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Nuclear Data Newsletter

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Contents

From the Section Head

Greetings from sunny Vienna!

In the spring we organized three large meetings (for our Section "large" means more than 25 participants). First, we held the Nuclear Reaction Data Centre (NRDC) meeting which concentrates on updates, quality and data compilation for the EXFOR database. It was followed by the Nuclear Structure and Decay Data (NSDD) meeting on the major nuclear structure databases, with the ENSDF library as its most famous component. We organized a large Technical Meeting on anti-neutrino spectra and their applications, which attracted many participants. The latter two were coordinated by Vivian Dimitriou. At the end of June, Nuclear Data Section said goodbye to Vivian, who has been with us for seven years, and whom many of you know from the various networks and meetings that she coordinated and chaired. Our Section will definitely feel her departure, but fortunately she will remain in the nuclear data field.

After all these meetings in Vienna it was time for us, and surely many of you too, to participate in the International Nuclear Data Conference ND-2019 in Beijing. The IAEA was well represented there, with our Director giving a keynote presentation in the honorary opening session. I wish to thank Wang Wenming, Ge Zhigang, and the rest of the team from CNDC for the excellent organization of the conference. I think all nuclear data topics were well represented and despite my age, I learned a lot of new things!

For our readers of this Newsletter in China: the IAEA Isotope Browser for smartphones is now also available on Baidu in China, next to the usual Apple Store and Google Play channels. Currently, the total number of downloads since 2014 has reached 85 000.

Meanwhile, we are further developing our databases, and currently ENDF formatted data files are being assembled for the new IAEA photonuclear data library, as a result of a Coordinated Research Project that was held over the past four years. TENDL-2019 is in preparation, too.

In the obituary Section you will see that Herbert Vonach passed away. I knew Herbert since I entered the nuclear data field, participated together with him at JEFF meetings, and only recently he came to the IAEA to contribute to our Neutron Standards project. He will be missed.

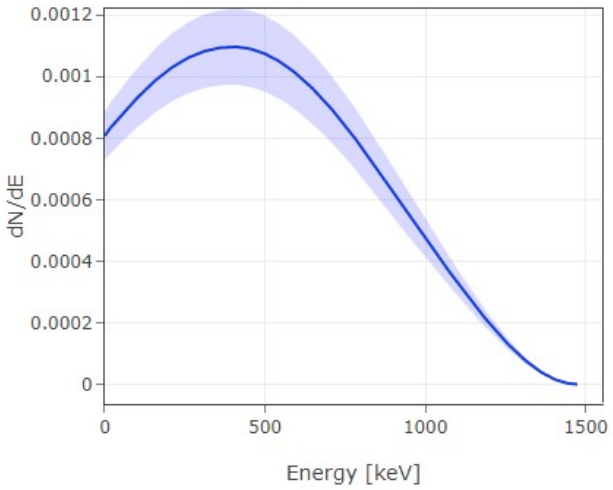
Finally, I wish you all good summer holidays!

Christian Hill-Unit Head, Atomic and Molecular Data Unit, Jean-Christophe Sublet-Unit Head, Nuclear Data Services Unit, Arjan Koning-Section Head, Nuclear Data Section, and Roberto Capote Noy-Deputy Section Head/Unit Head, Nuclear Data Development Unit.

Computer Codes, Data Libraries and Web News

Beta decay energy distribution

New plots and data tables for total energy spectra of β- decays are available in Livechart. They are obtained using the Betashape code developed at LNHB



$^{129}_{52}Te_{77}$ 100% β- 69.6 min $^{129}_{53}I_{76}$

Energy [keV]	dN/dE	unc
0	0.000808308	0.0000793462
0.7	0.000808248	0.000079512
1.4	0.000808695	0.0000796745
2.1	0.000809648	0.0000798338

This replaces the previous use of the Radlist code. Better reproduction of the energy distribution is needed in ionizing-radiation metrology, radiotherapy and dosimetry, residual power in nuclear power plants, astrophysics. Beta shape code can be installed and run on a computer, and Livechart now provides ready-to-use plots and tables. The next step will be to produce distributions for each beta transition, and also for neutrino spectra. Betashape results can be accessed in Livechart by choosing a nuclide, then going to the "Decay radiations" tab. Livechart is accessible at https://www-nds.iaea.org/livechart.

FRENDY

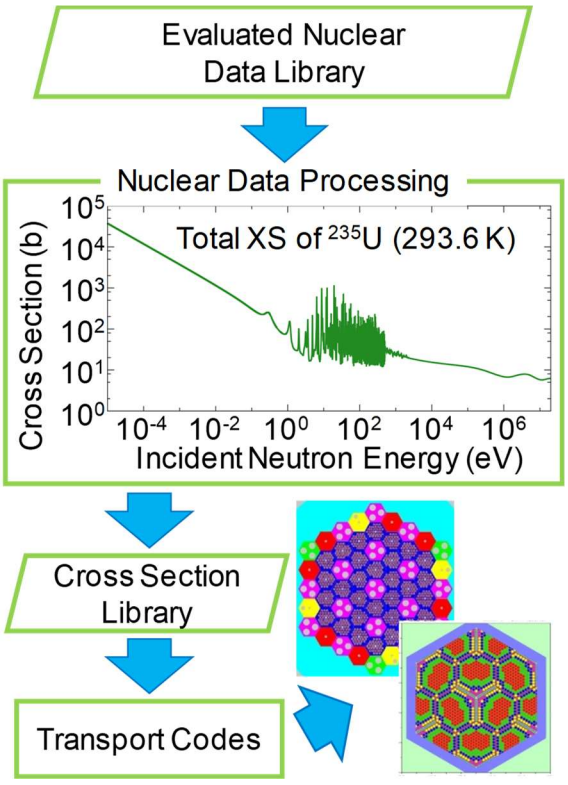
Nuclear data processing system

(K. Tada, Japan Atomic Energy Agency)

FRENDY (FRom Evaluated Nuclear Data librarY to any application) is a system to process evaluated nuclear data library and generate cross section library for transport codes. Main features of FRENDY are as follows:

- Simple input format
- Extensible & Modular
- Open source software (2-clause BSD license)

The package and manual can be downloaded from https://rpg.jaea.go.jp/main/en/program_frendy/.



NDS Meeting Reports

(TM = Technical Meeting, RCM = Research Coordination Meeting, CM = Consultants' Meeting, WS = Workshop, CRP = Coordinated Research Project)

Technical Meeting on Nuclear Data for Neutron Activation Analysis and Dosimetry (IRDFF)

15-18 July 2019, Vienna, Austria
Scientific Secretary: A. Trkov
18 participants and IAEA staff

Participants of the TM

The technical meeting is the culmination of many years of effort to create the International Reactor Dosimetry Fission Fusion file IRDFF-II. The purpose of the technical meeting was to discuss the comprehensive documentation of all the neutron cross sections and supporting documentation contained in IRDFF-II. The discussions focused on the preparation of a sizeable paper which will include numerous tables describing the content of the library and to supply recommended nuclear data as well as many figures chosen to illustrate the benchmarks and validation of the data, and will be submitted to Nuclear Data Sheets in July, to be published in January 2020.
It is expected that the IRDFF-II library will become the international reference in neutron activation and dosimetry for multiple applications.

Consultants' Meeting on Evaluation of Fundamental Atomic and Molecular Data of Beryllium-related Species for Edge Plasma

6-7 June 2019, Vienna, Austria
Scientific Secretary: C. Hill
10 participants and IAEA staff

Participants of the CM

This meeting brought together experts on the calculation and use of electron-impact collisional cross sections with atoms and molecules to evaluate the available data and plan a new database for the modelling of edge plasma processes in fusion devices. Beryllium will be used as a plasma-facing material in the ITER tokamak; its ablation will lead to the presence of, in addition to Be and its ions, beryllium hydrides (BeH, BeH^+, and probably BeH_2 and BeH_2^+). Due to its toxicity, the properties of beryllium-containing species in the plasma environment are largely deduced by theoretical calculation rather than experiment. Expert participants reviewed the available data, made plans for the calculation of new, relevant data, and discussed the most effective way to disseminate these data to the fusion community through the Section's data services.
More details, including presentations are available from the AMD Unit's website at:
https://www-amdis.org/meetings/be-2019/.

Consultants' Meeting on Fission Product Yield Experimental Database

27-30 May 2019, Tokyo, Japan
Scientific Secretary: N. Otsuka
15 participants and IAEA staff

Participants of the CM

Despite recent progress in the theoretical description of fission fragmentation, theories are still not applicable to the fission product yield (FPY) evaluation, and the quality of evaluated FPY is strongly affected by the experimental data included. The evaluation of FPY in nuclear data libraries continues for upgrading of the related sub-libraries. The Nuclear Data Section (NDS) is planning to initiate a new Coordinated Research Project (CRP) on the subject. EXFOR should serve as a common base for these national and international projects.

This Consultancy Meeting summarized the recommendations to the NDS and other Nuclear Reaction Data Centres on compilation and dissemination of fission product yield experimental data. Participants from China, France, Japan, Korea, USA, NDS and OECD NEA presented and discussed their data centre services as well as experimental and theoretical activities and evaluation.

A summary report of the meeting is available as INDC(NDS)-0793. All slides are available on the meeting web page (https://www-nds.iaea.org/index-meeting-crp/CM-FPY-2019/).

Consultants' Meeting of the International Nuclear Data Evaluation Network (INDEN) on Light Elements

15-17 May 2019, Vienna, Austria
Scientific Secretary: P. Dimitriou
12 participants and IAEA staff

The Consultants' Meeting was held to monitor progress in the new evaluations for light elements ^{9}Be, ^{14,15}N, ^{16}O and ^{23}Na. The goal of these new evaluations is to extend them to high energies to ensure a smooth transition from the resolved to the unresolved resonance region and the statistical region. Twelve participants from four Member States, two international organizations (JRC-EU, OECD/NEA Databank) and IAEA staff discussed important issues related to the R-matrix theory and experimental data. The discussions focused on the two main challenges faced by the evaluators when going to higher energies, i.e. the inclusion of a very large number of open channels and the treatment of break-out channels. Proposals and recommendations were made for dealing with both issues. Details of the discussions and actions agreed upon are available in the summary report of the meeting INDC(NDS)-0788. The presentations are available at the meeting website: https://www-nds.iaea.org/index-meeting-crp/CM_INDEN-LE-May2019/.

Participants of the CM of INDEN Light Elements

Consultants' Meeting on R-matrix for Charged-particle Reactions

13-14 May 2019, Vienna, Austria
Scientific Secretary: P. Dimitriou
11 participants and IAEA staff

This Consultants' Meeting was held to discuss the results of a coordinated effort to verify the minimization techniques implemented in the R-matrix codes through a well-defined exercise. Eleven participants from four Member States, one international organisation (JRC-EU) and IAEA staff were in attendance. Five R-matrix codes were included in this second exercise: AZURE2, CONRAD, EDA, SAMMY, and SFRESCOX. Furthermore, the final exercise which is the evaluation of the ^{7}Be system was agreed upon at this meeting. A summary of the presentations and technical discussions of the meeting is given in the meeting report INDC(NDS)-0787. The meeting presentations are available from the meeting website: https://www-nds.iaea.org/index-meeting-crp/CM-RMatrix-2019/.

Technical Meeting on Uncertainty Quantification in Nuclear Data Evaluation

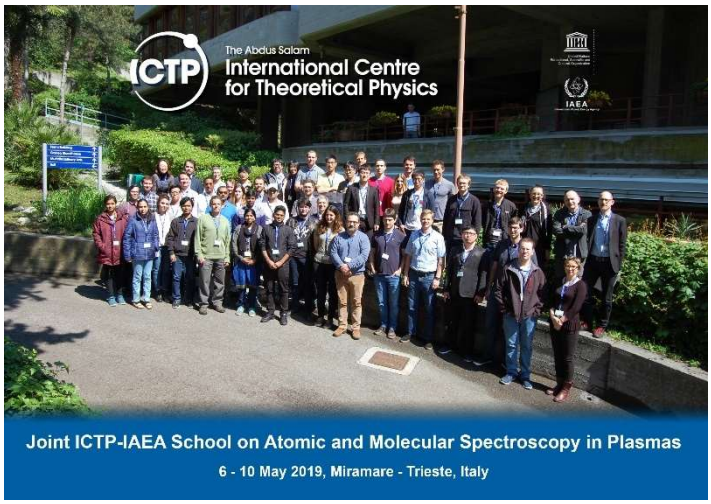
6-10 May 2019, Vienna, Austria
Scientific Secretary: R. Capote Noy
11 participants and IAEA staff

Participants of the TM on UQ

The meeting was a follow-up of the meeting held one year ago in July 2018; and focused on determination and quantification of unrecognized sources of uncertainties.
These unknown uncertainty sources are denoted as Unrecognized Sources of Uncertainties (USU), which is a generalization of the original USU that corresponded to the Unrecognized Systematic Uncertainty. These uncertainties limit both the precision and accuracy to which physical quantities can be measured by contemporary techniques to minimal achievable evaluated uncertainties.
These additional uncertainties were already used to increase assessed Neutron Standards uncertainties; additional advice and consensus was sought. Discussion of the two meetings led to the draft of the scientific paper named "Unrecognized Sources of Uncertainties (USU) in Experimental Nuclear Data" that was submitted at the end of July 2019 to the journal Nuclear Data Sheets. If approved by peer-reviewers, the paper will be published as open access in the Special Issue of the journal in January 2020.

Joint ICTP-IAEA Workshop on Atomic and Molecular Spectroscopy in Plasmas

6-10 May 2019, ICTP, Trieste, Italy
Directors: C. Hill, K. Heinola (IAEA), H.-K. Chung (NFRI), Yu. Ralchenko (NIST);
Local organizer: George Thompson
44 participants and 9 lecturers



Nine lecturers from seven countries and 44 students from 20 countries participated in this School to help early-career plasma physicists develop an understanding of the techniques used to model and simulate radiative processes in plasmas. The first half of the course programme dealt with the fundamental physics of the collisional and radiative properties of plasmas; the second half dealt with their application in areas including astrophysics and magnetic confinement fusion. Two afternoons of practical sessions introduced participants to collisional radiative modelling codes and the use of online databases and other resources in plasma physics.
More details of the School are available on the AMD Unit's website at: https://www-amdis.org/workshops/ictp-2019.

Consultants' Meeting on Decay Data of Radionuclides for Monitoring Applications

6-8 May 2019, Vienna, Austria
Scientific Secretary: P. Dimitriou
7 participants and IAEA staff

This consultancy meeting was held to review the decay data for selected fission products relevant to updating the fission yield libraries for applications, including applications in environmental monitoring performed, for example, at the IAEA Environmental Laboratories. Participants discussed the needs for evaluated and high-quality decay data for the analysis of daily accumulated radionuclide particulate spectra but also for performing high quality Monte Carlo simulations for identification and quantification of radionuclides. Participants agreed on creating a

"Recommended Decay Data Library for Selected Fission Products" that will consist of evaluated nuclear decay properties, atomic radiation data and beta spectra, for a selected list of priority fission radionuclides. The library will be produced in ENSDF format, hosted by the IAEA and disseminated upon request.

Participants of the Decay Data CM

Technical Meeting on Nuclear Data for Antineutrino Spectra and their Applications

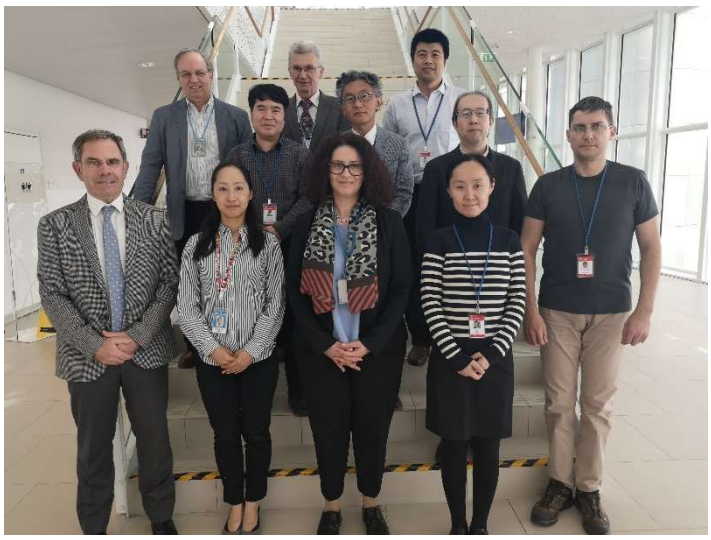
23-26 April 2019, Vienna, Austria
Scientific Secretary: P. Dimitriou
35 participants and IAEA staff

Participants of the Antineutrino TM

This meeting was held to review the state-of-affairs in experiments, models and nuclear data associated with the determination of the anti-neutrino flux and spectrum produced by nuclear reactors. Thirty-five experts from 11 Member States representing the major international reactor neutrino experiments, as well as nuclear theory, experiments and nuclear data including IAEA staff, discussed the latest results in measurements and comparisons with models. Achievements in the field were highlighted, and outstanding issues that remain to be resolved were identified. Recommendations were made for future improvements in the data analysis, nuclear model corrections and nuclear decay data. There was an overall consensus that the field of reactor neutrinos would benefit from international coordination in the form of an international working group. Details of the discussions and the proposed actions are presented in the summary report INDC(NDS)-0786. Presentations are available at:
https://www-nds.iaea.org/index-meeting-crp/Antineutrinos/

Consultants' Meeting on Reviewing New Evaluations for the Updated Photonuclear Data Library

15-17 April 2019, Vienna, Austria
Scientific Secretary: P. Dimitriou
11 participants and IAEA staff



Participants of the CM

This was the second meeting to review the evaluations of photonuclear reactions for the new IAEA Photonuclear Data Library. The five evaluators convened with the reviewers and IAEA project officer to discuss the issues pending from the first review meeting, to review the latest evaluations and agree on the selection of evaluated files to be included in the new library. The format and assembly of the final evaluated file was also discussed. The details of the discussions and final selection are discussed in the final CRP report on the new IAEA Photonuclear Data Library which has been submitted for publication in Nuclear Data Sheets (Special Issue 2020).

Technical Meeting of the International Network of Nuclear Reaction Data Centres

9-12 April 2019, Vienna, Austria
Scientific Secretary: N. Otsuka
17 participants and IAEA staff

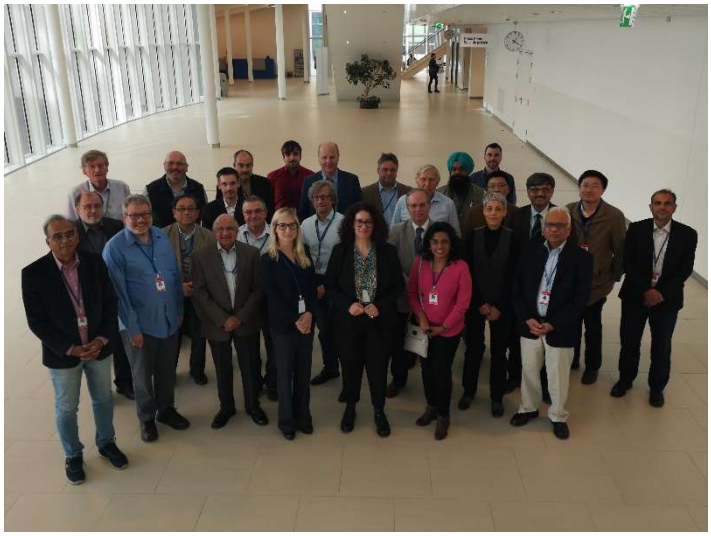
Sixteen participants representing 12 cooperative Centres from eight Member States (China, Hungary, India, Japan, Korea, Russia, Ukraine and USA) and two International Organizations (NEA, IAEA) as well as a participant from Kazakhstan were represented at the meeting. Main topics of the meeting were the EXFOR transmission statistics, EXFOR coverage and quality control, revisions of coding rules and manuals, EXFOR/CINDA dictionaries as well as improved tools for compilation and dissemination.
NDS presented EXFOR fission product yield completeness checking based on the articles compiled in England & Rider's experimental database (for ENDF/B-VI) and Robert Mill's experimental database (for UKFY3), and found that 12% of articles compiled by England & Rider and 22% of articles compiled by Mills are missing in EXFOR (NNDC also presented the result of their completeness checking by comparison between EXFOR and NSR). Coding of independent quantities (e.g., independent fission yield) was discussed, and the Centres agreed that it will be indicated by IND under REACTION for independent fission product yields (FY) only (i.e., not for other quantities such as cross section anymore). Amanda Lewis (intern from UC Berkeley) reported problems in the current uncertainty information coded under ERR-ANALYS, and presented an idea on incorporation of uncertainty templates into EXFOR. A summary report of the meeting is available as INDC(NDS)-0792. All progress reports, working papers and slides are available on the meeting web page (http://www-nds.iaea.org/nrdc/nrdc_2019/).

Participants of the NRDC Network

Technical Meeting of the International Network of Nuclear Structure and Decay Data Evaluators

8-12 April 2019, Vienna, Austria
Scientific Secretary: P. Dimitriou
23 participants and IAEA staff

This meeting was attended by 23 scientists from thirteen Member States and IAEA staff, all of whom are concerned primarily with the measurement, evaluation and dissemination of nuclear structure and decay data. The current status of mass chain evaluations, responsibilities and reviews as well as XUNDL compilations, and ENSDF codes was reviewed. Issues related to policies, treatment of uncertainties, and new proposals were also discussed. Presentations are available at the meeting website: https://www-nds.iaea.org/nsdd/. Details of the discussions are given in the meeting summary report INDC(NDS)-0783.



Participants of the NSDD Network

Third Research Coordination Meeting on Plasma-Wall Interaction with Reduced Steel Surfaces in Fusion Devices

25-27 March 2019, Vienna, Austria
Scientific Secretary: C. Hill
8 participants and IAEA staff

Participants of the 3. RCM on Steel Surfaces

The final Research Coordination Meeting of the Steel Surfaces CRP brought together eight representatives from research groups working on the experimental and theoretical

analysis of sputtering, surface modification and hydrogen retention in the various kinds of reduced-activation ferritic/martensitic (RAFM) steels proposed for use in a future fusion power plant such as DEMO. In addition to reviewing their individual activities over the last 18 months, a year-long coordinated sample comparison project, Comparison Experiment for the Sputtering of Steel (CESS), was launched.
More details, including the presentations, are available on the AMD website at:
https://www-amdis.org/meetings/steel-surfaces-rcm3/.

First Research Coordination Meeting on Atomic Data for Vapour Shielding in Fusion Devices

13-15 March 2019, Vienna, Austria
Scientific Secretary: K. Heinola
9 participants and IAEA staff

Participants of the 1. RCM on Vapour Shielding

The First Research Coordination Meeting of the CRP on Vapour Shielding in Fusion Devices brought together nine experts from the field of atomic collisional physics and of vapour formation on plasma-facing wall materials in magnetic confinement fusion devices. The vaporization of the wall material due to plasma-material interactions acts as a protective shield for the wall from further plasma interactions, and can take place in a continuous form with liquid metal wall materials hence making the liquid metal research of increasingly high interest in fusion materials. The RCM participants represented both theorists and modelers of plasma-vapour particle collisional processes as well as experimentalists of spectral line properties, and vapour formation and spectral analyses. During the meeting, open issues related to elemental particles formed during the vaporization and the related plasma-vapour interactions were discussed, and plans for the coordinated research were made. The meeting presentations and the meeting report are available at https://www-amdis.org/CRP/vapour-shielding and https://www-nds.iaea.org/publications/indc/indc-nds-0781/ , respectively.

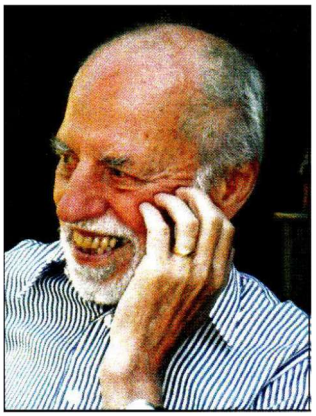
Second Research Coordination Meeting on Data for Atomic Processes of Neutral Beams in Fusion Plasmas

18-20 February 2019, Vienna, Austria
Scientific Secretary: C. Hill
11 participants and IAEA staff

Participants reviewed the status of their calculations of collisional cross sections for processes related to neutral beam particle penetration and photoemission and the use of these calculated data in fusion plasma modelling. Two code comparison workshops are planned to better understand the uncertainties and sensitivity of these data as applied to the modelling of neutral beams.
More details are available at the AMD Unit's website:
https://www-amdis.org/meetings/neutral-beams-rcm2/.

In Memoriam

Herbert Vonach



Prof. Herbert Vonach passed away on 12 May 2019 at the age of 88.

Herbert was a person who contributed a lot to our understanding of covariances and uncertainties in nuclear data. Particular projects which benefited from his knowledge are the neutron standards project and libraries for dosimetry cross sections and fields. He was involved in many experiments. Though based in Vienna, he made a large impact on precise nuclear measurements, especially in the US, where his involvement in experiments at Los Alamos and also Livermore, where he provided the inspiration to look at other physics when he saw that the LLNL Cyclograaff offered opportunities that had not exploited before.

He always pressed for making the most accurate measurements possible, as was his constant thrust, and to quantify the uncertainties in well-documented analyses.

He was the leading evaluator for the European EFF project, that used to be held during the JEFF meetings at the NEA in the 1990's. Together with Siegfried Tagesen he mastered especially the structural material region in the Ti – Cu range. The high-fidelity covariance matrices he developed for Fe-56 are still in use as part of the JEFF data library.

Until recently he took part in the Neutron Standards Meetings held at the IAEA, and it will be a challenge to maintain the high level of such projects without him.

Eric Fort

It is with much sadness that we announce the loss of Mr. Eric Fort who passed away on 28 June 2019.

He was born in 1935 in a small village of the Pyrenean mountains in south of France. After being hired at CEA/DAM (Paris), he worked in nuclear physics. In the 1970, he moved to Cadarache CEA nuclear research center to join the VdG experimental team for which he took the lead for some time. After the closure of the facility, he joined the Fast Breeder Reactor Department of Cadarache to work on nuclear data evaluation. He and others formed a little group of very knowledgeable persons that performed many of the CEA complete evaluations [0-15] MeV for heavy neutron target isotopes. Those evaluations were among the first major data files to make the JEF.1 and JEF.2 libraries. Eric succeeded defending the former and famous French "State Doctorate" early in his forties. Over 40 years, Eric taught nuclear physics and worked on many various topics as differential measurements, evaluated and adjusted data files, reactor data analyses and he can be considered as the father of the ERALIB (JEF2) fast reactor adjusted library that has been in used for a decade at Cadarache. He was an important contributor to the JEFF project and a search among papers presented at the JEFF meetings will summarize his life devoted to Science well. His strong personality and his vitality will be greatly missed.

Selected Charts, Reports and Documents

INDC(EUR)-0033 Results of Time-of-Flight Transmission Measurements for ^{103}Rh at a 10m Station of GELINA, prepared by Y.K. Kim, et al., March 2019.

INDC(NDS)-0770 Summary Report of the Consultants Meeting on International Nuclear Data Evaluation Network (INDEN) Meeting on the Evaluation of Structural Materials, 29 October-1 November 2018, Vienna, prepared by S. Kopecky and A. Trkov, March 2019.

INDC(NDS)-0774 Summary Report of the Technical Meeting on Improvement of Analysis Codes for Nuclear Structure and Decay Data Evaluation, 3-7 December 2018, Vienna, prepared by T. Kibedi and P. Dimitriou, February 2019.

INDC(NDS)-0776 Summary Report of the Technical Meeting on Nuclear Data for Medical Applications, 10-13 December 2018, Vienna, prepared by J.W. Eagle, A.L. Nichols and R. Capote Noy, May 2019.

INDC(NDS)-0777 Summary Report of the Third Research Coordination Meeting on Updating Photonuclear Data Library and Generating a Reference Database for Photon Strength Functions, 17-21 December 2018, Vienna, prepared by M. Wiedeking, D. Filipescu and P. Dimitriou, March 2019.

INDC(NDS)-0778 The Importance of Resonance Self-Shielding, prepared by D.E. Cullen, March 2019.

INDC(NDS)-0781 Summary Report of the First Research Coordination Meeting on Atomic Data for Vapour Shielding in Fusion Devices, 13-15 March 2019, Vienna, prepared by K. Heinola, May 2019.

INDC(NDS)-0782 Summary Report of the Third Research Coordination Meeting on Plasma-wall Interaction with Reduced-activation Steel Surfaces in Fusion Devices, 25-27 March 2019, Vienna, prepared by C. Hill, March 2019.

INDC(NDS)-0783 Summary Report of the 23rd Technical Meeting on Co-ordination of the International Network of Nuclear Structure and Decay Data Evaluators, 8-12 April 2019, Vienna, prepared by A.L. Nichols, E.A. Ricard-McCutchan, J.K. Tuli, P. Dimitriou, July 2019.

INDC(NDS)-0784 New Aggregate Data in the IAEA Reference Database for Beta-delayed Neutron Emission, prepared by V.M. Piksaikin, et al., May 2019.

INDC(NDS)-0785 MCNP modelling of the TIARA SINBAD shielding benchmark, prepared by B. Kos and I.A. Kodeli, May 2019.

INDC(NDS)-0786 Summary Report of the Technical Meeting on Nuclear Data for Antineutrino Spectra and their Applications, 23-26 April 2019, Vienna, prepared by M. Fallot, B. Littlejohn, P. Dimitriou, July 2019.

INDC(NDS)-0787 Summary Report of the Consultants Meeting on R-Matrix Codes for Charged-particle reactions in the Resolved Resonance Region, 13-14 May 2019, Vienna, prepared by H. Leeb, I. Thompson, P. Dimitriou, July 2019.

INDC(NDS)-0788 Summary Report of the Consultants Meeting on International Nuclear Data Evaluation Network (INDEN) Meeting on the Evaluation of Light Elements (2), 15-17 May 2019, Vienna, prepared by R.J. deBoer and P. Dimitriou, July 2019.

INDC(NDS)-0789 Final report of the IAEA Coordinated Research Project F41031 on Testing and Improving the IAEA International Reactor Dosimetry and Fusion File (IRDFF), prepared by M. Majerle, et al., May 2019.

INDC(NDS)-0790 Strength Functions derived from the Discrete and Average Resonance Capture, prepared by J. Kopecky and S. Goriely, July 2019.

INDC(NDS)-0792 Summary Report of the Technical Meeting of International Network of Nuclear Reaction Data Centres, 9-12 April 2019, Vienna, prepared by N. Otuka and M. Fleming, June 2019.

INDC(NDS)-0793 Summary Report of the Consultants Meeting on Fission Product Yield Experimental Database, 27-30 May 2019, Tokyo, Japan, prepared by M. Fleming, T. Kawano and N. Otuka, June 2019.

Available cost-free on request only for **teachers and scientists from developing countries:**

Chart of the Nuclides 2014 JAEA Nuclear Data Centre.

Karlsruher Nuklidkarte *Wall chart of the nuclides and folding chart with booklet, 10th edition (2018).*

Chart of the Nuclides *(Wall chart) prepared by Knolls Atomic Power Laboratory (KAPL) and distributed by Lockheed Martin (17th edition, revised 2009).*

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Feedback
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NDS.Contact-Point@iaea.org

NDS Staff Items

More details about the Nuclear Data Section Staff can be found at: http://www-naweb.iaea.org/napc/nd/aboutus.asp.

We welcome **Ludmila Marian** who joined the Nuclear Data Section as of 1st of April 2019, as Scientific Data Manager.

Prior to this position, Ludmila worked at CERN, Geneva, for 10 years, as a Computing Engineer and Service Manager, as part of the IT Department. She led the team developing CDS, the CERN Institutional Repository, managing more than 140TB of files. Prior to CERN, Ludmila worked both in academia and in industry.

Ludmila has a Master's degree in Computer Science from École Polytechnique Fédérale de Lausanne, Switzerland and a Diploma degree in Electrical and Computing Engineering from Polytechnic University Bucharest, Romania, with the Diploma Project being done at Carnegie Mellon University, USA. Her technical interests vary from Information Retrieval, Data Mining, Computer Vision to System Architecture and DevOps, with a focus on optimization.

Nuclear Data Services – Contact Points

For services to customers in USA and Canada:
US National Nuclear Data Center, Bldg. 197D, Brookhaven National Laboratory, P.O. Box 5000,
Upton, NY 11973-5000, USA.
Tel. +1 631-344-2902; Fax +1 631-344-2806; Email: nndc@bnl.gov; Worldwide Web: http://www.nndc.bnl.gov/
For information regarding on-line services, contact: B. Pritychenko: pritychenko@bnl.gov
For information regarding general NNDC services, contact: M. Blennau: blennau@bnl.gov

For services to customers in OECD/NEA Data Bank member countries:
NEA Data Bank, OECD Nuclear Energy Agency, Le Seine Saint-Germain, 12 blvd. des Iles,
F-92130 Issy-les-Moulineaux, France.
Tel. +33 1 4524 (plus extension); Fax +33 1 45241110;
Email: michael.fleming@oecd.org; data@oecd-nea.org; Worldwide Web: http://www.oecd-nea.org/databank/ contact: M. Fleming, ext. 1072.

For services to the customers from the former USSR:
Neutron data: Russia Nuclear Data Center, Centr Jadernykh Dannykh (CJD), Fiziko-Energeticheskij Institut, Ploschad Bondarenko,1,
249033 Obninsk, Kaluga Region, Russian Federation.
Tel. +7 08439-9-5803; Fax +7 08439-68235;
Photonuclear data: Centre for Photonuclear Experiments Data, Centr Dannykh Fotoyadernykh Eksperimentov (CDFE),
Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Leninskie Gory, 119 922 Moscow, Russian Federation.
Tel. +7 495-939-3483; Fax +7 495-939-0896;
Email: varlamov@depni.sinp.msu.ru; Worldwide Web: http://cdfe.sinp.msu.ru/; contact: V.V. Varlamov.

For services to customers in China:
China Nuclear Data Center, China Institute of Atomic Energy, P.O. Box 275(41), Beijing 102413, China.
Tel. +86 10-6935-7275; Fax +86 10-6935-8119; Email: gezg@ciae.ac.cn; contact: Ge Zhigang.

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Radiation Safety Information Computational Center (RSICC), Oak Ridge National Laboratory,
P.O. Box 2008, Oak Ridge, TN 37831-6003, USA.
Tel. +1 865-574-6176; Fax +1 865-241-4046;
Email: pdc@ornl.gov

Computer codes of non-US origin to all countries (there may be release restrictions):
NEA Data Bank (see above)
Email: is Alice.DUFRESNE@oecd.org; contact: A. Dufresne, ext. 1008.

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Users in India, China, Russia and neighbouring countries may use
IAEA-NDS mirror at Worldwide Web:
http://www-nds.indcentre.org.in (India); http://www-nds.ciae.ac.cn/ (China); http://www-nds.atomstandard.ru/ (Russia).

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