

# BAKHRAM UMAROV



- KULLIYAH OF SCIENCE
- IIUM Kuantan Campus
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## ACADEMIC QUALIFICATION

- PhD in Theoretical & Mathematical Physics
- Diploma in Physics

## TEACHING RESPONSIBILITIES

ADVANCED CALCULUS	2002/2003 2003/2004 2005/2006 2006/2007
ADVANCED MATHEMATICAL METHODS	2010/2011 2012/2013 2013/2014 2014/2015
ADVANCED MATHEMATICAL MTEHODS	2009/2010 2010/2011 2011/2012 2012/2013 2013/2014
ANALYSIS	2005/2006 2006/2007 2007/2008
ANALYTIC GEOMETRY	2006/2007
CALCULUS	2002/2003 2003/2004
DEVELOPING AND PROTECTING MATHEMATICAL IDEAS	2006/2007
ELECTRICITY AND MAGNETISM II	2017/2018 2018/2019 2019/2020
INTRODUCTION TO OPTICS	2010/2011
LINEAR ALGEBRA	2005/2006
MATHEMATICAL ANALYSIS	2011/2012 2014/2015 2015/2016 2016/2017 2017/2018
MATHEMATICAL METHODS	2006/2007 2007/2008 2008/2009
MATTER AND WAVES	2007/2008 2008/2009 2009/2010 2010/2011
OPTIC 1	2007/2008 2008/2009 2009/2010 2010/2011
OPTIC II	2008/2009 2009/2010 2010/2011 2011/2012
PROBABILITY AND DATA ANALYSIS	2017/2018
PROBABILITY AND STATISTICAL INFERENCE II	2009/2010
QUANTUM MECHANICS II	2015/2016 2016/2017 2017/2018 2018/2019 2019/2020

VECTOR ANALYSIS	2012/2013 2013/2014 2014/2015 2015/2016 2016/2017 2017/2018 2018/2019
VIBRATION, WAVES AND OPTICS	2016/2017

## RESEARCH PROJECTS

### In Progress

- 2018 - Present** - Vector solitons interaction with external potentials in Coupled Nonlinear Schrodinger Equation.
- 2016 - Present** - Floquet Engineering of Quantum Tunneling in the Array of Bose-Einstein Condensates with Spin-Orbit Coupling
- 2016 - Present** - Solitons and Unidirectional Scattering in Quadratically Nonlinear Optical Coupler with Parity -Time Symmetry
- 2013 - Present** - DYNAMICAL SYSTEMS AND THEIR APPLICATIONS (DSTA)

### Completed

- 2016 - 2018** - Soliton dynamics in a non intergrable continuous and discrete systems
- 2014 - 2016** - Faraday Pattern In The Bose-Eintein Condensate With Spin-Orbit Coupling
- 2013 - 2016** - Probing the Bound States in the Potential Well by Scattering of Matter-Wave Solutions
- 2013 - 2016** - P-Adic Statistical Models and Dynamics of Localized Excitations of Bose-Einstein Condensates
- 2010 - 2015** - The Soliton Radiation in an Optical System with Non-Kerr Nonlinearity
- 2009 - 2013** - Nonlinear Waves in Bose-Einstein Condensates & Optical Waveguide Systems with Higher Order Nonlinearity
- 2008 - 2011** - Quantum Markov Chains, Quantum Quadratic Stochastic Processes
- 2006 - 2010** - Intrinsic Localized Vectorial Mode in BEC and Waveguide Systems with Cubic-Quintic Nonlinearity

## PUBLICATIONS

### Article

- 2018** - [Introduction to nonlinear discrete systems: theory and modelling.](#) European Journal of Physics , 39 (5) pp.1-13

- 2017** [Binary matter-wave compactons induced by inter-species scattering length modulations.](#) Journal of Physics B: Atomic, Molecular and Optical Physics , 50 (16) pp.1-13
- 2016** [Atomic coupler with two-mode squeezed vacuum state.](#) Malaysian Journal of Mathematical Sciences , 10 pp.103-110
- 2016** [Scattering of a two-soliton molecule by Gaussian potentials in dipolar Bose-Einstein condensates.](#) Journal of Physics B: Atomic, Molecular and Optical Physics , 49 (12) pp.125307-1-125307-8
- 2016** [Scattering of a two-soliton molecule by Gaussian potential barriers and wells.](#) Journal of Physics: Conference Series , 697 pp.012023-1
- 2015** [The soliton scattering of the cubic-quintic nonlinear Schrödinger equation on the external potentials.](#) AIP Conference Proceedings , 1682 pp.020022-1
- 2015** [Vibration spectrum of a two-soliton molecule in dipolar Bose-Einstein condensates.](#) Physics Letters A , 379 pp.1828-1832
- 2014** [Exact solitonic solutions for optical media with  \$\chi\(2\)\$  nonlinearity and PT-symmetric potentials.](#) Journal of Physics: Conference Series , 553 (012001) pp.1-6
- 2014** [Compacton matter waves in binary bose gases under strong nonlinear management.](#) Physical Review A - Atomic, Molecular, and Optical Physics , 90 (063637) pp.1-11
- 2013** [Variational analysis of soliton scattering by external potentials.](#) Journal of Physics: Conference Series , 435 (012024) pp.012024-1
- 2013** [Parametric excitation of solitons in dipolar Bose Einstein condensates.](#) Modern Physics Letters B , 27 (25) pp.1350184(1)-350184(12)
- 2013** [Three level atom in bad cavity.](#) Middle-East Journal of Scientific Research , 13 pp.31-37
- 2013** [Strongly localized modes in discrete salerno model.](#) World Applied Sciences Journal , 21 pp.166-171
- 2013** [Study of localized solutions of the nonlinear discrete model for dipolar BEC in an optical lattice by the homoclinic orbit method.](#) Journal of Physics: Conference Series , 435 (012026) pp.012026-1
- 2013** [Interaction of two pulses in defocusing nonlinear Schrodinger equation.](#) Journal of Physics: Conference Series , 435 (012034) pp.1-4
- 2011** [Variational analysis of flat-top solitons in Bose-Einstein condensates.](#) International Journal of Modern Physics B , 25 (18) pp.2427-2440
- 2011** [Modulational instability in salerno model.](#) Australian Journal of Basic and Applied Sciences , 5 (5) pp.25-28
- 2011** [Variational analysis of flat-top solitons in Bose-Einstein condensates.](#) International Journal of Modern Physics B , 25 (18) pp.2427-2440
- 2010** [Modulational Instability in Salerno Model.](#) Australian Journal of Basic and Applied Sciences , 5 (5) pp.25-28

- 2009 [Modulational instability in two-component discrete media with cubic-quintic nonlinearity.](#) Physical Review E - Statistical, Nonlinear and Soft Matter Physics , 79 (4) pp.046605-1
- 2007 [Anticlonal Gaussian attack for continuous variable EPR correlations.](#) Journal of Physics B: Atomic, Molecular and Optical Physics , 40 (6) pp.1153-1160
- 2007 [Modulational instability and discrete breathers in discrete cubic-quintic nonlinear Schrödinger equation.](#) Physica D: Nonlinear Phenomena , 232 (1) pp.54-61
- 2006 [Generation of three-qubit entangled W-state by nonlinear optical state truncation.](#) Journal of Physics B : Atomic, Molecular and Optical Physics , 39 (6) pp.1269-1274
- 2002 [Autosoliton in Ablowitz-Ladik chain with linear damping and nonlinear amplification.](#) Physics Letters A , 305 (6) pp.371-306

#### Conference or Workshop Item

- 2018 [Strongly localized dark modes in binary discrete media with cubic-quintic nonlinearity within the anti-continuum limit.](#) In: **4th International Conference on Mathematical Applications in Engineering 2017 (ICMAE'17)**
- 2018 [Interaction of a spatial soliton on an interface between two nonlinear media.](#) In: **Simposium Kebangsaan Sains Matematik ke-26**
- 2017 [The soliton interaction in weakly nonlocal nonlinear media on the external potentials.](#) In: **37 International Conference Quantum Probability and Related Topics**
- 2017 [Flat top solitons on linear gaussian potential.](#) In: **1st International Conference on Applied & Industrial Mathematics and Statistics 2017 (ICoAIMS 2017)**
- 2017 [Localized solutions of extended discrete nonlinear schrödinger equation.](#) In: **1st International Conference on Applied and Industrial Mathematics and Statistics 2017, ICoAIMS 2017**
- 2017 [Anti-continuum approach on odd solitons in binary discrete media with cubic-quintic nonlinearity.](#) In: **37th International Conference on Quantum Probability and Related Topics, QP 2016**
- 2017 [Anti-continuum approach on nonlinear localized modes in dipolar Bose-Einstein condensates in optical lattice.](#) In: **37th International Conference on Quantum Probability and Related Topics, QP 2016**
- 2017 [Scattering of a flat top solitons of cubic - quintic nonlinear Schrödinger equation by a linear delta potential.](#) In: **37th International Conference on Quantum Probability and Related Topics (QP37) 2016**
- 2016 [Scattering of a flat top solitons of cubic - quintic nonlinear Schrödinger equation by delta potential.](#) In: **37 International Conference Quantum Probability and Related Topics**
- 2016 [Compactons of binary bose gases in optical lattices with inter-species scattering length management.](#) In: **Australian Conference on Optical Fibre Technology, ACOFT 2016**
- 2016 [Soliton scattering on the external potential in weakly nonlocal nonlinear media.](#) In: **The 3rd International Conference on Mathematical Applications in Engineering 2014 (ICMAE'14)**

- 2016 [Dark compactons in nonlinear Schrödinger Lattices with strong nonlinearity management.](#) In: **The 3rd International Conference on Mathematical Applications in Engineering 2014 (ICMAE'14)**
- 2016 [Atomic coupler with two-mode squeezed vacuum states.](#) In: **3rd International Conference on Mathematical Applications in Engineering (ICMAE'14)**
- 2015 [Interaction of solitons with delta potential in the Cubic-Quintic Nonlinear Schrodinger Equation.](#) In: **7th International Conference on Research and Education in Mathematics: Empowering Mathematical Sciences through Research and Education (ICREM7 2015)**
- 2015 [Markovian dynamics of the two-mode bose-einstein condensate.](#) In: **The 3rd International Postgraduate Conference in Science and Mathematics 2015 (IPCSM'15)**
- 2015 [The cubic-quintic nonlinear schrödinger equation soliton scattering on the linear potentials.](#) In: **International Conference on Applied Analysis and Mathematical Modeling**
- 2015 [Scattering of a two-soliton molecule by attractive potential well.](#) In: **International Conference of Algebra, Analysis and Quantum Probability**
- 2014 [Soliton scattering on the external potential in weakly nonlocal nonlinear media.](#) In: **ICMAE 2014**
- 2014 [Penyebaran soliton bagi persamaan Persamaan Kubik-Quintik Schrödinger Tak Linear terhadap potensi luar = The soliton scattering of the Cubic-Quintic Nonlinear Schrödinger Equation on the external potentials.](#) In: **Simposium Kebangsaan Sains Matematik Ke-22**
- 2013 [Quantum dynamics of nonlinear excitations in the Ablowitz-Ladik model.](#) In: **IUM Congres on Science 2013 (iCOS 2013)**
- 2013 [Generalized quantum rotation gates using STIRAP .](#) In: **The 4th International Conference on Information & Communication Technology for the Muslim World (ICT4M)**
- 2013 [Squeezing in four-mode Kerr nonlinear coupler via phase space representation.](#) In: **International Conference on Mathematical Sciences and Statistics (ICMSS2013)**
- 2012 [Strongly localized modes in discrete salerno model.](#) In: **2nd International Conference on Mathematical Applications in Engineering (ICMAE2012)**
- 2012 [Variational analysis of soliton scattering by external potentials.](#) In: **International Conference of Application Science & Technology (iCAST2012)**
- 2012 [Study of localized solutions of the nonlinear discrete model for dipolar Bose-Einstein condensate in an optical lattice by the homoclinic orbit method.](#) In: **International Conference of Application Science & Technology (iCAST2012)**
- 2012 [Interaction of two pulses in defocusing Nonlinear Schrödinger equation.](#) In: **International Conference of Application Science & Technology (iCAST2012)**

- 2011 [Solitons mobility in a dipolar Bose-Einstein condensate in an optical lattice.](#) In: **NANO-SciTech 2011**
- 2011 [Supercontinuum generation in nonlinear optical fibers with higher order nonlinearity.](#) In: **NANO-SciTech 2011**
- 2009 [Statics and dynamics solitons in Bose-Einstein condensates .](#) In: **National conference of Post Graduate Research - NCON-PGR**

**Book  
Book Section**

- 2011 [Modulational instability in Salerno model.](#) In: **Recent achievements in dynamical systems: proceedings of Department of Computational and Theoretical Sciences, Faculty of Science, IIUM** IIUM Press . ISBN 9789674182014 , pp.141-145
- 2011 [Strongly localized models in two-component discrete media with cubic-quintic nonlinearity.](#) In: **Recent achievements in dynamical systems: proceedings of Department of Computational and Theoretical Sciences, Faculty of Science, IIUM** IIUM Press . ISBN 9789674182014 , pp.184-194
- 2011 [Linear wave propagation in single mode optical fibre .](#) In: **Investigations on Pure Mathematics, Finance Mathematics and Optics** IIUM Press . ISBN 9789674181987 , pp.221-226
- 2011 [The optical ray tracing technique in lens system within and beyond paraxial approximation .](#) In: **Investigations on Pure Mathematics, Finance Mathematics and Optics** IIUM Press . ISBN 9789674181987 , pp.227-234
- 2011 [Wave propagation in nonlinear and homogeneous media: Kerr media .](#) In: **Investigations on Pure Mathematics, Finance Mathematics and Optics** IIUM Press . ISBN 9789674181987 , pp.235-240
- 2011 [Matrix methods of optical resonators .](#) In: **Investigations on Pure Mathematics, Finance Mathematics and Optics** IIUM Press . ISBN 9789674181987 , pp.241-246