

# **Workshop for Applied Nuclear Data Activities (WANDA 2021)**

## **Report of Contributions**

Contribution ID: 6

Type: **not specified**

## Opening Plenary Speakers

*Monday, 25 January 2021 11:00 (5h 15m)*

**Presenters:** DOUGAN, Arden; ROMANO, Catherine (IB3 Global Solutions); RAMOS, Christopher; MACKNEY, Daniel; HENDERSON, Dave; PETERSEN, David; HORNBACK, Donald; BOWDEN, Doug; BALKIN, Ethan (DOE); KUNG, Harriet; KOLOS, Kay (Lawrence Livermore National Laboratory); JANKOWSKI, Keith; PALOMARES, Kelsa; ASHENFELTER, Timothy; HALLMAN, Timothy; CALDWELL, Tod; SOBES, Vladimir (University of Tennessee)

**Session Classification:** Opening Plenary

Contribution ID: 7

Type: **not specified**

## **WANDA 2020 Session Reports Speakers**

*Monday, 25 January 2021 16:30 (1h 30m)*

**Presenters:** PIERSON, Bruce (PNNL, Battelle); NEUDECKER, Denise (Los Alamos National Laboratory); VERMEULEN, Etienne (Los Alamos National Laboratory); SEVERIN, Greg (Michigan State University); BERNSTEIN, Lee; Prof. BERNSTEIN, Lee (University of California - Berkeley/LBNL); DEVLIN, Matthew (LANL); SOBES, Vladimir (University of Tennessee)

**Session Classification:** WANDA 2020 Session Reports

Contribution ID: 9

Type: **not specified**

## Introduction

*Wednesday, 27 January 2021 11:00 (5 minutes)*

**Presenters:** VOYLES, Andrew; O'BRIEN, Ellen; HOGLE, Susan

**Session Classification:** Session One

Contribution ID: **10**

Type: **not specified**

## **Priorities for DOE IP with respect to nuclear data and predictive codes**

*Wednesday, 27 January 2021 11:05 (15 minutes)*

**Presenter:** BALKIN, Ethan (DOE)

**Session Classification:** Session One

Contribution ID: 11

Type: **not specified**

## **TALYS: The Predictive Power of TALYS**

*Wednesday, 27 January 2021 11:20 (15 minutes)*

**Presenter:** KONING, Arjan (IAEA)

**Session Classification:** Session One

Contribution ID: 12

Type: **not specified**

## **EMPIRE –Michal Herman**

*Wednesday, 27 January 2021 11:35 (10 minutes)*

**Presenter:** HERMAN, Michal

**Session Classification:** Session One

Contribution ID: 13

Type: **not specified**

## **ALICE: Physics Improvements for ALICE21**

*Wednesday, 27 January 2021 11:45 (10 minutes)*

**Presenter:** BLANN, Marshall

**Session Classification:** Session One



Contribution ID: 14

Type: **not specified**

## **CoH3 The Coupled-Channels and Hauser-Feshbach Code**

*Wednesday, 27 January 2021 11:55 (10 minutes)*

**Presenter:** KAWANO, Toshihiko

**Session Classification:** Session One

Contribution ID: 15

Type: **not specified**

## **Predicting Isotopes with FLUKA**

*Wednesday, 27 January 2021 12:40 (10 minutes)*

**Presenter:** FERRARI, Alfredo

**Session Classification:** Session One

Contribution ID: 16

Type: **not specified**

## **Recent and Future Improvements to MCNP6 for Isotope Production Applications**

*Wednesday, 27 January 2021 12:55 (20 minutes)*

**Presenter:** RISING, Michael (LANL)

**Session Classification:** Session One

Contribution ID: 17

Type: **not specified**

## **Isotope production calculations using FISPIN – Bethany Slingsby**

*Wednesday, 27 January 2021 13:15 (15 minutes)*

**Presenter:** SLINGSBY, Bethany

**Session Classification:** Session One

Contribution ID: **18**

Type: **not specified**

## **SCALE/MCNP Coupling for depletion – Charles Daily**

*Wednesday, 27 January 2021 13:30 (10 minutes)*

**Presenter:** DAILY, Charles

**Session Classification:** Session One

Contribution ID: 19

Type: **not specified**

## **Nuclear Data Needs for LISE++**

*Wednesday, 27 January 2021 13:40 (15 minutes)*

**Presenter:** TARASOV, Oleg

**Session Classification:** Session One

Contribution ID: 20

Type: **not specified**

## Overview of Benchmarks and their Uses for Nuclear Data

*Wednesday, 27 January 2021 14:45 (15 minutes)*

Introductory Video to Expanded Benchmarks and Validation for Nuclear Data:

<https://www.dropbox.com/s/9p0as8m03e43z0y/WANDA2021-Expanding%20Benchmarks%20Session%20Overview.mp4?dl=>

**Presenters:** PERCHER, Catherine; HUTCHINSON, Jesson; ZERKLE, Michael

**Session Classification:** Session Two

Contribution ID: 21

Type: **not specified**

## **Past, Present, and Future Benchmark Efforts for Nuclear Data Validation**

*Wednesday, 27 January 2021 15:00 (25 minutes)*

- Skip Kahler (Kahler Nuclear Data Services, LLC)
- Ian Hill (OECD/NEA)
- 5 Minute Discussion

**Presenters:** HILL, Ian; KAHLER, Skip

**Session Classification:** Session Two



Contribution ID: 22

Type: **not specified**

## Experimental Measurements that Could Become Benchmarks

*Wednesday, 27 January 2021 15:25 (30 minutes)*

- Sara Pozzi (UM)
- Jesse Holmes (NNL)
- Yaron Danon (RPI)
- Amanda Lewis (NNL)
- John Mattingly (NCSU)
- 10 Minute Discussion

**Presenters:** LEWIS, Amanda; PERCHER, Catherine (LLNL); HOLMES, Jesse; MATTINGLY, John; RODRIQUEZ, John; POZZI, Sara; DANON, Yaron (RPI)

**Session Classification:** Session Two

Contribution ID: 23

Type: **not specified**

## **The Centrality of Validation: Validation as a Three-Body Problem**

*Wednesday, 27 January 2021 15:55 (15 minutes)*

**Presenter:** MCKAMY, Jerry

**Session Classification:** Session Two

Contribution ID: 24

Type: **not specified**

## **Application Areas- Nuclear Data, Validation Methods, and Integral Needs**

*Wednesday, 27 January 2021 16:15 (1 hour)*

Application Areas- Nuclear Data, Validation Methods, and Integral Needs

- Thomas Miller (ORNL)
- Brad Rearden (X-Energy)
- Nuclear Data for Defense Nuclear Nonproliferation Applications, David Matters (NA-22)
- Pablo Romojaró (SCKCEN)
- 10 Minute Discussion

**Presenters:** REARDEN, Brad; MATTERS, David; ROMOJARO, Pablo; MILLER, Thomas

**Session Classification:** Session Two

Contribution ID: 25

Type: **not specified**

## **Data Evaluation and Sensitivity and Uncertainty Methods Development**

*Wednesday, 27 January 2021 17:15 (15 minutes)*

**Presenters:** NEUDECKER, Denise (Los Alamos National Laboratory); RISING, Michael (LANL)

**Session Classification:** Session Two

Contribution ID: 26

Type: **not specified**

## Higher-fidelity simulations with HPC

*Friday, 29 January 2021 11:10 (48 minutes)*

- Predictive theory for light-ion reactions, Kostas Kravvaris (LLNL)
- HPC for fission modeling in support of nuclear data, Ionel Stetcu (LANL)
- Propagation of nuclear model uncertainties in science applications, Trevor Sprouse (LANL)
- Perspectives from the ExaSMR Project: Nuclear Data Needs and Opportunities, Paul Romano (ANL)

**Presenters:** STETCU, Ionel; KRAVVARIS, Kostas; ROMANO, Paul; SPROUSE, Trevor

**Session Classification:** Session Three

Contribution ID: 28

Type: **not specified**

## AI/ML as Enabling Technologies

*Friday, 29 January 2021 11:58 (48 minutes)*

- Containerization and microservices for nuclear data, Georg Schnabel (IAEA)
- Selected topics from physics aware ML, Mateusz Ploskon (LBNL)
- Natural Language Processing for Nuclear Science Scholarship, Walid Younes (LBNL Consultant)
- Surrogate Modeling for Fission Cross Sections and Criticality - Studies using Artificial Neural Networks (ANNs), Christian Brazell (TAMU)

**Presenters:** BRAZELL, Christian; SCHNABEL, Georg; PLOSKON, Mateusz; YOUNES, Walid

**Session Classification:** Session Three

Contribution ID: 29

Type: **not specified**

## Quantum Computing

*Friday, 29 January 2021 12:46 (15 minutes)*

**Presenter:** WENDT, Kyle

**Session Classification:** Session Three

Contribution ID: **30**

Type: **not specified**

## **Call to order/brief introduction by co-chairs**

*Friday, 29 January 2021 14:45 (5 minutes)*

Introductory Video for Intro to Nuclear Data for Space Application:

<https://drive.google.com/file/d/196PFmNjb8k-noQCKcTvRHiOQG8Ow221y/view>

**Presenters:** HEILBRONN, Lawrence; BURKEY, Mary; PEPLOWSKI, Patrick

**Session Classification:** Session Four



Contribution ID: 31

Type: **not specified**

## Opening Thoughts and Priorities

*Friday, 29 January 2021 14:50 (20 minutes)*

**Session Classification:** Session Four

Contribution ID: 32

Type: **not specified**

## **Experimental cross sections needed for space radiation protection**

*Friday, 29 January 2021 15:10 (12 minutes)*

**Presenter:** LUONI, Francesca

**Session Classification:** Session Four

Contribution ID: 33

Type: **not specified**

## Neutron Energy Effects on Asteroid Deflection

*Friday, 29 January 2021 15:22 (12 minutes)*

**Presenter:** HORAN, Lansing

**Session Classification:** Session Four

Contribution ID: 34

Type: **not specified**

## **Nuclear Data Needs for the Space-based Nuclear Detonation Detection Community**

*Friday, 29 January 2021 15:34 (12 minutes)*

**Presenter:** GERTZ, David

**Session Classification:** Session Four

Contribution ID: 35

Type: **not specified**

## Planetary Nuclear Spectroscopy

*Friday, 29 January 2021 16:25 (12 minutes)*

**Presenter:** PRETTYMAN, Thomas

**Session Classification:** Session Four

Contribution ID: 36

Type: **not specified**

## **Inelastic Spectroscopy for Subsurface Exploration**

*Friday, 29 January 2021 16:37 (12 minutes)*

**Presenter:** MAUBORGNE, Marie-Laure

**Session Classification:** Session Four

Contribution ID: 37

Type: **not specified**

## **Nuclear Data Needs for Advanced Thermionic Energy Conversion in Space**

*Friday, 29 January 2021 16:49 (12 minutes)*

**Presenter:** LO, Austin

**Session Classification:** Session Four

Contribution ID: **38**

Type: **not specified**

## Space Reactors

*Friday, 29 January 2021 17:01 (12 minutes)*

**Presenter:** REARDEN, Bradley

**Session Classification:** Session Four



Contribution ID: 39

Type: **not specified**

## Concluding Thoughts

*Friday, 29 January 2021 17:40 (20 minutes)*

**Session Classification:** Session Four

Contribution ID: 40

Type: **not specified**

## Session Chairs

*Monday, 1 February 2021 11:00 (5 minutes)*

**Presenters:** ELSAWI, Mohamed; THOMPSON, Nicholas; WIESELQUIST, William

**Session Classification:** Session Five

Contribution ID: 41

Type: **not specified**

## Advanced Reactors

*Monday, 1 February 2021 11:05 (1h 50m)*

- Summary of Nuclear Data Needs for X-Energy Reactor Designs, Brad Rearden (X-Energy)
- Nuclear Data on Kairos Power's Fluoride-salt cooled High-Temperature Reactor, KP-FHR, Nader Satvat (Kairos Power)
- Molten Chloride Reactor Experiment Nuclear Data Uncertainty analysis and Needs, Tommy Cisneros (TerraPower, LLC)
- Nuclear Data for Advanced Fuel Cycles, Allan Simpson (UK NNL).
- Fast Neutron Source at UTK for Cross Section Measurements in Support of Advanced Reactor Development, Wes Hines and Vladimir Sobes (UTK)

**Presenters:** SIMPSON, Allan; REARDEN, Brad; SATVAT, Nader; CISNEROS, Tommy; SOBES, Vladimir (University of Tennessee); HINES, Wes

**Session Classification:** Session Five

Contribution ID: 42

Type: **not specified**

## Nuclear Security & Safeguards

*Monday, 1 February 2021 12:55 (1h 20m)*

- Nuclear Data for Non-Destructive Assay and Advanced Reactor Applications, Mike Dion (ORNL)
- Measuring the antineutrino spectrum below 1.8 MeV, Shikha Prasad (TAMU)

**Presenters:** DION, Mike; PRASAD, Shikha; SOBES, Vladimir (University of Tennessee); HINES, Wes

**Session Classification:** Session Five

Contribution ID: 43

Type: **not specified**

## Welcome and overview

*Monday, 1 February 2021 14:45 (5 minutes)*

**Presenters:** MCCUTCHAN, Elizabeth; RESSLER, Jennifer Jo; BERNSTEIN, Lee; BERNSTEIN, Lee (University of California - Berkeley/LBNL); DANON, Yaron

**Session Classification:** Session Six

Contribution ID: 44

Type: **not specified**

## **Outreach and Graduate Recruiting Efforts at FRIB**

*Monday, 1 February 2021 14:50 (18 minutes)*

**Presenter:** SPYROU, Artemis

**Session Classification:** Session Six

Contribution ID: 45

Type: **not specified**

## **Educating the Next Generation of Nuclear Experts: the Nuclear Science and Security Consortium 10-Year Experience**

*Monday, 1 February 2021 15:08 (18 minutes)*

**Presenter:** VUJIC, Jasmina

**Session Classification:** Session Six

Contribution ID: 46

Type: **not specified**

## **Undergraduate research and recruitment through MoNA and the CEU program**

*Monday, 1 February 2021 15:26 (18 minutes)*

**Presenter:** ROGERS, Warren

**Session Classification:** Session Six



Contribution ID: 47

Type: **not specified**

## **Connecting Students to Nuclear Data Projects at the National Laboratories**

*Monday, 1 February 2021 15:44 (18 minutes)*

**Presenter:** CHODASH, Perry

**Session Classification:** Session Six

Contribution ID: 48

Type: **not specified**

## **The Texas A&M Cyclotron Institute and CENTAUR as generators of nuclear talent**

*Monday, 1 February 2021 16:02 (18 minutes)*

**Presenter:** YENNELLO, Sherry

**Session Classification:** Session Six

Contribution ID: 49

Type: **not specified**

## **Automation in the Nuclear Data Pipeline**

*Monday, 1 February 2021 16:45 (18 minutes)*

**Presenter:** BROWN, Dave

**Session Classification:** Session Six

Contribution ID: 50

Type: **not specified**

## **Example on how to (intelligently) augment the nuclear-data pipeline with machine learning**

*Monday, 1 February 2021 17:03 (18 minutes)*

**Presenter:** NEUDECKER, Denise (Los Alamos National Laboratory)

**Session Classification:** Session Six

Contribution ID: 51

Type: **not specified**

## **Nuclear Data Evaluation Automation and Training and NCSU**

*Monday, 1 February 2021 17:21 (18 minutes)*

**Presenter:** HAWARI, Ayman

**Session Classification:** Session Six

Contribution ID: 52

Type: **not specified**

## **Automaton Discussion**

*Monday, 1 February 2021 17:39 (10 minutes)*

**Session Classification:** Session Six

Contribution ID: 53

Type: **not specified**

## Final Discussion and Wrap-up

*Monday, 1 February 2021 17:49 (11 minutes)*

**Presenters:** MCCUTCHAN, Elizabeth; RESSLER, Jennifer Jo; BERNSTEIN, Lee; DANON, Yaron (RPI)

**Session Classification:** Session Six

Contribution ID: 54

Type: **not specified**

## **Novel Approach for Improving Antineutrino Spectra Predictions for Nonproliferation Applications**

*Wednesday, 3 February 2021 11:00 (10 minutes)*

**Presenter:** KONDEV, Filip (ANL)

**Session Classification:** Funded Project Reports



Contribution ID: 55

Type: **not specified**

## **Improving the Nuclear Data on Fission Product Decays at CARIBU**

*Wednesday, 3 February 2021 11:10 (10 minutes)*

**Presenter:** KOLOS, Kay (Lawrence Livermore National Laboratory)

**Session Classification:** Funded Project Reports

Contribution ID: 56

Type: **not specified**

## **$^{238}\text{U}(\text{p},\text{xn})$ and $^{235}\text{U}(\text{d},\text{xn})$ $^{235-237}\text{Np}$ Nuclear Reaction Cross Sections Relevant to the Production of $^{236}\text{gNp}$**

*Wednesday, 3 February 2021 11:20 (10 minutes)*

**Presenter:** VOYLES, Andrew

**Session Classification:** Funded Project Reports

Contribution ID: 57

Type: **not specified**

## **State-of-the-art Gamma-ray Spectroscopy to Enhance the ENSDF database**

*Wednesday, 3 February 2021 11:30 (10 minutes)*

**Presenter:** MCCUTCHAN, Libby (BNL/NNDC)

**Session Classification:** Funded Project Reports

Contribution ID: 58

Type: **not specified**

## **Beta-strength function, reactor decay heat, and anti-neutrino properties from total absorption spectroscopy of fission fragments**

*Wednesday, 3 February 2021 11:40 (10 minutes)*

**Presenter:** RYKACZEWSKI, Krzysztof

**Session Classification:** Funded Project Reports

Contribution ID: 59

Type: **not specified**

## **Improving the $^{238}\text{U}(n,n')$ cross section using neutron-gamma coincidences**

*Wednesday, 3 February 2021 11:50 (10 minutes)*

**Presenters:** BERNSTEIN, Lee; BERNSTEIN, Lee (University of California - Berkeley/LBNL)

**Session Classification:** Funded Project Reports

Contribution ID: 60

Type: **not specified**

# **Integral Measurements of Independent and Cumulative Fission Product Yields Supporting Nuclear Forensics and Other Applications**

*Wednesday, 3 February 2021 12:00 (10 minutes)*

**Presenter:** BREDEWEG, Todd (LANL)

**Session Classification:** Funded Project Reports

Contribution ID: 61

Type: **not specified**

## **Evaluation of Energy Dependent Fission Product Yields**

*Wednesday, 3 February 2021 12:10 (10 minutes)*

**Presenter:** KAWANO, Toshihiko (LANL)

**Session Classification:** Funded Project Reports

Contribution ID: 62

Type: **not specified**

## **Measurement of Independent Fission Product Yields**

*Wednesday, 3 February 2021 12:20 (10 minutes)*

**Presenter:** DUKE, Dana (LANL)

**Session Classification:** Funded Project Reports



Contribution ID: 63

Type: **not specified**

## **Independent Fission Product Yields from 0.5 to 20 MeV**

*Wednesday, 3 February 2021 12:30 (10 minutes)*

**Presenter:** WINKELBAUER, Jack

**Session Classification:** Funded Project Reports

Contribution ID: 64

Type: **not specified**

## Energy Dependent Fission Product Yields

*Wednesday, 3 February 2021 12:40 (10 minutes)*

**Presenter:** TONCHEV, Anton (LLNL)

**Session Classification:** Funded Project Reports

Contribution ID: 65

Type: **not specified**

## **Modernization and Optimization of the Evaluated Nuclear Structure Data File**

*Wednesday, 3 February 2021 12:50 (10 minutes)*

**Presenter:** MCCUTCHAN, Libby (BNL/NNDC)

**Session Classification:** Funded Project Reports

Contribution ID: 66

Type: **not specified**

## **Fission product yield measurements using $^{252}\text{Cf}$ spontaneous fission and neutron-induced fission on actinide targets at CARIBU**

*Wednesday, 3 February 2021 13:00 (10 minutes)*

**Presenter:** SAVARD, Guy

**Session Classification:** Funded Project Reports

Contribution ID: 67

Type: **not specified**

## **Neutron Scattering Cross Sections: (n,n'), (n,n'g), and (n,g) Measurements**

*Wednesday, 3 February 2021 13:10 (10 minutes)*

**Presenter:** VANHOY, Jeffrey

**Session Classification:** Funded Project Reports

Contribution ID: 68

Type: **not specified**

## **Scoping Study of the Impact of (alpha,n) Reactions and Yields of Nonproliferation Applications**

*Wednesday, 3 February 2021 13:20 (10 minutes)*

**Presenter:** CATHY, Romano

**Session Classification:** Funded Project Reports

Contribution ID: 69

Type: **not specified**

## **Assessment of Nuclear Data Needs for Neutron Active Interrogation**

*Wednesday, 3 February 2021 13:30 (10 minutes)*

**Presenter:** MCCONCHIE, Seth (ORNL)

**Session Classification:** Funded Project Reports

Contribution ID: 70

Type: **not specified**

## WANDA 2021 Session Reports Speakers

*Wednesday, 3 February 2021 14:45 (3h 15m)*

**Presenters:** VOYLES, Andrew; LOER, Ben; GOLDBLUM, Bethany; PERCHER, Catherine (LLNL); BROWN, David (BNL/NNDC); MCCUTCHAN, Elizabeth; O'BRIEN, Ellen; RESSLER, Jennifer Jo; HUTCHINSON, Jesson; KOLOS, Kay (Lawrence Livermore National Laboratory); HEILBRONN, Lawrence; BERNSTEIN, Lee; BERNSTEIN, Lee (University of California - Berkeley/LBNL); BURKEY, Mary; MUMPOWER, Matthew; SMITH, Michael (ORNL); ZERKLE, Michael (Naval Nuclear Laboratory); ELSAWI, Mohamed; THOMPSON, Nicholas; SCHUNCK, Nicolas (LLNL); PEPLOWSKI, Patrick; HOGLE, Susan; SOBES, Vladimir (University of Tennessee); WIESELQUIST, William (Oak Ridge National Laboratory); DANON, Yaron (RPI)

**Session Classification:** WANDA 2021 Session Reports



Contribution ID: 72

Type: **not specified**

## Discussion

*Friday, 29 January 2021 13:01 (59 minutes)*

**Session Classification:** Session Three

Contribution ID: 73

Type: **not specified**

## Discussion

*Friday, 29 January 2021 15:46 (9 minutes)*

**Presenters:** HEILBRONN, Lawrence; BURKEY, Mary; PEPOWSKI, Patrick

**Session Classification:** Session Four

Contribution ID: 74

Type: **not specified**

## Discussion

*Friday, 29 January 2021 17:13 (27 minutes)*

**Presenters:** HEILBRONN, Lawrence; BURKEY, Mary; PELOWSKI, Patrick

**Session Classification:** Session Four

Contribution ID: 75

Type: **not specified**

## Education Discussion

*Monday, 1 February 2021 16:20 (10 minutes)*

**Session Classification:** Session Six

Contribution ID: 76

Type: **not specified**

## **State of computational nuclear data and future prospects**

*Friday, 29 January 2021 11:00 (10 minutes)*

**Presenter:** SCHUNCK, Nicolas (LLNL)

**Session Classification:** Session Three

Contribution ID: 77

Type: **not specified**

## **Introductory Video to Predictive Codes for Isotope Production**

*Wednesday, 27 January 2021 10:30 (30 minutes)*

[https://www.youtube.com/watch?v=wptZ86o\\_Ao4&feature=youtu.be](https://www.youtube.com/watch?v=wptZ86o_Ao4&feature=youtu.be)

**Session Classification:** Session One