

Curriculum Vitae of Prof. A. Rakhimov

Name: Abdulla Rakhimov

Birth: October 7, 1955, Tashkent, Uzbekistan

Family: married, one son and two daughters

Permanent position: Professor, Senior researcher, Institute of Nuclear Physics, Tashkent, Uzbekistan.

Address: Institute of Nuclear Physics, Tashkent, Uzbekistan.

Tel.: + 998-94-6831931, *E-mail :* rakhimovabd@yandex.ru;

Nationality: Uzbekistan

Home Address: Uzbekistan, Tashkent, 100147, Visol, II-proezd, 5.

E-mail : rakhimovabd@yandex.ru

Education:

2005 – Doctor of Sciences (Second degree), National University of Uzbekistan.

1983 - Candidate (PhD) in Physics and Mathematics, JINR, Dubna, Russia;

1977 - M.Sc. Tashkent State University, Physics Department, Uzbekistan

Employment:

2016-present Senior researcher, Lab. Condensed Matter Physics,
Institute of Nuclear Physics of Uzbekistan

2015- National University of Uzbekistan, Tashkent, Uzbekistan.

1998 – 2014 Senior researcher, Lab. Condensed Matter Physics,
Institute of Nuclear Physics of Uzbekistan

2006-2007 Visiting Professor, Yonsei University, Seoul, Korea

2003-2004 Visiting Professor, Yonsei University, Seoul, Korea

2001-2002 Postdoctoral researcher, Yonsei University, Seoul, Korea

2000-2001 Visiting Professor, University of Alberta (Canada)

1996-1997 Visiting Professor, University of Alberta (Canada)

1992 - 1997- Assistant Professor, Theoretical Physics Dept., Tashkent State University

1983 - 1992- Senior Researcher, Institute of Applied Physics, Tashkent

Research experience:

1977-2024, i.e more than 40 years work in theoretical physics.

Scientific Awards and Grants:

1993 - International Science Foundation personal research grant

1995 - International Science Foundation research grant

1996 - TRIUMF (Canada) research grant

1999 – DAAD grant, Institute of Nuclear Physics, Juelich, Germany

2000 – NSERC grant, University of Alberta, Canada

2001 –Brain Korea-21, Yonsei University, Seoul, Korea

2002 – SCOPES , SNSF grants, University of Bern, Switzerland

2003 –Brain Korea-21, Yonsei University, Seoul, Korea

2005 – DAAD grant, Institute of Nuclear Physics, Juelich, Germany

2007 -Brain Korea-21, Yonsei University, Seoul, Korea

2008-2010 Volkswagen Foundation grant, Berlin Free University, Germany
 2009 – DAAD grant, Berlin Free University, Germany
 2012 – SCOPES , SNSF grants, University of Zurich, Switzerland
 2012 – DAAD grant, Berlin Free University, Germany
 2014 – TUBITAK grant, Ankara University, Turkey
 2015 - SCOPES , SNSF grants, University of Zurich, Switzerland
 2015 and 2017 – TUBITAK , Ankara and Bilkent Universities, Turkey

International Collaboration:

1996 - Prof. F. Khanna, University of Alberta, Edmonton, Canada
 1997 - International Center of Theoretical Physics (ICTP)
 1999 - Prof. A. Wirzba, Institute of Nuclear Physics, Juelich, Germany
 2000 - Prof. F. Khanna, University of Alberta, Edmonton, Canada
 2001- Prof. J.H. Yee, Yonsei University, Seoul, Korea
 2002- Prof. J. Gasser, University Bern, Switzerland
 2003- Prof. Chul Koo Kim, Yonsei University, Seoul, Korea
 2004 - International Center of Theoretical Physics (ICTP)
 2005 - Prof. U. Meissner, Institute of Nuclear Physics, Juelich, Germany
 2007- Prof. Chul Koo Kim, Yonsei University, Seoul, Korea
 2008-2013 Prof. H. Kleinert, Dr. A. Pelster, Berlin Free University
 2008-2013 Prof. E. Sherman, Bilbao University, Spain
 2008-2013 Prof. V. Yukalov, JINR, Dubna, Russia
 2008-2013 Prof. A. Schilling, Zurich University, Switzerland
 2014-2015 prof. I. Askerszade, Ankara University, Turkey
 2014-2019 prof. B. Tanatar, Bilkent University, Turkey
 2019-2024 prof. V. I. Yukalov , Joint Institute of Nuclear Research, Dubna, Russia

Topics:

2007-present: Nonperturbative approaches in quantum field theory; application of quantum field theory to phase transitions in quantum magnets, optical lattices, superconductivity, Bose-Einstein condensates
2004-2008: Isospin breaking nucleon – nucleon interaction, Nolen-Schiffer anomaly
1996 - 2001: Thermofield theory, in - medium properties of hadrons and their interaction, QCD at finite temperature, application of thermo field theory, few nucleon systems in chiral effective Lagrangians
1991 -1995 : The Skyrme model, nucleon -nucleon and nucleon interactions in the Skyrme model, extension of Skyrme model including sigma - mesons
1984 -1991: Bag models, recoil effects, pion nucleon and electromagnetic interactions in the Cloudy Bag models
1978 -1983: Multiple scattering theory, pion- nuclear scattering at low energies
1977 -1978: Glauber theory, proton - helium scattering

Fields of interest.

Condensed matter physics: Nonperturbative methods in quantum field theories, phase transitions, superconductivity, Bose-Einstein condensation, quantum magnetic systems, optical lattices.

Nuclear and particle physics: hadrons in dense and hot matter, quark - gluon plasma, chiral effective Lagrangians of QCD, hadron structure.

Short description of the major accomplishments

As a theoretician Abdulla Rakhimov has a great experience on particle, nuclear and condensed matter physics. He published more than 60 articles in referred journals. In particle physics he proposed an extended Skyrme Lagrangian, taking into account a medium modification of nucleons in the nuclear medium. He has started working on low temperature condensed matter physics since 2007 and has been developing new field theoretical approaches based on the path integral formalism.

List of recent publications:

1. Abdulla Rakhimov, Asliddin Khudoyberdiev, *Hugenholtz -- Pines relations and the critical temperature of a Rabi coupled binary Bose system*, **Euro Physics . Journal . D** , 77, 37 (2023);
2. Abdulla Rakhimov, Asliddin Khudoyberdiev, Zabardast Narzikulov, Bilal Tanatar, *Defining a critical temperature of a crossover from BEC to the normal phase in anisotropic quantum magnets*, **Modern Physics Letters B** 37, 2250206 (2023);
3. Abdulla Rakhimov, Tolibjon Abdurakhmonov, Zabardast Narzikulov, Vyacheslav I. Yukalov, *Self-consistent theory of a homogeneous binary Bose mixture with strong repulsive interspecies interaction*, **Physical Review A** 106, 033301 (2022);
4. Abdulla Rakhimov, Asliddin Khudoyberdiev, Bilal Tanatar, *Effects of exchange and weak Dzyaloshinsky-Moriya anisotropies on thermodynamic characteristics of spin-gapped magnets*, **International Journal of Modern Physics B (IJMPB)**, 35, 2150223 (2021);

5. Abdulla Rakhimov, Tolib Abdurakhmonov and B Tanatar, *Critical behavior of Tan's contact for bosonic systems with a fixed chemical potential* , **Journal of Physics : Condens. Matter** 33 , 465401 (2021);
6. Abdulla Rakhimov , Asliddin Khudoyberdiev , Luxmi Rani , B. Tanatar, *Spin-gapped magnets with weak anisotropies I: Constraints on the phase of the condensate wave function*, **Annals of Physics**, 424, 168361 (2021);
7. Abdulla Rakhimov, Mukhtorali Nishonov, Luxmi Rani, Bilal Tanatar, Characteristic temperatures of a triplon system of dimerized quantum magnets, **International Journal of Modern Physics B**, 35, 2150018, (2021).
8. Abdulla Rakhimov, *Tan's contact as an indicator of completeness and self-consistency of a theory*, **Physical Review A** 102, 063306 (2020);
9. Abdulla Rakhimov, Mukhtorali Nishonov, Bilal Tanatar *Joule-Thomson temperature of a triplon system of dimerized quantum magnets*, **Physics Letters A** 384 , 126313 (2020)
10. Abdulla Rakhimov, Zabardast Narzikulov, Andreas Schilling, and E. Ya. Sherman , *Magnetocaloric effect and Grüneisen parameter of quantum magnets with a spin gap*, **Physical Review. B** 98, 144416 (2018)