Vram Nerses Mughnetsyan

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Group Leader

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Education

Institution	Yerevan State University
Faculty	Faculty of Physics
Date	1999 - 2008
Degree name	PhD student

Scientific Rank/degree

Institution	Yerevan State University
Date	2008
Degree name	Candidate
Scientific Supervisor	A.A. Kirakosyan
Research Topic	Theoretical investigation of the effects of interdiffusion and external fields on electronic and optical properties of semiconductor nanostructures

Language skills

Հայերեն English Русский

Work experience

Institution	Center of Modeling and Simulations of Nanostructures
Period of time	2023 till now
Rank/degree	head of the research group

Institution	Research Laboratory of the Solid State Physics, Yerevan State University
Period of time	2022 - 2023

Rank/degree	Senior Researcher

Institution	Chair of Solid State Physics
Period of time	2016 - 2023
Rank/degree	Head of Educational Laboratory

Institution	Department of Medical Physics, Yerevan State Medical University after Mkhitar Hetatsi
Period of time	2015 - 2025
Rank/degree	Lecturer

Institution	Research Laboratory of the Solid State Physics, Yerevan State University
Period of time	2008 - 2022
Rank/degree	Researcher

Publications

Article

Enhanced efficiency of intermediate-band semiconductor solar cells embedded with quantum dot superlattices

Naira Petrosyan, Lilit Yeganyan, Aram Manaselyan, Vram Mughnetsyan, Vidar Gudmundsson, Albert Kirakosyan

Physics Letters A 2026 131639

https://doi.org/10.1016/j.physleta.2026.131639

Article

Signatures of broken symmetries in the excitations of a periodic 2DEG coupled to a cylindrical photon cavity

Vidar Gudmundsson, Vram Mughnetsyan, Hsi-Sheng Goan, Jeng-Da Chai, Nzar Rauf Abdullah, Chi-Shung Tang, Wen-Hsuan Kuan, Valeriu Moldoveanu, Andrei Manolescu

New Journal of Physics 2026 043502 - 043502

https://doi.org/10.1088/1367-2630/ae5738

Article

Effect of two-dimensional nonlocal screening on mobility of electrons in transition-metal dichalcogenide monolayers

Aram Manaselyan, Vram Mughnetsyan, Anna Asatryan, Albert Kirakosyan

Semiconductor Science and Technology 2026 045015

https://doi.org/10.1088/1361-6641/ae5f43

Article

Electronic states in a semiconductor nanobelt in the two-wave approximation

Minas Balyan, Vram Mughnetsyan, Albert Kirakosyan

Physics Letters A 2026 132007

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Article

Electronic states in a bending semiconductor nanobelt within the framework of finite potential well approximation
Minas Balyan, Vram Mugnetsyan, Albert Kirakosyan

Micro and Nanostructures 2026 208850

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Article

Magneto-Optical Properties of Electron Gas in a Chain of Planar Quantum Rings: Effect of Screening on the Signature of Quantum Phase Interference
Armen Harutyunyan, Vram Mughnetsyan, Albert Kirakosyan, Vidar Gudmundsson

Annalen der Physik 2025 2400337

Article

Spin configuration of an array of quantum rings controlled by cavity photons
Vidar Gudmundsson, Vram Mughnetsyan, Hsi-Sheng Goan, Jeng-Da Chai, Nzar Rauf Abdullah,

Chi-Shung Tang, Valeriu Moldoveanu, Andrei Manolescu

Physical review. B./Physical review. B 2025 115304

Article

Effect of two-dimensional non-local screening on characteristics of transition metal dichalcogenide monolayers
Vram Mughnetsyan, Aram Manaselyan, Ashot Movsisyan, Albert Kirakosyan

Semiconductor Science and Technology 2024 045016

Article

Planar quantum dots: Theoretical approaches
Aram Manaselyan, Vram Mughnetsyan, Albert Kirakosyan

Encyclopedia of Condensed Matter Physics (Second Edition) 2024 297-307

Article

Magnetic Properties of A Cavity-Embedded Square Lattice of Quantum Dots or Antidots
Vram Mughnetsyan, Vidar Gudmundsson, Nzar Rauf Abdullah, Chi-Shung Tang, Valeriu Moldoveanu,

Andrei Manolescu

Annalen der Physik 2024 2300274

Article

Magneto-optical properties of a quantum dot array interacting with a far-infrared photon mode of a cylindrical cavity
Vidar Gudmundsson, Vram Mughnetsyan, Hsi-Sheng Goan, Jeng-Da Chai, Nzar Rauf Abdullah,

Chi-Shung Tang, Valeriu Moldoveanu, Andrei Manolescu

Physical review. B./Physical review. B 2024 235306

Article

MAGNETO-OPTICAL PROPERTIES OF ARRAYED STRUCTURES OF CYLINDRICAL AND ELLIPTICAL QUANTUM DOTS
Lilit YEGANYAN, Vram MUGHNETSYAN, Maryam MANSOURY

NANOCOM ... 2024 64-69

Article

Tuning of paramagnetic and diamagnetic cavity photon excitations in a square array of

quantum dots in a magnetic field
Vram Mughnetsyan, Vidar Gudmundsson, Hsi-Sheng Goan, Jeng-Da Chai, Nzar Rauf Abdullah,

Chi-Shung Tang, Valeriu Moldoveanu, Andrei Manolescu

Physical review. B./Physical review. B 2024 205301

Article

Controlling the excitation spectrum of a quantum dot array with a photon cavity
Vidar Gudmundsson, Vram Mughnetsyan, Nzar Rauf Abdullah, Chi-Shung Tang, Valeriu Moldoveanu,

Andrei Manolescu

Physical review. B./Physical review. B 2023 115306

Article

Hofstadter-like spectrum and magnetization of artificial graphene constructed with cylindrical and elliptical quantum dots
Maryam Mansoury, Vram Mughnetsyan, Aram Manaselyan, Albert Kirakosyan, Vidar Gudmundsson,

Vigen Aziz-Aghchegala

Physics Letters A 2023 129115

Conference

Magneto-optical properties of arrayed structures of quantum dots and rings
Yeganyan Lilit, Mughnetsyan Vram, Mansoury Maryam

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Conference

Magneto-Optical Properties of Artificial Graphene Constructed of Cylindrical and Elliptical Quantum Dots
YEGANYAN Lilit, MUGHNETSYAN Vram, MANSOURY Maryam, KIRAKOSYAN Albert, GUDMUNDSSON Vidar

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Article

Unified approach to cyclotron and plasmon resonances in a periodic two-dimensional GaAs electron gas hosting the Hofstadter butterfly
Vram Mughnetsyan, Vidar Gudmundsson, Nzar Rauf Abdullah, Chi-Shung Tang, Valeriu Moldoveanu,

Andrei Manolescu

Physical review. B./Physical review. B 2022 155302

Article

Signature of miniband nodes in magneto-optical properties of one-dimensional superlattice of planar quantum rings
Maryam Mansoury, Vigen Aziz-Aghchegala, Vram Mughnetsyan, Albert Kirakosyan, Vidar Gudmundsson

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Article

Electron–hole interaction in cylindrical quantum dots
Vram Mughnetsyan, Ashot Movsisyan, Albert Kirakosyan

Physica E: Low-dimensional Systems and Nanostructures 2022 115366

Article

Effects of a far-infrared photon cavity field on the magnetization of a square quantum dot array

Vidar Gudmundsson, Vram Mughnetsyan, Nzar Rauf Abdullah, Chi-Shung Tang, Valeriu Moldoveanu, Andrei Manolescu

Physical review. B./Physical review. B 2022 115308

Article

Electronic and Magnetic Properties of Laser Dressed Quantum Dot and Ring with Rashba Spin-Orbit Coupling

Vram Mughnetsyan, Aram Manaselyan, Manuk Barseghyan, Albert Kirakosyan, Laura M. Perez, David Laroze

Springer Proceedings in Physics (Optics and Its Applications) 2022 145-154

Article

Interminiband absorption in a quantum ring superlattice in magnetic field with periodic vector potential

Vram Mughnetsyan, Ara Atayan, Albert Kirakosyan, Vigen Aziz-Aghchegala

Physica E: Low-dimensional Systems and Nanostructures 2020 113722(1-6)

Article

Control of electronic and optical properties of a laser dressed double quantum dot molecule by lateral electric field

M.G. Barseghyan, V.N. Mughnetsyan, H.M. Baghramyan, F. Ungan, L.M. Perez, D. Laroze

Physica E: Low-dimensional Systems and Nanostructures 2020 114362(1-7)

Article

Tuning of energy gap and 1D Dirac-like points in artificial graphene and boron nitride monolayer by an external electric field

Vram Mughnetsyan

Micro and Nanostructures (Previously known as Superlattices and Microstructures) 2020 106700

Article

Effect of anisotropic strain on the electronic characteristics of an InAs/GaAs honeycomb superlattice

Vram Mughnetsyan, Albert Kirakosyan

Micro and Nanostructures (Previously known as Superlattices and Microstructures) 2019 243-251

Article

Effect of the impurity on the Aharonov-Bohm oscillations and the intraband absorption in GaAs/ Ga1− xAlxAs quantum ring under intense THz laser field

M.G. Barseghyan, V.N. Mughnetsyan, L.M. Perez, A.A. Kirakosyan, D. Laroze

Physica E: Low-dimensional Systems and Nanostructures 2019 91-97

Article

Exciton–Exciton Interactions in Coaxial Double Quantum Rings

Vram Mughnetsyan, Vanik Shahnazaryan, Ivan Shelykh, Hayk Sarkisyan

Nanomaterials 2019 1469(1-13)

Article

Rashba splitting of Dirac points and symmetry breaking in strained artificial graphene
Vram Mughnetsyan, Aram Manaselyan, Manuk Barseghyan, Albert Kirakosyan, David Laroze

Physical review. B./Physical review. B 2019 195132(1-8)

Article

Effect of interdiffusion and external magnetic field on electronic states and light absorption in Gaussian-shaped double quantum ring
V.L. Aziz Aghchegala, V.N. Mughnetsyan, A.A. Kirakosyan

Physica E: Low-dimensional Systems and Nanostructures 2018 11-16

Article

EFFECT OF DONOR IMPURITY ON AHARONOV–BOHM OSCILLATIONS IN A DOUBLE QUANTUM RING WITH GAUSSIAN CONFINEMENT
V. N. MUGHNETSYAN

Proceedings of the YSU A Physical and Mathematical Sciences 2018 205-212

Article

Effect of interdiffusion and magnetic field on two-electron states in Gaussian-shaped double quantum rings
V.L. Aziz Aghchegala, V.N. Mughnetsyan, A.A. Kirakosyan

Physica E: Low-dimensional Systems and Nanostructures 2017 157-163

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Article

Effect of Rashba spin-orbit coupling and external magnetic field on electronic minibands in highly strained one-layer quantum ring superlattice
Vram Mughnetsyan, Aram Manaselyan, Albert Kirakosyan

Micro and Nanostructures (Previously known as Superlattices and Microstructures) 2017 10-18

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Strain distribution and band structure of InAs/GaAs quantum ring superlattice
Vram Mughnetsyan, Albert Kirakosyan

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Article

Elastic strain distribution in one layer quantum ring superlattice
V.N. Mughnetsyan, A.A. Kirakosyan

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Article

Rashba Spin-Orbit Coupling in a Two-Dimensional Quantum Ring Superlattice
V. Mughnetsyan, A. Manaselyan, A. Kirakosyan

Micro and Nanostructures (Previously known as Superlattices and Microstructures) 2015 584-591

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Electron capture processes in quantum dots due to one-and two-phonon assisted transitions: The role of optical phonon confinement
A L Vartanian, K A Vardanyan, V N Mughnetsyan, A A Kirakosyan

Journal of Physics Conference Series 2015 012017/4pp

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Article

Effect of phonon confinement on one- and two-polar optical phonon capture processes in quantum dots

K.A. Vardanyan, A.L. Vartanian, V.N. Mughnetsyan, A.A.Kirakosyan

Physica E: Low-dimensional Systems and Nanostructures 2015 268-274

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Article

Effect of interdiffusion on electronic states of strain-free Gaussian-shaped double quantum ring superlattice

V.L. Aziz Aghchegala, V.N. Mughnetsyan, A.A. Kirakosyan

Physica E: Low-dimensional Systems and Nanostructures 2015 30-35

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Article

Effect of interdiffusion on nonlinear intraband light absorption in Gaussian-shaped double quantum rings

V.L. Aziz Aghchegala, V.N. Mughnetsyan, A.A. Kirakosyan

Physica E: Low-dimensional Systems and Nanostructures 2015 210-216

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Article

Effect of interdiffusion on band structure in GaAs/Ga1-xAlxAs quantum ring superlattices

V. Mughnetsyan, A. Kirakosyan, A. Manaselyan

6-th International Conference on Nanomaterials, NANOCON-2014, Conference Proceedings 2015 47-53

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Elastic Strain Distribution in one layer InAs/GaAs Quantum Ring Superlattice.

V.N. Mughnetsyan, A.A. Kirakosyan

2015 59-60

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Electron capture processes in quantum dots due to one- and two-phonon assisted transitions: The role of optical phonon confinement.

A.L. Vartanian, K.A. Vardanyan, V.N. Mughnetsyan, A.A. Kirakosyan

2015 42-42

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