IAEA
International Atomic Energy Agency
Atoms for Peace and Development

International cooperation on nuclear data for basic sciences and applications at the IAEA

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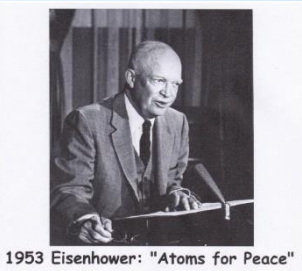
How did it all start?

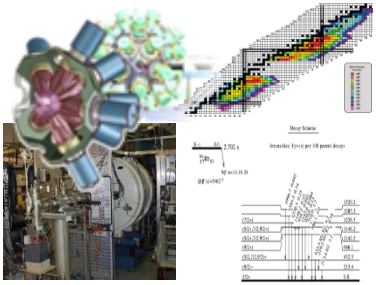
- Eisenhower's historical speech "Atoms for Peace" on 8 December 1953
- First International Conference on Peaceful Uses of Atomic Energy, Geneva, 1955
- IAEA is founded in 1957
- UK, USSR and US discuss making nuclear data public at Geneva conferences 1955, 1958
- Carl Westcott was hired in 1963 by the Agency to oversee the Nuclear Data Program
- International Nuclear Data Committee guides the Nuclear Data Section in promoting research and exchange of data among member states


1953 Eisenhower: "Atoms for Peace"

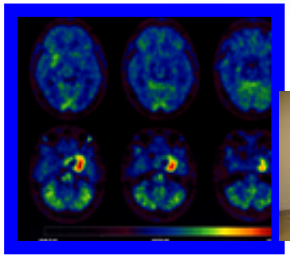
Nuclear Data Section

- Develops nuclear data worldwide through networks and international coordinated projects
- Promotes research through international cooperation (coordinated research projects, technical meetings)
- Enhances capacity building through training workshops and mentoring schemes
- Disseminates databases, reports and technical documents online and offline to all 174 member states

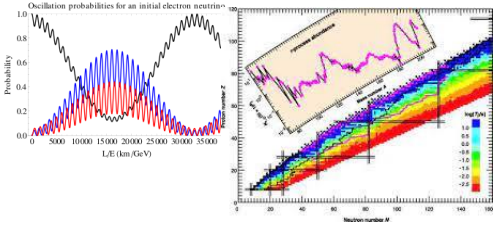
Nuclear Data for Basic Science and Applications



Radiation Safety



Medicine



Basic Research

Energy

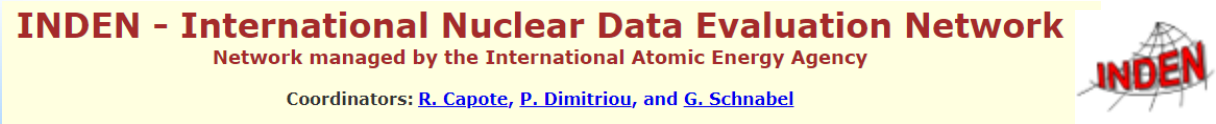
Cultural Heritage

IAEA Networks

- Nuclear Reaction Data Centers (NRDC) – since 1975:
  13 data centers maintaining EXFOR – exp. nuclear reaction data
  - **USA/BNL**, NEA Data Bank, IAEA, Russia (3), China, Hungary, Japan (2), Korea, India, Ukraine

- Nuclear Structure and Decay Data (NSDD) – since 1976:
  17 data centers contributing to ENSDF database
  - **USA (ANL, BNL, FRIB/MSU, LBNL, ORNL, TAMU, TUNL),** Australia, Bulgaria, Canada, China (2), Hungary, India, Japan, Romania, Russia

- International Nuclear Data Evaluation Network (INDEN) – since 2018: international cooperation on nuclear reaction data evaluation
  - **USA (BNL, LANL, LLNL, Notre-Dame, ORNL, RPI)**, IAEA, JRC/EU, Austria, Czech Rep., China, France, Germany, Greece, Japan, Slovenia, Spain, Switzerland, Romania, Russia



Coordinated Research Programs

- 3-4-year international projects aimed at promoting research and addressing data needs for basic science and applications

- Outputs include databases, data files, IAEA reports, and publications in international peer-reviewed journals

- US national labs and academic institutions have and are making important contributions to these projects but they are also benefiting from them (⇄)

CRPs completed

- Reference Input Parameter Library (RIPL): widely used library of input parameters for nuclear reaction modelling

- Reference Database for beta-delayed neutron emission:
  - comprehensive compilation of experimental $T_{1/2}$, P_n data; recommended values; systematics; models;
  - compilation of; systematics and recommended aggregate data: total delayed neutron yields, 6- and 8-group constants

- Photonuclear Data Library and Photon Strength Functions:
  - Updated recommended photonuclear cross sections and spectra
  - Compilation of Photon Strength Functions (photonuclear; neutron capture; charged-particle reaction; NRF); global models

Available online at www.sciencedirect.com
ScienceDirect
Nuclear Data Sheets
Nuclear Data Sheets 110 (2009) 3107–3214
www.elsevier.com/locate/nds

RIPL – Reference Input Parameter Library for Calculation of Nuclear Reactions and Nuclear Data Evaluations

R. Capote,[1,*] M. Herman,[1,2] P. Obložinský,[1,2] P.G. Young,[3] S. Goriely,[4] T. Belgya,[5] A.V. Ignatyuk,[6] A.J. Koning,[7] S. Hilaire,[8] V.A. Plujko,[9] M. Avrigeanu,[10] O. Bersillon,[8] M.B. Chadwick,[3] T. Fukahori,[11] Zhigang Ge,[12] Yinlu Han,[12] S. Kailas,[13] J. Kopecky,[14] V.M. Maslov,[15] G. Reffo,[16] M. Sin,[17] E.Sh. Soukhovitskii,[15] P. Talou[3]

Available online at www.sciencedirect.com
ScienceDirect
Nuclear Data Sheets
Nuclear Data Sheets 173 (2021) 144–238
www.elsevier.com/locate/nds

Development of a Reference Database for Beta-Delayed Neutron Emission

P. Dimitriou,[1,*] I. Dillmann,[2,3] B. Singh,[4] V. Piksaikin,[5] K.P. Rykaczewski,[6] J.L. Tain,[7] A. Algora,[7] K. Banerjee,[8] I.N. Borzov,[9,10] D. Cano-Ott,[11] S. Chiba,[12] M. Fallot,[13] D. Foligno,[14] R. Grzywacz,[15,6] X. Huang,[16] T. Marketin,[17] F. Minato,[18] G. Mukherjee,[8] B.C. Rasco,[19,6,15,20] A. Sonzogni,[21] M. Verpelli,[1] A. Egorov,[5] M. Estienne,[13] L. Giot,[13] D. Gremyachkin,[5] M. Madurga,[15] E.A. McCutchan,[21] E. Mendoza,[11] K.V. Mitrofanov,[5] M. Narbonne,[13] P. Romojaro,[11] A. Sanchez-Caballero,[11] and N.D. Scielzo[22]

Eur. Phys. J. A (2019) 55: 172
DOI 10.1140/epja/i2019-12840-1
THE EUROPEAN PHYSICAL JOURNAL A
Review

Reference database for photon strength functions

S. Goriely[1], P. Dimitriou[2,a], M. Wiedeking[3], T. Belgya[4], R. Firestone[5], J. Kopecky[6], M. Krtička[7], V. Plujko[8], R. Schwengner[9], S. Siem[10], H. Utsunomiya[11], S. Hilaire[12], S. Péru[12], Y.S. Cho[13], D.M. Filipescu[14], N. Iwamoto[15], T. Kawano[16], V. Varlamov[17], and R. Xu[18]

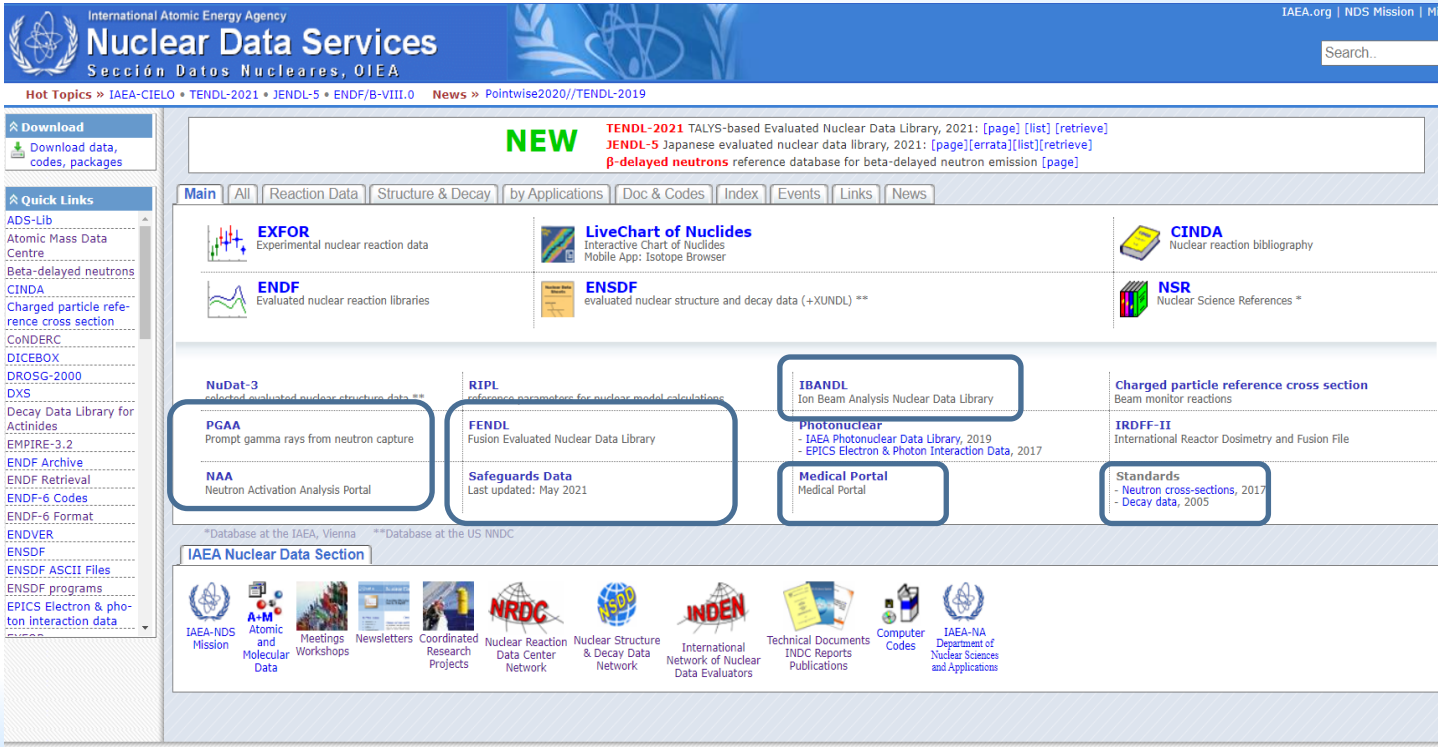
Available online at www.sciencedirect.com
ScienceDirect
Nuclear Data Sheets
Nuclear Data Sheets 163 (2020) 109–162
www.elsevier.com/locate/nds

IAEA Photonuclear Data Library 2019

T. Kawano,[1,*] Y. S. Cho,[2] P. Dimitriou,[3] D. Filipescu,[4] N. Iwamoto,[5] V. Plujko,[6] X. Tao,[7] H. Utsunomiya,[8] V. Varlamov,[9] R. Xu,[7] R. Capote,[3] I. Gheorghe,[4] O. Gorbachenko,[6] Y.L. Jin,[7] T. Renstrøm,[10] M. Sin,[11] K. Stopani,[9] Y. Tian,[7] G.M. Tveten,[10] J.M. Wang,[7] T. Belgya,[12] R. Firestone,[13] S. Goriely,[14] J. Kopecky,[15] M. Krtička,[16] R. Schwengner,[17] S. Siem,[10] and M. Wiedeking[18]

Nuclear Data Services

https://www-nds.iaea.org/



Data products are the result of international cooperation

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Thank you!