

# Curriculum Vitae of Krzysztof Byczuk

**Name:** Krzysztof Byczuk

**Born:** January 17, 1967, Warsaw, Poland

**Current Position:** Professor of Physics

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## Scientific interest:

- Condensed matter theory, solid state physics, quantum and statistical physics
- Electronic correlation and magnetism
- Superconductivity, superfluidity, Bose-Einstein condensation
- Disordered and inhomogeneous systems
- Topological phases of matter
- Development of new theoretical and computational methods

## Academic Degrees:

- Professor title - February, 2014, President of Poland
- Habilitation Ph.D. - January, 2006, Warsaw University
- Ph.D. in theoretical physics - September, 1995, Warsaw University
- M.Sc. in physics - May, 1991, Warsaw University

November 28th, 2022

## 1. Professional Experience and Education:

- Occupied functions
  - October 2020 - September 2024, Director of the Institute of Theoretical Physics, Physics Department, University of Warsaw
  - October 2016 - September 2020, Deputy Director for students affairs of the Institute of Theoretical Physics, Physics Department, University of Warsaw
  - October 2012 - September 2016, Deputy Director for students affairs of the Institute of Theoretical Physics, Physics Department, University of Warsaw
- Employment in Poland
  - since July, 2010, Professor position at Department of Physics, University of Warsaw, Poland
  - March, 1996 - June, 2010, Faculty position (adiunkt) at Department of Physics, University of Warsaw, Poland
  - September, 1995 - February 1996, Assistant at Physics Department, University of Warsaw, Poland
  - June, 1991 - August, 1992, Assistant at Physics Department, University of Warsaw, Poland
- Employment abroad (on leave from University of Warsaw)
  - July - September, 2012, Research position through TRR80 at Physics Department, Augsburg University, Germany
  - July - September, 2011, Research position through TRR80 at Physics Department, Augsburg University, Germany
  - June - September, 2010, Research position through TRR80 at Physics Department, Augsburg University, Germany
  - June - September, 2009, Research position through SFB484 at Physics Department, Augsburg University, Germany
  - June, 2005 - August, 2008, Research position through SFB484 at Physics Department, Augsburg University, Germany
  - May, 2002 - September 2002, Research position at Physics Department, Augsburg University, Germany
  - May, 2000 - April, 2002, Alexander von Humboldt (AvH) fellowship at Physics Department, Augsburg University, Germany
  - September, 1998 - August, 1999, Polish Science Foundation (FNP) fellowship at Physics Department, Harvard University, USA
- Education
  - September, 1992 - August, 1995, Doctoral (PhD) study at Physics Department, University of Warsaw, Poland
  - October, 1986 - May, 1991, Undergraduate study at Physics Department, University of Warsaw, Poland

## 2. Prices, Awards, Fellowships, Research Grants, Invited Lectures:

- Prices, awards and fellowships
  - University of Warsaw Rector's price of III degree in 2022
  - University of Warsaw medal - 2021
  - University of Warsaw Rector's price of III degree in 2020
  - Scholarship awarded by the Rector of University of Warsaw - 2005 (1 year).
  - "Rector S. Pienkowski name" price awarded by the Dean of Physics Department, University of Warsaw, 2002.

- Postdoctoral fellowship of the Alexander von Humboldt Foundation (AvH) (for long-term collaboration) at Augsburg University - 2001-2002 (1 year).
- Postdoctoral fellowship of the Alexander von Humboldt Foundation (AvH) at Augsburg University - 2000-2001 (1 year).
- Postdoctoral fellowship of the Polish Science Foundation (Fundacja na Rzecz Nauki Polskiej, FNP) at Harvard University - 1998-99 (1 year)
- Scholarship of the Polish Science Foundation (Fundacja na Rzecz Nauki Polskiej, FNP) for Ph.D. students - 1994 (1 year).
- Faculty Award for M.Sc. thesis, 1991.
- Research grants
  - TEAM project supported by the Polish Foundation of Science (FNP), *Predictive multi-scale simulations for correlated particles inside complex environments*, (2011-2015).
  - Four individual grants founded by the Committee of the Scientific Research (KBN) - 1994-95 (2 years), 1996-1997 (1.5 year), and 2003-2005 (3 years), and Ministry of Science and Higher Education (MNiSW) - 2010-2013 (3 years).
  - Participation by name in two grants of German Science Foundation (DFG) in SFB484 (2006-2010) and TRR80 (2010-2014).
- Invited lectures
  - “XXV International School on Physics of Semiconducting Compounds” - Jaszowiec 1996, Poland.
  - “XXVII International School on Physics of Semiconducting Compounds”, tutorial session - Jaszowiec 1998, Poland.
  - ”Electron and spin correlations in solids”, Suprasl 2001, Poland.
  - “MAG-EL-MAT conference”, Bedlewo 2005, Poland.
  - “Conference on Dynamical Mean-Field Theory for Correlated Electrons: Applications to Real Materials, Extensions and Perspectives”, Trieste, Italy, 2005.
  - “Polish Physical Society Meeting”, Warsaw, Poland, 2005.
  - “II Krajowa Szkoła Nadprzewodnictwa”, Ustron, Poland, 2006.
  - School on theoretical physics ”Condensed Matter Physics in the Prime of the 21st Century: Phenomena, Materials, Ideas, Methods”, Karpacz, Poland, 2007.
  - International conference ”Physics of magnetism 2008”, Poznan, Poland, 2008.
  - “Korrelationstages 2009”, Dresden, Germany 2009.
  - “Workshop on recent developments in DMFT”, ETH, Zurich, Switzerland, 2009.
  - ”Electronic Correlations in Models and Materials”, Augsburg, Germany, 2011.
  - ”Magnetomechanical properties of complex functional materials”, Turku, Finland, 2012.
  - ”Non-linear Phenomena in Electrochemistry and Photovoltaics”, Kraków, Poland, 2022.

### 3. Teaching and Organization Activity:

- Supervised and promoted four PhD student, many MSc students and bachelor students
- Lectures at University of Warsaw
  - Advanced Graduated Quantum Mechanics, 2020/21, 2021/22, 2022/23
  - Topics in Many Body Theory, 2020/21, 2022/23
  - Statistical Physics A ,2020/21, 2021/22, 2022/23
  - Electrodynamics, 2017/18, 2018/19, 2019/20
  - Statistical Physics A, 2014/15, 2015/16, 2016/17
  - Introduction to physics of transport in biological systems 2015/16, 2016/17, 2017/18, 2018/19, 2019/20

- Physics of Fluids, 2014/15
- Quantum mechanics in 2011/12, 2012/13, 2013/14
- Superconductivity, Superfluidity, and Bose-Einstein Condensation in 2009/2010, 2011/12, 2014/15
- Quantum mechanics II, many body theory in 2008/09, 2009/10, 2010/11, 2011/12, 2012/13, 2013/14, 2014/15
- Introduction to many body physics, in 1996/97 and 2004/05
- Solid state theory - disordered systems and Anderson localization, in 1998
- Many different tutorials at University of Warsaw and Augsburg University
- Organization:
  - Deputy director of the Institute of Theoretical Physics, 2012-16
  - chairman of the two-day tutorial session at “International school on the physics of semiconducting compounds - Jaszowiec” in 2004 and 2005
- Activity:
  - Member of board of the Pro-Physica Foundation, since 2012
  - Member of ”Korpus Ekspertow Narodowego Centrum Nauki”, 2012 - now.
  - Member of teaching programs commission at Physics Faculty, Warsaw University, 2009-now
  - Advisory committee, ”Physics of magnetism 2011 (PM’11)”, Poznan, Poland, 2011.

## Publication list of Krzysztof Byczuk

### Articles:

1. K.Byczuk, J.Spalek, W.Wójcik,  
"Microscopic Model of Hybrid Pairing:II. Exact Solution for a Single Pair",  
Phys. Rev. B **46**, 14134 (1992).
2. K.Byczuk, J.Spalek,  
"Statistical Properties and Statistical Interaction for Particles with Spin: Hubbard Model in One Dimension and Statistical Spin Liquid",  
Phys. Rev. B **50**, 11403 (1994).
3. K.Byczuk, J.Spalek,  
"Universality Classes, Statistical Exclusion Principle and Properties of Interacting Fermions",  
Phys. Rev. B **51**, RC 7934 (1995).
4. K.Byczuk, J.Spalek, J.M.Honig,  
"Intermediate Statistics of Interacting Electrons: a Bond Approach",  
Solid State Comm. **98**, 367 (1996).
5. K.Byczuk, J.Spalek,  
"Spin-charge Separated Luttinger Liquid in Arbitrary Spatial Dimensions",  
Solid State Comm. **99**, 99 (1996).
6. K.Byczuk, J.Spalek,  
"Transition Temperature and a Spatial Dependence of the Superconducting Gap for Multilayer High-Temperature Superconductors",  
Phys. Rev. B **53**, RC 518 (1996).
7. G.S.Joyce, S.Sarkar, J.Spalek, K.Byczuk,  
"Thermodynamic Properties of Particles with Intermediate Statistics",  
Phys. Rev. B **53**, BR 990 (1996).
8. K.Byczuk,  
"Spin-Charge Separated Luttinger Liquid in the Magnetic Field",  
Phys. Rev. B **57**, 3821 (1998).
9. K.Byczuk, T.Dietl,  
"Realistic Electron-Electron Interaction in a Quantum Wire",  
Phys. Rev. B **60**, 1507 (1999).
10. G.Grabecki, J.Wrobel, T.Dietl, K.Byczuk, E.Papis, E.Kaminska, A.Piotrowska, G.Springholz, M.Pinczolits, G.Bauer,  
"Ballistic quantum transport in constriction of n-PbTe",  
Phys. Rev. B **60**, R5133 (1999).
11. Y. Oreg, K. Byczuk, B. I. Halperin,  
"Spin configuration of carbon nanotube in a nonuniform external potential",  
Phys. Rev. Lett. **85**, 365 (2000).
12. K. Byczuk, D. Vollhardt,  
"Derivation of the Curie-Weiss Law in Dynamical Mean-Field Theory",  
Phys. Rev. B **65**, 134433 (2002).
13. K. Byczuk, R. Bulla, R. Claessen, D. Vollhardt,  
"Phenomenological Modeling of Photoemission Spectra in Strongly Correlated Electron Systems",  
Int. J. Mod. Phys. B **16**, 3759 (2002).
14. K. Byczuk, M. Ulmke, D. Vollhardt,  
"Ferromagnetism and Metal-Insulator Transition in the Disordered Hubbard Model",  
Phys. Rev. Lett. **90**, 196403 (2003).
15. K. Byczuk, W. Hofstetter, D. Vollhardt,  
"Mott-Hubbard metal-insulator transition at non-integer filling",  
Phys. Rev. B **69**, 045112 (2004).

16. K. Byczuk, W. Hofstetter, D. Vollhardt,  
“Mott-Hubbard transition vs. Anderson localization of correlated electron systems with disorder”,  
Phys. Rev. Lett. **94**, 056404 (2005).
17. K. Byczuk, C. Janowitz, R. Manzke, J. Spalek, W. Wojcik,  
“Luttinger liquid phenomenology and angle resolved photoemission for single layer  $Bi_2Sr_{2-x}La_xCuO_{6+\delta}$   
high-temperature superconductor”,  
Europhys. Lett. **67**, 1011 (2004).
18. M. Eckstein, M. Kollar, K. Byczuk, D. Vollhardt,  
“Arbitrary-range hopping on the Bethe lattice: Exact results for densities of states and dynamical mean-  
field theory”,  
Phys. Rev. B **71**, 235119 (2005).
19. K. Byczuk, M. Ulmke,  
“Curie temperature in the Hubbard model with alloy disorder”,  
Eur. Phys. J. B **45**, 449-454 (2005).
20. K. Byczuk,  
“Metal-Insulator Transitions in the Falicov-Kimball Model with Disorder”,  
Phys. Rev. B **71**, 205105 (2005).
21. M. Kollar, M. Eckstein, K. Byczuk, N. Blümer, P. van Dongen, M. H. Radke de Cuba, W. Metzner, D.  
Tanaskovic, V. Dobrosavljevic, G. Kotliar, D. Vollhardt,  
“Green functions for nearest- and next-nearest-neighbor hopping on the Bethe lattice”,  
Ann. Phys. (Leipzig) **14**, 642 (2005).
22. K. Byczuk, M. Kollar, K. Held, Y.-F. Yang, I. A. Nekrasov, Th. Pruschke, D. Vollhardt,  
“Kinks in the dispersion of strongly correlated electrons”,  
Nature Physics **3**, 168 (2007).
23. K. Byczuk, D. Vollhardt,  
“Correlated bosons on a lattice: Dynamical mean-field theory for Bose-Einstein condensed and normal  
phases”,  
Phys. Rev. B **77**, 235106 (2008).
24. U. Yu, K. Byczuk, D. Vollhardt,  
“Ferromagnetism and Kondo Insulator Behavior in the Disordered Periodic Anderson Model”,  
Phys. Rev. Lett. **100**, 246401 (2008).
25. M. Snoek, I. Titvinidze, C. Toke, K. Byczuk, W. Hofstetter,  
“Antiferromagnetic Order of Strongly Interacting Fermions in a Trap: Real-Space Dynamical Mean-Field  
Analysis”,  
New J. Phys. **10**, 093008, (2008).
26. U. Yu, K. Byczuk, D. Vollhardt,  
“Influence of Band and Orbital Degeneracies on Ferromagnetism in the Periodic Anderson Model”,  
Phys. Rev. B **78**, 205118 (2008).
27. K. Byczuk, W. Hofstetter, D. Vollhardt,  
“Competition between Anderson localization and antiferromagnetism in correlated lattice fermion systems  
with ”disorder”,  
Phys. Rev. Lett. **102**, 146403 (2009).
28. K. Byczuk, M. Sekania, W. Hofstetter, and A.P. Kampf  
“Insulating behavior with spin and charge order in the ionic Hubbard model”,  
Phys. Rev. B **79**, 121103(R) (2009).
29. K. Byczuk and D. Vollhardt  
“Mixtures of correlated bosons and fermions: Dynamical mean-field theory for normal and condensed  
phases”  
Ann. Phys. (Berlin) **18**, 622 (2009).
30. D. Semmler, K. Byczuk, and W. Hofstetter  
“Mott-Hubbard and Anderson metal-insulator transitions in correlated lattice fermions with binary dis-  
order”  
Phys. Rev. B **81**, 115111 (2010)

31. G. Schubert, J. Schleede, K. Byczuk, H. Fehske, and D. Vollhardt  
“Distribution of the local density of states as a criterion for Anderson localization: Numerically exact results for various lattices in dimensions  $D=2$  and  $3$ ”  
*Phys. Rev. B* **81**, 155106 (2010).
32. H.-J. Lee, K. Byczuk, R. Bulla,  
“NRG for the bosonic single-impurity Anderson model: Dynamics ”,  
*Phys. Rev. B* **82**, 054516 (2010).
33. D. Semmler, J. Wernsdorfer, U. Bissbort, K. Byczuk, W. Hofstetter,  
“Localization of correlated fermions in optical lattices with speckle disorder”,  
*Phys. Rev. B* **82**, 235115 (2010)
34. G. Pelka, K. Byczuk, J. Tworzydło,  
“Paired phases and Bose-Einstein condensation of spin-one bosons with attractive interaction”,  
*Phys. Rev. A* **83**, 033612 (2011).
35. P. B. Chakraborty, K. Byczuk, D. Vollhardt,  
“Interacting lattice electrons with disorder in two dimensions: Numerical evidence for a metal-insulator transition with a universal critical conductivity”  
*Phys. Rev. B* **84**, 035121 (2011).
36. D. Semmler, K. Byczuk, W. Hofstetter,  
“Anderson-Hubbard model with box disorder: Statistical dynamical mean-field theory investigation”,  
*Phys. Rev. B* **84**, 115113 (2011).
37. P. B. Chakraborty, K. Byczuk, D. Vollhardt,  
“Magnetic properties of interacting, disordered electron systems in  $d=2$  dimensions”,  
*Phys. Rev. B* **84**, 155123 (2011).
38. A. Kauch and K. Byczuk,  
“Variational local moment approach: from Kondo effect to Mott transition in correlated electron systems”  
*Physica B* **407**, 209 (2012).
39. K. Byczuk, J. Kunes, W. Hofstetter, D. Vollhardt,  
“Quantification of correlations in quantum many-particle systems”, *Phys. Rev. Lett.* **108**, 087004 (2012);  
erratum: *Phys. Rev. Lett.* **108**, 189902 (2012).
40. K. Makuch, J. Skolimowski, P. B. Chakraborty, K. Byczuk, D. Vollhardt  
“Thermodynamic properties of correlated fermions in lattices with spin-dependent disorder”, *New J. Phys.* **15**, 045031 (2013).
41. Jaromir Panas, Anna Kauch, Jan Kuneš, Dieter Vollhardt, Krzysztof Byczuk  
“Numerical calculation of spectral functions of the Bose-Hubbard model using B-DMFT”, *Phys. Rev. B* **92**, 045102 (2015).
42. Damian Zdulski, Krzysztof Byczuk  
“Thermodynamic and topological phase diagrams of correlated topological insulators”, *Phys. Rev. B* **92**, 125102 (2015).
43. J. Skolimowski, D. Vollhardt, K. Byczuk  
“Spin-selective localization of correlated lattice fermions”, *Phys. Rev. B* **92**, 094202 (2015).
44. Jaromir Panas, Anna Kauch, Krzysztof Byczuk  
“Spectral properties and phase diagram of correlated lattice bosons in an optical cavity within the B-DMFT”, *Phys. Rev. B* **95**, 115105 (2017).
45. J. Skolimowski, D. Vollhardt, K. Byczuk  
“Multitude of phases in correlated lattice fermion systems with spin-dependent disorder”, *J. Phys. Commun.* **2**, 025031 (2018).
46. K. Byczuk, B. Chatterjee, D. Vollhardt  
“T-matrix formulation of real-space dynamical mean-field theory and the Friedel sum rule for correlated lattice fermions”, *Eur. Phys. J. B* **92**, 23 (2019).
47. B. Chatterjee, J. Skolimowski, K. Makuch, K. Byczuk  
“Real-space dynamical mean-field theory of Friedel oscillations in strongly correlated electron systems”, *Phys. Rev. B* **100**, 115118 (2019).

48. A. Östlin, Y. Zhang, H. Terletska, F. Beiușeanu, V. Popescu, K. Byczuk, L. Vitos, M. Jarrell, D. Vollhardt, L. Chioncel  
"Ab initio typical medium theory of substitutional disorder", *Phys. Rev. B* **101**, 014210 (2020).
49. A. Weh, Y. Zhang, A. Östlin, H. Terletska, D. Bauernfeind, K. -M. Tam, H. G. Evertz, K. Byczuk, D. Vollhardt, L. Chioncel  
"Dynamical mean-field theory of the Anderson-Hubbard model with local and non-local disorder in tensor formulation", *Phys. Rev. B* **104**, 045127 (2021).
50. Banhi Chatterjee, Jan Skolimowski, Krzysztof Byczuk  
"Impurities and other defects in correlated lattice electrons: Friedel oscillations and interference patterns", *Phys. Rev. B* **105**, 235129 (2022).
51. K. Byczuk, P. Jakubczyk  
"Hubbard-Stratonovic transformation revisited", in submission
52. J. Skolimowski, B. Chatterjee, K. Byczuk  
"Fermions scattered on few impurities: Friedel oscillations and Huygens like superposition principle", in submission

**Conference papers:**

1. J. Spalek, K. Byczuk, J. Karbowski, W. Wójcik,  
"Strongly Correlated Fermions at Low Temperatures",  
*Physica Scripta T* **49**, 206 (1993).
2. K. Byczuk, J. Spalek,  
"Application of Statistical Spin Liquid Concept to High-Temperature Superconductivity",  
*Acta Physica Polonica A* **85**, 337 (1994).
3. K. Byczuk, J. Spalek, W. Wójcik,  
"Electronic Structure and Real Space Pairing for Statistical Spin Liquid in Two Dimension",  
*Physica C* **235-240**, 2347 (1994).
4. J. Spalek, K. Byczuk, W. Wójcik,  
"Electronic States and Real Space Pairing in Statistical Spin Liquid",  
*Molecular Physics Reports* **12**, 219 (1995).
5. K. Byczuk, J. Spalek, G. Joyce, S. Sarkar,  
"What is Between Fermi-Dirac and Bose-Einstein Statistics?",  
*Acta Physica Polonica B* **26**, 2167 (1995).
6. K. Byczuk, J. Spalek,  
"Luttinger Liquid as a New Metallic State of Correlated Fermions",  
*Acta Phys. Polonica A* **90**, 595 (1996).
7. K. Byczuk, J. Spalek,  
"Model of Spin-Charge Separated Luttinger Liquid in Arbitrary Spatial Dimensions",  
*Molecular Phys. Rep.* **15/16** 273-276, (1997).
8. K. Byczuk, J. Spalek, W. Wójcik,  
"Normal and Superconducting Phases of Luttinger Liquid",  
*Molecular Phys. Rep.* **15/16** 71-75, (1997).
9. K. Byczuk, J. Spalek, W. Wójcik,  
"Spectral Properties of Luttinger Liquid and Comparison Fermi Liquid",  
*Molecular Phys. Rep.* **20**, 39-50 (1998).
10. K. Byczuk, J. Spalek, W. Wójcik,  
"Electronic Properties of High temperature Superconductors within a Phenomenological Anderson-Luttinger Picture",  
*Acta Phys. Polonica B* **29** 3871-3884, (1998).
11. G. Grabecki, J. Wrobel, T. Dietl, K. Byczuk, E. Papis, E. Kaminska, A. Piotrowska, G. Springholz, M. Pinczolits, G. Bauer,  
"Ballistic quantum transport in n-PbTe",  
*Proc. of Conference on Semiconductors in Jerozolima* (1998).
12. K. Byczuk,  
"Spin Configurations in Carbon Nanotubes",  
*Acta Phys. Polonica B* **31**, 2997 (2000).



13. K. Byczuk, W. Hofstetter, D. Vollhardt,  
"Mott-Hubbard and Anderson Transitions in Dynamical Mean-Field Theory",  
*Physica B* **359-361**, 651 (2005).
14. A. Kauch, K. Byczuk,  
"Local moment approach to multi-orbital single impurity Anderson model; application to dynamical mean-field theory",  
*Physica B* **378-380**, 297-298 (2006).
15. G. Keller, K. Held, V. Eyert, V.I. Anisimov, K. Byczuk, M. Kollar, I. Leonov, X. Ren, D. Vollhardt,  
"Realistic Modeling of Materials with Strongly Correlated Electrons",  
NIC Series Volume 32, (Julich, 2006).
16. A. Kauch and K. Byczuk,  
"Local moment approach to multi-orbital Anderson and Hubbard models",  
in *Quantum Magnetism, Proceedings of the NATO Advanced Study Institute on Quantum Magnetism, Les Houches, France, 6-23 June 2006*, Barbara, B.; Imry, Y.; Sawatzky, G.; Stamp, P.C.E. (Eds.) (Springer, 2008),
17. K. Byczuk, W. Hofstetter, M. Kollar, and D. Vollhardt,  
"Surprises in correlated electron physics",  
*Acta Physica Polonica A* **111**, 549 (2007).
18. K. Byczuk,  
"Dynamical mean-field theory for correlated lattice fermions",  
in: *Condensed Matter Physics in the Prime of the 21st Century: Phenomena, Materials, Ideas, Methods*,  
ed. by Janusz Jedrzejewski, pp. 1-33 (World Scientific, 2008).
19. K. Byczuk, U. Yu, W. Hofstetter, and D. Vollhardt,  
"Ferromagnetism and metal-insulator transitions in correlated electron systems with alloy disorder",  
*Acta Physica Polonica A* **115**, 7 (2009).
20. K. Byczuk, W. Hofstetter, U. Yu, D. Vollhardt,  
"Correlated electrons in the presence of disorder",  
*Eur. Phys. J. Special Topics* **180**, 135 (2010).
21. J. Kunes, I. Leonov, M. Kollar, K. Byczuk, V. I. Anisimov, D. Vollhardt,  
"Dynamical mean-field approach to materials with strong electronic correlations",  
*Eur. Phys. J. Special Topics* **180**, 5 (2010).
22. B. Chatterjee, K. Byczuk  
"Screening of a single impurity and Friedel oscillations in Fermi liquids", *Journal of Physics: Conference Series* 592, 012059 (2015).

**Book chapters:**

1. K.Byczuk, J.Karbowski, J.Spalek, W.Wójcik,  
"Electronic Structure and Pairing of Strongly Correlated Fermions: Fermi Liquid versus Spin Liquid",  
Proceeding of the Conference "Strongly Correlations and Superconductivity", Amalfi, October 14-16.1993,  
World Scientific, Singapore, pp.159 (1994).
2. J.Spalek, K.Byczuk,  
" Universal Properties of Multilayer High-Temperature Superconductors: Transition Temperature and a Spatial Modulation of the Gap",  
in "Recent developments in High Temperature Superconductivity", eds. J.Klamut et al., (Lecture Notes in Physics No. 475, (Springer- Berlin, Heidelberg, 1996), pp. 285.
3. K. Byczuk,  
"Dynamical mean-field theory for correlated lattice fermions",  
in: *Condensed Matter Physics in the Prime of the 21st Century: Phenomena, Materials, Ideas, Methods*,  
ed. by Janusz Jedrzejewski, pp. 1-33 (World Scientific, 2008).
4. K. Byczuk, W. Hofstetter, D. Vollhardt,  
"Anderson localization vs. Mott-Hubbard metal-insulator transition in disordered, interacting lattice fermion systems"  
in "50 Years of Anderson Localization", ed. E. Abrahams (World Scientific, Singapore, 2010), p. 473;  
reprinted in *Int. J. Mod. Phys. B* **24**, 1727 (2010).

5. D. Vollhardt, K. Byczuk, M. Kollar,  
"Dynamical Mean-Field Theory",  
in "Theoretical Methods for Strongly Correlated Systems", edited by A. Avella and F. Mancini, Springer  
(2012).

#### **Hand-books for secondary schools**

1. M. Braun, K. Byczuk, A. Seweryn-Byczuk, E. Wojtowicz,  
"Zrozumiec fizyke - podrecznik dla liceum ogólnokształcącego i technikum" - zakres rozszerzony, cz. 1,  
Nowa Era 2019
2. M. Braun, K. Byczuk, A. Seweryn-Byczuk, E. Wojtowicz,  
"Zrozumiec fizyke - podrecznik dla liceum ogólnokształcącego i technikum" - zakres rozszerzony, cz. 2,  
Nowa Era 2020
3. M. Braun, K. Byczuk, A. Seweryn-Byczuk, E. Wojtowicz,  
"Zrozumiec fizyke - podrecznik dla liceum ogólnokształcącego i technikum" - zakres rozszerzony, cz. 3,  
Nowa Era 2021
4. M. Braun, K. Byczuk, A. Seweryn-Byczuk, E. Wojtowicz,  
"Zrozumiec fizyke - podrecznik dla liceum ogólnokształcącego i technikum" - zakres rozszerzony, cz. 4,  
Nowa Era 2022
5. M. Braun, K. Byczuk, A. Seweryn-Byczuk, E. Wojtowicz,  
"Zrozumiec fizyke - podrecznik do szkół ponadgimnazjalnych", cz. 1, Nowa Era 2013
6. M. Braun, K. Byczuk, A. Seweryn-Byczuk, E. Wojtowicz,  
"Zrozumiec fizyke - podrecznik do szkół ponadgimnazjalnych", cz. 2, Nowa Era 2013
7. M. Braun, K. Byczuk, A. Seweryn-Byczuk, E. Wojtowicz,  
"Zrozumiec fizyke - podrecznik do szkół ponadgimnazjalnych", cz. 3, Nowa Era 2014

#### **Educational materials:**

1. Z.Suwald, S.Suwald, A.Byczuk, K.Byczuk,  
"Physics and Astronomy - materials for teaching in post gymnasium schools on basic level" (in polish),  
admitted to use by Ministry of Education in Poland (**DKOS-4015-97/02**), (2002).
2. Z.Suwald, S.Suwald, A.Byczuk, K.Byczuk,  
"Physics and Astronomy - materials for teaching in post gymnasium schools on basic and advanced levels"  
(in polish),  
admitted to use by Ministry of Education in Poland (**DKOS-4015-98/02**), (2002).

#### **Popularization of Science:**

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