

## CURRICULUM VITAE

### Personal data

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Date of birth: 23 March 1940  
Place of birth: Vilnius, Lithuania  
Status: married to Maria Anna Polaszek, 3 children  
Nationality: Polish

### Degrees:

1962 MSc, Theoretical Physics  
1968 PhD, Quantum Chemistry  
1974 Dr. hab., Atomic and Molecular Physics  
All degrees from Nicolaus Copernicus University, Toruń, Poland

### Positions:

1962-1969 Assistant at the Department of Theoretical Physics,  
Nicolaus Copernicus University, Toruń, Poland  
1969-1975 Adjunct at the Institute of Physics, the same University  
1975-1988 Docent at the same Institute  
1978-1981 Deputy Director of the Institute  
1975-2005 Head of a research group  
1988-2010 Full Professor at the same Institute  
2010- Professor Emeritus at the same Institute

### Fellowships and visiting positons:

- 1972-73 – Department of Chemistry, University of Alberta, Edmonton, Canada (Postdoctoral Fellow with Prof. S. Fraga),
- 1975 (3 months), 1978 (3 months) – Department of Chemistry, University of Alberta, Edmonton, Canada (Research Associate with Prof. S. Fraga),

- 1980 (4 months) – Zentrum für Interdisziplinäre Forschung, Bielefeld, Germany (Visiting Scientist, Prof. J. Hinze),
- 1985-2000 (one to three months every year) – Max-Planck-Institut für Physik und Astrophysik, Institut für Astrophysik, Garching, Germany (Visiting Scientist, Prof. G. H. F. Diercksen),
- 1987/88 (one year) – Instituto de Ciencia de Materiales, Consejo Superior de Investigaciones Científicas, Madrid, Spain (Visiting Professor, cooperation with Prof. C. Valdemoro),
- 1989 (one month) – Universidad de Valladolid, Spain (Visiting Professor, cooperation with Prof. I. Martin),
- 1990 (one month), 1993 (one month) – Universidad de la Republica, Montevideo, Uruguay (Visiting Professor, cooperation with Prof. O. Ventura),
- 1990 (two months), 1991 (one month), 1993 (one month), 2000 (one month) – Universitat de Girona, till 1992 Col·legi Universitari de Girona, Girona, Spain (Visiting Professor, cooperation with Prof R. Carbó-Dorca),
- 1992, 1994, 1996, 1997 (one month each year) – Universitat Jaume I, Castelló, Spain (Visiting Professor, cooperation with Prof. J. Planelles),
- 1999 (three months) – Nagoya City University, Nagoya, Japan (Visiting Professor, cooperation with Prof. H. Tatewaki),
- 1998, 2000, 2001, 2003 (two weeks each year) – Indian Association for the Cultivation of Science, Calcutta, India (Visiting Professor, cooperation with Prof. P. K. Mukherjee).

## Research:

- Relativistic effects in atoms and molecules
- Exactly and quasi-exactly solvable problems
- Configuration interaction methods
- Group theoretical approaches to many-electron problems
- Statistical theory of spectra
- Theory of mesoscopic systems
- Atomic Hartree-Fock and Dirac-Fock calculations

- Structure of organic molecules and molecular complexes

**Publications:**

- 180 papers in scientific journals
- Coauthor (with S. Fraga and K. M. S. Saxena) of two books:
  1. "Handbook of Atomic Data", Elsevier, Amsterdam 1976
  2. "Atomic Energy Levels", Elsevier, Amsterdam 1979

**Teaching:** (Undergraduate and graduate courses)

- Advanced and intermediate quantum mechanics
- Contemporary physics
- Atomic and molecular physics
- Quantum chemistry
- Numerical methods
- Group theory for quantum chemists
- Classical mechanics

## LIST OF PUBLICATIONS

1. W. Woźnicki, J. Dolewski, K. Jankowski, J. Karwowski and S. Kwiatkowski  
Electronic Structure of Nitrogen Heterobenzenes, Bull. Acad. Polon. Sci., Ser. sci. math. astronom. et phys 12 (1964) 655-661
2. J. Karwowski  
The Optimal Empirical Parameters in  $SCF - MO - CI$  Theory, Bull. Acad. Polon. Sci., Ser. sci. math. astronom. et phys. 14 (1966) 319-324
3. J. Karwowski  
On the Choice of Empirical Parameters in  $SCF - MO - CI$  Theory, Bull. Acad. Polon. Sci., Ser. sci. math. astronom. et phys. 15 (1967) 521-527
4. J. Karwowski  
Effect of Doubly Excited Configurations on the Locations of Electronic Levels in Benzene, Bull. Acad. Polon. Sci., Ser. sci. math. astronom. et phys. 16 (1968) 141-147
5. J. Karwowski, J. Wasilewski and W. Woźnicki  
On the Inclusion of Doubly Excited Configurations in  $SCF - MO - CI$  Calculations for some Heterobenzenes, Bull. Acad. Polon. Sci., Ser. sci. math. astronom. et phys. 16 (1968) 259-264
6. J. Karwowski  
A Method of Choice of Empirical Parameter Values in Molecular Orbital Theories, Acta Phys. Polon. A37 (1970) 417-428
7. J. Karwowski  
Evaluation of Empirical Parameters from Spectroscopic Data by the Least Squares Method, Acta Phys. Polon. A42 (1972) 647-654
8. J. Karwowski  
On the Role of Configuration Interaction and Multicenter Corrections in Semiempirical  $\pi$ -Electron Theory, Acta Phys. Polon. A42 (1972) 655-662
9. J. Karwowski  
Complete Configuration Interaction Calculation of Doublet Energy Levels of Benzene Ions, Bull. Acad. Polon. Sci., Ser. sci. math. astronom. et phys. 20 (1972) 413-416
10. J. Karwowski  
Assignment of the Electronic Transitions in Benzene, J. Mol. Structure 19 (1973) 143-166

11. J. Karwowski  
The Electronic Spectrum of Benzene, Chem. Phys. Letters 18 (1973) 47-50
12. J. Karwowski and A. Łodzińska  
The Crystal-Field-Independent Transitions in Orthoaxial  $MnII$  Complexes, J. Mol. Structure 19 (1973) 709-717
13. J. Karwowski  
Matrix Elements of One- and Two-Electron Operators, Theoret. Chim. Acta (Berlin) 29 (1973) 151-166
14. J. Karwowski  
Matrix Elements of Spin-Dependent Operators, Chem. Phys. Letters 19 (1973) 279-283
15. S. Fraga, K.M.S. Saxena and J. Karwowski  
Hartree-Fock Ionization Potentials of Atoms, Can. J. Phys. 51 (1973) 2063-2074
16. S. Fraga, J. Karwowski and K. M. S. Saxena  
Hartree-Fock Values of Coupling Constants, Polarizabilities, Susceptibilities and Radii for Neutral Atoms and First Four Positive Ions. Helium to Nobelium, Atomic Data and Nuclear Data Tables 12 (1973) 467-477
17. S. Fraga and J. Karwowski  
Electronic Structure of Atoms, Technical Report TC-AS-II-73 of the Department of Chemistry University of Alberta, Edmonton 1973, pp 82. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
18. J. Karwowski and S. Fraga  
Matrix Elements for Many-Electron Atoms: Electrostatic Interaction Energies for One-Open-Shell Configurations, Technical Report TC-ME-I-73 of the Department of Chemistry University of Alberta, Edmonton 1973, pp 81. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
19. J. Karwowski  
Results of the Spectral Matching Procedure for Benzene Technical Report, Institute of Physics, Nicholas Copernicus University, Preprint No. 268, Toruń 1974, pp 31
20. J. Karwowski and S. Fraga  
Matrix Elements for Many-Electron Atoms. Electrostatic Interaction Energies, Can. J. Phys. 52 (1974) 238-240

21. J. Karwowski and S. Fraga  
Nuclear Mass Dependence of the Dirac-Breit-Pauli Hamiltonian, *Can. J. Phys.* 52 (1974) 536-540
22. S. Fraga and J. Karwowski  
Some Forgotten Terms in the Dirac-Breit-Pauli Hamiltonian, *Can. J. Phys.* 52 (1974) 1045
23. J. Karwowski and S. Fraga  
State Functions for Many Electron Atoms: Eigenfunctions of  $L^2$  and  $S^2$  for One-Open-Shell Configurations, *Can. J. Phys.* 52 (1974) 1672-1675
24. J. Karwowski and S. Fraga  
State Functions for Many-Electron Atoms: Eigenfunctions of  $J^2$  and  $S^2$  for One-Open-Shell Configurations, *Can. J. Phys.* 52 (1974) 1845-1846
25. J. Karwowski and S. Fraga  
State Functions for Many-Electron Atoms: Eigenfunctions of  $L^2$  and  $S^2$  for One- and Two-Open-Shell Configurations, Technical Report TC-SF-I-74 of the Department of Chemistry University of Alberta, Edmonton 1974, pp 71. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
26. J. Karwowski and S. Fraga  
State Functions for Many-Electron Atoms: Eigenfunctions of  $J^2$  and  $S^2$  for  $p^N$ ,  $d^N$ , and  $f^N$  Configurations, Technical Report TC-SF-II-74 of the Department of Chemistry University of Alberta, Edmonton 1974, pp 69. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
27. J. Karwowski and S. Fraga  
State Functions for Many-Electron Atoms: Eigenfunctions of  $J^2$  and  $S^2$  for  $f^6$  Configurations Technical Report TC-SF-III-74 of the Department of Chemistry University of Alberta, Edmonton 1974, pp 92. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
28. J. Karwowski and S. Fraga  
State Functions for Many-Electron Atoms: Eigenfunctions of  $J^2$  and  $S^2$  for  $f^7$  Configurations, Technical Report TC-SF-IV-74 of the Department of Chemistry University of Alberta, Edmonton 1974, pp 114. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa

29. J. Karwowski and S. Fraga  
Electronic Structure of the Alkaline Metals: Lithium Series, *Acta Phys. Polon.* A45 (1974) 405-411
30. S. Fraga and J. Karwowski  
Relativistic Treatments for Bound-State Atomic Energies, *Theoret. Chim. Acta* (Berlin) 35 (1974) 183-187
31. J. Karwowski and S. Fraga  
Matrix Elements for Many-Electron Atoms: Electrostatic Interaction. Energies for Two-Open-Shell Configurations, Technical Report TC-ME-II-74 of the Department of Chemistry University of Alberta, Edmonton 1974, pp 354. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
32. J. Karwowski and S. Fraga  
Matrix Elements for Many-Electron Atoms: Spin-Orbit Interaction for One-Open-Shell Configurations Technical Report TC-ME-III-74 of the Department of Chemistry University of Alberta, Edmonton 1974, pp 107. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
33. S. Fraga and J. Karwowski  
Tables of Hartre-Fock Atomic Data, Department of Chemistry, University of Alberta, Edmonton 1974, 350 pages
34. J. Karwowski,  
Metoda obliczania elementów macierzowych pomiędzy funkcjami typu *SAAP* i jej zastosowania w teorii atomów i drobin, Uniwersytet Mikołaja Kopernika, Toruń, 1974, 39 pages
35. J. Karwowski  
Matrix Elements of Spin-Dependent Operators. Part II: N-Electron Integrals Over Spin Variables, *Acta Phys. Polon.* A48 (1975) 553-557
36. S. Fraga, K.M.S. Saxena, J. Karwowski and B. Bray  
Atomic Ionization Potentials Derived from Theoretical Calculations, *Can. J. Phys.* 53 (1975) 2415-2420
37. J. Karwowski, K. M. S. Saxena and S. Fraga  
Fine Structure Intervals in Transition Elements, *Can. J. Phys.* 53 (1975) 2421-2427

38. J. Karwowski, K.M.S. Saxena and S. Fraga.  
Matrix Elements for Many-Electron Atoms: Electrostatic and Spin-Orbit Interaction Energies for One-Open-Shell Configurations, Technical Report TC-ME-IV-75 of the Department of Chemistry University of Alberta, Edmonton 1975, pp 85. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
39. S. Fraga, K.M.S. Saxena and J. Karwowski  
Hartree-Fock Atomic Data, Department of Chemistry, University of Alberta, Edmonton 1975, 309 pages
40. J. Karwowski, K.M.S. Saxena, B. Bray and S. Fraga  
Atomic Energy Levels: Isoelectronic Series  $2p^n$ ,  $3p^n$ ,  $4p^n$  and  $3d^n$ , Technical Report TC-AEL-I-75 of the Department of Chemistry University of Alberta, Edmonton 1975, pp 59. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
41. K.M.S. Saxena, J. Karwowski and S. Fraga  
Atomic Energy Levels: Isoelectronic Series  $3d^8$ ,  $4p^4$ ,  $4d^n$ ,  $5p^n$ ,  $4f^n$ ,  $5d^n$ ,  $6p^n$ , and  $5f^n$ , Technical Report TC-AEL-II-76 of the Department of Chemistry University of Alberta, Edmonton 1976, pp 226. The Report is available from the Rare Earth Information Center, Institute of Atomic Research, Iowa State University, Ames, Iowa
42. S. Fraga, J. Karwowski and K. M. S. Saxena  
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43. A. Bielski, J. Karwowski and J. Wolnikowski  
A Numerical Method for Separation of Overlapping Components of a Spectral Line, Optics Commun. 23 (1977) 362-364
44. J. Karwowski and M. Kłobukowski  
A Relativistic Pseudopotential for Spherical Systems, Acta Phys. Polon. A54 (1978) 237-242
45. M. Szulkin and J. Karwowski  
The Effect of Core Polarization on Oscillator Strengths and on the Locations of Energy Levels in Sodium, Acta Phys. Polon. A54 (1978) 231-236
46. M. Kłobukowski and J. Karwowski  
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47. A. Surdykowski, J. Karwowski, E. Danileczuk and L. Światała  
Optimum Parameters for the Ligand Field Model, Polish J. Chem. 52 (1978)  
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48. S. Fraga, K. M. S. Saxena and J. Karwowski  
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Sciences Data, 482 pages
49. W. Duch and J. Karwowski  
Coupling Constants in the Direct CI Method, Theoret. Chim. Acta (Berlin)  
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50. J. Karwowski and M. Szulkin  
An Application of Relativistic Pseudopotentials in Atomic Hartree-Fock Cal-  
culations: Lithium Series, Acta Phys. Polon. A56 (1979) 835-838
51. J. Karwowski and M. Anioła  
Relativistic Effects in Three-Electron Atoms, Acta Phys. Polon. A58 (1980)  
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52. J. Karwowski and J. Kobus  
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53. J. Karwowski and M. Szulkin  
Relativistic Calculations on the Alkali Atoms by a Modified Hartree-Fock Method,  
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Symmetric Group Graphical Approach to CI Method, Lecture Notes in Chem-  
istry (J. Hinze, Ed.), vol. 22, p. 260-271, Springer, Berlin 1981
55. M. Szulkin and J. Karwowski  
Core Polarization and Relativistic Effects in the Alkali Atoms, J. Phys. B: At.  
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56. W. Duch and J. Karwowski  
Symmetric Group Graphical Approach to the Direct Configuration Interaction  
Method, Intern. J. Quantum Chem. 22 (1982) 783-824
57. W. Nowak, J. Karwowski and M. Kłobukowski  
Relativistic and Correlation Corrections to Electron Affinities of Alkali and  
Halogen Atoms, Theoret. Chim. Acta (Berlin) 63 (1983) 313-316
58. J. Karwowski  
Review of a book "Symmetry Properties of Molecules" by G. S. Ezra, Springer,  
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59. J. Karwowski  
Review of a book "Elementy Mechaniki i Chemii Kwantowej" by A. Gołbiewski,  
PWN, Warszawa 1982, Polish J. Chem. 58 (1984) 314-317
60. M. Bancewicz and J. Karwowski  
A Study on Atomic Energy Level Distribution, Acta Phys. Polon. A 65 (1984)  
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61. W. Nowak, J. Karwowski and J. Dembczyński  
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63. J. Karwowski and J. Styszyński,  
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66. J. Karwowski, W. Duch and C. Valdemoro,  
Matrix Elements of Spin-Adapted Reduced Hamiltonian, Phys. Rev. A 33  
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67. M. Bancewicz and J. Karwowski  
Statistical Behaviour of Energy Levels in  $(d + s)^8$  Spectra of *FeI*, *CoII* and  
*RuI* Atoms, Acta Phys. Polon. A69 (1986) 665-672
68. J. Karwowski and J. Kobus  
The Dirac Second-Order Equation and an Improved Quasirelativistic Theory  
of Atoms, Int. J. Quantum Chem. 30 (1986) 808-819
69. W. Duch and J. Karwowski  
A Multireference Direct CI Program Based on the Symmetric Group Graphical  
Approach, Theoret. Chim. Acta (Berlin), 71 (1987) 187-199

70. J. Kobus, J. Karwowski and W. Jaskólski  
Matrix Elements of  $r^q$  for Quasirelativistic and Dirac Hydrogenic Wavefunctions, *J. Phys. A: Math. Gen.* 20 (1987) 3347-3352
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Quasirelativistic Calculations of the Elastic Scattering of Slow Electrons from *Xe* Atom, *Physica Scripta* 36 (1987) 436-440
72. M. Bancewicz and J. Karwowski  
On Moment-Generated Spectra of Atoms, *Physica* 145C (1987) 241-248
73. G.H.F. Diercksen and J. Karwowski  
Invariance Properties of the Moments of the Hamiltonian Matrix as a Test of Correctness of Configuration Interaction Programs, *Computer Phys. Commun.* 47 (1987) 83-89
74. J. Karwowski i M. Bancewicz  
The First Two Moments of Energy Level Distributions in  $N$ -Electron Spin-Adapted Model Spaces, *J. Phys. A: Math. Gen.* 20 (1987) 6309-6320
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Reply to "The Spin-Adapted Reduced Hamiltonian in View of the Spectral Distribution Method", *Phys. Rev. A* 37 (1988) 2712-2713
76. J. Karwowski, W. Jaskólski and J. Kobus  
Comment on "A Comparison of Relativistic and Quasirelativistic Line Strengths" by A. K. Mohanty and D. H. Sampson, *Physica Scripta* 38 (1988) 554-556
77. W. Duch, J. Karwowski, G.H.F. Diercksen, and S. Rettrup  
A Comment on Several Results of *CI* Calculations for  $H_2O$ , *Chem. Phys. Letters* 144 (1988) 421-422
78. J. Styszyński and J. Karwowski  
Multiconfiguration Dirac-Fock Study on the Ground State Energies of Two-Electron Atoms, *J. Phys. B: At. Mol. Phys.* 21 (1988) 2389-2397
79. L. Lain, A. Torre, J. Karwowski and C. Valdemoro  
Matrix Elements of the Third-Order Spin-Adapted Reduced Hamiltonian, *Phys. Rev. A* 38 (1988) 2721-2728
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The Second-Order Spin-Adapted Reduced Hamiltonian in the Coordinate Representation, *Phys. Rev. A* 39 (1989) 4967-4971

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Symmetric Group Approach to Theory of Many-Electron Systems: Several Non-Standard Applications, in "Quantum Chemistry Basic Aspects, Actual Trends", R. Carbo editor, Elsevier, Amsterdam 1989, ss 213-232
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83. J. Planelles, C. Valdemoro and J. Karwowski  
Symmetric Group Approach to the Study of Traces of  $p$ -order Reduced Density Operators and their Products, Phys. Rev. A 41 (1990) 2391-2397
84. G.H.F. Diercksen, W Duch and J. Karwowski  
CI Calculation on the Rydberg Spectrum of  $H_3$ , Chem. Phys. Letters 168 (1990) 69-74
85. G.H.F. Diercksen, W. Duch and J. Karwowski  
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86. W. Jaskólski, J. Karwowski and J. Kobus  
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87. J. Styszyński and J. Karwowski  
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88. J. Planelles and J. Karwowski  
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89. J. Planelles, C. Valdemoro and J. Karwowski  
Matrix Elements of Spin-Adapted Reduced Hamiltonians, Phys. Rev. A 43 (1991) 3392-3400
90. I. Martin and J. Karwowski  
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91. J. Karwowski and I. Martin  
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Symmetric Group Approach to Theory of Many-Electron Systems in Finite-Dimensional Hilbert Spaces in "Symmetry and Structural Properties of Condensed Matter" W. Florek, T. Lulek and M. Mucha, editors, World Scientific, Singapore, 1991, pp 258-264
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94. I. Martin, J. Karwowski, C. Lavin and G. H. F. Diercksen  
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A Numerical Study on the Validity of the Breit-Pauli Approximation, J. Phys. B: At. Mol. Opt. Phys. 24 (1991) 4877-4886; **Erratum: 25 (1992) 2763-2764**
96. C. Lavin, I. Martin and J. Karwowski  
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97. J. Planelles and J. Karwowski  
Some Results for Symmetric-Group-Adapted Reduced Density Operators Theoret. Chim. Acta (Berlin) 82 (1992) 239-248
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Quantum Defect Orbital Study of Electron Transitions in Rydberg Molecules. I. Triatomic Hydrogen *Intern. J. Quantum Chem.* **S27** (1993) 723-730.
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Statistical Properties of Spin-Adapted Reduced Hamiltonians *Intern. J. Quantum Chem.* **51** (1994) 487-497.
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Core Polarisation Effects in the Relativistic Quantum Defect Orbital Theory *Acta Phys. Polon. A* **85** (1994) 805-812.
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Statistical Properties of Spectra of Finite Systems in "Symmetry and Structural Properties of Condensed Matter" T. Lulek, W. Florek and S. Wałcerz, editors, World Scientific, Singapore, 1995, pp 67-76.
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An Application of Murnaghan-Nakayama Rule in Statistical Spectroscopy of the Heisenberg Hamiltonian *Lithuanian Journal of Physics* **35** (1995) 171-175.
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Statistical Theory of Vibronic Spectra. Envelopes of the Electronic Bands *Phys. Rev. A* **52** (1995) 1067-1071.
112. F. Rajadell, J. Planelles, J. Karwowski and V. Mas  
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113. J. Karwowski  
 Model Spaces in Theory of Many-Electron Systems Proceedings of the Ninth International School of Condensed Matter Physics, Białowieża, July 16-25, 1995. Institute of Physics, Warsaw University Branch, Białystok, October 1995. Contribution No. 10, 48 pages.
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### Conferences attended (since 1987):

1. Symposium on Computational Quantum Chemistry and Parallel Processors, University of Alberta, Edmonton, Canada, 30 June - 2 July 1987; Invited lecture: "A multireference direct CI program based on the symmetric group graphical approach" (with W. Duch).
2. XIV Arbeitstagung über Probleme der Quantenchemie, Ostseebad Kühlungsborn, DDR, 16 - 21 March 1987; Poster: "Symmetric group approach to CI method" (with W. Duch)
3. 5-th School on Advanced Methods of Quantum Chemistry, Bachotek, 31 May - 5 June 1987, coorganizer; 5 posters: 1. Properties of exact solutions of PPP model (with W. Nowak) 2. Relativistic correlation cross effects (with J. Styszyński) 3. Statistical properties of spectra (with M. Bancewicz) 4. Symmetric group approach to CI methods (with W. Duch) 5. Quasirelativistic scattering (with W. Jaskólski and J. Kobus).
4. XVII Congreso de Químicos Teóricos de Expresión Latina, Peniscola, 22 - 25 September 1987; 3 posters: 1. Límites de precisión en cálculos de muchos cuerpos: Interdependencia de los efectos relativistas y de correlación en la serie isoelectrónica del helio (with J. Styszyński). 2. Aplicación de métodos de la teoría de distribución de densidad espectral a la verificación de programas de interacción de configuraciones (with G. H. F. Dierksen). 3. Hamiltonianos reducidos con adaptación de espín y momentos de distribución de densidad espectral (with C. Valdemoro).
5. "Curso Monográfico Sobre Técnicas Avanzadas en Química Cuántica" 15 - 19 February 1988, Universidad de Barcelona; Prof. J. Novoa Series of 10 lectures: "Symmetric group approach to many-electron problems".
6. I Congreso Nacional del GEFAM (Grupo Especializado de Física Atómica y Molecular del Real Sociedad Española de Física y Real Sociedad Española de Química; Consejo Superior de Investigaciones Científicas, Madrid, 8 - 9 April 1988, Invited lecture: "Statistical Properties of Atomic Spectra".
7. Workshop on Quantum Chemistry: Basic Aspects, Actual Trends; Girona, 12 - 18 June 1988, Invited lecture: "Symmetric Group Approach to Theory of Many Electron Systems: Several Non-Standard Applications"; Posters: 1. Matrix Representations of Semiempirical Hamiltonians (with W. Nowak). 2. Correlation Relativistic Cross-Term Effects for Helium-Like Atoms (with J. Styszyński) 3. Many-channel quasi-relativistic scattering theory (W. Jaskólski)
8. Laboratoire de Chimie Quantique, Strasbourg, 28 VI 1988, (prof. Marc Bernard); lecture: "New SGA CI Program"

9. Sixth International Congress on Quantum Chemistry, Jerusalem, 21 - 25 August 1988, Poster "The Third Order Spin-Adapted Reduced Hamiltonian" (with L. Lain, A. Torre and C. Valdemoro, presented by L. Lain).
10. XV Arbeitstagung über Probleme der Quantenchemie, Ostseebad Kühlungsborn, DDR, 14–18 March 1989, Invited lecture: "Statistical Properties of Spectra".
11. Molecular Physics Seminar 1989, Max-Planck-Institut für Physik und Astrophysik, Institut für Astrophysik, Garching bei München, 16 August 1989, Lecture: "Statistical Properties of Hamiltonian Spectra"
12. Max Planck Institut für Physik und Astrophysik, Institut für Astrophysik, Molecular Astrophysics Group, A series of 12 lectures "SGGA CI program", Garching, 5 - 28 May 1990
13. VI Reunio del Grup de Quimica Quantica de l'Institut d'Estudis Catalans, 4 - 5 VI 1990, Valencia, Two invited lectures: 1. SGA CI and its application to the study of excited states of  $H_3$ ; 2. Statistical properties of spectra of a model Hamiltonian and of atomic spectra
14. III International School on Quantum Chemistry, Girona 2 - 8 July 1990, (Estudi General de Girona); A series of 3 lectures: "Configuration Interaction Method"
15. 8-th Strassbourg Seminar on Computational Methods in Quantum Chemistry, 2 - 5 September 1990, Gl. Avernoes Fyn, Danemark, Lecture: "Statistical properties of spectra"
16. Symmetry and Structural Properties of Condensed Matter, Zajaczkowo near Poznań, 6-12 September 1990, Invited lecture: "Symmetric Group Approach to Theory of N-Electron Systems in Finite-Dimensional Hilbert Spaces"
17. XIX Congreso Internazionale dei Chimici Teorici dei Paesi di Espressione Latina, 10–14 September 1990, Roma; Poster: Efectos Relativistas en el Calculo de Probabilidades de Transicion. Serie Isoelectronica del Sodio (with C. Lavin and I.Martin, presented by C. Lavin)
18. Molecular Physics Seminar, Max-Planck Institut für Physik und Astrophysik, Institut für Astrophysik, Garching (Germany), 9 - 16 October 1990, Lecture: "Traces - why bother?"
19. Seminars of the Molecular Astrophysics Group, Max Planck Institut für Astrophysik, Garching, 5 - 14 June 1991, A series of 4 lectures: "MOLIX system and SGGA CI"



20. VI International School on Computational Chemistry, Girona 25–28 June 1991; A series of 3 lectures: “Large Scale CI Calculations. General Methodology. Recent Developments. Specific Calculations”
21. Advanced NATO Study Institute ”Methods in Computational Molecular Physics”, Bad Windsheim, 22 July - 2 August 1991, A series of 4 lectures: “The Configuration Interaction Approach to Electron Correlation” .
22. Atomo Teorijos Seminaras, Institute of Theoretical Physics and Astrophysics, Lithuanian Academy of Sciences, Vilnius, 25 September 1991, Lecture “Some properties of operators in finite-dimensional model spaces”
23. The 24-th Seminar on Mathematical Physics, Toruń, 3 - 6 December 1991, Lecture: “Moments of Spectral Density Distribution” .
24. Workshop “Relativistic Effects in Heavy–Element Chemistry and Physics”, Strasbourg 26 - 27 February 1992.
25. Fizyka a Mikroelektronika, Toruń 11–12 March 1992 lecture (delivered by W. Jaskólski): “Kwantowe struktury półprzewodnikowe”
26. Fourth European Conference on Atomic and Molecular Physics (ECAMP 4), Riga 6 - 10 April 1992, Invited lecture: “Reduced Hamiltonians and statistical theory of spectra” .
27. Department of Chemistry, University of Valencia, Spain Physical Chemistry Seminar, 16 July 1992, Lecture: “Some Remarks on Semiempirical Theories of Molecular Electronic Structure” .
28. Symmetry and Structural Properties of Condensed Matter. The Second International School on Theoretical Physics, Poznań, 26 August - 2 September 1992 Invited lecture: “Symmetric Groups and Organic Ferromagnets” .
29. Symposium “Metody i Zastosowania Chemii Kwantowej w Badaniach Układów Molekularnych”, Katowice, 18 September 1992 Invited lecture: “Rydberg Molecules” .
30. Seminars of the Molecular Astrophysics Group, Max Planck Institut für Astrophysik, Garching 10 - 13 May 1993, lecture “Relativistic CI within the MOLIX system”
31. ESF coference “Relativistic Effects in Heavy Element Chemistry and Physics (REHE)”, De Haan, Belgium, 10 – 14 June 1993. Invited lecture: “Symmetric Group Approach to the Relativistic CI” .
32. First Congress of the International Society for Theoretical Chemical Physics, Girona (Spain), 28 June – 3 July 1993. Invited lecture: “Statistical Theory of Spectra”

33. The First Girona Seminar on Molecular Similarity, Girona – S’agaro (Spain), 8 – 10 July 1993.
34. 9th Strasbourg Seminar on Computational Methods in Quantum Chemistry, Girona – S’agaro (Spain), 12 – 14 July 1993. Lecture: “Some properties of spectra of the Heisenberg Hamiltonians”
35. Sympozjum Chemii Teoretycznej HITY 93, Warszawa 3 - 4 December 1993
36. The 26-th Symposium on Mathematical Physics, Toruń, 7 - 10 December 1993
37. Workshop of the ESF Program “Relativistic Pseudopotentials” Toulouse (France) 7 - 9 May 1994 Lecture: Several remarks on two-component approximations.
38. Molecular Physics Seminar, MPA, Garching, 11 - 12 July 1994, a series of 2 lectures: ”No-pair approach”.
39. Symmetry and Structural Properties of Condensed Matter. The Third International School on Theoretical Physics, Poznań, 1 - 7 September 1994 Invited lecture: “Statistical Properties of Spectra of Finite Systems”.
40. Seminar of the Polish Physical Society: “Symetria Wewnętrzna Układów Fizycznych. Recepta Weyla”, Rzeszów, 13 - 14 October 1994; Invited lecture: “Niektóre aspekty statystycznej teorii widm”
41. Workshop “Intelligent Software in Computational Chemistry” Bad Windsheim, Germany, 25 - 28 January 1995; Organizer: COST Action D-3/5 Invited lecture: ”Configuration interaction methods”
42. Workshop “Excited States, from Gas-Phase to Condensed Phase” Bad Windsheim, Germany, 28 - 31 January 1995; Organizer: EC Program ‘Training and mobility of researchers’ Lecture: “Configuration-interaction-method-based studies on electron correlation and relativistic effects in excited states of small weakly bound systems”.
43. Research conference of the European Science Foundation Program “Relativistic Effects in Heavy Element Chemistry and Physics: Relativistic Quantum Theory of Many-Electron Systems” Il Ciocco near Pisa (Italy) 30 March - 4 April 1995 Two posters (with N. Flocke, M. Barysz and G. H. F. Dierksen): 1. “Relativistic SGA-based CI Method” 2. “Limits of Applicability of the Pauli Approximation in the Gaussian Bases”
44. Ninth International School of Condensed Matter Physics, Białowieża, 16 - 25 July 1995 Invited lecture: “Model Spaces in Theory of Many-Electron Systems: From Configuration Interaction Method to Statistical Theory of Spectra”

45. Departamento de Química Física, Universidad de Valladolid, 27 October 1995  
Lecture: "Relativistic Effects in Atomic and Molecular Structure Calculations".
46. Workshop "Heavy Elements and relativistic Effects in Catalysis" Soria Moria  
Conference Center, Oslo, 8 - 10 March, 1996.
47. Workshop "Recent Advances in Computational Quantum Chemistry" Munich,  
29 - 30 March, 1996; Organizer of the meeting; Guest Editor of the 28th volume  
of *Advances in Quantum Chemistry* (Proceedings of the Workshop).
48. European Workshop of COST: "Quantum Systems in Chemistry and Physics",  
San Miniato (Italy), 14 - 17 April, 1996 Invited lecture: "Envelopes of vibronic  
bands"
49. NATO Advanced Study Institute "Problem Solving in Computational Molecu-  
lar Science: Molecules in Different Environments", Bad Windsheim, Germany,  
12 - 22 August 1996, A series of five lectures: "Quantum Chemical Models"
50. Symmetry and Structural Properties of Condensed Matter. The 4th Interna-  
tional School on Theoretical Physics, Zajęczkowo, 29 August - 4 September  
1996, Invited lecture: "Casimir Operators of the Unitary Groups and Spectral  
Density Distribution Moments".
51. III Ogólnopolska Konferencja Chemii Teoretycznej (in memoriam of Prof. W.  
Kołos), Warszawa, 6 - 7 December 1996.
52. Seminar "Hidden Symmetry of Physical Structures, Recipe of Weyl", Rzeszów  
5 - 6 November 1996; Invited lecture: "Spectral Density Distribution Moments  
in the Low Density Limit".
53. European Conference "Relativistic Effects on Structure, Dynamics and Spec-  
troscopy", Granada, Spain, 8 - 13 March 1997 Invited lecture: "Relativistic  
Calculations with Explicitly Correlated Wavefunctions".
54. Symposium: *From Quantum Mechanics to Quantum Chemistry; in Memoriam  
of the Late Professor Alojzy Gołębiewski*, Kraków 3 - 5 April 1997; Invited  
lecture: "Symmetric Group in Quantum Chemistry".
55. Second European Workshop on "Quantum Systems in Chemistry and Physics",  
Jesus College, Oxford, 6 - 9 April 1997. Invited lecture: "Variational Relativis-  
tic Calculations with Explicitly Correlated Wavefunctions".
56. 7-th Conference on Mathematical Chemistry, Girona, Spain, 25 - 31 May  
1997 Invited lecture: "Applications of the Symmetric-Group-Based Methods  
in Quantum Chemistry".

57. Third Canadian Computational Chemistry Conference Edmonton 19 - 23 July 1997 Invited lecture: "Statistical Theory of Atomic and Molecular Spectra"
58. Seminarium "Metody Komputerowe w Nauce", Poznań, 18 December 1997, Invited lecture: "Metody Oddziaływania Konfiguracyjnego"
59. REHE Workshop "Spin-Orbit Coupling in Chemical Reactions", Toruń, 24 - 27 January 1998 Invited lecture: "Introduction to Relativistic Theory of Many-Electron Systems"
60. Spotkanie Sekcji Fizyki Atomowej, Molekularnej i Optyki (FAMO) Komitetu Fizyki PAN z okazji Stulecia Urodzin Aleksandra Jabłońskiego, 26 lutego 1998 Poster: G. Pestka i J. Karwowski: "Explicitly Correlated Wavefunctions in Variational Dirac-Coulomb Problem"
61. Third European Workshop on "Quantum Systems in Chemistry and Physics", Hotel los "Alixares", Granada, Spain, 19-22 April 1998. Invited lecture: "Variational Principle in the Dirac Theory: Theorems, Examples and Counterexamples".
62. "The Jabłoński Centennial Conference on Luminescence and Photophysics", Toruń 23-27 July 1998 Poster: "Shapes of Bands in Molecular Spectra" (with D. Bielińska-Wąż).
63. Symmetry and Structural Properties of Condensed Matter. The 5th International School on Theoretical Physics, Zajęczkowo, 27 August - 2 September 1998, Invited lecture: "Spectral Density, Permutations and MBPT Diagrams"
64. Mikrosymposium of Theoretical Chemistry, Polanica 17-19 September 1998 Invited lecture: "New Implementations of SGA" Poster: "Statistical Theory of Spectra" (with D. Bielińska-Wąż).
65. Third International Seminar "Hidden Symmetry", Rzeszów 20-22 October 1998 Invited lecture: "Symmetry and Structure of Spectra"
66. Fourth European Workshop on "Quantum Systems in Chemistry and Physics", Marly-le-Roi near Paris, April 1999 Poster: M. Stanke and J. Karwowski "Variational Principle in the Dirac Theory: Spurious Solutions, Unexpected Extrema, and other Traps".
67. "IV Girona Seminar on Molecular Similarity", Girona 2-8 July 1999 Invited lecture: "Atoms in Molecules: A Relativistic View"
68. IV Workshop on Quantum Fluid Clusters, Schloss Ringberg, June 25-28 2000 Oral presentation: D. Bielińska-Wąż, J. Karwowski, and G. H. F. Dierksen, "Spectral properties of confined systems" (presented by G. H. F. Dierksen).

69. EGAS 2000, Vilnius 4-7 July 2000 Poster: M. Stanke, J. Karwowski and H. Tatewaki, "Dirac Equation for Kinetically-Balanced Functions" (presented by M. Stanke).
70. XIII International Congress on Mathematical Physics 2000, London 17-22 July 2000 Poster: D. Bielińska-Wąż, G. H. F. Dierksen and J. Karwowski, "Spectral properties of confined many-electron systems" (presented by D. Bielińska-Wąż).
71. Symmetry and Structural Properties of Condensed Matter. The 6th International School on Theoretical Physics, Myczkowce, 31 August - 6 September 2000, Invited lecture: "Symmetric Group Approach to the Many-Electron Problem"
72. European Congress on Computational Methods in Applied Science and Engineering "ECCOMAS 2000", Barcelona 11-14 September 2000. Organization of a session "Numerical Methods for Approaching Exact Results in Quantum Chemistry" Keynote lecture: "Numerical Methods for Approaching Exact Results in Quantum Chemistry" Lecture: Hylleraas-CI Approach to Dirac-Coulomb Eigenvalue Problem: Ground States of Helium-like Atoms".
73. Workshop on Present Trends in Theoretical Chemistry, Girona 16 September 2000. Lecture: "Variational approach to solving Dirac and Levy-Léblond equations"
74. Indian Association for the Cultivation of Science, Kolkata, India, 21 March 2001, Lecture: "Symmetric group approach to many-electron problems".
75. Department of Physics, Santiniketan University, Bolpur, West Bengal, India, 23 and 24 March 2001, Two lectures: "Spectral properties of confined systems" and "Numerical methods for approaching exact results in quantum chemistry"
76. Department of Physics, Kalyani University, West Bengal, India, 22 March 2001, Lecture: "Variational principle in Dirac theory: unexpected minima, spurious solutions, multiple extrema and other traps".
77. "V Girona Seminar on Molecular Similarity", Girona 12-17 July 2001, Invited lecture: "Harmonic Oscillators in Relativistic Quantum Mechanics"
78. XXXVI Zjazd Fizyków Polskich, Uniwersytet Mikołaja Kopernika, Toruń, 16-21 September 2001, Poster: D. Bielińska-Wąż, J. Karwowski i G. H. F. Dierksen *Wpływ ograniczeń przetrzennych na widma układów dwuelektronowych.*
79. Sympzjum "Od naiwności do granic poznania", Instytut Fizyki Teoretycznej UW, Warszawa, 16-17 III 2002; Lecture: "Metoda wariacyjna w zagadnieniu własnym hamiltonianu Diraca-Coulomba".

80. Fifty Years of Theoretical Chemistry in Poland, Historical Symposium, Krakow 13 June 2002.
81. Current Trends in Theoretical Chemistry IV, Kraków 14-15 June 2002; Poster: J. Karwowski and M. Stanke, "Dirac Equation and Variational Principle".
82. Symmetry and Structural Properties of Condensed Matter. The 7th International School on Theoretical Physics, Myczkowce, 11 - 18 September 2002, Invited lecture: "Harmonic Oscillators Revisited: Relativistic Formulations, Confined Particles, and Several other Aspects".
83. FAMO: The 4th Workshop on Atomic, Molecular Physics and Optics, Jurata 9-12 September 2002, Poster: M. Stanke and J. Karwowski, "Strange features of Dirac-Coulomb Variational Problem".
84. 1st Pomeranian Quantum Chemistry and Physics Workshop, Pobierowo, May 22-25, 2003, Invited lecture: "Harmonium" Przewodnictwo sesji.
85. VI Girona Seminar on Molecular Similarity, 21-24 VII 2003, Girona, Spain. Invited lecture: "How Spatial Confinement Influences the Properties of Quantum Systems"
86. Relativistic Effects in Heav-Element Chemistry and Physics: "REHE 2003", Technische Universität Berlin, Berlin, Germany. Poster: M. Stanke and J. Karwowski, "Variational principle and the Dirac eigenvalue problem". Poster: G. Pestka and J. Karwowski, "Ground states of helium isoelectronic series atoms using Hylleraas-CI".
87. "Blaski i cienie relatywistycznej mechaniki kwantowej", Sympozjum RMK2, Olsztyn, 7-8 May 2004. Lecture: "Metoda wariacyjna w modelu Diraca"
88. 2nd Pomeranian Quantum Chemistry and Physics Workshop: Electronic Structure of Atoms and Molecules, Pobierowo 20-23 May 2004. Invited Lecture: "A class of exactly solvable Schrödinger equations",
89. European Congress on Computational Methods in Applied Science and Engineering "ECCOMAS 2004", Jyväskylä, 24-28 July 2004. Organization of a session "Confined Quantum Systems: Theory and Applications" and a lecture under the same title.
90. XLVII Zjazd Polskiego Towarzystwa Chemicznego, Wrocław, 12-19 września 2004, Sekcja Chemii Kwantowej. Lecture: "Układy przestrzennie ograniczone: teoria i zastosowania".

91. 9th Workshop on Quantum Systems in Chemistry and Physics. Grenoble, 25-30 September 2004, Lecture: "Dirac-Coulomb equation in non-standard representations".
92. 3rd Pomeranian Quantum Chemistry and Physics Workshop: Electronic Structure of Atoms and Molecules, Pobierowo 11-14 May 2005, Invited lecture: "Variational Methods in Dirac Theory".
93. Professor Brian G. Wybourne Commemorative Meeting: Symmetry, Spectroscopy and SCHUR, Torun, June 12-14 2005, Lecture: "The Polish Odyssey of Brian G. Wybourne", Head of the Organizing Committee.
94. 1st International Symposium on Methods and Applications of Computational Chemistry, Kharkiv, June 30 - July 1 2005. Invited Lecture: "Variational Method in Dirac Theory: Unexpected Results and New Developments".
95. 10th European Workshop on Quantum Systems in Chemistry and Physics, Carthage, 1-7 September 2005. Lecture: "Relativistic Hylleraas-CI".
96. 65th Anniversary of Prof. Ramon Carbó-Dorca Symposium, Girona, 11 November 2005, Invited lecture "The research of Prof. Ramon Carbo-Dorca in the field of mathematical chemistry".
97. 46th Sanibel Symposium, St Simons Island, GA, 26 February - 3 March 2006, Lecture: "The representation of Dirac equation and the variational principle"
98. Honorary degree to Prof Serafin Fraga at Universidad Autonoma de Madrid, Madrid, 14 March 2006.
99. 7th Girona Seminar on the Nature of the Chemical Bond, Girona, 10-13 July 2006, Invited lecture: "A new approach to the variational treatment of the Dirac equation: Scaling of the coordinates". Member of Scientific Committee
100. 11th European Workshop on Quantum Systems in Chemistry and Physics, StPetersburg, 20-25 August 2006, Lecture "Kinetically-balanced Dirac equation" Member of International Scientific Committee
101. Ogólnopolska Sesja Naukowa z okazji 100 rocznicy urodzin Prof Włodzimierza Trzebiatowskiego oraz 40 rocznicy powstania INTiBS PAN, Wrocław 15 IX 2006. Adres w imieniu Dziekana WFAIS UMK.
102. 6th Workshop on Atomic and Molecular Physics, Jurata, 25-27 September 2006, Invited lecture: "The contribution of Eugeniusz Czuchaj to molecular physics"
103. 2nd International Symposium on Methods and Applications of Computational Chemistry, Kyiv, 2-4 July 2007. Invited Lecture: "Quasi-exactly solvable models of atoms and molecules". Member of International Scientific Committee.

104. 12-th European Workshop "Quantum Systems in Chemistry and Physics", Royal Holloway College, London, 30. VIII - 5. IX 2007, Lecture: "Dirac-Coulomb equation: Playing with artifacts",
105. Symposium on Advanced Methods of Quantum Chemistry and Physics, Torun 2-6. IX. 2007. Poster: M. Bylicki, J. Karwowski, G. Pestka, "Artifacts of Dirac-Coulomb Hamiltonian eigenvalue problem"
106. The Ninth International School on Theoretical Physics 'Symmetry and Structural Properties of Condensed Matter', Myczkowce, 5-12. IX. 2007; Invited lecture: "Few-particle systems: Quasi-exactly solvable problems", Member of International Scientific Committee.
107. Centrum Fizyki Teoretycznej PAN, Warszawa 10. X. 2007, lecture: "Rownanie Diraca-Coulomba: Zabawa artefaktami".
108. 'Third International Meeting: Mathematical Methods for Ab initio Quantum Chemistry', Nice, 19-20 X 2007, Invited lecture "Geminals in Dirac-Coulomb Hamiltonian eigenvalue problem".
109. European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS-2008), Venice, 30 VI - 4 VII 2008 Lecture: Inverse problems in atomic and molecular physics
110. Current Trends in Theoretical Chemistry V, Kraków, 6 - 10 VII 2008, Lecture: A separable model of N interacting particles
111. Central European Symposium on Theoretical Chemistry – CESTC2008, Hejnice (Czech Republic), 28 IX - 1 X 2008, Lecture: A new approach to the Dirac-Coulomb eigenvalue problem
112. 2009 Molecular Informatics and Bioinformatics, Budapest, 17-19 III 2009, Lecture: Inverse problems in quantum chemistry
113. Workshop on Theoretical Chemistry, Girona, 8 - 12 VII 2009, Invited lecture: Exactly and quasi-exactly solvable models of N interacting particles
114. The 10-th International School on Theoretical Physics Symmetry and Structural Properties of Condensed Matter, Myczkowce, 1 - 9 IX 2009 Invited lecture: Separable N-particle Hookean models
115. Quantum Systems in Chemistry and Physics XIV, Madrid, 13 - 19 IX 2009, Invited lecture: A separable model of N interacting particles
116. IX Girona Seminar: Electron density, density matrices, and density functional theory, Girona 5 - 8 VII 2010, Invited lecture: Unexpected features of relativistic models



117. Girona Workshop on Theoretical Chemistry 2010, Girona 18 - 20 X 2010, Invited lecture: Inverse problems
118. 14-th International Conference on the Applications of Density Functional Theory in Chemistry and Physics, Athens, August 29 - September 2 2011, Invited lecture: Density functional theory and multi-component wavefunctions
119. 10-th Central European Symposium on Theoretical Chemistry, Torun, 25 -28 September 2011
120. Kathmandu 2012 Workshop on Theoretical Chemistry. Atoms, molecules and solids: models and concepts;  
[https://wiki.lct.jussieu.fr/workshop/index.php/Kathmandu\\_Workshop\\_2012](https://wiki.lct.jussieu.fr/workshop/index.php/Kathmandu_Workshop_2012)  
Kathmandu, 30 April - 4 May 2012; Memeber of the International Organizing Committee

## Graduate students

1. Dr. Mariusz Kłobukowski, 12. XI. 1975 – 23. II. 1978  
Current position: Professor at the University of Alberta, Edmonton, Canada;  
Head of Division of Theoretical Chemistry
2. Dr. Mikołaj Szulkin, 21. IX. 1977 – 5. III. 1980  
Current position: High School Teacher in Lund, Sweden.
3. Dr. Włodzisław Duch, 8. VI. 1977 – 14. V. 1980  
Current position: Professor at Nicolaus Copernicus University, Deputy Rector,  
Head of the Department of Informatics.
4. Dr. Jacek Kobus, 18. II. 1981 – 4. XII. 1984  
Current position: Associate Professor at the Institute of Physics, Nicolaus  
Copernicus University
5. Dr. Włodzimierz Jaskólski, 18. II. 1981 - 3. XII. 1985  
Current position: Professor at Nicolaus Copernicus University, Director of the  
Institute of Physics.
6. Dr. Jacek Styszyński, 14. XI. 1984 - 16. VI. 1989  
Associate Professor at the University of Szczecin, Deputy Rector.
7. Dr. Wiesław Nowak, 22. II. 1984 - 11. X. 1989  
Current position: Professor at Nicolaus Copernicus University, Head of a re-  
search group.
8. Dr. Małgorzata Bancewicz, 25. VI. 1984 – 10. I. 1990,  
Current position: Assistant Professor at Poznań Technical University
9. Dr. Dorota Bielińska-Wąż, 1. X. 1992 - 7. I. 1998  
Current position: Associate Professor at the Institute of Physics, Nicolaus  
Copernicus University
10. Dr. Grzegorz Pestka, XI. 1995 - 7. VI. 2000  
Current position: Associate Professor at the Institute of Physics, Nicolaus  
Copernicus University
11. Dr. Monika Stanke, 5. IV. 2000 - 26. IX. 2004  
Current position: Assistant Professor at the Institute of Physics, Nicolaus  
Copernicus University.

## Current research interest

- *Exactly and quasi-exactly solvable models*  
Studies aimed at designing model Hamiltonians for which the corresponding Schrödinger or Dirac equations are either exactly or quasi-exactly solvable. The models include all kinds of Hooke'an systems (harmonic is the best known prototype). Solutions to these problems may be used to investigate the consequences and the ranges of applicability of different kinds of approximations as, e.g. the Born-Oppenheimer approximation, separability problems in many-particle systems, etc.
- *Influence of confinement on properties of quantum systems*  
Properties of many-electron systems (mainly atoms but also small molecules and interacting electrons) strongly depend on the form of the external confining potentials which may model various kinds of environments (as e.g. plasma or crystal field). The effects of confinement may be studied using a variety of methods ranging from standard quantum chemical approaches (Hartree-Fock, configuration interaction) to exact numerical integration.
- *Operators in model spaces and statistical theory of spectra*  
Studies are aimed at understanding the structure and properties of many-fermion and many-boson finite-dimensional model spaces. The results may be applied to matrix element evaluation, developing new approaches to studies on the operator spectra, deriving expressions for moments of spectral density distributions, studying statistical properties of spectra.
- *Relativistic and correlation effects in many-electron systems.*  
Works aimed at both developing new methods and studying properties of specific systems. In particular studies on properties of Dirac-Coulomb equation in the context of variational methods appropriate for solving this equation are developed. The implementations range from very accurate calculations (as relativity-correlation cross term effects) to semiempirical ones (relativistic formulation of the quantum defect orbital method).