

## CURRICULUM VITAE

### 1. Personal information

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**WWW:** <http://www.fuw.edu.pl/~dobaczew/>  
**Date of Birth:** May 9, 1952  
**Place of Birth:** Płońsk, POLAND  
**Family Status:** Divorced, two sons (Michał born 1977 and Piotr born 1985)  
**Present Employment:** Professor, Warsaw University & Jyväskylä University

### 2. Education and Degrees

**Secondary studies:** School "Jan Zamoyski" in Warsaw  
**M.Sc. in Physics:** Warsaw University, 1974  
**Ph.D. in Theoretical Nuclear Physics:** Warsaw University, 1979  
**D.Sc. (habilitation):** Warsaw University, 2 Sep. 1991  
**Professor degree:** Warsaw University, 8 Jul. 1997

### 3. Employment History

**Assistant:** Warsaw University, 1974 – 1980  
**Adjunct professor:** Warsaw University, 1980 – 1993  
**Associate professor:** Warsaw University, 1993 – 31 Jan. 2002  
**Full professor:** Warsaw University, 1 Feb. 2002 – present  
**FiDi professor:** Jyväskylä University, 2007 – 2011

## 4. Visiting Positions:

- Postdoc:** 18 months at the *Institut de Physique Nucléaire*  
Orsay, France, 1981-1982
- Postdoc:** 12 months at the W. K. Kellogg Laboratory, California Institute of Technology  
Pasadena, U.S.A., 1982-1983
- Visiting associate:** 12 months at the *Centre d'Etudes Nucléaires de Saclay*  
Saclay, France, 1987-1988
- Visiting associate:** 9 months at the *Institut de Physique Nucléaire*  
Orsay, France, 1988-1989
- Visiting professor:** Stellenbosch University, South Africa,  
August-September 1990
- Visiting professor:** *Centre d'Etudes Nucléaires de Saclay*  
Saclay, France, November-December 1990
- Visiting professor:** Stellenbosch University, South Africa,  
September-October 1991
- Visiting scholar:** Joint Institute for Heavy Ion Research  
Oak Ridge, U.S.A., November 1991
- Visiting professor:** Louisiana State University  
Baton Rouge, U.S.A., November 1991
- Visiting professor:** *Centre de Recherches Nucléaires de Strasbourg*  
Strasbourg, France, November 1992 – February 1993
- Visiting scholar:** Joint Institute for Heavy Ion Research  
Oak Ridge, U.S.A., July 1993
- Visiting professor:** Stellenbosch University, South Africa,  
August-September 1993
- Visiting professor:** *Centre de Recherches Nucléaires de Strasbourg*  
Strasbourg, France, October 1993 – December 1993
- Visiting professor:** Joint Institute for Heavy Ion Research  
Oak Ridge, U.S.A., October 1994 – December 1994
- Visiting scholar:** Joint Institute of Heavy Ion Research  
Oak Ridge, U.S.A., July 1995
- Visiting scholar:** Institute for Nuclear Theory  
Seattle, U.S.A., October – December 1995
- Visiting professor:** *Centre de Recherches Nucléaires de Strasbourg*  
Strasbourg, France, January 1996
- Visiting scholar:** Joint Institute of Heavy Ion Research  
Oak Ridge, U.S.A., August 1996
- Visiting professor:** *Centre de Recherches Nucléaires de Strasbourg*  
Strasbourg, France, October – December 1996
- Visiting professor:** University of Tennessee and Oak Ridge National Laboratory  
Oak Ridge, U.S.A., January 1997 – January 1998
- Visiting professor:** *Institut de Recherches Subatomiques de Strasbourg*  
Strasbourg, France, July 1998
- Visiting professor:** *Institut de Recherches Subatomiques de Strasbourg*  
Strasbourg, France, June – July 1999
- Visiting professor:** *Institut de Recherches Subatomiques de Strasbourg*  
Strasbourg, France, January – July 2000

**Visiting professor:** Joint Institute for Heavy Ion Research  
Oak Ridge, U.S.A., August – September 2000

**Visiting scholar:** Institute for Nuclear Theory  
Seattle, U.S.A., October – December 2000

**Visiting professor:** *Institut de Recherches Subatomiques de Strasbourg*  
Strasbourg, France, June – July 2002

**Visiting professor:** University of Tennessee and Oak Ridge National Laboratory  
Oak Ridge, U.S.A., October 2003 – January 2005

**Visiting professor:** *Université Louis Pasteur*  
Strasbourg, France, 14 June – 13 July, 2005

**Visiting professor:** University of Tennessee and Oak Ridge National Laboratory  
Oak Ridge, U.S.A., July 2006

## 5. Professional Societies & Activities:

**Member:** Polish Physical Society

**Member:** American Physical Society, Fellow 15 Nov. 1998

**Co-organizer:** ECT\* International Workshop on "Structure of Nuclei far from  $\beta$ -Stability", Trento, May 20-31, 1996

**Head:** Nuclear Structure Theory Division, Institute of Theoretical Physics, University of Warsaw, March 1997 – present

**Co-organizer:** INT Theory Program "Nuclear structure for the 21st century" Seattle, October 1 – December 10, 2000

**Associate Editor:** Nuclear Physics A, March 2000 – present

**Scientific Secretary and Editor of Proceedings:** International Conference "High Spin Physics 2001" Warsaw, February 6 – 10, 2001

**Member:** Board of Directors of the European Centre for Theoretical Studies in Nuclear Physics and Related Areas (ECT\*), Trento, Italy, June 2001 – June 2004

**Member:** National Advisory Committee of the Institute for Nuclear Theory at the University of Washington, 2002 – 2004, Chairman 2003 – 2004

**Member:** National Science Foundation panel to evaluate 2001 proposals in nuclear theory, January 2002

**Co-ordinator:** ECT\* Doctoral Training Programme 2003, Trento, Italy, June – September 2003

**Co-organizer:** INT workshop "Towards a Universal Density Functional for the Nucleus", Seattle, September 26-30, 2005

**Member:** RIA Theory Group Executive Committee, 2004 – 2005

**Member:** Editorial Board of Physical Review C, 2006 – 2008

**Co-organizer:** First FIDIPRO-JSPS Workshop on Energy Density Functionals in Nuclei Jyväskylä, Finland, October 25-27, 2007

**Member:** Editorial Board of Journal of Physics G, 2008 – 2010  
**Organizer:** FIDIPRO-UNEDF Collaboration Meeting on Nuclear Energy-Density-Functional Methods  
 Jyväskylä, Finland, October 9-10, 2008

## 6. Awards & Honors:

**Award:** Rector of the Warsaw University, 19 Nov. 1999  
**Professorial Grant:** Foundation for Polish Science (FNP), 14 June 2003

## 7. M.Sc. and Ph.D. Supervision:

**Krzysztof Burzyński, M.Sc. 1991:** Description of configuration mixing in many-body systems within the generator coordinate method  
**Elżbieta Perlińska, M.Sc. 1994:** Description of nuclear mean fields at high angular momenta  
**Krzysztof Burzyński, Ph.D. 1996:** Self-consistent description of proton impurities in nuclear matter of neutron stars  
**Jolanta Karny, M.Sc. 1999:** Rotational bands in superdeformed nuclei in the rare-earth region  
**Elżbieta Perlińska, Ph.D. 2001:** Self-consistent description of proton-neutron correlations in atomic nuclei  
**Rainald Kirchner, Ph.D. 2002:** Particle-number conserving mean-field description of drip-line nuclei  
**Przemysław Olbratowski, Ph.D. 2004:** Chiral and magnetic rotation in atomic nuclei studied within self-consistent mean-field method

## 8. Publications:

Until October 2008, my list of publications contained the following numbers of papers:

Papers published in periodicals	155
Papers submitted for publication in periodicals and papers in press	6
Popularized papers for general public	4
Papers published as preprints and e-prints	5
Conference invited talks	91
Conference communications	76
Total	312 <sup>a</sup>

<sup>a</sup>Excluding conference invited talks and communications that have been published in periodicals.

## 9. Citations:

According to Web of Science, until October 2008 my papers have been cited 4700 times, with the h-index of 38. Ten most cited papers are as follows:

	No. of citations
1. <b>J. Dobaczewski</b> , H. Flocard, J. Treiner: <i>Hartree-Fock-Bogolyubov description of nuclei near the neutron-drip line</i> , Nucl. Phys. <b>A422</b> (1984) 103.	389
2. <b>J. Dobaczewski</b> , W. Nazarewicz, T.R. Werner, J.F. Berger, C.R. Chinn, J. Dechargé: <i>Mean-field description of ground-state properties of drip-line nuclei: Pairing and continuum effects</i> , Phys. Rev. <b>C53</b> (1996) 2809.	279
3. <b>J. Dobaczewski</b> , I. Hamamoto, W. Nazarewicz, J.A. Sheikh: <i>Nuclear shell structure at particle drip lines</i> , Phys. Rev. Lett. <b>72</b> (1994) 981.	222
4. S. Ćwiok, <b>J. Dobaczewski</b> , P.-H. Heenen, P. Magierski, W. Nazarewicz: <i>Shell Structure of the Superheavy Elements</i> , Nucl. Phys. <b>A611</b> (1997) 211.	184
5. P.-G. Reinhard, D.J. Dean, W. Nazarewicz, <b>J. Dobaczewski</b> , J.A. Maruhn, M.R. Strayer: <i>Shape coexistence and the effective nucleon-nucleon interaction</i> , Phys. Rev. <b>C60</b> (1999) 014316.	113
6. D. Rudolph, C. Baktash, M.J. Brinkman, E. Caurier, D.J. Dean, M. Devlin, <b>J. Dobaczewski</b> , P.-H. Heenen, H.-Q. Jin, D.R. LaFosse, W. Nazarewicz, F. Nowacki, A. Poves, L.L. Riedinger, D.G. Sarantites, W. Satuła, C.-H. Yu: <i>Rotational bands in the doubly magic nucleus <math>^{56}\text{Ni}</math></i> , Phys. Rev. Lett. <b>82</b> (1999) 3763.	100
7. B. Gall, P. Bonche, <b>J. Dobaczewski</b> , H. Flocard, P.-H. Heenen: <i>Superdeformed rotational bands in the mercury region; a cranked Skyrme-Hartree-Fock-Bogolyubov study</i> , Z. Phys. <b>A348</b> (1994) 183.	95
8. D. Rudolph, C. Baktash, <b>J. Dobaczewski</b> , W. Nazarewicz, W. Satuła, M.J. Brinkman, M. Devlin, H.-Q. Jin, D.R. LaFosse, L.L. Riedinger, D.G. Sarantites, C.-H. Yu: <i>Prompt proton decay of a well-deformed rotational band in <math>^{58}\text{Cu}</math></i> , Phys. Rev. Lett. <b>80</b> (1998) 3018.	94
9. B. Chen, <b>J. Dobaczewski</b> , K.-L. Kratz, K. Langanke, B. Pfeiffer, F.-K. Thielemann, P. Vogel: <i>Influence of shell-quenching far from stability on the astrophysical r-process</i> , Phys. Lett. <b>B355</b> (1995) 37.	94
10. P. Bonche, <b>J. Dobaczewski</b> , H. Flocard, P.-H. Heenen, J. Meyer: <i>Analysis of the Generator Coordinate Method in a study of shape isomerism in <math>^{194}\text{Hg}</math></i> , Nucl. Phys. <b>A510</b> (1990) 466.	92

## 10. Scientific works:

In my diploma thesis, which I have completed in 1974 under the direction of S. G. Rohoziński, I investigated properties of the collective quadrupole states of nuclei which are soft against the triaxial  $\gamma$  deformation. Afterwards I studied dynamics of the nuclear quadrupole motion in terms of the generalized Bohr Hamiltonian with the inertial functions and the potential determined microscopically. In 1979 I have presented my Ph.D. thesis on a self-consistent method of determination of the inertial functions within the adiabatic time-dependent Hartree-Fock-Bogolyubov method.

Since 1979 I have been working on the boson expansion methods for fermion systems. I was able to derive a general classification of the available expansions in terms of the structure of their underlying Lie algebras.

During my stay in Orsay, I collaborated with H. Flocard on an improvement of the Skyrme interaction aiming at the simultaneous correct description of the mean-field and pairing properties of nuclei. We applied the improved force in a study of nuclei near the neutron-drip line within the Hartree-Fock-Bogolyubov method. We constructed and analyzed the solutions of pairing problem in the configuration space.

In collaboration with S. E. Koonin I worked at the California Institute of Technology on applications of the Monte-Carlo method to determine exact ground-state energies of many-fermion systems for a given two-body interaction. We used the functional integration methods and the real coherent states which we have constructed to determine the imaginary-time evolution of the system. At the same time I worked on the description of the zero-point motion of nuclear surface and its influence on the nuclear radii. Such an analysis allowed to explain the discrepancy between the mean-field results and the experimental data on radii of deformed nuclei.

In years 1983-1987 I worked in Warsaw on the self-consistent determination of structure of collective particle and quasiparticle pairs. Together with Dr J. Skalski, we tried in this way to derive the boson models of quadrupole excitations from the Hartree-Fock theory with an effective two-body interaction.

I continued my interest in self-consistent methods during my stay in Saclay, where I worked together with P. Bonche on the spontaneous left-right symmetry breaking under fast rotation. We also analyzed the charge densities of nuclei around  $^{208}\text{Pb}$ , trying to pin-point the effects of correlations in nuclear systems, and determined the shape-isomeric states in the mercury isotopes within the Generator Coordinate Method.

At the same time, I came back to the boson expansion problems and derived a new method of obtaining the boson-fermion mapping through a fermion expansion of boson operators. In a schematic single- $j$  shell model I also analyzed the structure of quadrupole collective excitations and showed that they can be fairly well described by single-particle coherent excitations of a spherical core.

Since many years I have been collaborating with physicists from Orsay, Saclay, Brussels, Lyon and Livermore working on a self-consistent description of superdeformed states in nuclei. In particular, we were interested in studying their decay modes, pairing properties, and octupole correlations.

My collaboration with the groups in Stellenbosch and Řež was concentrated on properties and applications of boson expansion in nuclear physics.

In collaboration with P. Haensel, I have been studying properties of neutron-star crust matter using self-consistent mean-field methods. In particular, we were interested in deriving the equation of state of the stellar medium at densities above the nuclear density. We also analyzed the problem of localization of protons diluted in neutron gas.

My collaboration with J. Dudek aims at a self-consistent description of nuclear rotation and exotic shapes with a particular emphasis on properties of tetrahedral and octahedral minima.

At present, my scientific activity is focused on deriving energy-density-functionals that would precisely describe nuclear spectroscopic data. This project is realized within the FIDIPRO project in Jyväskylä and in collaboration with W. Nazarewicz and the group in Oak Ridge. In particular, we study properties of exotic nuclei far from the beta stability as well as the shell structure and pairing correlations in these nuclei.