



# MARCO T. PIGNI

Oak Ridge National Laboratory  
Nuclear Data & Criticality Safety  
P.O. Box 2008 MS6170  
Oak Ridge, TN 37831-6170  
Phone: (865) 576.3357  
Fax: (865) 576.3513  
Mobile: (631) 662.4968  
[pignimt@ornl.gov](mailto:pignimt@ornl.gov)

---

## Education

**Atominstutit of the Austrian Universities, Vienna University of Technology**

Ph.D. in Nuclear Physics<sup>1</sup> (Dec 2006)

Dissertation Title: "Reliability of optical potentials for nuclear data evaluation."

**Università degli Studi di Milano**

Dottore Magistrale in Physics<sup>2</sup> (Oct 2002)

Thesis Title: "Emissions of intermediate mass fragments in the interaction of <sup>16</sup>O with <sup>59</sup>Co and <sup>93</sup>Nb."

## Research Activities

**Oak Ridge National Laboratory,**

Nuclear Data & Criticality Safety, Research & Development Staff Member (Apr 2011)

**Brookhaven National Laboratory,**

National Nuclear Data Center, Assistant Nuclear Physicist (Jan 2010-Apr 2011)

**Brookhaven National Laboratory,**

National Nuclear Data Center, Post-doctoral Research Associate (Jan 2007-Dec 2009)

## Publications

- M. T. Pigni, S. Croft, I. C. Gauld, "Uncertainty quantification in ( $\alpha$ ,n) neutron source calculations for an oxide matrix," *Progress in Nuclear Energy* **91**, 147 (2016).
- T. M. Shneidman, A. V. Andreev, C. Massimi, et al., "Angular Anisotropy of the Fission Fragments in the Dinuclear System Model," *Nucl. Phys. Review* **32**, 175 (2015).
- M. T. Pigni, M. W. Francis, I. C. Gauld, "Investigation of Inconsistent ENDF/B-VII.1 Independent and Cumulative Fission Product Yields with Proposed Revisions," *Nuclear Data Sheets* **123**, 231 (2015).
- I. C. Gauld, M. T. Pigni, G. Ilas, "Validation and Testing of ENDF/B-VII Decay Data," *Nuclear Data Sheets* **120**, 33 (2014).

---

<sup>1</sup>Research group of Ao.Univ.Prof. Dipl.-Ing. Dr. techn. H. Leeb.

<sup>2</sup>Research group of Prof. E. Gadioli.

- E. Leal-Cidoncha, I. Duran, C. Paradela, et al., "Study of  $^{234}\text{U}(n,f)$  Resonances Measured at the CERN nTOF Facility," *Nuclear Data Sheets* **119**, 42 (2014).
- G. Palmiotti, M. Salvatores, G. Aliberti, et al., "Combined Use of Integral Experiments and Covariance Data," *Nuclear Data Sheets* **118**, 596 (2014).
- M. T. Pigni, L. C. Leal, M. E. Dunn, et al., "Evaluation of Tungsten Neutron Cross Sections in the Resolved Resonance Region," *Nuclear Data Sheets* **114**, 147 (2013).
- F. Belloni, M. Calviani, N. Colonna, et al., "Measurement of the neutron-induced fission cross-section of  $^{241}\text{Am}$  at the time-of-flight facility nTOF," *Eur. Phys. J. A* **49**, 2 (2013).
- F. Gunsing, E. Berthoumieux, G. Aerts, et al., "Measurement of resolved resonances of  $^{232}\text{Th}(n,\gamma)$  at the nTOF facility at CERN," *Phys. Rev. C* **85**, 064601 (2012).
- C. Guerrero D. Cano-Ott, E. Mendoza, et al., "Measurement and resonance analysis of the  $^{237}\text{Np}$  neutron capture cross section," *Phys. Rev. C* **85**, 044616 (2012).
- C. Massimi, P. Koehler, S. Bisterzo, et al., "Resonance neutron-capture cross sections of stable magnesium isotopes and their astrophysical implications," *Phys. Rev. C* **85**, 044615 (2012).
- M. Calviani, M. H. Meaze, N. Colonna, et al., "Neutron-induced fission cross section of  $^{245}\text{Cm}$ : New results from data taken at the time-of-flight facility nTOF," *Phys. Rev. C* **85**, 034616 (2012).
- S. Hoblit, Y. -S. Cho, M. Herman, et al., "Neutron Cross Section Covariances for Structural Materials and Fission Products," *Nuclear Data Sheets* **112**, 3075 (2011).
- M. B. Chadwick, M. Herman, P. Obložinský, et al., "ENDF/B-VII.1 Nuclear Data for Science and Technology: Cross Sections, Covariances, Fission Product Yields and Decay Data," *Nuclear Data Sheets* **112**, 2887 (2011).
- F. Belloni, M. Calviani, N. Colonna, et al., "Measurement of the neutron-induced fission cross-section of  $^{243}\text{Am}$  relative to  $^{235}\text{U}$  from 0.5 to 20 MeV," *Eur. Phys. J. A* **47**, 160 (2011).
- G. Tagliente, P. M. Milazzo, K. Fujii, et al., " $^{96}\text{Zr}(n,\gamma)$  measurement at the nTOF facility at CERN," *Phys. Rev. C* **84**, 055802 (2011).
- R. Sarmiento, M. Calviani, J. Praena, et al., "Measurement of the  $^{236}\text{U}(n,f)$  cross section from 170 meV to 2 MeV at the CERN nTOF facility," *Phys. Rev. C* **84**, 044618 (2011).
- G. Tagliente, P. M. Milazzo, K. Fujii, et al., "Neutron capture on  $^{94}\text{Zr}$ : Resonance parameters and Maxwellian-averaged cross sections," *Phys. Rev. C* **84**, 015801 (2011).

- D. Tarrío, L. Tassan-Got, L. Audouin, et al., “Neutron-induced fission cross section of  $^{nat}\text{Pb}$  and  $^{209}\text{Bi}$  from threshold to 1 GeV: An improved parametrization,” *Phys. Rev. C* **83**, 044620 (2011).
- C. Lederer, N. Colonna, C. Domingo-Pardo, et al., “ $^{197}\text{Au}(n,\gamma)$  cross section in the unresolved resonance region,” *Phys. Rev. C* **83**, 034608 (2011).
- M. T. Pigni, M. Herman, P. Obložinský, et al., “Sensitivity analysis of neutron total and absorption cross sections within the optical model,” *Phys. Rev. C* **83**, 024601 (2011).
- F. Belloni, M. Calviani, N. Colonna, et al., “Neutron-induced fission cross-section of  $^{233}\text{U}$  in the energy range  $0.5 < E_n < 20$  MeV,” *Eur. Phys. J. A* **47**, 2 (2011).
- C. Paradela, L. Tassan-Got, L. Audouin, et al., “Neutron-induced fission cross section of  $^{234}\text{U}$  and  $^{237}\text{Np}$  measured at the CERN Neutron Time-of-Flight (nTOF) Facility,” *Phys. Rev. C* **82**, 034601 (2010).
- G. Tagliente, P. M. Milazzo, K. Fujii, et al., “The  $^{92}\text{Zr}(n,\gamma)$  reaction and its implication for stellar nucleosynthesis,” *Phys. Rev. C* **81**, 055801 (2010).
- C. Massimi, C. Domingo-Pardo, G. Vannini, et al., “ $^{197}\text{Au}$  cross-section in the resonance region,” *Phys. Rev. C* **81**, 044616 (2010).
- M. Calviani, J. Praena, U. Abbondanno, et al., “High-accuracy  $^{233}\text{U}(n,f)$  cross-section measurement at the white-neutron source nTOF from near-thermal to 1 MeV neutron energy,” *Phys. Rev. C* **80**, 044604 (2009).
- C. Guerrero, U. Abbondanno, et al., “The nTOF Total Absorption Calorimeter for neutron capture measurements at CERN,” *Nucl. Inst. Meth. In Phys. Res. A* **608**, 424 (2009).
- M. T. Pigni, M. Herman, and P. Obložinský, “Extensive set of cross section covariance estimates in the fast neutron energy region,” *Nucl. Sci. Eng.* **162**, 25 (2009).
- C. Domingo-Pardo, U. Abbondanno, G. Aerts, et al., “The measurement of the  $^{206}\text{Pb}(n,\gamma)$  cross section and stellar implications,” *J. Phys. G: Nucl. Phys.* **35**, 014020 (2008).
- M. Mosconi, M. Heil, F. Käppeler, et al., “Nuclear physics for the Re/Os clock,” *J. Phys. G: Nucl. Phys.* **35**, 014015 (2008).
- M. Herman, M. T. Pigni, P. Obložinský, et al., “Development of covariance capabilities in EMPIRE code,” *Nuclear Data Sheets* **109**, 2752 (2008).
- R. C. Little, T. Kawano, G. D. Hale et al., “Low-fidelity Covariance Project,” *Nuclear Data Sheets* **109**, 2828 (2008).

- G. Tagliente, P. M. Milazzo, K. Fujii, et al., “Experimental study of the  $^{91}\text{Zr}(n,\gamma)$  reaction up to 26 keV,” *Phys. Rev. C* **78**, 045804 (2008).
- G. Tagliente, K. Fujii, P. M. Milazzo, et al., “Neutron capture cross section of  $^{90}\text{Zr}$ : Bottleneck in the s-reaction flow,” *Phys. Rev. C* **77**, 035802 (2008).
- M. T. Pigni, M. Herman, P. Obložinský, “Estimated  $^{55}\text{Mn}$  and  $^{90}\text{Zr}$  cross section covariances in the fast neutron energy region,” *Nuclear Data Sheets* **109**, 2900 (2008).
- F. Gunsing, U. Abbondanno, G. Aerts, et al., “Status and outlook of the neutron time-of-flight facility nTOF at CERN,” *Nucl. Inst. Meth. In Phys. Res.* **B261**, 925 (2007).
- G. Aerts, U. Abbondanno, H. Alvarez, et al., “Neutron capture cross section of  $^{232}\text{Th}$  measured at the nTOF facility at CERN in the unresolved resonance region up to 1 MeV,” *Phys. Rev. C* **73**, 054610 (2006).
- S. Marrone, U. Abbondanno, G. Aerts, et al., “Measurement of the  $^{151}\text{Sm}(n,\gamma)$  cross section from 0.6 eV to 1 MeV via the neutron time-of-flight technique at the CERN nTOF facility,” *Phys. Rev. C* **73**, 034604 (2006).
- H. Leeb, E. Jericha, J. Kasper, et al., “Unique reconstruction of depth profiles in neutron specular reflectometry: practical aspects,” *Physica* **B356**, 41 (2005).
- E. Gadioli, G. F. Steyn, F. Albertini, et al., “Emission of intermediate-mass fragments in the interaction of  $^{16}\text{O}$  with  $^{59}\text{Co}$ ,  $^{93}\text{Nb}$  and  $^{197}\text{Au}$ ,” *Eur. Phys. J.* **A17**, 195 (2003).

### Conference Proceedings

- M. T. Pigni and L. C. Leal, “EVALUATED  $^{182,183,184,186}\text{W}$  NEUTRON CROSS SECTIONS AND COVARIANCES IN THE RESOLVED RESONANCE REGION,” ICNC 2015, Charlotte, North Carolina, September 13-17, 2015, (accepted for publication).
- M. L. Williams, F. Havluj, D. Wiarda, et al., “SCALE UNCERTAINTY QUANTIFICATION METHODOLOGY FOR CRITICALITY SAFETY ANALYSIS OF USED NUCLEAR FUEL,” ANS NCS D 2013 - Criticality Safety in the Modern Era: Raising the Bar Wilmington, NC, September 29-October 3, 2013, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2013).
- T. M. Shneidman, A. V. Andreev, M. T. Pigni, et al., “Angular Anisotropy of the Fission Fragments in the Dinuclear System Model,” *Nuclear Theory* Vol. 31, ed. A. Georgieva, N. Minkov, Heron Press, Sofia (2012) p. 25.
- T. M. Shneidman, A. V. Andreev, M. T. Pigni, et al., “Collective spectra along the fission barrier,” NSRT12 - International Conference on Nuclear Structure and Related Topics, Dubna, Russia, July 3-7, 2012, EPJ Web of Conferences Vol. 38 (2012).

- M. T. Pigni, M. E. Dunn, and K. H. Guber, “ $^{183}\text{W}$  Resonance Parameter Evaluation in the Neutron Energy Range Up to 5 keV,” PHYSOR 2012 - Advances in Reactor Physics - Linking Research, Industry, and Education, Knoxville, Tenn., April 15-20, 2012, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2012).
- M. Herman, P. Obložinský, C. Mattoon, et al., “AFCI-2.0 Library of Neutron Cross Section Covariances,” *Trans. Am. Nucl. Soc.*, **140**, 769 (2011).
- G. Palmiotti, M. Salvatores, H. Hiruta, et al., “Use of covariance matrices in a consistent (multiscale) data assimilation for improvement of basic nuclear parameters in nuclear reactor applications: from meters to femtometers,” *J. Korean Phys. Soc.* **59**, 1123 (2011).
- G. Palmiotti, M. Assawaroongruengchot, M. Salvatores, et al., “Nuclear Data Target Accuracies for Generation-IV Systems Based on the Use of New Covariance Data,” *J. Korean Phys. Soc.* **59**, 1264 (2011).
- C. Guerrero, F. Alvarez-Velarde, D. Cano-Ott, et al., “Study of Photon Strength Function of Actinides: the Case of  $^{235}\text{U}$ ,  $^{238}\text{Np}$  and  $^{241}\text{Pu}$ ,” *J. Korean Phys. Soc.* **59**, 1510 (2011).
- D. Cano-Ott, F. Alvarez-Velarde, E. Gonzalez-Romero, et al., “Neutron Capture Measurements on Minor Actinides at the nTOF Facility at CERN: Past, Present and Future,” *J. Korean Phys. Soc.* **59**, 1809 (2011).
- D. Tarrío, L. Tassan-Got, L. Audouin, et al., “High-energy Neutron-induced Fission Cross Sections of Natural Lead and Bismuth-209,” *J. Korean Phys. Soc.* **59**, 1904 (2011).
- C. Paradela, L. Tassan-Got, L. Audouin, et al., “ $^{237}\text{Np}(n,f)$  Cross Section: New Data and Present Status,” *J. Korean Phys. Soc.* **59**, 1908 (2011).
- M. Calviani, S. Andriamonje, E. Chiaveri, et al. “Fission Cross-section Measurements of  $^{233}\text{U}$ ,  $^{245}\text{Cm}$  and  $^{241;243}\text{Am}$  at CERN nTOF Facility,” *J. Korean Phys. Soc.* **59**, 1912 (2011).
- M. Herman, M. T. Pigni, F. S. Dietrich, et al., “Optical Model and Cross Section Uncertainties,” CNR\*09 - Second International Workshop on Compound Nuclear Reactions and Related Topics, Bordeaux, France, October 5-8, 2009.
- M. T. Pigni, M. Herman, C. M. Mattoon, et al., “Evaluation of  $^{23}\text{Na}$  Cross Sections for Nuclear Data Assimilation,” Wonder 2009 - 2<sup>nd</sup> International Workshop On Nuclear Data Evaluation for Reactor application, CEA Cadarache Château, France, September 29 - October 2, 2009.

- M. T. Pigni, M. Herman, and P. Obložinský, "Extensive set of low-fidelity cross section covariances in fast neutron region," International Conference on the Physics of Reactors ((Nuclear Power: A sustainable Resource)), Interlaken, Switzerland, September 14-19, 2008.
- M. T. Pigni, M. Herman, P. Obložinský, et al., "Extensive set of low-fidelity covariances in fast neutron region," 8<sup>th</sup> International Meeting on Nuclear Applications of Accelerator Technology, Pocatello, ID, July 30-August 2, 2007 p. 753.
- M. Herman, S. F. Mughabghab, P. Obložinský, et al., "EMPIRE ultimate expansion: resonances and covariances," International Conference on Nuclear Data for Science & Technology, Nice, France, April 22-27, 2007.
- D. Rochman, M. Herman, P. Obložinský, et al., "Neutron cross section covariances from thermal energy to 20 MeV," International Conference on Nuclear Data for Science & Technology, Nice, France, April 22-27, 2007.
- C. Guerrero, U. Abbondanno, G. Aerts, et al., "The neutron capture cross sections of <sup>237</sup>Np (n,γ) and <sup>240</sup>Pu (n,γ) and its relevance in the transmutation of nuclear waste," International Conference on Nuclear Data for Science & Technology, Nice, France, April 22-27, 2007, p. 627.
- H. Leeb and M. T. Pigni, "Basics statistics and consistent covariances for nuclear data files," Workshop on perspective of nuclear data in the next decade, Bruyères-le-Châtel, France, September 6-28, 2005, p. 233.
- H. Leeb, M. T. Pigni, and I. Raškinytė, "Covariances for evaluations based on extensive modeling," International Conference on NUCLEAR DATA for Science & Technology, Santa Fe, NM, September 28 - October 1, 2004, p. 161.
- M. T. Pigni and H. Leeb, "Uncertainty estimates of evaluated <sup>56</sup>Fe cross sections based on extensive modeling at energies beyond 20 MeV," Proceedings of the International Workshop on Nuclear Data for the Transmutation of Nuclear Waste, GSI-Darmstadt, September 1-5, 2003.
- E. Gadioli, G. F. Steyn, C. Birattari, et al., "Emission of Boron Fragments in Reactions Induced by <sup>16</sup>O up to 25 MeV/amu," Nuclear Theory'21, ed. V. Nikolaev, Heron Press, Sofia (2002) p. 223.

## Reports

- M. W. Francis, C. F. Weber, M. T. Pigni, et al., "Reactor Fuel Isotopics and Code Validation for Nuclear Applications," ORNL/TM-2014/464 (2015).
- G. Ilas, I. C. Gauld, R. M. Westfall, et al., "Evaluation of Hanford B Reactor Experiments (PTA-069 and PTA-084) for Code and Data Benchmarking," ORNL/TM-2014/53 (2014).



- Members of Subgroup 24, "Covariance Data in the Fast Neutron Region," Nuclear Science NEA/WPEC-24, NEA/NSC/WPEC/DOC(2010)427, OECD/NEA 2011.
- M. Herman, P. Obložinský, C. M. Mattoon, et al., "COMMARA-2.0 Neutron Cross Section Covariance Library," Internal Report BNL-94830-2011.
- P. Obložinský, C. M. Mattoon, M. Herman et al., "Progress on Nuclear Data Covariances: AFCI-1.2 Covariance Library," Internal Report BNL- 90897-2009.
- M. T. Pigni, F. S. Dietrich, M. Herman et al., "Can cross sections be accurately known a priori?," Internal Report BNL-81627-2008-CP.
- M. Herman, S. F. Mughabghab, P. Obložinský, et al., "Neutron cross section covariances in the resolved resonance region," Internal report BNL-80173-2008. April 2008.
- H. Leeb and M. T. Pigni, "Theoretical calculations of covariances for reactions on Lithium isotopes," Internal Report ATI-NDC-2006-01. January 2006.
- H. Leeb, K. Nikolics, and M. T. Pigni, "Theoretical calculations of covariances for reactions on Oxygen isotopes," Internal Report TTMN- 2006-139. February 2006.
- M. T. Pigni and H. Leeb, "Prior covariances with Talys for  $^{208}\text{Pb}$ ," Internal Report EFF-DOC-980. May 2006.
- M. T. Pigni and H. Leeb, "Covariance analysis of the  $^{232}\text{Th}(n,\gamma)$  measurements at the nTOF facility at CERN," Internal Report ATI-NDC- 2004-03. March 2004.
- M. T. Pigni and H. Leeb, "Covariance analysis of the  $^{151}\text{Sm}(n,\gamma)$  measurements at the nTOF facility at CERN," Internal Report ATI-NDC- 2004-02. February 2004.
- M. T. Pigni and H. Leeb, "Covariances for nuclear data evaluations strongly relying on modeling," Internal Report EFF-DOC-888.

## **Languages**

Italian (native speaker),  
English (full professional proficiency),  
German (elementary proficiency).

## **Military Service**

Artillery, Italian Army, "Reggimento Artiglieria a Cavallo" (2001).

## **Personal Interests**

Sport:

Track and Cycling (competitive)

Swimming (amateur)

Music:

Violin

## **Professional Membership**

American Nuclear Society (ANS) and American Physical Society (APS).

## **Notes**

Green Card holder.