



Ilia State University

Professor

George I. Japaridze

Personal Data (CV)

Surname	Japaridze	First Name	George
Address (work, home)	Work: Ilia State University, Cholokash-vili Avenue 3-5, 0162 Tbilisi Georgian National Academy of Sciences, Rustaveli Aven. 52, Tbilisi TSU Andronikashvili Institute of Physics. Tamarashvili 6, Tbilisi Home: 3 Ateni street, app. 7, Tbilisi 0179	Date and place of birth	29.07.1953
Citizenship	Georgian	Telephone number(s)	
E-mail	gia_japaridze@iliaini.edu.ge giajaparidze@gmail.com		

3. Education

Education	Institution	Learning Time
Secondary	Tbilisi city school N 55	1960-1970
Higher	Tbilisi State University, Physics Department	1970-1975
Postgraduate study, doctoral candidacy	Institute of Physics, Georgian Academy of Sciences	1975-1978

4. Knowledge of Languages

Foreign languages	Level of language proficiency (fluent, intermediate, beginning with the help of a dictionary)
Russian	fluent
English	fluent

5. Scientific or Academic Degree and Rank

	Title of the thesis	Date of conferment
Ph.D. thesis	"Magnetic properties of one-dimensional interacting electrons. Exactly solvable cases"	25.03.1983
Doctoral thesis	"Low Dimensional Models of Electronic Superconductivity and unconventional magnetism"	30.11.1998
Professor	Ilia State University, School of Natural Sciences and Medicine	01.07.2009
Corresponding Member of the Academy	Mathematics and Physics Department	25.12.2001
Member of the Academy	Mathematics and Physics Department	01.05.2013

6. Work Experience

Date	Institution	Position
01.12.78-30.11.84	Institute of Physics, Georgian Academy of Sciences	Junior researcher
01.12.84-30.11.98	Institute of Physics, Georgian Academy of Sciences	Senior researcher
01.12.98-30.12.01	Andronikashvili Institute of Physics, Georgian Academy of Sciences	Leading researcher
01.01.02-30.06.05	Andronikashvili Institute of Physics, Georgian Academy of Sciences	Principal researcher
01.07.05-30.06.10	Andronikashvili Institute of Physics	Head of the Condensed Matter Physics Department
01.07.10-31.05.12	Andronikashvili Institute of Physics	Senior researcher
From 01.06.2012-01.12.2013	Andronikashvili Institute of Physics Center for support of nonproliferation of massive destruction weapons	Leading researcher
01.09.05-30.06.09	Javakishvili State University	Invited Professor
From 07.2009	Ilia State University, Faculty of Engineering	Full Professor
From 07.2013	Georgian National Academy of Sciences, Commission for Nuclear Energy and radiation safety problems	Head of the Commission
01.12.2013-01.09.2018	Andronikashvili Institute of Physics. Condensed Matter Physics Department	Head of the Condensed Matter Physics Department
01.01.2016-15.11.2023	Andronikashvili Institute of Physics. Condensed Matter Physics Department	Head of the Scientific Counsel of the Institute
From 01.09.2018	Andronikashvili Institute of Physics	Leading researcher
From 19.06.2019	Georgian National Academy of Sciences	Academician-secretary of the Mathematics and Physics Division

6.1 Teaching Activity

Date	Institution	Position
01.09.98-30.06.05	Javakishvili State University	Invited lecturer
01.09.05-30.06.09	Javakishvili State University	Invited Professor
From 07.2009	Ilia State University, Faculty of Natural sciences and Medicine	Full Professor

6.2 Work Abroad

Form of activity	Date	Place and Institution
Delivering a course of lectures at foreign higher education institutions	01.09. 1993-31.03. 1994	Institute of Theoretical Physics, University of Cologne
	May 2010	Institute of Theoretical Physics, University of Gothenburg
Long-term academic mission to research institutions	1991-2009 systematically	Institute of Theoretical Physics, Univ. of Cologne (Germany)
	1998-2003 systematically	Center for Magnetism and Strongly Correlated Electron Systems, University of Augsburg (Germany)
	2002-2006 systematically	Institute of Theoretical Physics, Hannover Univ. (Germany)
	1999-2016	Institute of Theoretical Physics, University of Fribourg (Switzerland)
	1996-2016 systematically	Institute of Theoretical Physics, Gothenburg Univ. (Sweden)
	2002 - 2005	Max Plank Institute for Physics of Complex Systems, Dresden (Germany)
	2006-2007	Institute of Micro- and Nano-Electronics, Paul Sezanne University of Marseilles (France)
2005-2009	International Center for Condensed Matter Physics, University of Brasilia (Brazil)	
2009 -2015	International Institute of Physics, University of Natal (Brazil)	

7. Sphere of Scientific Interests

1. Theory of low dimensional strongly correlated electron and spin systems
2. Physics of unconventional superconductors
3. Theory of metal-insulator transitions
4. Spintronics. Theory of low-dimensional correlated electrons with strong spin-orbit interaction
5. Unconventional phases of matter realized in systems of ultracold atoms trapped in optical lattices.

8. Publications

Total number of publications 90,

Citation Index >2600,

h-index -27

g-index - 49

8.2 Principal Papers

Years	
1978-1989	1. G.I. Japaridze and A.A. Nersesyan, <i>"Phase transition with respect to magnetic field in one-dimensional electron system"</i> , Pis'ma ZhETF, v.27, 356, (1978).
	2. G.I. Japaridze and A.A. Nersesyan, <i>"One dimensional electron system with attraction in magnetic field"</i> , Jour. Low Temp. Phys., v.37, 95, (1979).
	3. G.I. Japaridze and A.A. Nersesyan, <i>"Magnetic properties of one-dimensional interacting fermions"</i> , Phys.Letters A, v.87, 23, (1981).
	4. G.I. Japaridze and A.A. Nersesyan, <i>"Low-temperature thermodynamics of one-dimensional interacting fermions"</i> , Jour. Low Temp. Phys. v.47, 91, (1982).

	<ol style="list-style-type: none"> 5. G.I. Japaridze, A.A. Nersesyan and P.B. Wiegmann, "<i>Crossover from strong-coupling regime to the weak-coupling regime in the SU(2)-symmetric Thirring model</i>", Phys.Letters A, v.94, 254, (1983). 6. G.I. Japaridze and A.A. Nersesyan, "<i>Excitation spectrum and low-temperature thermodynamics of one-dimensional interacting Fermi system</i>", Phys. Lett, A, v.94, 224, (1983). 7. G.I. Japaridze, A.A. Nersesyan and P.B. Wiegmann, "<i>Exact results in two-dimensional U(1)-Thirring model</i>", Nuclear Physics B, v.230, FS10, 511, (1984).
1990-1999	<ol style="list-style-type: none"> 8. A.A. Nersesyan, G.I. Japaridze and I.G. Kimeridze, "<i>Low-temperature magnetic properties of the two-dimensional spin nematic</i>", Journal of Physics C: Cond.Matt., v.3, 3353, (1991). 9. G.I. Japaridze and E.Mueller-Hartmann, "<i>Electrons with correlated hopping interaction on one dimension</i>", Annalen der Physik, v.3, 163-180, (1994). 10. G.I. Japaridze "<i>The bond-located antiferromagnetism in the One-Dimensional interacting electron system</i>", Physics Letters A, v.201, 239-246, (1995). 11. G. Japaridze and E. Mueller-Hartmann, "<i>Bond-located ordering in the one-dimensional Penson-Kolb-Hubbard model</i>", Journal of Physics C: Cond. Matt. v.9, N47, 10509 (1997). 12. G. Bouzerar and G.I. Japaridze, "<i>η-superconductivity in the one-dimensional Penson-Kolb model</i>", Zeit. f. Physik B, v.104, 215-219, (1997). 13. G. Bouzerar, A.P. Kampf and G.I. Japaridze, "<i>Elementary excitation in dimerized and frustrated Heisenberg chains</i>" Phys. Rev. B v. 58, 3117-3123, (1998). 14. G.I. Japaridze and A.P. Kampf, "<i>Phase diagram of the extended Hubbard model with correlated-hopping interactions</i>" Phys. Rev. B v. 59, 12822-12829, (1999).
2000-2009	<ol style="list-style-type: none"> 15. G.I. Japaridze and E. Mueller-Hartmann, "<i>Triplet superconductivity in a one-dimensional ferromagnetic t-J model</i>" Phys. Rev. B v. 61, 9019-9027 (2000). 16. G.I. Japaridze, A.P. Kampf, M.Sekania, P. Kakashvili and Ph. Brune "<i>Local pair superconductivity in one-dimensional electron system with pair hopping interaction</i>", Phys. Rev. B v. 65, 014518 (2002). 17. A.P. Kampf, M. Sekania, G.I. Japaridze, and Ph. Brune, "<i>Nature of the insulating phases in the half-filled ionic Hubbard model</i>", Jour. Phys. C: Cond. Matt. v15, 5895 (2003). 18. T. Vekua, G.I. Japaridze and H.J. Mikeska, "<i>Phase diagrams of spin ladders with ferromagnetic legs</i>", Phys. Rev. B . v.67, 064419 (2003). 19. C. Dziurzik, G.I. Japaridze, A. Schadschneider, and J. Zittartz, "<i>Triplet superconductivity vs easy-plane ferromagnet in a 1D itinerant electron system with transverse spin anisotropy</i>", Eur. Phys. J. B v.37, 453-463 (2004). 20. V. Gritsev, G. Japaridze, M. Pletyukhov, and D. Baeriswyl, "<i>Competing Effects of Interactions and Spin-Orbit Coupling in a Quantum Wire</i>", Phys. Rev. Lett. 94, 137207 (2005). 21. M.E. Torio, A.A. Aligia, G.I. Japaridze and B. Normand, "<i>Quantum phase diagram of the generalized ionic Hubbard model for AB_n chains</i>", Phys. Rev. B 73, 115109 (2006). 22. P. Lombardo, R. Hayn and G.I. Japaridze, "<i>Insulator-metal-insulator transition and selective spectral weight transfer in a disordered strongly correlated system</i>", Phys. Rev. B 74, 085116 (2006).

	<p>23. G.I. Japaridze, R.M. Noack, D. Baeriswyl and L. Tincani, <i>"Phases and phase transitions in the half-filled $t-t'$ Hubbard chain "</i>, Phys. Rev. B 76, 115118 (2007).</p> <p>24. G.I. Japaridze, R. Hayn, P. Lombardo and E. Mueller-Hartmann, <i>"Band-Insulator-Metal-Mott-Insulator transition in the half-filled $t-t'$ ionic-Hubbard chain"</i>, Phys. Rev. B 75, 245122 (2007).</p> <p>25. L. Craco, P. Lombardo, R. Hayn, G.I. Japaridze, E. Müller-Hartmann, <i>"Electronic phase transitions in the half-filled ionic Hubbard model"</i>, Phys. Rev. B 78, 075121 (2008).</p> <p>26. G.I. Japaridze, Henrik Johannesson, and Alvaro Ferraz, <i>"Metal-insulator transition in a quantum wire driven by a modulated Rashba spin-orbit coupling"</i>, Phys. Rev. B 80, 041308 (R) (2009).</p>
<p>2010 -2019</p>	<p>27. Anders Ström, Henrik Johannesson, G. I. Japaridze, <i>"Edge Dynamics in a Quantum Spin Hall State: Effects from Rashba Spin-Orbit interaction"</i>, Phys. Rev. Lett. 104, 256804 (2010) .</p> <p>28. Zoran Ristivojevic, George I. Japaridze and Thomas Nattermann, <i>"Spin-filtering by field dependent resonant tunnelin"</i>. Phys. Rev. Lett. 104, 076401 (2010)</p> <p>29. Bernd Braunecker, George I. Japaridze, Jelena Klinovaja, and Daniel Loss, <i>"Spin-selective Peierls transition in interacting one-dimensional conductors with spin-orbit interaction"</i>, Phys. Rev. B 82, 045127 (2010).</p> <p>30. T. Jonckheere, G.I. Japaridze, T. Martin, and R. Hayn, <i>"Transport through a band insulator with Rashba spin-orbit coupling:metal-insulator transition and spin-filtering effects"</i>, Phys. Rev. B 81, 165443 (2010).</p> <p>31. M. Malard, Inna Grusha, G. I. Japaridze and H. Johannesson, <i>"Modulated Rashba interaction in a quantum wire: Spin and charge dynamics"</i> Phys. Rev. B 84, 075466 (2011).</p> <p>32. Bernd Braunecker, Anders Stroem and G.I. Japaridze, <i>"Magnetic-field switchable metal-insulator transition in a quasi-helical conductor"</i>, Phys. Rev. B v.87, 075151 (2013).</p> <p>33. M. Di Liberto, D. Malpetti, G.I. Japaridze C. Morais Smith, <i>"Ultracold fermions in a one-dimensional bipartite optical potential: metal-insulator transitions driven by shaking"</i>Phys. Rev. A 90, 023634 (2014).</p> <p>34. G. I. Japaridze, Henrik Johannesson and Mariana Malard. <i>"Synthetic helical liquid in a quantum wire"</i>Phys. Rev. B 89, 201403 (2014).</p> <p>35. M. Eliashvili, G.I. Japaridze, G. Tsitsishvili, and G. Tukhashvili, <i>"Edge states in 2D lattices with hopping anisotropy and Chebyshev polynomials"</i>, Jour. of Phys. Soc. Japan 83, 044706 (2014).</p> <p>36. M. Di Liberto, C. E. Creffield, G. I. Japaridze C. Morais Smith. <i>"Quantum simulation of correlated-hopping models with fermions in optical lattices"</i> Phys. Rev. A 89, 013624 (2014).</p> <p>37. Mariana Malard, George I. Japaridze and Henrik Johannesson, <i>"Synthesizing Majorana zero-energy modes in a periodically gated quantum wire"</i>, Phys. Rev. B 94, 115128 (2016).</p> <p>38. Inna Grusha, Micheil Menteshashivi and G.I. Japaridze, <i>"Effective Hamiltonian for a half-filled asymmetric ionic Hubbard chain with alternating on-site interaction"</i>, International Jour of Mod . Phys. B 30, 1550260 (2016).</p> <p>39. D. C. Cabra, G. L. Rossini. A. Ferraz, G. I. Japaridze and H. Johannesson, <i>"Half-metal phases in a quantum wire with modulated spin-orbit interaction"</i>, Phys. Rev. B 96, 205135 (2017).</p>

	<p>40. Michael Sekania, Dionys Baeriswyl, Luka Jibuti, and G.I. Japaridze „<i>The Mass-Imbalanced Ionic Hubbard Chain</i>“, Phys. Rev. B 96, 035116 (2017).</p> <p>41. Niko Avalishvili, Bachana Beradze and George I. Japaridze, „<i>Magnetic phase diagram of a spin $S=1/2$ antiferromagnetic two-leg ladder in the presence of modulated along legs Dzyaloshinskii-Moriya interaction</i>” . Eur. Phys. J. B 92, 262 (2019) .</p> <p>42. N. Avalishvili, G.I. Japaridze and G. L. Rossini, “<i>Long-range spin chirality dimer order in the Heisenberg chain with modulated Dzyaloshinskii-Moriya interactions</i>”, Phys. Rev. B 99, 205159 (2019).</p> <p>43. G.I. Japaridze and A.A.Nersesyan “<i>Ground state phases and quantum criticalities of one-dimensional Peierls model with spin-dependent sign-alternating potentials</i>”, Phys. Rev. B 99, 035134 (2019).</p>
From 2020-	<p>44. G. L. Rossini, D. C. Cabra, G. I. Japaridze „<i>Long-range alternating spin current order in a quantum wire with modulated spin-orbit interactions</i>“, Phys. Rev. B 101, 014441 (2020).</p> <p>45. F. Khastehdel Fumani, B. Beradze, S. Nemati, S. Mahdavifar and George I. Japaridze, „<i>Quantum correlations in the spin-1/2 Heisenberg XXZ chain with modulated Dzyaloshinskii-Moriya interaction</i>” Jour. Magn. Magnetic Materials, 518 167411 (2020).</p> <p>46. G. I. Japaridze , Hadi Cheraghi and Saeed Mahdavifar, „<i>Magnetic phase diagram of a Spin-1/2 XXZ chain with modulated Dzyaloshinskii-Moriya interaction</i>“, Phys. Rev. E 104, 014134 (2021).</p> <p>47. Shota Garuchava and George I. Japaridze, “The mean-field ground state phase diagram of the half-filled mass-imbalanced $t-t'$ Ionic Hubbard Chain”, Proceeding of the GNAS v17, N1 49-56 (2023).</p> <p>48. Gerardo L. Rossini and George I. Japaridze, “<i>Repulsion driven metallic phase in the ground state of the half-filled $t - t'$ ionic Hubbard chain</i>” , Phys. Rev. A 108, 063307 (2023)</p> <p>49. Sh. Garuchava, G.I. Japaridze and A.A.Nersesyan, “Orbital <u>antiferromagnetic</u> currents in a frustrated <u>fermionic</u> ladder”, Eur. Phys. J. B 97, N9 139 (2024).</p> <p>50. S. Garuchava, B. Beradze, T. Sharia and G.I. Japaridze, “<i>The large U expansion for a half-filled asymmetric Hubbard model on a triangular ladder in the presence of spin-dependent magnetic flux</i>” Journal.of Physics A, Mathematical and Theoretical v.58 N21 215203 (2025).</p>

8.3 Textbooks, Additional Manuals, and other Methodological Literature and Training means

1. M. Chabashvili, G.I. Japaridze et. al, “*Nuclear nonproliferation policy development in independent Georgia*” in “Georgia’s Nuclear Odyssey” (Eds T. Akubardia, S.Lordkipanidze,T. Pataraya and I. Mchedlishvili Tbilisi CCDS 2013)
2. M. Chabashvili, G.I. Japaridze et. al, “*Nuclear research in Soviet Georgia*” in “Georgia’s Nuclear Odyssey” (Eds T. Akubardia, S.Lordkipanidze,T. Pataraya and I. Mchedlishvili Tbilisi CCDS 2013)
3. G. Japaridze, L. Chelidze, R. Shanidze, S. Lordkipanidze, T. Pataraya and I. Mchedlishvili, “*Georgia needs assessment: preparations and response to nuclear accidents outside the country*” (Tbilisi CCDS 2019 ISBN 978-9941-8-1819-6)

4. G. I. Japaridze and L. S. Chkhartishvili, “*Professor Alex B. Gerasimov (1936 – 2019): long and great life in science*”, Nano Studies v. 21/22, 7-22 (2022).

8.4 Participation in Scientific Symposiums, Conferences for the last ten years

Year	Name of Event
2023	1. International Conference “Modern trends in Physics” Baku State University. 30.11-01.12.2023 ; “ <i>Repulsion driven metallic phase in the ground state of the half-filled $t - t'$ ionic Hubbard chain</i> ”.
2022	1. International school and Conference “Functional Materials for modern technologies” Batumi 1-7.10.2022 ; “One-dimensional models of metal-insulator transitions”. 2. School on Advances in Condensed Matter Physics: New Trends and Materials in Quantum Technologies 22.09-01.10. 2022 Baku (Azerbaijan). “Quantum phase transitions in the half-filled zig-zag ladder with imbalanced legs” 3. Dynamical days in Central Asia and Caucasus 28-30.09.2022 Baku (Azerbaijan). “LONG-RANGE SPIN CHIRALITY DIMER ORDER IN THE SPIN $S = 1/2$ HEISENBERG CHAIN WITH MODULATED DZYALOSHINSKII-MORIYA INTERACTIONS” 4. International Conference “Quantum Magnetism and Statistical Mechanics of Lattice Models”, Yerevan, Armenia 11-13. 05.2022 “Metal-insulator transitions in the Ground state of the in 1D $t-t'$ ionic-Hubbard chain“
2019	5. School on Advances in Condensed Matter Physics: New Trends and Materials in Quantum Technologies 20-28.09. 2019 Samarkand (Uzbekistan).
2017	6. MPI PKS Conference “Quantum Transport in One Dimension” Dresden 10-15.09.2017 7. Summer School " New Advances in Condensed Matter Physics: Quantum transport, topological effects and energy conversion in low- dimensional systems " 20-28.09. 2017 Khiva (Uzbekistan).
2015	8. Institute of Theoretical Physics, “Simulation of the correlated-hopping models with ultracold atoms on optical lattices with shaking”. Gothenborg University, 26.05.2015 9. MPI PKS Conference “Quantum Transport in One Dimension” Dresden 14-18.09.2015
2014	10. MPI for PKS Dresden, International Conference “Topological matter out of Equilibrium” 27-29.03.2014 “Synthetic helical liquid in a quantum wire” (H. Johannesson) 11. School and Workshop “Georgian-German Science Bridge” Tbilisi 07-12.07.2014 12. NORDITA Conference “Quantum Engineering of States and Devices” Stockholm 18-23.08.2014

9. Organizational Work (Holding of Congresses and Conferences, Editorial Work)

Years	Name
2019	International School and workshop “Emergent Low-D phenomena in topological and strongly correlated matter” Tbilisi 01-10.06.2019 (Codirector)
2013	ITAP workshop and conference on “ <i>Physics of Topological Materials</i> ” Marmaris, Turkey, 17.08.2012 (Codirector)
2011	Conference: "Recent Advances in Quantum Field and String Theory" Tbilisi, 27.09. 2011.
2009	“The Heisenberg Model: Past, Present and Future” ICCMP, University of Brasilia, (Brazil) 20-27.07.2009 (Codirector)
2007	Alexander von Humbolt Stiftung Workshop “Gauge theories in Field Theory and Condensed Matter”, Yerevan-Tbilisi 11-23.10.2007
2004	International conference “ <i>Selected topics in theoretical Physics</i> ”, Tbilisi 18-23.09.2004

11. International and Local Scientific grants

Years	Name
2000-2002	1. “Low-dimensional strongly correlated electron and spin systems“ INTAS-GEORGIA 97-1340
2001-2004	2. “Low-energy properties of low-dimensional quantum systems with unconventional ordering“ SCOPEs 7GEPJ62379
2006-2008	3. “Unconventional magnetic and superconducting (superfluid) order in low-dimensional strongly correlated fermion systems in the case of restricted geometry” GNSF/ST06/4-018
2007-2009	4. “Creation of multifunctional modern hydrogen sensors” STCU-3867L
2010-2012	5. “Dynamical effects in low-dimensional electron and spin systems” GNSF/ST09/4-447
2010-2012	6. “Theoretical Study of metal-hydrogen systems used for Hydrogen energetics” GNSF/ST09/4-280
2010-2013	7. “Symmetry breaking effects in strongly correlated low-dimensional systems” SCOPEs IZ73Z0_128058
2014-2016	8. Georgian National Science Foundation and Science and Technology Center in Ukraine through the joint Grant No. STCU-5906.
2015-2018	9. “Hydrogen Influence on Mechanical and Magnetic Properties of Metal Alloys” SRNSF grant № FR/265/6-100/14 “ <i>Quantum group and topologically nontrivial states in low-dimensional fermion systems.</i> ”
2019-2023	10. SRNSF grant № FR-19-11872 “ <i>Ground-State properties of low-dimensional strongly correlated spin-imbalanced Fermi systems in the presence of symmetry breaking fields</i> ”

13. Other Activities

	Name	Years
Supervision of Theses and Masters work	More than 30 Master and 15 PhD thesis works supervised and co-supervised at the Tbilisi Javakishvili State University, at the Ilia state University as well as at the universities of Cologne, Hannover, Augsburg, Gothenberg and Fribourg	1990-2023

14. Awards and Prizes, Honorary Title

Date	Name of Awards, Prizes, Honorary Title
2013	Andronikashvili Prize in Physics of the Georgian National Academy of Sciences
2024	Georgia National Prize for the work cycle “Quantum phase transitions in the low-dimensional strongly correlated and frustrated systems”

15. Family Status

Married. Two children