Curriculum Vitae

Personal information

Name: Jacek Jan Dobaczewski

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Date of Birth: May 9, 1952, **Place of Birth:** Płońsk, POLAND

Family Status: Married to Anna Kuśmidrowicz-Król, two sons (Michał born 1977 and Piotr born 1985)

Present Employment: Chair in Theoretical Nuclear Physics at the University of York (50% employment) & FiDi Professor at the University of Jyväskylä (50% employment).

Education and degrees

Secondary studies: School "Jan Zamoyski" in Warsaw

MSc in Physics: University of Warsaw, 1974

PhD in Theoretical Nuclear Physics: University of Warsaw, 1979

"Self-consistent method for the determination of nuclear inertia parameters"

DSc (habilitation): University of Warsaw, 2 September 1991

Professor degree: University of Warsaw, 8 July 1997

Employment history

Assistant: University of Warsaw, 1974 – 1980

Adjunct professor: University of Warsaw, 1980 – 1993

Associate professor: University of Warsaw, 1993 – 31 January 2002

Full professor: University of Warsaw, 1 February 2002 – 31 May 2015

FiDi professor: University of Jyväskylä, 1 January 2007 – 31 December 2017

Adjunct Senior Scientist: Helsinki Institute of Physics, 1 January 2014 – present, honorary position

Full professor: University of Warsaw, 1 June 2015 – present, honorary position

Full professor: Chair in Theoretical Nuclear Physics, University of York, 1 June 2015 – present

- 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 scholar: twice at the Institute for Nuclear Theory, Seattle, USA., for the total period of 6 months, 1995 – 2000

Visiting professor: three times at the Stellenbosch University, South Africa, for the total period of 4 months, 1990 – 1993

Visiting professor: nine times at the Centre de Recherches Nucléaires de Strasbourg, Institut de Recherches Subatomiques de Strasbourg, Université Louis Pasteur, Strasbourg, France, for the total period of 23 months, 1992 – 2005

Visiting professor: nine times at the Joint Institute for Heavy Ion Research, Oak Ridge National Laboratory, Oak Ridge, and University of Tennessee, Knoxville, USA, for the total period of 39 months, 1991 – 2013

- MSc and PhD Supervision

1. Krzysztof Burzyński, MSc, 1991: **Description of configuration mixing in many-body systems within the generator coordinate method**
2. Elżbieta Perlińska, MSc, 1994: **Description of nuclear mean fields at high angular momenta**
3. Krzysztof Burzyński, PhD, 1996: **Self-consistent description of proton impurities in nuclear matter of neutron stars**
4. Jolanta Karny, MSc, 1999: **Rotational bands in superdeformed nuclei in the rare-earth region**
5. Elżbieta Perlińska, PhD, 2001: **Self-consistent description of proton-neutron correlations in atomic nuclei**
6. Rainald Kirchner, PhD, 2002: **Particle-number conserving mean-field description of drip-line nuclei**
7. Przemysław Olbratowski, PhD, 2004: **Chiral and magnetic rotation in atomic nuclei studied within self-consistent mean-field method**
8. Francesco Raimondi, PhD, 2011: **Higher-order energy density functionals in nuclear self-consistent theory**

9. Yuan Gao, PhD, 2015: **Uncertainty analysis and symmetry restoration in nuclear self-consistent methods**

- Most important scientific positions of trust and administration

Head of the Nuclear Structure Theory Division, Institute of Theoretical Physics, University of Warsaw, March 1997 – August 2016

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

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

Member of the RIA Theory Group Executive Committee, 2004 – 2005

Member of the UK STFC Nuclear Physics Grant Panel, 2008 – 2018

Member of the Program Advisory Committee (PAC) of the JYFL Accelerator Laboratory, University of Jyväskylä, 2008 – 2010, **Chairman** 2009 – 2010

Member Belgian FNRS Commission des Sciences Exactes et Naturelles, 2010 – 2015

Member of the Steering Committee and Board of the Training in Advanced Low Energy Nuclear Theory (TALENT), 2011 – present

Member of the ISOLDE and Neutron Time-of-flight Committee (INTC), 2013 – 2016

- Most important scientific acknowledgements and awards

Award: Rector of the University of Warsaw, 19 November 1999

Academic Grant for Professors: Foundation for Polish Science (FNP), 14 June 2003

Finland Distinguished Professor Grants: Academy of Finland, 2006 & 2012

Award: Rector of the University of Warsaw, 19 November 2008

Award: Rector of the University of Warsaw, 19 November 2014

Wojciech Rubinowicz scientific prize: Polish Physical Society, 7 September 2015

- Scientific work

In my diploma thesis, which I completed in 1974 under the supervision of Professor S. G. Rohoziński, I investigated properties of the collective quadrupole states of nuclei that are soft against the triaxial γ deformation. In 1979 I presented my PhD thesis on the self-consistent method of determination of the inertial functions within the adiabatic time-dependent Hartree-Fock-Bogolyubov method.

During my stay in Orsay, I collaborated with H. Flocard on an improvement of the Skyrme interaction aimed at the simultaneous correct description of the mean-field and pairing properties of nuclei.

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.

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.

For 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 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.

My collaboration with J. Dudek (Strasbourg) aimed at a self-consistent description of nuclear rotation and exotic shapes with a particular emphasis on the 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 carried out within the FIDIPRO grant in Jyväskylä, and in collaboration with W. Nazarewicz and the group at MSU, with K. Bennaceur and the group at Lyon, and with C. Barbieri and the group at Surrey. In particular, we study properties of exotic nuclei far from beta stability, fission properties of transfermium nuclei, and shell structure and pairing correlations.

- Summary of the publication record as of 13th December 2016

Total of **215** papers published in international peer reviewed journals, of which **19** in **Physical Review Letters**, plus **4** papers submitted.

Total number of citations **9081** (without self-citations: **8044**) (database Web of Science).

The **h-index** of **53**

Total of **133 invited talks**.

Total of **92 conference communications**.

My most cited paper (**652 times**) is: Hartree-Fock-Bogolyubov description of nuclei near the neutron-drip line, J. Dobaczewski, H. Flocard, and J. Treiner, Nucl. Phys. A422, 103-139 (1984).

- Leadership role in organising scientific research

In years 1997 – 2015, I have been the Head of the Nuclear Structure Theory Division, in the Institute of Theoretical Physics at the University of Warsaw. During this time, I have been leading the scientific activity and defining research directions of a group of five to six nuclear theorists and numerous MSc and PhD students. At the same time, I was the Principal Investigator of a series of highly competitive research grants awarded by the Polish Committee for Scientific Research (KBN) and Polish Ministry of Science and Higher Education:

No. 2 P03B 034 08	1995 – 1997	11 participants	Budget of 310 000 PLN
No. 2 P03B 040 14	1998 – 2000	10 participants	Budget of 160 000 PLN
No. 5 P03B 014 21	2001 – 2003	12 participants	budget of 300 000 PLN
No. 1 P03B 059 27	2004 – 2006	14 participants	budget of 275 000 PLN
No. N N 202 328234	2008 – 2011	12 participants	budget of 250 000 PLN

Although the nominal budgets of these grants were not spectacularly large, they have been consistently amongst the largest awarded by the Polish grant agencies. The research activities of these grants attracted nuclear physicists from other Polish institutions beyond the immediate research environment of the University of Warsaw. In 2003, I was awarded a prestigious Academic Grant for Professors of the Foundation for Polish Science (http://www.fnp.org.pl/). This grant of 240 000 PLN and 36 months was to co-finance MSc and PhD students collaborating with my research group.

The most substantial and fascinating leadership opportunity started for me in 2006, when I was awarded with the Academy-of-Finland FIDIPRO (Finland Distinguished Professor) grant (http://www.fidipro.fi/pages/home.php) of 60 months, which I have realised at the University of Jyväskylä. In 2012. I was awarded the second FIDIPRO grant for years 2013 – 2017. These grants were matched by equal amounts of financial support from the University of Jyväskylä. They allowed me to build up an entirely new group of theorists who were and will be able to undertake extremely ambitious tasks.

On 1 June 2015, another fantastic opportunity begun for me, when I was appointed the Chair in Theoretical Nuclear Physics at the University of York, UK. My mission at York is to establish a new theory group that will complement the work of York's experimental groups and will work closely with theory groups at Universities of Manchester and Surrey, as well as other groups across Europe and beyond.

- Published computer codes

Four large computer codes published in 11 papers in *Computer Physics Communications*:
HFBTHO: *Comput. Phys. Commun*. **167** (2005) 43
HFBRAD: *Comput. Phys. Commun*. **168** (2005) 96
HOSPHE: *Comput. Phys. Commun*. **181** (2010) 1641
HFODD: *Comput. Phys. Commun*. **183** (2012) 166, plus 7 earlier publications.

- Meetings organised

Numerous memberships in steering and programme committees of international conferences and several conferences co-organised. **Four international meetings** organised in the period of 2000 – 2009:

NATO Advanced Research Workshop: High Spin Physics 2001, Warsaw, Poland, 6-10 February, 2001

First FIDIPRO-JSPS Workshop on Energy Density Functionals in Nuclei, Keurusselka, Finland, 25-27 October, 2007

FIDIPRO-UNEDF collaboration meeting on nuclear energy-density-functional methods, Jyväskylä, Finland, 9-10 October, 2008

Arctic FIDIPRO-EFES Workshop: Future Prospects of Nuclear Structure Physics, Saariselkä, Finland 20-24 April, 2009

- Peer review activities

Numerous **papers peer reviewed** for Nature, Physical Review Letters, Physical Review C, Nuclear Physics A, European Journal of Physics A, Journal of Physics G, Europhysics Letters, Computer Physics Communications, Foundations of Physics, Physics Letters B.

Numerous **grant applications peer reviewed** for Polish Ministry of Science and Higher Education (MNiSW), Polish National Science Centre (NCN), Polish National Centre for Research and Development (NCBiR), Foundation for Polish Science (FNP), European Research Council (ERC), Fonds de la Recherche Scientifique (FNRS), Croatian Science Foundation (HRZZ), Natural Sciences and Engineering Research Council of Canada (NSERC), Office of Science of the U.S. Department of Energy (DOE)

Numerous **peer reviewed** job applications, promotion applications, MSc Theses, PhD Theses, and DSc Theses.

- Memberships in editorials boards of international journals and professional societies

Member of the Polish Physical Society
Fellow of the American Physical Society since 15 November 1998
Associate Editor: *Nuclear Physics A*, March 2000 – December 2016
Member of the Editorial Board of *Physical Review C*, 2006 – 2008
Member of the Editorial Board of *Journal of Physics G*, 2008 – 2019. **Associate Editor** since 2014, **Editor-in-Chief** since 2017
Specialist Editor of *Computer Physics Communications*, 2011 – 2014

- Teaching and dissemination

During my 40-odd-years-long academic career, I have been teaching numerous courses and tutorials on all subjects of the theoretical-physics curriculum and on many subjects of mathematics, experimental physics, and numerical methods taught at the University of Warsaw. In particular, I gave courses on: Quantum Mechanics, Electrodynamics, Thermodynamics, Statistical Physics, Classical Mechanics, Many-Body Theory, and Theoretical Nuclear Physics.

I gave numerous graduate and post-graduate theoretical-nuclear-physics courses at various international schools, and in particular at:

- International Summer School on Subatomic Physics, 2nd Course (Beijing) 2001
- Ecole Internationale Joliot-Curie (Maubuisson) 2002
- 3rd International Balkan School of Nuclear Physics (Thessaloniki) 2002
- Third RIA Summer School on Exotic Beam Physics (Argonne) 2004
- Ecole Doctorale de Physique, Chimie Physique et Mathématiques (Strasbourg), 2005
- Theoretical nuclear physics school "Exotic Nuclei: New Challenges" (Les Houches) 2007
- The 18th Jyväskylä Summer School (Jyväskylä) 2008
- 15th Euroschool on Exotic Beams (Piaski) 2008
- 20th Chris Engelbrecht Summer School in Theoretical Physics (Stellenbosch) 2009
- ECT* Doctoral Training Programme, Strongly Correlated Quantum Systems (Trento) 2009
- The 9th CNS-EFES International Summer School (Tokyo) 2010
- The 18th STFC UK Postgraduate Nuclear Physics Summer School (Lancaster) 2015
- The TALENT Course on *Density functional theory and self-consistent methods* (York) 2016

Based on my courses and lectures, I am currently writing a book on ***Nuclear structure physics, mean-field methods and density functionals***, for which in 2011 I have signed a contract with Oxford University Press UK.