes that access it, allowing web users to search for level and γ -ray properties extracted from ENSDF, ground and metastable state properties (Wallet Cards), and atomic and nuclear radiations derived from ENSDF. Additionally, NuDat contains an interactive Chart of Nuclides and interactive level schemes.

BNL Planned Activities	Status	Issues/Path Forward
Update NuDat database as necessary.		

E. Experimental Reaction Data File (EXFOR)






The NNDC is responsible for maintaining the EXFOR database for Area 1 (North America). This database contains experimental nuclear reaction data for incident energies below 1 GeV, including neutron-induced reactions and reactions with incident-charged particles of mass $A \leq 12$. Many groups worldwide compile experimental data and send it to the central database at the International Atomic Energy Agency in Vienna in the EXFOR format. Then, each center is responsible to update its own database. The effort described here includes quality control, file update, and data transfer activities. The NNDC database is updated as compilations are exchanged and checked from the compiling centers. The compilation activity is given under Nuclear Reaction Physics.

BNL Planned Activities	Status	Issues/Path Forward
Update EXFOR database with compilations from cooperating centers (500 entries expected). The NNDC compilation work can be found under Nuclear Reaction Physics, Section V of the present document.		
Compile experimental data for neutron, charged-particle, and photon-induced reactions from over one hundred publications.		
Explore possibilities of recovering previously unobtainable reaction data and proactively respond to users' needs.		
Lead to WPEC Subgroup 54, the successor group to subgroup 50, focused on creating a critically reviewed version of EXFOR.		

F. Evaluated Nuclear Data File (ENDF)


The NNDC is responsible for ENDF, a database of evaluated nuclear data required for many nuclear applications. The work is organized under the CSEWG, coordinated by the NNDC. The ENDF file contains complete descriptions of nuclear reactions of neutrons with many nuclides and elements for energies up to 20 MeV and radiations from radioactive decay. A number of evaluations for energies up to 150 MeV and for incident-charged particles and photons are also included. The data are stored in the ENDF format developed at NNDC in the 1960s and adopted as an international standard. In addition to the U.S. library, ENDF/B, the database contains evaluated data libraries from the European Union, Japan, Russia, and China. This activity includes the processing and quality control of the U.S. ENDF/B library, the distribution of this database in the U.S. and the exchange of libraries internationally. New evaluations for the next

release of the library, following ENDF/B-VIII.0, are assembled, tested and made available to users through NNDC's Web servers and GitLab collaboration server at git.nndc.bnl.gov.




BNL Planned Activities	Status	Issues/Path Forward
Maintain and improve Sigma database and web interface for users without specialized knowledge of ENDF-6 format.		
Maintain and extend ADVANCE, the ENDF continuous integration system that continually checks for modification to the ENDF database then runs all available tests on the changed data files.		
Maintain the ENDF project area on NNDC's GitLab instance.		
Coordinate the peer review of evaluations submitted to the ENDF project.		
Prepare and release beta releases of the next ENDF library, as determined by CSEWG.		

III. Nuclear Structure Physics

A. National Coordination

MSU Planned Activities	Status	Issues/Path Forward
Co-chair and organize a nuclear data session at the annual Low-Energy Community Meeting.		



B. International Coordination



MSU Planned Activities	Status	Issues/Path Forward
Co-lead and coordinate hands-on activities for ENSDF evaluation of a mass chain at the IAEA-ICTP nuclear structure and decay data workshop		
Coordinate the post-workshop collaborative evaluation of the mass chain by international working groups of the ICTP workshop		
Serve as rapporteur for the technical meetings of the international Nuclear Structure and Decay Data (NSDD) evaluator network and the IAEA-		




led project on "Evaluated Decay Data Library for Monitoring Applications"		
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C. Compilation of Experimental Nuclear Structure Data

This activity involves compilation of recently published or completed experimental nuclear structure data for inclusion in XUNDL. The compilation is managed by the NNDC.

ANL Planned Activities	Status	Issues/Path Forward
Compile recently published experimental nuclear structure data relevant to the AME and NUBASE libraries. Interact with the authors for requesting additional experimental data or for further clarification of the published results.		
Compile B(E3) experimental data for inclusion into the new topical evaluation on B(E3) transition probabilities. This work is carried out in collaboration with a data scientist from the Australian National University.		Effort was redirected to evaluation of nuclear data for AME and ENSDF.



BNL Planned Activities	Status	Issues/Path Forward
Compile new B(E2) experimental data. Continue work on a B(E2) evaluation project.		
Compile new double-beta decay experimental data. Start working on a data project with Kiev Institute for Nuclear Research.		Project complete and results published.






LBNL Planned Activities	Status	Issues/Path Forward
As part of our work on the Berkeley Evaluated Alpha proton Radioactivity (BEApR) database, we are compiling all experimental structure data relevant to the topic into the database. In FY25 the group will complete the compilation of all existing data and switch over to maintaining the database as new publications are produced.		
Compile and review datasets for recently published experimental nuclear structure data for inclusion in the XUNDL database. Interact with the authors for requesting additional experimental data or for further clarification of the published results.		
LBNL update on IAEA Photon Strength Function Database new experimental data (unrelated to quasicontinuum data evaluator traineeship).		


LBNL updating and Improving Nuclear Level Densities for Applications through IAEA CRP (unrelated to quasicontinuum data evaluator traineeship).		
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D. A-Chains and Nuclides Evaluations for ENSDF




USNDP evaluates nuclear structure and decay data for inclusion in the ENSDF database. This effort includes the critical analysis of all available experimental nuclear structure and radioactive decay data for a nuclide or a group of related nuclei to deduce recommended values from the measured data and prepare a file in ENSDF format that is the basis for publications in Nuclear Data Sheets and is used to update the contents of the USNDP nuclear structure and decay database, ENSDF.




ANL Planned Activities	Status	Issues/Path Forward
Evaluate at least one mass chain from the ANL region of responsibility.		
Review mass chain evaluations, as requested by the ENSDF coordinator.		No review was requested by the ENSDF manager



BNL Planned Activities	Status	Issues/Path Forward
Evaluate at least four mass chains or their equivalent nuclides.		
Review at least four mass chains or their equivalent nuclides.		
Update ENSDF for the identification of new nuclides and for the first publication on the findings of the excited states of nuclides.		
Edit all evaluations submitted for publication, including checking their format and physics content.		
Continue mentoring new ENSDF evaluators.		



LBNL Planned Activities	Status	Issues/Path Forward
Plan to submit at least one mass chain (~15 nuclides), address reviewer/editorial comments of the submitted mass chains for publication. - Review at least one mass-chain evaluations, as requested.		

MSU Planned Activities	Status	Issues/Path Forward
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Evaluate the equivalent of at least three mass chains (two by the PI and one by the new ENSDF evaluator trained by the PI).		
Review one mass-chain evaluation.		
Train the new ENSDF evaluator hired at FRIB in FY25 for ENSDF evaluation		


ORNL Planned Activities	Status	Issues/Path Forward
Evaluate the equivalent of one mass chain.		
Review mass-chain evaluations, as requested.		
Post review edits for at least 2 mass chains. The objective is to reduce the backlog of post review mass chains.		


TAMU Planned Activities	Status	Issues/Path Forward
At least one mass chain, or their equivalent nuclides, will be evaluated.		
Review mass-chain evaluations, as requested.		

TUNL Planned Activities	Status	Issues/Path Forward
Evaluate about one A-chain per year for publication in Nuclear Data Sheets and inclusion in the ENSDF database. An objective is to produce two A-chain evaluations per year.		
Evaluate and update ENSDF for A=2-20 near drip-line nuclides, especially for first observations or when ENSDF has no previous dataset.		


E. Ground and Excited State Properties


ANL Planned Activities	Status	Issues/Path Forward
Evaluate atomic masses and complementary nuclear structure data for the AME and NUBASE libraries.		


Respond to user needs for evaluated nuclear masses and other related nuclear physics properties		
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TAMU Planned Activities	Status	Issues/Path Forward
Developing a visualization of high-spin level schemes		


F. Non-ENSDF Decay Data Evaluations



ANL Planned Activities	Status	Issues/Path Forward
Technical coordinator of the IAEA-led project on "Evaluated Decay Data Library for Monitoring Applications". Contribute to the evaluation and review of nuclear decay data for selected radionuclides and overseen the review process.		


LBNL Planned Activities	Status	Issues/Path Forward
Worked with researchers at Pacific Northwest National Laboratory on the development of a numerical database with complete Gamma-ray-X ray coincidence data in a joint effort with the Defense Threat Reduction Agency. The resulting Python Archive of Coincident Emissions from ENSDF (paceENSDF) database is being disseminated through GitHub and PyPi. It is being benchmarked against existing decay data from ENSDF as well as recently published datasets not yet included in ENSDF.		


MSU Planned Activities	Status	Issues/Path Forward
Contribute to the IAEA-led project on "Evaluated Decay Data Library for Monitoring Applications."		


G. Nuclear Structure Data Measurements

ANL Planned Activities	Status	Issues/Path Forward
Contribute to nuclear physics research activities at ANL (ATLAS and CARIBU), MSU (FRIB), and other nuclear physics user facilities with the main emphasis on decay studies of neutron-rich nuclei, spectroscopy of heavy actinide nuclei, and nuclei far from the line of stability.		

BNL Planned Activities	Status	Issues/Path Forward
Precisely determine decay schemes relevant for applications using state-of-the-art gamma-ray spectroscopy.		
Contribute to measurements at user facilities, such as Argonne's ATLAS and MSU's FRIB.		




LBNL Planned Activities	Status	Issues/Path Forward
Analyze historical $^{238}\text{U}(n,f)$ decay and prompt data gamma-ray data sets obtained using the GENESIS array. Results from these experiments are planned for publication as a part of the dissertation of a Berkeley student planned for 2028.		





MSU Planned Activities	Status	Issues/Path Forward
Contribute to gamma-ray spectroscopy and lifetime measurements with GRETINA and beta-delayed proton-decay measurements of astrophysically-important nuclei at FRIB		


TAMU Planned Activities	Status	Issues/Path Forward
Contribute to beta-gamma spectroscopy for precision measurements of halfives and branching ratios for Standard Model at Cyclotron Institute.		

H. ENSDF Physics and Checking Codes

BNL Planned Activities	Status	Issues/Path Forward
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Maintain and upgrade ENSDF checking and physics programs for format changes as required.		
Prepare ENSDF file editor for use in data evaluation.		
Work on the development of a new editor for the ENSDF format and develop applications that apply Machine Learning techniques to the new format.		





MSU Planned Activities	Status	Issues/Path Forward
Maintain and improve the ENSDF utility and analysis codes in Java developed at MSU, such as McMaster-MSU-Java-NDS, ConsistencyCheck, GLSC, Java-RULER, Excel2ENSDF, FormatCheck, AlphaHF, KeynumberCheck, AME-Nubase-viewer.		
Continue to develop and improve the ENSDF-evaluation toolkit (EvaluationToolkit) that combines all cENSDF Java codes and provides a simple user-friendly interface to help facilitate, streamline and automate the ENSDF-evaluation process.		
Continue to develop new Java codes to replace the remaining legacy ENSDF codes in Fortran that lack maintenance.		
Continue to develop the new Java-NDS program and other utility and analysis Java codes to work with the new ENSDF JSON format		




LLNL Planned Activities	Status	Issues/Path Forward
Collaborate with BNL in the development of the next generation ENSDF format and develop applications that apply Machine Learning techniques to the new format.		

IV. Nuclear Reaction Physics

A. National Coordination



The NNDC is the Secretariat for the Cross Section Evaluation Working Group (CSEWG). Other members of the USNDP also have leadership roles within CSEWG.

BNL Planned Activities	Status	Issues/Path Forward
Organize and chair CSEWG meeting at BNL.		Nuclear Data Week 2024 (including the annual CSEWG meeting) was held at BNL from 4-8 Nov. 2024.
Edit and publish summary reports and proceedings of the CSEWG meetings.		The meeting minutes were published as a BNL internal report BNL-227509-2025-INRE.
Chair the CSEWG Executive Committee.		
Organize mini-CSEWG and/or Hackathon meetings in the summer if needed.		The ENDF Hackathon was held at ORNL from 4-7 Aug., 2025.

LANL Planned Activities	Status	Issues/Path Forward
Organize and chair CSEWG Fission Product Yield Subcommittee.		
Organize and chair CSEWG Covariance Subcommittee.		
Organize and chair Nuclear Reaction Working Group.		




B. International Coordination

Members of the USNDP plan an active role coordinating international reaction evaluation and data preservation activities

BNL Planned Activities	Status	Issues/Path Forward
Chair OECD/NEA Working Party on Evaluation Cooperation Subgroup 53 "Stable Zirconium Evaluations and Validation"		
Chair OECD/NEA Working Party on Evaluation Cooperation Subgroup 54 "Continuation of Subgroup 50 - developing an automatically readable, comprehensive, and curated experimental reaction database"		









C. ENDF Manuals and Documentation

The NNDC is responsible for maintaining the format and procedures manual for the ENDF system as well as producing the documentation supporting the contents of the ENDF/B library.






BNL Planned Activities	Status	Issues/Path Forward
Maintain the GitLab version of the ENDF-6 formats manual current with CSEWG-endorsed format changes. Issue official release of the manual.		
Automate the generation and posting of the latest unofficial version of the ENDF-6 formats manual.		
Coordinate development of the format specification for the GNDS (the successor format to ENDF-6) with the legacy ENDF-6 format during the transition to GNDS.		


D. ENDF Evaluations


Evaluated nuclear reaction data, for applications and basic science needs, are stored in the ENDF database, which is maintained by BNL. As Chair of the CSEWG Evaluation Committee, LANL staff works with BNL to ensure quality control, particularly for new evaluations. New evaluations funded primarily from other sources are prepared for archival in the ENDF library. BNL, LANL, LLNL and ORNL provided neutron, proton, and photonuclear reaction data evaluations.


BNL Planned Activities	Status	Issues/Path Forward
Respond to user needs for evaluated nuclear reaction data.		
Collect and address users feedback related to the ENDF library.		
Complete evaluations for Zr isotopes to support new reactor fuel concepts.		This project is more involved than originally envisioned. Work is moving to WPEC subgroup 53. This subgroup is coordinated by BNL.
Work with CSEWG on upgraded evaluations for future release of the ENDF/B library.		
Improve methodology for providing covariance data in the resonance and fast neutron region to the next release of ENDF.		
Update the Decay Data Sub-library as new data for neutron-rich nuclides become available.		
Improve methodology for generating unresolved resonance region cross section probability distributions.		
Maintain the Atlas of Neutron Resonances electronic files in preparation for a future update of the Atlas of Neutron Resonances. Continue working on the use of ML techniques to better determine resonance properties.		



Contribute to the Fission Yield evaluation CRP at the IAEA.		
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LANL Planned Activities	Status	Issues/Path Forward
Upgrade the LANL ENDF evaluations for actinides as well as some other materials in the intermediate mass region, which perform well in criticality benchmarks, including new theoretical development of statistical models for deformed systems. Close collaboration with international nuclear data library activities at the IAEA and OECD/NEA.		
Provide new evaluations of the prompt and delayed neutron multiplicities for both major and minor actinides, which are consistent with the fission product yield evaluations.		
Improve fission cross section calculations that maintain consistency across the actinide mass numbers.		
Improve photon production data for neutron inelastic scattering based on an advanced model of pre-equilibrium process.		
Improve calculations for neutron-induced charged-particle reactions in collaboration with LENZ/LANSCE, and produce evaluated files based on these data.		

LBNL Planned Activities	Status	Issues/Path Forward
Supporting ENDF via contribution to the Gamma-Rays Induced by Neutrons (GRIN) collaboration, which has a focus on the improvement of the gamma-ray data in the ENDF libraries. Extrapolation methods to higher incident neutron energies are also under development. In FY25, a capture-gamma database, pyEGAF was developed and described in a corresponding reference article.		



LLNL Planned Activities	Status	Issues/Path Forward
Perform new evaluations as per LLNL customer requests and submit these as well as other LLNL-generated evaluations into ENDF.		


Perform evaluations for Y and Zr isotopes for a possible activation (sub)library, including data from LLNL surrogate measurements.		
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LBNL Planned Activities	Status	Issues/Path Forward
Working with IAEA "Charged-particle cross section database for medical radioisotope production" CRP group for selection of new reaction monitor standards for upcoming database update.		
Planning to perform an evaluation of the $^{93}\text{Nb}(p,4n)^{90}\text{Mo}$ monitor reaction, based on prior work performed by the LBNL/UCB Nuclear Data Group, along with LANL and BNL collaborators.		The LBNL group will work with collaborators at LANL, BNL-BLIP and the IAEA to work on this evaluation in the coming year.

LLNL Planned Activities	Status	Issues/Path Forward
Verify R-matrix fits for $^6\text{Li}(n,t)$ and $^{10}\text{B}(n,a)$ standards reactions		
Participate in IAEA standards meetings and review impact of changes in standard cross sections for LLNL applications.		





E. Neutron-induced g-Ray Data Evaluation


LBNL Planned Activities	Status	Issues/Path Forward
Continue updating the Inelastic Scattering of Reactor Fast Neutrons Database (e.g., the "Baghdad Atlas") with modern ENSDF data, as a validation database for $(n,n'\gamma)$ as well as with additional sources of energy differential $(n,n'\gamma)$ data from GELINA at Geel, neutronELBE at HZDR, and the GENESIS array at LBNL. Extract information from ENDF needed to produce flux-weighted partial gamma-ray cross sections and comparing the result to values in the Atlas.		
Start benchmarking reaction modeling codes, including TALYS and EMPIRE. This work will be performed in collaboration with researchers from the IAEA and Naval Nuclear Laboratory.		

Explore the role of quasi-continuum contributions through collaboration with researchers from LLNL and the University of Oslo.		
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F. Nuclear Model Development






This task covers activities, such as the development and validation of nuclear reaction models, used for prediction of nuclear reaction cross sections. The two major codes are CoH3 (LANL) and EMPIRE (BNL). Measurements made by ANL, LANL and LBNL, along with other measurements made with DOE low-energy physics funds, will play a crucial role in the validation of the models in these computer codes. LANL participates in the IAEA Coordinated Research Project RIPL that improves the accuracy and reliability of input parameters used in nuclear reaction calculations.



LANL Planned Activities	Status	Issues/Path Forward
Continue to develop a microscopic description of the fission process based on penetrability calculations through multi-dimensional potential energy surface. Implement the theory into the Hauser-Feshbach code to facilitate actinide evaluations.		
Continue to develop a coupled-channels Hauser-Feshbach method for better prediction of neutron- induced reactions on deformed nuclei, with particular emphasis on fission, capture, and inelastic scattering channels.		
Continue to develop the Hauser-Feshbach fission fragment decay code for evaluating major actinides, which has a unique capability to produce all the fission observables simultaneously.		
Develop a semi-microscopic model for nuclear level density that includes realistic spin and parity distributions.		






LBNL Planned Activities	Status	Issues/Path Forward
Continue benchmarking and improving reaction modeling codes, including TALYS and EMPIRE. This work will be performed in collaboration with researchers from the IAEA.		





G. Nuclear Reaction Data Measurements

BNL Planned Activities	Status	Issues/Path Forward
Measure product yields at NASA Space Radiation Laboratory (NSRL) for reactions relevant for space Applications.		
Collaborate with the Brookhaven Linear Isotope Producer (BLIP) on cross-section measurements for isotopes relevant for nuclear medicine.		

LANL Planned Activities	Status	Issues/Path Forward
Publish reports on double-differential cross sections of $^{54}\text{Fe}(n,z)$, $^{56}\text{Fe}(n,z)$, $^{58}\text{Ni}(n,z)$ and $^{60}\text{Ni}(n,z)$ in respect to incoming neutron energies and outgoing particles angles for the neutron energy range of 0.5 - 20 MeV.		
Publish reports on cross sections of $^{40}\text{K}(n,p)$ and $^{40}\text{K}(n,a)$ reactions for the neutron energy range of 0.1 - 6.0 MeV.		
Finalize double-differential cross sections of Zn isotopes in respect to incoming neutron energies and outgoing particles angles for the neutron energy range of 0.5 - 20 MeV.		
Perform the precision measurements on improved angular distributions of the $^{16}\text{O}(n,\alpha)$ reaction using SREFT, Time Projection Chamber, at LANSCE.		
Work on development of experimental capability for measuring nuclear reactions on radionuclides		


LBNL Planned Activities	Status	Issues/Path Forward
Study $n,n'\gamma$ reactions using the Gamma Energy Neutron Energy Spectrometer for Inelastic Scattering (GENESIS) and nEXUS. This work is continuing, with measurements and data analysis being carried out in collaboration with students and staff supported by the NA-113 Stewardship Science Academic Alliance program.		
LBNL will work with external collaborators to study production rates of $^{209}\text{Bi}(d,2n)^{209}\text{Po}$ for RTG power sources. Planning for this work is		


taking place in collaboration with a private sector sponsor (L3Harris)		
LBNL will continue collecting (p,x) reaction data from threshold to 200 MeV in collaboration with LANL and BNL, for production of isotopes of interest to the DOE Isotope Program. This work is continuing as a part of a broader proposal focused on improving nuclear reaction modeling using Machine Learning.		
LBNL will continue exploring the use of intense neutron sources from deuteron breakup to measure (n,x) cross sections of interest for isotope production. Plans for this work are continuing to be made in collaboration with colleagues from the Missile Defense Agency.		
LBNL will perform measurements of Mo(d,xn) cross section measurements for the production of 95mTc and 97mTc, as tracers for diagnostics for NIF radiochemical applications. This effort ended in FY24.		
LBNL will work with partners at the National Ignition Facility at LLNL in the Starfire collaboration to identify nuclear data needs related to materials damage and gas production cross section measurements relevant to fusion power systems. This includes identifying speakers for the WANDA meeting and creating prioritized lists of measurements, modeling and processing activities. It will also include carrying out one or more irradiation of high-priority materials for fusion power systems using energetic neutrons from the thick target deuteron breakup neutron source at the 88-Inch cyclotron. This work is continuing in FY25.		
LBNL will engage with partners in NASA and the Missile Defense Agency to identify and carry out one or more targeted stopping power measurements using heavy-ion beams at the 88-Inch cyclotron. This work will be carried out by members of the 88-Inch cyclotron operations staff as part of their graduate studies in the UC Berkeley Nuclear Engineering Department (UCBNE). This work is being carried out in collaboration with staff from the 88-Inch Cyclotron Operations team, one member of whom is a graduate student at UCBNE.		

As a partner in the NDIAWG FOA-funded Berkeley Atlas project LBNL will perform targeted (n,n'gamma) cross section measurements using a Deuterium-Tritium Associated Particle Imaging (DT-API) at LBNL and partner with the Nuclear Technology Innovation Laboratory in the UC Berkeley Nuclear Engineering Department to and install and operate a new system DT-API system in Etcheverry Hall on the UC Berkeley campus. This work is continuing, with the first run at the new DT-API generator planned for the end of FY25Q2.		
In partnership with NA-241 the LBNL group will engage in targeted high-priority microcalorimeter measurements and decay data evaluations relevant to nuclear safeguards. LBNL will also produce radionuclides needed to calibrate microcalorimeters used to produce the required decay data. This work is continuing in FY25, with the focus moving from 238U to other actinides.		
LBNL investigating nuclear plasma interactions through measurements in 196,198Au.		
LBNL carry out decay data measurements of Rb target with high energy neutron beams to address the decay data issue and analyze the data for publication.		




H. Astrophysics Nuclear Data Needs


The objective of this activity is to support the nuclear data needs of the increasingly sophisticated simulations of astrophysical phenomena.

ANL Planned Activities	Status	Issues/Path Forward
Provide recently compiled and evaluated nuclear data of nuclear physics properties for astrophysics modeling at FRIB		


BNL Planned Activities	Status	Issues/Path Forward
Work on neutron capture and fission integral values and their uncertainties in the energy region of interest for nuclear astrophysics.		

Evaluate nuclear astrophysics potential of EXFOR library.		
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LANL Planned Activities	Status	Issues/Path Forward
Work on improvement of neutron capture, beta-delayed neutron and fission modeling for astrophysical hydrodynamics simulations.		
Work on Monte Carlo simulation effort using Geant4, to implement radioactive nuclear reaction studies at Time of Flight facilities, in the interest of providing improved neutron reaction rates on radionuclides.		
Develop network calculations for nucleosynthesis of heavy elements by implementing newly updated experimental reaction rates in relevant astrophysical scenarios.		



ORNL Planned Activities	Status	Issues/Path Forward
Continue assessments of capture reactions on p-rich unstable nuclides that are important for novae and X-ray bursts. The nuclei to be studied are those planned for measurements at radioactive beam facilities.		

I. Covariances Development

LBNL Planned Activities	Status	Issues/Path Forward
Continue to develop an experimentally driven fission covariance database		


J. Reactor Antineutrino Spectra and Decay Heat Calculations

BNL Planned Activities	Status	Issues/Path Forward
Improve our methods and databases to calculate anti-neutrino spectra for major actinides.		

Perform decay-heat calculations in collaboration with experimental groups.		
Contribute to relevant experiments.		

K. Verification and Validation

Quality Assurance (QA) of a nuclear data library requires that all files are checked for integral consistency and conformance with the adopted format. This part of the QA is called verification and is one of the fundamental functions of the NNDC. Furthermore, checking performance of the library against the integral experiments, known as validation, is also an important step to ensure the usefulness of the library for the end-users. The most extensive validation is performed by LANL and other CSEWG contributors funded with non-DOE-SC sources. The USNDP supports the ultimate validation effort carried out at BNL.

BNL Planned Activities	Status	Issues/Path Forward
Maintain automatic, real-time verification and validation of new/modified ENDF evaluations submitted to the NNDC GitLab server.		

Appendix A – Additional Funding Sources

This appendix lists additional funding for certain USNDP contributors. This funding either aligns with existing USNDP activities or is funded as part of the NDIAWG series of funding opportunities.

ANL

Additional support (a fully funded post-doc) for the nuclear data work comes from a DOE/SC/NP funded proposal #0000269682 led by W. Nazarewicz (MSU/FRIB).

BNL

BNL scientists are engaged in a number of non-USNDP funded nuclear data activities, most notably with the continued support of the National Criticality Safety Program (NCSP) and the Defense Nuclear Nonproliferation (NA-22) Program. Currently the NCSP partly funds the operation of the Evaluated Nuclear Data File library project, in conjunction with the USNDP. NA-22 and Fusion Energy programs funds several projects as a direct result of the Nuclear Data Interagency Working Group proposal process.

LANL

Additional supports for the nuclear data project are as follows:

1. Advanced Simulation and Computing under NNSA.
2. The US Nuclear Criticality Safety Program (NCSP).
3. Evaluation of energy dependent fission product yields, funded by NA-22.
4. Fission in R-Process Elements (FIRE) collaboration.
5. LANL-LDRD to develop transmission measurement capability for studying radionuclides at LANSCE.
6. Science Campaign support under Office of Experimental Sciences by NNSA.
7. New experimental (a,n) nuclear data effort, funded by NA-22

LBNL

Additional supports for the LBNL nuclear data program are as follows:

1. DoD-DARPA Decay on Demand: Performing experiments using the BELLA facility at LBNL for Nuclear Isomeric State Excitation for the production of Actinium-225
2. DOE-NP (NDIAWG): Quasicontinuum Evaluation Traineeship – Performing data evaluation for the
- 3 Google Project X: Faculty support grant for exploring the use of energetic photons and electrons to transmute nuclear waste through photoexcitation.
4. DOE-NA22 (NDIAWG) Nuclear Level Density/Photon Strength measurements in ^{136}Xe
5. DOE-NA22 Nuclear Data Scoping Study: Determining the role of nuclear data in nonproliferation.
6. DOE-FES NIF Starfire: Measuring fast neutron damage laser-driven inertial confinement fusion
7. DoD-Missile Defense Agency: Developing a capability to perform neutron single event effects
8. DOE-Isotope Program Tri-lab Effort in Nuclear Data 2.0: Providing data for machine learning nuclear reaction modeling in support of isotope production.
9. DOE-NA22 CLYC Spectrometer: Fabricating and testing a field-deployable neutron spectrometer for nonproliferation applications.
10. NRD, LLC: ^{209}Po production cross section measurements for the production of Radioisotope Thermal Generators.

11. NA241 Microcalorimetry for Nuclear Data: This project involved the evaluation and measurement of nuclear data relevant to nuclear safeguards.

12. GENESIS (NA-22, SSAA): These two grants (with SSAA coming through campus) support neutron scattering measurements using the GENESIS array at LBNL. Support is provided for both UC staff and students.

13. Nuclear Technology Innovation Laboratory (NTIL): Support is provided by the UC Berkeley College of Engineering to stand up a capability in nuclear technology research. The NTIL has paid for the installation and commissioning of a DT-API neutron generator called NeXUS that became operational in May 2025.

LLNL

Livermore Laboratory has had a program for nuclear data for almost 60 years, and this has been often independent of the national ENDF library format. In that time, LLNL has made its own ENDL libraries in format designed for punched cards, and it has its own groups of evaluators leading to revisions about twice per decade. In the 70s the ENDL libraries were described by a comprehensive series of 20 descriptive volumes published under the label of UCRL-50400.

Because this original ENDL format was less flexible than the ENDF format, in the recent decade we have had some incentive to make more modern data structure, and this led us to designing, coding and translating the new Generalized Nuclear Data Structure (GNDS). This GNDS method is now maintained internationally by WPEC, and it is used internally at LLNL for all stages of the nuclear pipeline from decay models, data storage, translation, testing and processing for transport codes. It is the most comprehensive method for interchange of nuclear data and is becoming widely adopted as the preferred future standard.

The nuclear data that LLNL uses comes from a variety of sources. We examine existing libraries to determine which provides the best description of nuclear cross sections, and often use our own models for neutron reactions and decay processes. We have optimized our own Hauser-Feshbach models for neutron reactions on a wide variety of fission fragments and other nuclides of use for radiochemistry. As one of the first labs to comprehensively transport both neutrons and charged particles (isotopes of hydrogen and helium) we have a comprehensive library of low-energy charged-particle evaluations, with particular attention to exothermic reactions on targets up to lithium isotopes.

In the last 15 years the experimental groups at LLNL have been using the indirect 'surrogate' method to measure cross-sections for which direct detection is unavailable, and the results have been made into GNDS evaluations to determine the effects of the new cross-sections. We test all evaluations by comparison with the standard database of critical-assembly measurements and also by comparison with the pulsed-sphere measurements once performed at LLNL. New critical assemblies are being created, measured and modeled. The national collaboration to use a Time Projection Chamber to measure actinide and standard cross-sections is being led by LLNL experimentalists. We have used both ENDL and ENDF processed libraries in transport codes for programmatic work.

The USNDP provides a small contribution to the LLNL nuclear data team to enable the sharing of in-house data products with the national community. Our GNDS work is funded outside USNDP and has provided thorough checks of the ENDF libraries submitted by various groups.

Additional supports for the LLNL nuclear data project are as follows:

1. Advanced Simulation and Computing under NNSA.
2. The US Nuclear Criticality Safety Program (NCSP).
3. Support from the evaluator traineeship program from DOE-NP & NNSA through NDIAWG FOA DE-FOA-0003238
4. ENSDF modernization project.

MSU

Data activities are supported by U.S. Department of Energy, Office of Science, Office of Nuclear Physics, under Contract No. DE-SC0016948.

Appendix B – USNDP Data and Code Products

Joint Products		
Evaluated Nuclear Data File (ENDF)	POC: David Brown (dbrown@bnl.gov) CSEWG Chair, Gustavo Nobre (gnobre@bnl.gov) ENDF Library Manager	URL: https://www.nndc.bnl.gov/endlf/ ; https://doi.org/10.11578/endlf/2571019
	Description: Core nuclear reaction database containing evaluated (recommended) data from the ENDF/B-VIII.1 library. It provides data in the ENDF-6 and GNDS formats, covering all nuclides of practical relevance for neutrons up to 20 MeV and partly up to 150 MeV. It serves as principal input for neutronics calculations, including nuclear reactor design, national security, accelerators, criticality safety, shielding, nuclear reaction research, radiation protection and detector simulation. This produced derived from AME, Atlas of Neutron Resonances, ENSDF, EXFOR, NSR, Literature.	
Evaluated Nuclear Structure Data File (ENSDF)	POC: Elizabeth Ricard (mccutchan@bnl.gov)	URL: https://www.nndc.bnl.gov/ensdf/ ; https://doi.org/10.18139/nndc.ensdf/1845010
	Description: Core nuclear structure and decay database containing evaluated (recommended) data for 3,171 nuclides, organized in over 17,269 individual datasets. It serves as principal source of data for nuclear structure research, nuclear spectroscopy applications, MIRD, NuDat, and publications such as Nuclear Data Sheets and Table of Isotopes. This produced derived from AME, NSR, XUNDL.	
Experimental Nuclear Reaction Data (EXFOR)	POC: Naohiko Otsuka (NDS, International Atomic Energy Agency, n.otsuka@iaea.org) Database Manager, Boris Pritychenko (pritychenko@bnl.gov) Area 1 Lead	URL: https://www-nds.iaea.org/exfor
	Description: Experimental nuclear reaction data from the Area no. 1 (USA and Canada). Contains 8,095 compiled experiments based on 9,792,673 data points.	
eXperimental Unevaluated Nuclear Data Library (XUNDL)	POC: Elizabeth Ricard (mccutchan@bnl.gov)	URL: https://www.nndc.bnl.gov/xundl/ ; https://doi.org/10.18139/nndc.xundl/1860326
	Description: Experimental nuclear structure and decay data, covering more than 2,500 recent nuclear structure and decay articles. The XUNDL database contains 4,212 datasets for 1,990 nuclides. This produced derived from Literature.	

Argonne National Laboratory		
Argonne Nuclear Data and Measurements Reports	POC: Filip Kondev (kondev@anl.gov)	URL: https://www.anl.gov/phy/reference/argonne-nuclear-data-measurement-anlndm-reports
	Description: Contain experimental and evaluated data produced at ANL since 1978, including a) measured microscopic nuclear parameters, b) experimental techniques and	

(ANL/ NDM)	facilities employed in measurements, c) the analysis, correlation and interpretation of nuclear data, d) the compilation and evaluation of nuclear data	
Atomic Mass Evaluation (AME)	POC: Filip Kondev (kondev@anl.gov)	URL: https://www.anl.gov/phy/atomic-mass-data-resources
	Description: Provides evaluated (recommended) data for the atomic masses and their derivatives for 3557 nuclides This produced derived from NSR and NUBASE.	
Evaluation of Properties of K-Isomers in Deformed Nuclei	POC: Filip Kondev (kondev@anl.gov)	URL: https://www.sciencedirect.com/science/article/pii/S0092640X15000029 ; https://epjst.epj.org/articles/epjst/abs/2024/05/11734_2024_Article_1096/11734_2024_Article_1096.html
	Description: Contain evaluated (recommended) data for the properties of K isomers in deformed nuclei. This produced derived from NSR, NUBASE and ENSDF.	
NUBASE Evaluation of Basic Nuclear Properties (NUBASE)	POC: Filip Kondev (kondev@anl.gov)	URL: https://www.anl.gov/phy/atomic-mass-data-resources
	Description: Provides evaluated (recommended) data for the basic properties for 3340 nuclides in their ground state and 1938 isomers (T1/2>100 ns) This produced derived from NSR, AME and ENSDF.	
Nucleus++	POC: Filip Kondev (kondev@anl.gov)	URL: https://www.anl.gov/phy/atomic-mass-data-resources
	Description: Desktop (MacOS Windows) and mobile (iOS, iPadOS Android) applications visualizing evaluated data available in the AME and NUBASE libraries	

Brookhaven National Laboratory, National Nuclear Data Center		
Atlas of Neutron Resonances	POC: David Brown (dbrown@bnl.gov)	URL: https://www.nndc.bnl.gov/atlas/
	Description: The sixth edition of the vaunted BNL-325 "Barn book", authored by Dr. Said Mughabghab and published by Elsevier in two volumes on April 17, 2006. The present sixth edition differs from previous editions in that available capture, fission, and total neutron cross sections in the keV-Mev neutron energy region were analyzed by the author with the objective of determining average neutron resonance parameters and compared to those obtained from the resolved energy regions. In addition to the extensive list of detailed individual resonance parameters for each nucleus, this contains thermal cross sections and average resonance parameters as well as a short survey of the physics of thermal and resonance neutrons with emphasis on evaluation methods. This produced derived from EXFOR, NSR, CINDA, Literature.	
B(E2) Evaluation	POC: Boris Pritychenko (pritychenko@bnl.gov)	URL: https://www.nndc.bnl.gov/be2/

	Description: Recent data on electric quadrupole transition probabilities or B(E2; 0+ → 2+) values This produced derived from Literature.	
CapGam	POC: Benjamin Shu (bshu@bnl.gov)	URL: https://www.nndc.bnl.gov/capgam/
	Description: The energy and photon intensity with uncertainties of gamma rays as seen in thermal-neutron capture are presented in two tables, one in ascending order of gamma energy and a second organized by Z, A of the target. This produced derived from ENSDF, CINDA, EXFOR, NSR, Literature.	
CapGam (Mobile App)	POC: Benjamin Shu (bshu@bnl.gov)	URL: https://play.google.com/store/apps/details?id=gov.bnl.nndc.capgam=en_US
	Description: A collection of CapGam datasets packaged into a mobile app which requires no Internet connection. This produced derived from CapGam.	
Computer Index of Nuclear (reaction) Data (CINDA)	POC: Boris Pritychenko (pritychenko@bnl.gov)	URL: https://www.nndc.bnl.gov/cinda/
	Description: Bibliographical neutron induced reaction information, including experimental, theoretical and evaluation works. It contains references to 275,000 reactions from 55,000 works. This produced derived from Literature.	
Double Beta Decay Data	POC: Boris Pritychenko (pritychenko@bnl.gov)	URL: https://www.nndc.bnl.gov/bbdecay/
	Description: Data on double beta ($\beta\beta$) decay, data content is integrated with the Nuclear Science References (NSR) database. This produced derived from ENSDF.	
LogFT Calculator (Website)	POC: Benjamin Shu (bshu@bnl.gov)	URL: https://www.nndc.bnl.gov/logft/
	Description: A web application which uses Jun Chen's RadiationReport to calculate LogFT values. This produced derived from RadiationReport code.	
Maxwellian-averaged Cross Sections (MACS)	POC: Boris Pritychenko (pritychenko@bnl.gov)	URL: https://www.nndc.bnl.gov/astro/
	Description: Maxwellian-averaged cross sections and astrophysical reaction rates calculated from ENDF/B, JEFF, JENDL, CENDL, BROND, ROSFOND, and EAF libraries. This produced derived from ENDF.	
Medical Internal Radiation Dose (MIRD)	POC: Elizabeth Ricard (mccutchan@bnl.gov)	URL: https://www.nndc.bnl.gov/mird/
	Description: Evaluated nuclear decay data for over 2,100 radioactive nuclei. Data are extracted from ENSDF, processed by the program RadList, and used for medical internal radiation dose calculations. This produced derived from ENSDF.	

NSR Java Libraries	POC: Benjamin Shu (bshu@bnl.gov)	URL: https://gitlab.osti.gov/nndc/utilities/nndc-nuclide ; https://gitlab.osti.gov/nndc/utilities/nsr-data ; https://gitlab.osti.gov/nndc/utilities/nsr-exchange ; https://gitlab.osti.gov/nndc/utilities/nsr-jdbc
	Description: Java libraries used for modeling NSR entries, converting them into JSON, and retrieving them from SQL databases. This produced derived from NSR.	
NuDat3	POC: Donnie Mason (dmason@bnl.gov)	URL: https://www.nndc.bnl.gov/nudat3/
	Description: Evaluated (recommended) nuclear structure and decay information for 3,175 nuclides, about 161,895 levels, 243,639 gamma-rays, etc. Obtained from ENSDF and Nuclear Wallet Cards. This produced derived from ENDF, ENSDF, Nuclear Wallet Cards.	
Nuclear Science References (NSR)	POC: Boris Pritychenko (pritychenko@bnl.gov)	URL: https://www.nndc.bnl.gov/nsr ; https://doi.org/10.18139/nndc.nsr/1866086
	Description: Bibliography of nuclear physics articles (252,568 as of November 19, 2025), indexed according to content and spanning more than 100 years of research.	
Nuclear Wallet Cards	POC: Elizabeth Ricard (mccutchan@bnl.gov)	URL: https://www.nndc.bnl.gov/walletcards/search.html ; https://doi.org/10.18139/nndc.walletcards/2558149
	Description: Observable nuclear properties for ground- and isomer-states of all known nuclides. This produced derived from ENSDF.	
Nuclear Wallet Cards (Mobile App)	POC: Benjamin Shu (bshu@bnl.gov), Donnie Mason (dmason@bnl.gov)	URL: https://play.google.com/store/apps/details?id=gov.bnl.nndc.walletcards&hl=en_US (Google Play); https://apps.apple.com/us/app/nuclear-wallet-cards/id6741994617 (App Store)
	Description: A collection of Wallet Cards data packaged into a mobile app which requires no Internet connection. This produced derived from Nuclear Wallet Cards.	
Nuclear Wallet Cards for Radioactive Nuclei	POC: Benjamin Shu (bshu@bnl.gov)	URL: https://www.nndc.bnl.gov/walletcards/radioactive.html
	Description: Half-lives and gamma ray energies for long-lived radioactive isotopes.	
Q Value Calculator (QCalc)	POC: Benjamin Shu (bshu@bnl.gov)	URL: https://www.nndc.bnl.gov/qcalc/
	Description: QCalc calculates Q-values for nuclear reactions or decay. It uses mass values from the 2020 Atomic Mass Evaluation by M. Wang et al. This produced derived from AME.	
Sigma	POC: Donnie Mason (dmason@bnl.gov)	URL: https://www.nndc.bnl.gov/sigma/

	Description: Evaluated (recommended) nuclear reaction and decay data from ENDF/B-VII.0, JEFF-3.1, JENDL-4.0, JENDL-3.3, CENDL-3.1, ROSFOND 2008 and ENDF/B-VI.8 libraries. Advanced plotting, browsing, and search options. This produced derived from ENDF, EXFOR.	
x4i	POC: David Brown (dbrown@bnl.gov)	URL: https://github.com/brown170/x4i
	Description: x4i provides a "simple" python interface to the EXFOR library, allowing users to search for and then translate EXFOR files into an easy to understand (and then plot) form. This produced derived from EXFOR.	

Los Alamos National Laboratory		
CENS	POC: Toshihiko Kawano (kawano@lanl.gov)	URL: https://github.com/toshihikokawano/CENS
	Description: Code to translate adopted discrete levels in ENSDF into a Hauser-Feshbach code readable format, such as the discrete level section in RIPL	
CGMF	POC: Michael E. Rising (mrising@lanl.gov)	URL: https://github.com/lanl/CGMF
	Description: Code for simulating emission of prompt fission neutrons and gamma rays from excited fission fragments right after scission	
CoH3	POC: Toshihiko Kawano (kawano@lanl.gov)	URL: https://github.com/toshihikokawano/coh3
	Description: Code for calculating comprehensive nuclear reactions in the keV to MeV energy range using the coupled-channels optical model and statistical Hauser-Feshbach theory with the pre-equilibrium process. The subcode BeoH, calculates statistical decay of compound nucleus that is produced by beta-decay, fission, or any other nuclear reaction mechanisms	
DeCE	POC: Toshihiko Kawano (kawano@lanl.gov)	URL: https://github.com/toshihikokawano/DeCE
	Description: Interactive ENDF-6 formatted data manipulation code to edit/create ENDF files	
KALMAN	POC: Toshihiko Kawano (kawano@lanl.gov)	URL: None
	Description: Parameter adjustment and production of covariance based on the Bayesian approach	
LACE (Los Alamos CoH-based Evaluation)	POC: Toshihiko Kawano (kawano@lanl.gov)	URL: None
	Description: a proto-type of the model code based system to produce the evaluated nuclear data files. The LACE library includes neutron-induced reaction cross section, isotope production cross section, scattering angular distribution, secondary particle energy distribution, prompt and delayed fission neutron spectra and multiplicities, prompt and delayed fission photon spectra and multiplicities, and fission energy release in ENDF-6 format.	
SOK/PySOK	POC: Toshihiko Kawano (kawano@lanl.gov)	URL: None
	Description: Least-squares fitting code for arbitrary shape data, and production of covariance	

Lawrence Berkeley National Laboratory		
Atlas of Gamma-Ray Spectra from the Inelastic Scattering of Reactor Fast Neutrons (Baghdad Atlas)	POC: Aaron Hurst (amhurst@lbl.gov)	URL: https://nucleardata.berkeley.edu/atlas/index.html
	Description: A relational database based on the original (n,n'γ) work carried out by A.M. Demidov et al., at the Nuclear Research Institute in Baghdad, Iraq. Downloadable SQLite software platform shipped with CSV-style ASCII files for 105 datasets based on irradiation of 76 natural and 29 isotopically-enriched targets. Bundled with SQL scripts and a Jupyter Notebook enabling interaction and manipulation of the data.	
Attenuation code for Prompt Gamma Activation Analysis	POC: Aaron Hurst (amhurst@lbl.gov)	URL: https://github.com/AaronMHurst/attenuation_integration
	Description: A C++ program to calculate the attenuation integrated over the sample thickness for elemental and compound samples irradiated in prompt gamma activation analysis measurements. The software is shipped complete with mass-attenuation coefficients covering 1 keV to 20 MeV for all elements in the XMuDat database.	
Fission Induced Electromagnetic Response (FIER)	POC: Mathis Wiedeking (MWiedeking@lbl.gov)	URL: https://nucleardata.berkeley.edu/fier/index.html
	Description: FIER analytically predicts delayed gamma-ray spectra following fission using evaluated nuclear data and solutions to the Bateman equations to calculate the time-dependent populations of fission products and their decay daughters resulting from irradiation of a fissionable isotope.	
Fission Product Yield Covariance Matrices (COM)	POC: Mathis Wiedeking (MWiedeking@lbl.gov)	URL: https://nucleardata.berkeley.edu/FYCoM/index.html
	Description: Covariance matrices for all of the fissioning systems of the ENDF/B-VIII.0 and JEFF-3.3 evaluations created using a constrained Monte-Carlo resampling approach.	
Global Heavy Charged-Particle Decay Database (BEApR)	POC: Jon Batchelder (JCBatchelder@lbl.gov)	URL: https://nucleardata.berkeley.edu/research/betap.html
	Description: A complete compilation of decay data from proton-rich nuclei that decay through the emission of protons and alphas from $T_z = -7/2$ to $T_z = +33/2$ are currently included, with additional T_z groups still to be included up to the heaviest nuclei known ($T_z = +32$). This database will be updated as new papers are published. Information from this database can currently be downloaded as a pdf document as we are developing a more useful format for future dissemination.	
Isotope Production Nuclear Data Issues (IPNDI)	POC: Andrew Voyles (ASVoyles@lbl.gov)	URL: https://nucleardata.berkeley.edu/ipndi/index.html
	Description: The purpose of the IPNDI website is to provide a mechanism for the data users of the Isotope Production community to submit requests when they lack the nuclear data to carry out R I	
NucScholar	POC: Bethany Goldblum (Bethany@lbl.gov)	URL: https://nucscholar.lbl.gov/

	Description: NucScholar is a project to automate the processing of nuclear science literature to simultaneously boost researcher productivity while lowering the effort required to maintain important databases.	
Nuclear Structure Experimental Issues (NSEI)	POC: Aaron Hurst (amhurst@lbl.gov)	URL: https://nucleardata.berkeley.edu/nsei/
	Description: The NSEI website provides a mechanism for nuclear data evaluators and the low-energy community, in general, to raise awareness of issues in nuclear structure data. Users enter a brief description of the issue they would like to raise, and a committee will make researchers in the field who might be interested in helping to resolve the problem aware of the issue.	
Photon Strength Function library	POC: Mathis Wiedeking (mwiedeking@lbl.gov), Thibault Laplace (lapthi@berkeley.edu), Kgashane Malatji (malatji@lbl.gov)	URL: https://www-nds.iaea.org/PSFdatabase
	Description: The library provides measured photon strength functions of 100's of nuclei with various experimental methods. Each data file is accompanied by readme files with pertinent information such as publication, measurement and analytical information. The library also includes two recommended theoretical models.	
Python Archive of Coincident Emissions from ENSDF (paceENSDF)	POC: Aaron Hurst (amhurst@lbl.gov)	URL: https://pypi.org/project/paceENSDF/ and https://github.com/AaronMHurst/pace_ensdf
	Description: paceENSDF is an open-source Python-based software package enabling access, manipulation, analysis, and visualization of the radioactive decay data from the Evaluated Nuclear Structure Data File (ENSDF) archive and corresponding gamma-gamma and gamma-X-ray coincidence relationships derived from the original ENSDF-sourced datasets. The library is based on a representative JSON-format for 3254 radioactive-decay datasets (parsed from the September 2023 ENSDF archive) encompassing 834 alpha-, 1141 beta-minus and 1279 electron-capture/beta-plus decay datasets. The software package is also bundled with a Reference Input Parameter Library (RIPL)-translated format of the corresponding decay-scheme data in addition to JSON data structures for the derived coincidence gamma-gamma and gamma-X-ray datasets.	
Python library for the Evaluated Gamma-ray Activation File (pyEGAF)	POC: Aaron Hurst (amhurst@lbl.gov)	URL: https://pypi.org/project/pyEGAF/ and https://github.com/AaronMHurst/python_egaf
	Description: pyEGAF is an open-source Python-based software package enabling interaction, manipulation, analysis, and visualization of the thermal neutron-capture gamma-ray data in the Evaluated Gamma-ray Activation File (EGAF) based on the prompt gamma activation analysis measurements carried out at the Budapest Research Reactor (BRR). The library comes complete with ENSDF-, RIPL-, and JSON-formatted databases for all 245 isotopes measured at the BRR.	
Scintillator library	POC: Bethany Goldblum (bethany@lbl.gov),	URL: https://scintillator.lbl.gov/

	Thibault Laplace (lapthi@berkeley.edu)	
Description: The website provides measured scintillation properties of many inorganic and organic scintillating materials including scintillator response to recoil nuclei along with citations to published papers in which the original measurements were reported.		

Lawrence Livermore National Laboratory		
Ferdinand, Translate R-matrix Evaluations	POC: Ian Thompson (thompson97@llnl.gov)	URL: https://github.com/LLNL/ferdinand
	Description: Code for reading input files for R-matrix codes fresco, sfresco, eda, amur, rac, azure and standard formats endf and gnps, to translate between them. Can also convert between widths and amplitudes, and generate various kinds of reconstructed cross sections.	
Fresco, Scattering code for coupled-channels calculations	POC: Ian Thompson (thompson97@llnl.gov)	URL: https://github.com/LLNL/Frescox
	Description: Documentation at https://www.fresco.org.uk/frescox.htm	
Rflow, R-matrix methods for fitting EXFOR data using tensorflow	POC: Ian Thompson (thompson97@llnl.gov)	URL: https://github.com/LLNL/Rflow
	Description: An R-matrix evaluation and fitting code that reads and writes gnps parameter files. Calculations performed using Tensorflow, which uses GPUs when available otherwise using CPUs with openmp.	

Michigan State University, Facility for Rare Isotope Beams		
AME-NUBASE-viewer	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/AME-NUBASE-viewer
	Description: A useful program to provide easy and customized retrieval of AME (Atomic Mass Evaluation) entries and NUBASE (evaluation of ground-state and isomer properties) entries. It can also be used to update Q records in Adopted datasets automatically for ENSDF evaluation.	
AlphaHF code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/AlphaHF
	Description: AlphaHF is a Java code to calculate Hindrance Factor and nuclear radius parameter R0 for alpha decay. It is intended to replace the ALPHAD_RADD, ALPHAD, and RADD Fortran codes.	
ConsistencyCheck code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/ConsistencyCheck
	Description: A toolkit recommended by USNDP and NSDD to check data consistency among ENSDF datasets, group levels and gammas, and average values from different datasets (with user selections), and more.	
Discovery of Nuclide Project (in collaboration)	POC: Michael Thoennessen (non-USNDP member), Jun Chen (chenj@frib.msu.edu)	URL: https://frib.msu.edu/users/nuclides

with Michael Thoennesen of FRIB)	Description: The Discovery of Nuclides Project documents the discovery of all isotopes, with information about discovery year, authors, laboratory, country, publishing journal, as well as an abstract briefly describing each discovery and history. The project was started and led by Michael Thoennesen since 2007. Jun Chen joined in this project in 2023, has modernized the database with JSON and created a viewer/editor of the database as well as webpages to display and query those data, and will maintain the database and webpages regularly. Jun Chen's effort is within the scope of data activities supported by his grant from DOE/NP.	
EvaluationToolkit	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/EvaluationToolkit
	Description: A Java toolkit that consolidates all ENSDF Java codes to automate and streamline the ENSDF evaluation workflow	
EXCEL2ENSDF code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/Excel2ENSDF
	Description: A program widely used by XUNDL compilers and ENSDF evaluators to convert an Excel file (formatted data) to an ENSDF file and vice versa. It can be also used to perform simple operations on column data in Excel, such as multiplying a factor or adding a constant. It was originally developed for XUNDL compilation to convert Excel to ENSDF but the current version is also useful for extracting data from an ENSDF dataset to an Excel table.	
FormatCheck code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/FormatCheck
	Description: A Java code used to check ENSDF datasets for format errors. The same checking function is also included in the ConsistencyCheck code among the default checking.	
GLSC code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/GLSC
	Description: GLSC (Gamma to Level Scheme Computation) is a Java code for fitting gammas to obtain level energies and calculating level feedings, and also calculating absolute gamma emission probabilities from decay. It is an alternative to the GTOL and GABS Fortran code combined, with lots of improvements and new interactive features and options for user to control the fitting parameters.	
Java-RULER code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/Java-RULER
	Description: The program recommended by USNDP and NSDD to calculate gamma-ray transition strengths in ENSDF file with proper propagations of large/asymmetric uncertainties including the Monte-Carlo approach for ENSDF evaluation.	
KeynumberCheck code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/KeynumberCheck
	Description: A program to check NSR key-numbers in ENSDF datasets for format errors, irrelevant or nonexistence by searching in an input list of key-numbers or in the NSR database directly.	
McMaster-MSU JAVA-NDS code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/McMaster-MSU-Java-NDS

	Description: The official program to generate PDF outputs from ENSDF file(s) for the Nuclear Data Sheets journal and web-display of ENSDF and XUNDL databases on NNDC retrieval webpages. This program was initiated by Balraj Singh and his students at McMaster University in 2007 and was re-started by Jun Chen in 2017 at MSU.	
RadiationReport code	POC: Jun Chen (chenj@frib.msu.edu)	URL: https://github.com/IAEA-NSDDNetwork/RadiationReport
	Description: A program to calculate energies, intensities and doses of all radiations as well as logft values for a decay dataset. It replaces the RADLIST and LOGFT Fortran codes and can calculate logft values for forbidden-unique decays with order>2 which are calculated incorrectly as allowed decays by the legacy LOGFT code.	

Oak Ridge National Laboratory		
Computational Infrastructure for Nuclear Astrophysics (CINA)	POC: Augusto Macchiavelli (interim)	URL: https://nucastrodata.org/infrastructure.html
	Description: unique online nuclear astrophysics data pipeline that enables point-and-click investigations of astrophysical impacts of nuclear data sets via the uploading, manipulation, processing, and sharing of nuclear data sets, thermonuclear reaction rates, and astrophysical simulations	
Nuclear Astrophysics Datasets	POC: Augusto Macchiavelli (interim)	URL: https://nucastrodata.org/datasets.html
	Description: collection of nuclear data sets needed for research in nuclear astrophysics	

Triangle Universities Nuclear Laboratory (TUNL)		
Energy Levels of Light Nuclei website	POC: John Kelley (jhkelley@ncsu.edu)	URL: https://nucldata.tunl.duke.edu/
	Description: Access to html navigable archive of Fay Ajzenberg-Selove (UPenn) and TUNL "Energy Levels of Light Nuclei" publications, documentation and up-to-date lifetimes of A=3-20 nuclei. The site includes some compiled and evaluated data on light nuclei related to p-, alpha- and n-capture reactions, and ground-state decays; we also host an archive of TUNL dissertations.	

Appendix C – Fiscal Year 2025 Articles authored by USNDP staff

[2024HA23] D.J. Hartley, F.G. Kondev, M.P. Carpenter, J.A. Clark, P. Copp, B.P. Kay, T. Lauritsen, A. Leland, G. Savard, D. Seweryniak, G.L. Wilson, and J. Wu. "Nuclear structure of ^{157}Sm in β^- decay of ^{157}Pm ," Phys. Rev. C109, 044319 (2024).

[2024KE04] J.H. Kelley, C.G. Sheu, J.E. Purcell. "Energy Levels of Light Nuclei $A=13$," Nuclear Data Sheets 198, Pages 1-448 (2024). <https://doi.org/10.1016/j.nds.2024.11.001>

[2024LO13] R. Lozeva, M. Si, H. Naidja, A. Odahara, C.-B. Moon, S. Nishimura, P. Doornenbal, G. Lorusso, P.-A. Soderstrom, T. Sumikama, J. Wu, Z. Y. Xu, D. S. Ahn, H. Baba, F. Browne, R. Daido, Y. Fang, N. Fukuda, N. Inabe, T. Isobe, D. Kameda, I. Kojouharov, N. Kurz, T. Kubo, D. Murai, Z. Patel, S. Rice, H. Sakurai, H. Schaffner, L. Sinclair, H. Suzuki, H. Takeda, H. Watanabe, A. Yagi, R. Yokoyama, F. L. Bello Garrote, J.-M. Daugas, F. Didierjean, E. Ideguchi, T. Ishigaki, H. S. Jung, T. Komatsubara, Y. K. Kwon, P. Lee, C. S. Lee, S. Morimoto, M. Niikura, H. Nishibata, and I. Nishizuka. "First β -decay spectroscopy of the ^{139}Te nucleus and its Pn branching," Phys. Rev. C, 110:064303, Dec (2024).

<http://dx.doi.org/10.1103/PhysRevC.110.064303>;<https://link.aps.org/doi/10.1103/PhysRevC.110.064303>

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<https://doi.org/10.1140/epja/s10050-024-01396-2>

[2024NE07] C.D.Nesaraja. "Nuclear Data Sheets for $A=246$," Nucl.Data Sheets 198, 449 (2024).

<https://doi.org/10.1016/j.nds.2024.11.002>

[2024NI13] N.Nica. "Double helix level scheme of ^{171}Yb nucleus," At.Data Nucl.Data Tables 160, 101682 (2024). <https://doi.org/10.1016/j.adt.2024.101682>

[2024ST10] M.Stepaniuk, M.Karny, A.Fijalkowska, K.P.Rykaczewski, B.C.Rasco, R.K.Grzywacz, M.Wolinska-Cichocka, J.M.Allmond, J.C.Batchelder, C.Bingham, J.C.Blackmon, N.T.Brewer, S.Go, K.C.Goetz, C.J.Gross, J.Johnson, C.U.Jost, J.H.Hamilton, T.T.King, K.Kolos, J.T.Matta, K.Miernik, M.Madurga, D.Miller, C.D.Nesaraja, S.Padgett, S.V.Paulauskas, M.M.Rajabali, D.W.Stracener, E.H.Spejewski, S.Taylor, E.H.Wang, J.A.Winger, Y.Xiao, E.F.Zganjar. "Decay studies of the β -delayed neutron emitters ^{87}Br and ^{88}Br measured by means of the Modular Total Absorption Spectrometer at ORNL HRIBF," Phys.Rev. C 110, 054321 (2024). <https://doi.org/10.1103/PhysRevC.110.054321>

[2024UD02] M. S. Uddin, S. Sudár, M. S. Basunia, I. Spahn, A. S. Voyles, A. Hermanne, L. A. Bernstein, B. Neumaier, and S. M. Qaim. "Cross sections for the formation of $^{84}\text{m,gRb}$, ^{83}Rb , and ^{82}mRb in $^{86}\text{Sr}(d,x)$ reactions up to deuteron energies of 49 MeV: Competition between alpha -particle and multinucleon emission processes," *Physical Review C* 110 (6), 064608 (11/12/24).

<https://doi.org/10.1103/PhysRevC.110.064608>

[2025AB10] A. D. Abbott, M. Q. Sorensen, A. B. McIntosh, A. Alvarez, A. Couture, K. Hagel, L. Bills, A. Hannaman, B. M. Harvey, J. Gauthier, L. A. McIntosh, S. Ota, A. L. Richard, S. Schultz, Z. Tobin, K. Zelga, and S. J. Yennello. "Using DAPPER to extract the photon strength function of ^{58}Fe using the inverse Oslo and shape methods," *Phys. Rev. C*, 111:034322, Mar (2025).

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