

**RamazKhomeiriki**

**Associate Professor**

**Physics of Nonlinear Phenomena**

e-mail: ramaz.khomeiriki@tsu.ge

Phone (office): +995 32 2290807

Phone (mobile): +995 595 397216

**Education:**

- University Diploma in Physics (Theoretical Physics), IvaneJavakhishvili Tbilisi State University, 1986.
- Candidate of Phys.-Math. Sciences, in Theoretical and Mathematical Physics, IvaneJavakhishvili Tbilisi State University, 1995.
- Doctor of Phys.-Math. Sciences, in Theoretical and Mathematical Physics, IvaneJavakhishvili Tbilisi State University, 2002.

**Teaching Courses:**

- Mechanics (practicum)
- Molecular Physics (practicum)
- Optics
- Computer Modeling of Physical Problems
- Physics of Nonlinear Phenomena

**Research Interests**

Theoretical Physics, Condensed Matter Physics, Nonlinear Physics, Photonics.

**Running projects**

- Dynamics and Thermodynamics in Magnetic Nanoparticle Systems
- Solitonic Switching in Photonic and Multiferroic Nanostructures
- Development of Post-Wall Guiding Systems and Circuits for Microwave and Millimeter Devices

**Selected Publications**

- (1) S. Flach, **R. Khomeiriki** (2017), “Fractional Lattice Charge Transport”, Scientific Reports **7**, 40860. <http://www.nature.com/articles/srep40860>
- (2) V. Loladze and **R. Khomeiriki** (2017) “Landau-Zener tunneling of solitons” Phys. Rev. E, **95**, 042204. <https://journals.aps.org/pre/abstract/10.1103/PhysRevE.95.042204>
- (3) **R. Khomeiriki** and SergejFlach (2016), “Landau-Zener Bloch Oscillations with Perturbed Flat Bands”, Phys. Rev. Lett., **116**, 245301. <http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.116.245301>
- (4) **R. Khomeiriki**, L. Chotorlishvili, I. Tralle, and J. Berakdar (2016), “Positive–Negative Birefringence in Multiferroic Layered Metasurfaces”, Nano Letters, **16**, 7290. <http://pubs.acs.org/doi/abs/10.1021/acs.nanolett.6b03936>
- (5) M. Malishava, **R. Khomeiriki** (2015), “All-Phononic Digital Transistor on the Basis of Gap-Soliton Dynamics in Anharmonic Oscillator Ladder” Phys. Rev. Lett., **115**, 10430. <http://dx.doi.org/10.1103/PhysRevLett.115.104301>

- (6) G. Miloshevich, J.P. Nguenang, Th. Dauxois, **R. Khomeriki**, S. Ruffo, (2015) "Instabilities and relaxation to equilibrium in long-range oscillator chains", *Phys. Rev. E* **91**, 032927. <http://dx.doi.org/10.1103/PhysRevE.91.032927>
- (7) V. Jandieri, **R. Khomeriki**, (2015) "Linear Amplification of Optical Signal in Coupled Photonic Crystal Waveguides", *Photonics Technology Letters, IEEE*, **27**, 639. <http://dx.doi.org/10.1109/LPT.2014.2388354>
- (8) **R. Khomeriki**, L. Chotorlishvili, J. Berakdar (2015), "Landau-Zener tunneling in multiferroic composites", *New Journal of Physics*, **17**, 013030. <http://dx.doi.org/10.1088/1367-2630/17/1/013030>
- (9) G. Miloshevich, Th. Dauxois, **R. Khomeriki**, S. Ruffo (2013), "Dipolar needles in the microcanonical ensemble: Evidence of spontaneous magnetization and ergodicity breaking", *Europhys. Lett.*, **104**, 17011. <http://iopscience.iop.org/0295-5075/104/1/17011>
- (10) L. Chotorlishvili, **R. Khomeriki**, A. Sukhov, S. Ruffo, J. Berakdar (2013), "Dynamics of Localized Modes in a Composite Multiferroic Chain", *Phys. Rev. Lett.* **111**, 117202. <http://prl.aps.org/abstract/PRL/v111/i11/e117202>
- (11) S. Flach, M. Ivanchenko, **R. Khomeriki**, (2012) "Correlated metallic two-particle bound states in quasiperiodic chains", *Europhys. Lett.*, **98**, 66002. <http://iopscience.iop.org/0295-5075/98/6/66002>
- (12) **R. Khomeriki**, D.O. Krimer, M. Haque, S. Flach (2010), "Interaction-induced fractional Bloch and tunneling oscillations", *Phys. Rev. A*, **81**, 065601. <http://dx.doi.org/10.1103/PhysRevA.81.065601>
- (13) **R. Khomeriki**, J. Leon, (2009), "Chaotic spatial soliton rays in smooth two Dimensional optical lattices", *Optics Letters* **34**, 3376. <http://www.opticsinfobase.org/ol/abstract.cfm?URI=ol-34-21-3376>
- (14) D.O. Krimer, **R. Khomeriki**, S. Flach, (2009), "Delocalization and spreading in a nonlinear Stark ladder", *Phys. Rev. E*, **80**, 036201. <http://link.aps.org/abstract/PRE/v80/e036201>
- (15) G. Miloshevich, **R. Khomeriki**, S. Ruffo, (2009), "Stochastic Resonance in the Fermi-Pasta-Ulam Chain", *Phys. Rev. Lett.*, **102**, 020602. <http://link.aps.org/doi/10.1103/PhysRevLett.102.020602>
- (16) **R. Khomeriki**, J. Leon (2007), "Driving Light Pulses with Light in Two-Level Media", *Phys. Rev. Lett.* **99**, 183601. <http://link.aps.org/abstract/PRL/v99/e183601>
- (17) A. Campa, **R. Khomeriki**, D. Mukamel, S. Ruffo (2007) "Long-range effects in layered spin structures", *Phys. Rev. B*, **76**, 064415. <http://link.aps.org/abstract/PRB/v76/e064415>
- (18) **R. Khomeriki**, J. Leon, S. Ruffo (2006), "Coexistence of Josephson Oscillations and Self-Trapping Regime in Optical Waveguide Arrays", *Phys. Rev. Lett.* **97**, 143902. <http://dx.doi.org/10.1103/PhysRevLett.97.143902>
- (19) **R. Khomeriki**, J. Leon (2005), "Bistability in sine-Gordon: the Ideal Switch", *Phys. Rev. E*, **71**, 056620. <http://link.aps.org/abstract/PRE/v71/e056620>
- (20) **R. Khomeriki**, J. Leon (2005), "Bistable light detectors nonlinear waveguide arrays", *Phys. Rev. Lett.*, **94**, 243902. <http://link.aps.org/abstract/PRL/v94/e243902>
- (21) **R. Khomeriki**, S. Ruffo (2005), "Nonadiabatic Landau-Zener Tunneling in Waveguide Arrays with a Step in the Refractive Index", *Phys. Rev. Lett.*, **94**, 113904. <http://link.aps.org/abstract/PRL/v94/e113904>
- (22) **R. Khomeriki**, S. Lepri, S. Ruffo (2004), "Nonlinear supratransmission and bistability in the Fermi-Pasta-Ulam model", *Physical Review E*, **70**, 066626. <http://link.aps.org/abstract/PRE/v70/e066626>
- (23) Yu.A. Kosevich, **R. Khomeriki**, S. Ruffo (2004): "Supersonic Discrete Kink-Solitons and Sinusoidal Patterns with "Magic" Wavenumber in Anharmonic Lattices", *Europhysics Letters*, **66**, 21-27. <http://dx.doi.org/10.1209/epl/i2003-10156-5>.
- (24) **R. Khomeriki** (2004): "Nonlinear Bandgap Transmission in Optical Waveguide Arrays", *Phys. Rev. Lett.*, **92**, 063905, 4 pages. <http://link.aps.org/abstract/PRL/v92/e063905>
- (25) **R. Khomeriki** (2002): "Interaction of a Kink-soliton with a Breather in a Fermi-Pasta-Ulam Chain", *Physical Review E*, **65**, 026605, 6 pages. <http://link.aps.org/abstract/PRE/v65/e026605>
- (26) **R. Khomeriki**, S. Lepri, S. Ruffo (2001): "Pattern Formation and Localization in Forced-Damped Fermi-Pasta-Ulam Lattice", *Physical Review E*, **64**, 056606, 8 pages. <http://link.aps.org/abstract/PRE/v64/e056606>.