United States Nuclear Structure Data Program (USNDP) and Evaluated Nuclear Structure Data File (ENSDF) at Texas A&M University ENSDF Data Evaluation Center

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Nuclear data evaluation fills a century-long chapter of nuclear science. A search in the *Nuclear Science Reference* (NSR) database maintained at the National Nuclear Data Center (https://www.nndc.bnl.gov/nsr/) on the author "M. Curie" produces a paper titled "*The Radioactive Constants as of 1930*" [1]. The introduction to this paper states that "*the need has arisen for the publication of special Tables of the Radioactive Constants*" and continues, "*This responsibility has been assumed by the International Radium Standards Commission chosen in Brussels in 1910 (...)*". Here we have the origin of what today is known as nuclear data evaluation.

Starting with the first generation of nuclear chemists and physicists, when measurements were already producing diverse and sometimes conflicting data, it became evident that assembling and reconciling the data from all across the published literature was a tedious and difficult task. Nevertheless, only after such a systematic analysis could the community arrive at recommended "practical standards," which could then be updated periodically to reflect the continuous improvements in knowledge and technology. Soon nuclear data evaluation became a specialized branch of research in its own right.

After the Second World War most of this activity was taken across the Atlantic and hosted by the United States Nuclear Structure Data Program (USNDP), which maintains the Evaluated Nuclear Structure Data File (ENSDF) database. While mostly undertaken by U.S. national laboratories, it has expanded to a relatively small number of university research labs, which has included the Texas A&M Cyclotron Institute since 2005. For more than a decade, the Texas A&M effort was financed by a contract with Brookhaven National Laboratory, but in 2017 it started to receive direct financing through the DOE Grant DE-FG03-93ER40773, "Cyclotron-based Nuclear Science"; and since May 2017 Texas A&M Cyclotron Institute has been recognized as an independent ENSDF Data Evaluation Center included within the Nuclear Structure and Decay Data international network.

Since 2005 N. Nica has completed and published the following full mass chain evaluations: the superheavy A=252 mass chain [2]; the very data-rich mid-mass chains, A=140 [3], A=141 [4], A=147 [5] and A=148 [6]; the relatively lighter chains, A=97 [7] and A=84 [8], the latter in a large international collaboration. In collaboration with B. Singh and a group of authors from McMaster University, Canada, he also published the A=77 [9], A=37 [10], A=36 [11], and A=34 [12] chains. At the beginning of 2016 another of his big mass chains, A=157, was published in Nuclear Data Sheets [13], followed by A=158 in 2017 [14], and by a new full evaluation of A=140 in 2018 [15]. Evaluation of the A=153 isobars was also completed and submitted to NNDC by Oct 1st, 2018; and a previously completed evaluation of A=160 was resubmitted after a number of pre-review editorial changes had been made.

Also after more than two years in the review process (due to the size of the evaluation and the lack of reviewers in ENSDF) Nica's A=155 evaluation was returned to him from the review process. He is now in the process of finally preparing it for publication. Another evaluation completed some time ago, that of A=160, is still stuck in the queue waiting to be reviewed. Meanwhile, Nica himself has completed a review of the A=177 mass chain, which was prepared and submitted by another evaluator.

After the crisis created by the lack of ENSDF evaluators over the last decade, in the last couple of years it appears that the crisis has shifted to a lack of ENSDF reviewers. From now on, the most experienced evaluators are going to be required more and more to be involved in the review process, to replace the generation of older evaluators who have now retired.

After Oct 2018, N. Nica started a new full evaluation for the mass chain A=147, covering all publications since Nov 2008. The mass chain consists of the following isobars, in total, 16 nuclei: Xe, Cs, Ba, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, and Tm. Bibliographical searches found that, since Nov 2008, 242 papers have been published relating to this mass chain, of which 195 are primary references (most important). In all, 96 are experimental. This work is in progress.

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[3] N. Nica, Nucl. Data Sheets **108**, 1287 (2007).

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[5] N. Nica, Nucl. Data Sheets **110**, 749 (2009).

[6] N. Nica, Nucl. Data Sheets **117**, 1 (2014).

[7] N. Nica, Nucl. Data Sheets **111**, 525 (2010).

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[14] N. Nica, Nucl.Data Sheets **142**, 1 (2017).

[15] N. Nica, Nucl.Data Sheets **154**, 1 (2018).