



WANDA 2024/2025

Todd Bredeweg (LANL) chair, NDWG
Jo Ressler (LLNL) vice-chair, NDWG

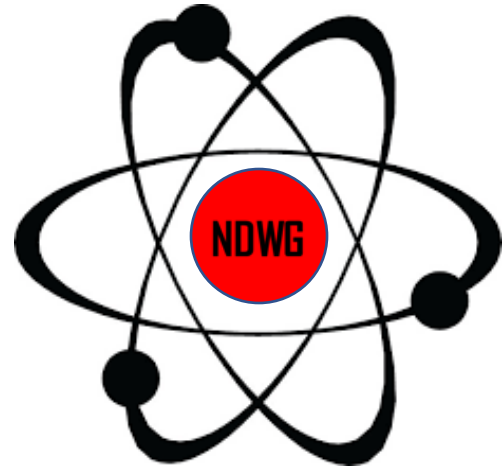
LANL-NDWG, December 9, 2024

The Nuclear Data Working group (NDWG)

Mission Statement

- The goal of the Nuclear Data Working Group (NDWG) is to facilitate communication, collaboration, coordination, and prioritization of nuclear data efforts across multiple program offices, the national laboratories, universities, and industry.
- Established 2015.
- Current leadership:
 - Todd Bredeweg (chair)
 - Jo Ressler (vice-chair)

NDWG website: <https://www.nndc.bnl.gov/ndwg/>

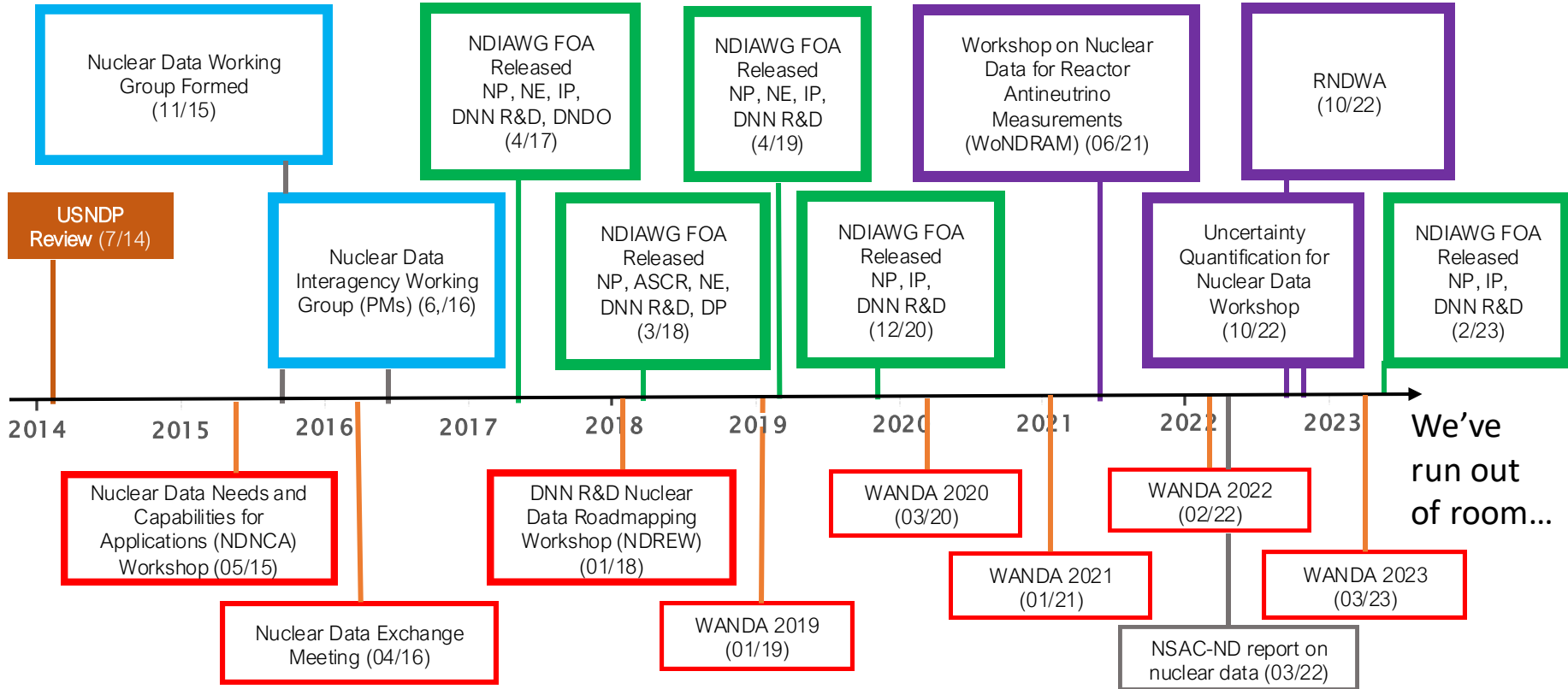


Nuclear Data Interagency Working Group (NDIAWG)

- Led by:
 - Linda Horton, DOE OS, Associate Director for Nuclear Physics (acting)
 - Keith Jankowski, DOE OS-NP, Program Manager, Nuclear Data
- Consists of federal program managers from across the US government that invest in or require nuclear data to achieve mission objectives.
- Funds nuclear data efforts through an annual collaborative NDIAWG Funding Opportunity Announcement (FOA), or via other mechanisms.
- Meets biannually for information exchange, identification of mutual nuclear data needs and coordination of nuclear data efforts.
- Most recent invite list included 60 federal program managers across a variety of federal agencies covering basic science, energy, national security, defense, space applications, and isotope production.
- Most recent outreach was to the fusion energy science community.

NDWG/NDIAWG Timeline

NDIAWG FOA 1/24
 WANDA 2024 2/24
 NDIAWG FOA 12/24
 WANDA 2025 2/25



We've run out of room...

PARTNERS	NDWG Member	Organization
DOE/SC/Nuclear Physics	Lee Bernstein	LBNL
	Catherine Romano	Aerospace Corp
NNSA/DNN R&D/PD/NA-22	Fredrik Tovesson	ANL
NNSA/DNN R&D/Forensics/NA-22	Todd Bredeweg	LANL
	Jason Harke	LLNL
NNSA/DNN R&D/SNDD/NA-22	Ron Soltz	LLNL
	David Gerts	LANL
NNSA/NCSP/NA-511	Mike Zerkle	NNL
	Marco Pigni	ORNL
NNSA/NR/NA-30	Mike Zerkle	NNL
	Tim Trumbell	NNL
NNSA/DP/NA-113	Jo Ressler	LLNL
	Shea Mosby	LANL
NNSA/DP/NA-114	Nathan Gibson	LANL
	Robert Casperson	LLNL
DOE/Nuclear Energy	Matthew Jesse	ORNL
	Javier Ortensi	INL
NRC	Will Wieselquist	ORNL
	Jesse Brown	ORNL
NNSA/Office of Nuclear Forensics/NA-83	Corey Keith	LANL
	Barbara Alan	LLNL
NNSA/Emergency Response/NA-82	John Koglin	LLNL
	Tyler Remedés	LANL
DOE/SC/Fusion Energy Science	Michael Loughlin	ORNL
	Paul Romano	ANL
DOE/SC/Isotope Office	Etienne Vermeulen	LANL
NIST	Brian Zimmerman	NIST
US Nuclear Data Program	Dave Brown	BNL
NNSA/Nuclear Safeguards and Security/NA-24	Ramkumar Venkataraman	ORNL
Missile Defense Agency/Rad Hardness	Courtney Matzkind	MDA

NDWG Roster as of November 2024

54 total Members

LAB	NDWG Member
ANL	Filip Kondev
	Guy Savard
BNL	Alejandro Sonzogni
INL	Mark DeHart
JLAB	Mike Dion
LANL	Mark Chadwick
	Robert Little
LBNL	Brian Quiter
	Bethany Goldblum
LLNL	Michael Buchoff
	Kay Kolos
ORNL	TBD
PNNL	Stephanie Lyons
	Bruce Pierson
SNL	Pat Griffin
	Phil Dreike
SRNL	Kalee Fenker
	Chris McGrath

AT LARGE MEMBERS*	
LANL	Patrick Talou
Univ. WISC	John Engle
LLNL	Teresa Bailey
LANL	Morgan White

*Non-voting members

Organizations Represented at NDWG Workshops

Federal Agencies	National Laboratories	Universities	Universities (continued)
DOE	Argonne National Laboratory	Air Force Institute of Technology	University of California, Davis
Office of Science, Office of Nuclear Physics	Brookhaven National Laboratory	Boston University	Missouri State University
Office of Science, Fusion Energy Sciences	Idaho National Laboratory	Central Michigan University	Carnegie Mellon University
Office of Science, Office of High Energy Physics	Jefferson Laboratory	Colorado School of Mines	University of Nevada, Las Vegas
Office of Science, Adv. Scientific Computing Research	Lawrence Berkeley National Laboratory	George Washington University	Vanderbilt University
Office of Science, Isotope Program	Lawrence Livermore National Laboratory	Illinois Institute of Technology	East Carolina University
Office of Nuclear Energy	Los Alamos National Laboratory	Johns Hopkins University	Kansas State University
ARPA-E	National Institute of Standards and Technology	Michigan State University	Western Norway Univ. of Applied Sciences
NNSA	National Superconducting Cyclotron Laboratory	North Carolina State University	North Carolina Central University
Defense Programs, NA-11	Naval Nuclear Laboratory	Ohio University	Duke University
Defense Nuclear Nonproliferation, NA-20	Oak Ridge National Laboratory	Oregon State University	Technical University of Darmstadt
Naval Reactors, NA-30	Pacific Northwest National Laboratory	Rensselaer Polytechnic Institute	Lancaster University
Infrastructure & Environment, NA-50	Sandia National Laboratories	Texas A&M University	Massachusetts Institute of Technology
Defense Nuclear Security, NA-80	Savannah River National Laboratory	Triangle Universities Nuclear Laboratory	Industry
DOD	SLAC National Accelerator Laboratory, Stanford University	United States Naval Academy	ARA
Defense Threat Reduction Agency	JPL - Jet Propulsion Laboratory	University of Tennessee	Schlumberger
MDA - Missile Defense Agency	Johns Hopkins Applied Physics Laboratory	University of Wisconsin	Studsвик, Scandpower
AFTAC - Air Force Technical Applications Center	Thomas Jefferson National Accelerator Facility	University of California, Berkeley	Westinghouse
Other	International Agencies	University of Massachusetts	X-energy
NRC - Nuclear Regulatory Commission	European Commission, Joint Research Centre	University of Michigan	The Aerospace Corporation
NASA - National Aeronautics and Space Administration	International Atomic Energy Agency	University of Notre Dame	Mayo Clinic
NIH - National Institute of Health, National Cancer Inst.	Japan Atomic Energy Agency	University of Tennessee, Knoxville	KBR Wyle/ SSAI
DHS - Countering Weapons of Mass Destruction	National Institute for Nuclear Physics (INFN)	University of Washington	
	UK Ministry of Defence		
	European Space Agency		
	CERN		
	Institute of Astronomy and Space Physics (IAFE)		

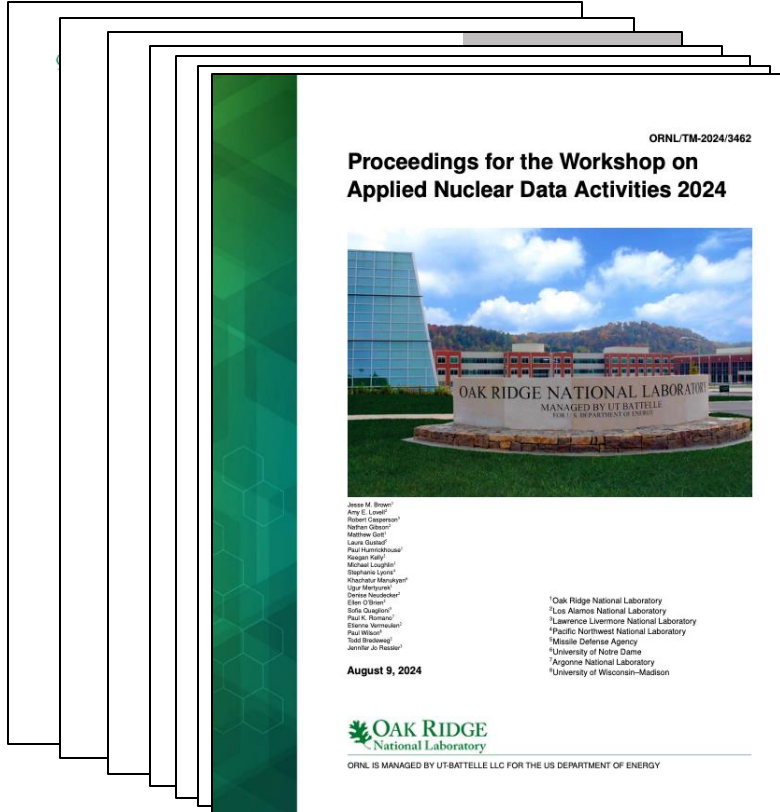
Wanda Topics that have Been Funded

NDNCA (2015) Cross-cutting recommendations		WANDA2019 Topics		WANDA2022 Topics	
Dosimetry Standards		Nuclear Data for Isotope Production	x	Reactions on Unstable Nuclei	
Fission	x	Safeguards	x	High Energy Ion Interactions and Secondary Particles	
Decay Data and g-Branching Ratios	x	Materials Damage		Neutrons as Secondary Particles and Interactions	x
Neutron Transport Covariance Reduction		Nuclear Data for Nuclear Energy	x	Photon Reactions and Transport	
Expanded Integral Validation		(n,x) Reactions	x	Stopping Powers, Energy Deposition and Dose	
Antineutrinos from Reactors	x	Atomic Data, NRF Data		Nuclear Data Adjustments and Impact on Applications	
NDEM (2016) Cross-cutting recommendations		WANDA2020 Topics		WANDA2023 Topics	
Improving the Pipeline Infrastructure	x	Covariance/Uncertainty/Sensitivity/Validation		Fission Yields/Theory, Evaluation, Experiments, Validation	x
Improved Covariance Data		Nuclear Data for Isotope Production and Targetry Needs	x	Isotope Programs	
Inelastic Scattering on actinides	x	Machine Learning/AI		Gamma-Ray Strength Functions and Level Densities	
Capture gamma spectra	x	Detector Models, Atomic Data and Stopping Powers		Nuclear Data Processing & Preservation	
Improved Fission yields	x	Scattering, Transport and Shielding	x		
Target Production to Support Nuclear Data Experiments	x	Neutron induced gammas and gamma decay	x		
NDREW (2018) Topics		WANDA2021 Topics			
Uncertainty, Sensitivity, and Covariance		Advanced Computing for Nuclear Data			
Neutron Capture and Associated Spectra	x	Predictive Codes for Isotope Production			
Fission I, Independent and Cumulative Yields	x	Expanded Benchmarks and Validation for Nuclear Data			
Gamma-Induced Reactions	x	Nuclear Data for Space Applications			
Inelastic Neutron Scattering and Associated Spectra	x	Nuclear Data for Advanced Reactors and Security			
Fission II, Prompt Gammas and Neutrons	x	The Human Pipeline for Nuclear Data			
(α ,n) Reactions	x	WoNDRAM Topics			
Targets, Facilities and Detector Systems	x	Reactor Antineutrino Source Term	x		
Fission III, Decay Data	x	Antineutrino Spectrum Calculations	x		
Development of Benchmark Exercises		Detector Response			
Data Processing & Transport Code Needs					
Actinide Cross Sections	x				

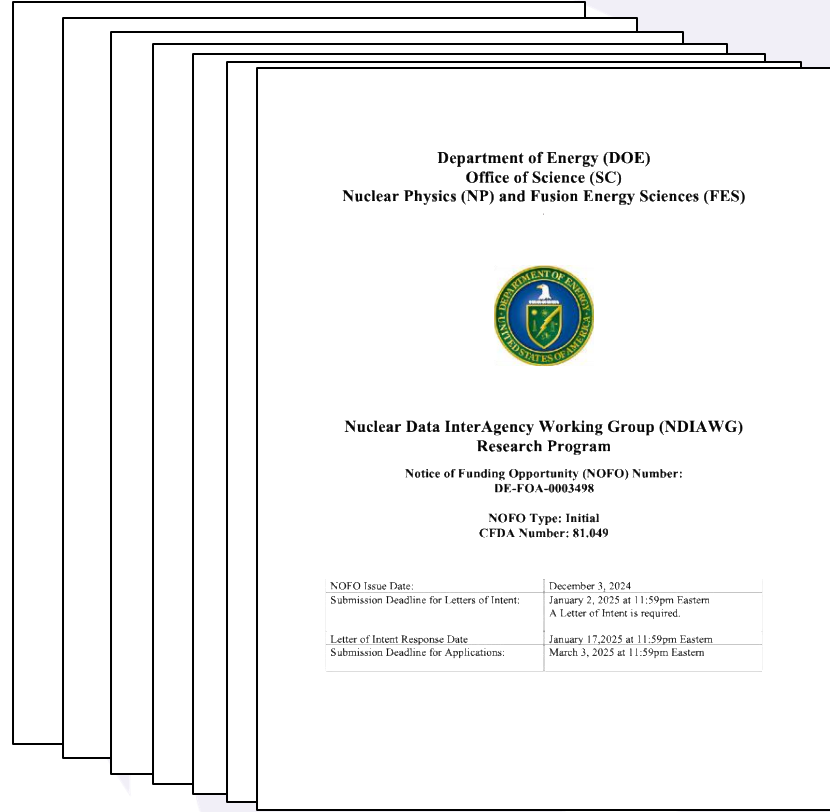
\$50 Million NDIAWG FOA Funded Projects 2018-2022

FY start	Title	Lead	PI
FY18	Novel Approach for Improving Antineutrino Spectra Predictions for Nonproliferation Applications	ANL	Kondev, Filip
FY18	Improving the Nuclear Data on Fission Product Decays at CARIBU	ANL	Savard, Guy
FY19	Independent Fission Product Yields from 0.5 to 20 MeV	LANL	Winkelbauer, Jack
FY19	Energy Dependent Fission Product Yields	LLNL	Tonchev, Anton
FY19	Measurements of Independent Fission Product Yields	LANL	Duke, Dana
FY19	Beta-strength function, reactor decay heat, and anti-neutrino properties from total absorption spectroscopy of fission fragments	ORNL	Rykaczewski, Krzysztof
FY19	Integral Measurements of Independent and Cumulative Fission Product Yields Supporting Nuclear Forensics and Other Applications	LANL	Bredeweg, Todd
FY19	Evaluation of Energy Dependent Fission Product Yields	LANL	Kawano, Toshihiko
FY19	Improving the double-differential $^{238}\text{U}(n,n'\gamma)$ cross section using neutron-gamma coincidences	LBNL	Bernstein, Lee
FY20	Scoping Study of the Impact of (α,n) Reactions and Yields of Nonproliferation Applications	ORNL	Romano, Catherine
FY20	Assessment of Nuclear Data Needs for Neutron Active Interrogation	ORNL	McConchie, Seth
FY20	Fission product yield measurements using ^{252}Cf spontaneous fission and neutron-induced fission on actinide targets at CARIBU	ANL	Savard, Guy
FY20	Modernization and Optimization of the Evaluated Nuclear Structure Data File	BNL	McCutchan, Elizabeth
FY20	$^{238}\text{U}(p,xn)$ and $^{235}\text{U}(d,xn)$ $^{235}\text{-}^{237}\text{Np}$ Nuclear Reaction Cross Sections Relevant to the Production of ^{236}gNp	LBNL	Bernstein, Lee
FY21	Neutron Scattering Cross Sections: (n,n') , $(n,n'\gamma)$, and (n,γ) Measurements	USNA	Vanhoy, Jeff
FY19	State-of-the-art Gamma-ray Spectroscopy to Enhance the ENSDF	BNL	McCutchan, Elizabeth
FY22	Gamma Rays Induced by Neutrons	BNL	Brown, Dave
FY22	White-source neutron-gamma coincidence measurements of gamma production cross sections at LANSCE	LANL	Kelly, Keegan
FY22	Evaluation of Gamma-ray Production	LANL	Kawano, Toshihiko
FY22	β -energy spectral shapes in fission products affecting reactor decay heat and anti-neutrino flux	ORNL	Charlie Rasco
FY22	Two and Three-body Photodisintegration of the Triton at Energies Below 30 MeV	Duke Univ	Calvin Howell
FY22	Designing Nuclear-data Measurements that Resolve Discrepancies in Existing Data	LANL	Denise Neudecker
FY22	Modern Structure-based Nuclear Data Evaluations for Basic Science, Nuclear Safety & Security	LANL	Mark Paris

WANDA Outcomes...



Inform NDIAWG FOAs



WANDA 2024

- Where: Hilton Arlington National Landing, Crystal City, VA
Near Ronald Reagan Washington National Airport (DCA)
- When: February 26 – 29, 2024 (Mon-Thu)
- Program Chairs
 - Amy Lovell (LANL)
 - Jesse Brown (ORNL)

WANDA 2024 Technical Sessions

ORNL/TM-2024/3462

Proceedings for the Workshop on Applied Nuclear Data Activities 2024



James M. Slone¹
Amy E. Lovell²
Robert Casperson³
Nathan Gibson⁴
Matthew Gott⁵
Laura Gustad⁶
Paul Humrickhouse⁷
Keegan Kelly⁸
Michael Loughlin⁹
Stephanie Lyons¹⁰
Khachatur Manukyan¹¹
Ugur Mertuyurek¹²
Denise Neudecker¹³
Ellen O'Brien¹⁴
Sofia Quaglioni¹⁵
Paul K. Romano¹⁶
Etienne Vermeulen¹⁷
Paul Wilson¹⁸
Todd Wisniewski¹⁹
Jennifer J. Paster²⁰

¹Oak Ridge National Laboratory
²Los Alamos National Laboratory
³Livermore National Laboratory
⁴Pacific Northwest National Laboratory
⁵Missile Defense Agency
⁶University of Notre Dame
⁷Argonne National Laboratory
⁸University of Wisconsin-Madison

August 9, 2024



ORNL IS MANAGED BY UT-BATTELLE LLC FOR THE U.S. DEPARTMENT OF ENERGY

- **FES: Fusion Neutronics**
Session Chairs: Keegan Kelly (LANL), Laura Gustad (MDA) and Michael Loughlin (ORNL)
- **FES: Tritium Production**
Session Chairs: Paul Humrickhouse (ORNL), Sofia Quaglioni (LLNL), and Stephanie Lyons (PNNL)
- **FES: Material Damage**
Session Chairs: Paul Romano (ANL) and Paul Wilson (Wisc)
- **Isotopes & Targetry for Nuclear Data**
Session Chairs: Ellen O'Brien (LANL), Etienne Vermeulen (LANL), Khachatur Manukyan (Notre Dame) and Matthew Gott (ORNL)
- **Uncertainty Quantification**
Session Chairs: Nathan Gibson (LANL), Denise Neudecker (LANL), Robert Casperson (LLNL) and Ugur Mertuyurek (ORNL)

Workshop Summary submitted to DOE/OS/NP Aug 9, 2024.

Enjoy

WANDA 2025

The Future

WANDA 2026

Stay Tuned