Karen Martin Gambaryan

23-11
kgambaryan@ysu.am

Institute of Physics
Chair of Materials Science and Nanotechnology
Professor

Institute of Physics

Chair of Materials Science and Nanotechnology
Professor

Research Institute of Physics

Նյութագիտության և նանոտեխնոլոգիաների գիտական կենտրոն
Senior Researcher

Education

Institution	Yerevan State University
Faculty	Radiophysics
Date	1976 - 1981
Degree name	Qualified specialist

Scientific Rank/degree

Institution	Yerevan State University
Date	2015
Degree name	Professor

Institution	Yerevan State University
Date	2013
Degree name	Doctor
Research Topic	The Growth and Investigation of Epitaxial Semiconducting Nanostructures and Mid-Infrared Photodetectors Based on Them

Language skills

English Русский

Work experience

Institution	Yerevan State University, Institute of Physics, Chair of Physics of Semiconductors and Microelectronics
Period of time	2019 till now

Rank/degree	Head of Chair, Full Professor

Participation in international conferences and seminars

16/07/2023 - 20/07/2023	World Renewable Energy Congress–XXII (WREC-XXII) Kuala Lumpur Convention Center Malaysia
22/08/2017 - 24/08/2017	European Advanced Materials Congress (EAMC-2017) Stockholm Sweden
10/06/2019 - 12/06/2019	5th Global Congress & Expo on Materials Science & Engineering (GCEMSE-2019) Osaka Japan
31/08/2020 - 04/09/2020	The 28th Condensed Matter General Conference (Condensed Matter Divisions of the Spanish Royal Physics Society and the European Physical Society) Madrid Spain
21/07/2021 - 25/07/2021	World Renewable Energy Congress (WREC-2020) Lisbon Portugal

Membership

Institution	Fellow of the International Association of Advanced Materials
Period of time	2020 till now
Institution	“World Renewable Energy Network and Council (WREN/WREC)”
Period of time	1998 till now
Institution	“Asia-Pacific Chemical, Biological and Environmental Engineering Society (APCBEES)”
Period of time	2011 till now
Institution	Member of the “International Association of Academy of Sciences” (MAAN, Moscow) Scientific Council on “Functional materials for electronics”
Period of time	2017 till now

State awards and honorary titles

2023 World Renewable Energy Network Pioneer Award (2023)

2017 International Association of Advanced Materials (IAAM) Gold Medal

2019 Gold medal of the Yerevan State University

Publications

Article

Energy level alignment of confined hole states in InAs1−x−ySbxPy asymmetric double quantum dots for single-photon energy up- and downconversion
Karen M. Gambaryan, Owen Ernst, Torsten Boeck, Oliver Marquardt

Applied Physics Letters 2025 061102

Article

In(AsSbP) Graded Composition Quantum Dots, Quantum Rings and Quantum Dot Molecules
Karen Gambaryan, Oliver Marquardt, Lilit Yeranyan, Torsten Boeck

Nanoscience and technology 2025 235-275

Conference

Simulation of Electronic Properties of Volcano-Shaped Quantum Rings with Type-II Band Alignment
L.S. Yeranyan, M.T. Sahakyan, K.M. Gambaryan

2025 58-59

https://ipr.sci.am/LP25/

Article

Photoconductive Cells Based on Type-II Conical Quantum Dots for Thermophotovoltaic and Other Mid-infrared Applications
Karen M. Gambaryan

Transition Towards a Carbon Free Future: Selected Papers from the World Renewable Energy Congress (WREC) 2023
2024 31-37

Article

Miscibility Gaps Analysis for BN–Si–C Ternary Material System
L. S. Yeranyan, A. V. Margaryan, K. M. Gambaryan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2024 91-96

Article

Near-Infrared Optoelectronic Non-Invasive Sensing Technology for Glucose Concentration Monitoring in Liquid Solutions
K. Gambaryan, M. Sahakyan, G. Manukyan

Armenian Journal of Physics 2024 101-109

Conference

Emerging Horizons in TCAD
Karen Gambaryan
2024 90-91

https://www.eda2.com/conferenceHome

Patent

Optoelectronic nanostructure, radiation conversion processes and processes for the production of asymmetric double quantum dots
Gambaryan Karen M., Marquardt Oliver

2024

Article

Energy level alignment of confined hole states in InAs1−x−ySbxPy double quantum dots
Karen M. Gambaryan, Owen Ernst, Torsten Boeck, Oliver Marquardt

Weierstraß-Institut für Angewandte Analysis und Stochastik (Leibniz-Institut im Forschungsverbund, Berlin e.V.), Proceedings (Preprint)
2023 1-8

Conference

Photoconductive Cells Based on Type-II Conical Quantum Dots for Thermo-Photovoltaic and Other Mid-Infrared Applications
Karen Gambaryan
2023 1

https://www.ukm.my/seri/upcoming-events/world-renewable-energy-congress-wrec-20...

Conference

Calculation of miscibility regions for BN-Si-C ternary solid solutions
K.M. Gambaryan, L.S. Yeranyan, A.V. Margaryan

2023 46 - 47

https://ipr.sci.am/pl/conferences/archive.html

Article

Nano-Scale Architecture of Quantum-Size Structures at the Growth From Quaternary In–As–Sb–P Liquid Phase on InAs(100) Substrate
K. M. Gambaryan
Journal of Contemporary Physics (Armenian Academy of Sciences) 2022 146–159

Article

Нано-архитектура кванторазмерных структур при выращивании из четырехкомпонентной In–As–Sb–P жидкой фазы на подложке InAs(100)
К. М. Гамбарян
Proceedings of NAS RA Physics 2022 212–233

Article

ГЕОМЕТРИЧЕСКИЕ ОСОБЕННОСТИ И ЧИСЛЕННЫЙ АНАЛИЗ ТРАНСФОРМАЦИИ ПОВЕРХНОСТИ МИКРО- И НАНОСТРУКТУР СОСТАВА InAsSbP ПРИ ЗАРОДЫШЕОБРАЗОВАНИИ ИЗ ЖИДКОЙ ФАЗЫ
Ղամբարյան Կարեն Մարտինի, Հարությունյան Վլադիմիր Միխաիլի

Proceedings of NAS RA Physics 2021 208-217

Article

Geometric Features and Numerical Analysis of InAsSbP Composition Micro- and Nanostructures Shape Transformation at Nucleation from Liquid Phase
K. M. Gambaryan, V. M. Aroutiounian

Journal of Contemporary Physics (Armenian Academy of Sciences) 2021 133–138

Patent

Հեղուկ ֆազից կիսահաղորդչային նանոկառուցվածքների աճեցման եղանակ

Ղամբարյան Կարեն Մարտինի

2021

Article

Nucleation Chronology and Electronic Properties of InAs1−x−ySbxPy Graded Composition Quantum Dots Grown on an InAs(100) Substrate

Karen M. Gambaryan, Torsten Boeck, Achim Trampert, Oliver Marquardt

ACS Applied Electronic Materials 2020 646-650

Article

Micro- and nano-scale engineering and structures shape architecture at nucleation from In-As-Sb-P composition liquid phase on an InAs(100) surface

Karen M. Gambaryan, Marquardt Oliver, Boeck Torsten, Trampert Achim

Proceedings (Preprint) of Weierstraß-Institut für Angewandte Analysis und Stochastik (Leibniz-Institut im Forschungsverbund, Berlin e.V.)
2020 2775(1-22)

Article

CdTe–ZnTe–HgTe Material System: Solid Solutions Miscibility Analysis

K. M. Gambaryan, V. M. Aroutiounian, A. K. Simonyan, M. K. Gambaryan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2020 334–338

Article

МАТЕРИАЛЬНАЯ СИСТЕМА CdTe–ZnTe–HgTe: АНАЛИЗ СМЕШИВАЕМОСТИ ТВЕРДЫХ РАСТВОРОВ

К.М. ГАМБАРЯН, В.М. АРУТЮНЯН, А.К. СИМОНЯН, М.К. ГАМБАРЯН

Proceedings of NAS RA Physics 2020 519–526

Article

Nanostructured P-N Junctions and Photoconductive Cells for Thermal Energy Conversion

Karen M. Gambaryan, Vladimir M. Aroutiounian, Martin K. Gambaryan

Innovative Renewable Energy: Sustainable Energy Development and Innovation 2020 47-51

Conference

Nucleation chronology and electronic properties of In(As,Sb,P) graded-composition quantum dots

Karen M. Gambaryan, Oliver Marquardt, Torsten Boeck, Achim Trampert

2020 88

https://www.youtube.com/playlist?list=PLWIVj90xdDE9tMfI3wdVOIOTcUjlyQ1nj

---

Article

Nucleation chronology and electronic properties of InAsSbP graded composition quantum dots grown on InAs(100) substrate

Karen M. Gambaryan, Torsten Boeck, Achim Trampert, Oliver Marquardt

Proceedings (Preprint) of Weierstraß-Institut für Angewandte Analysis und Stochastik (Leibniz-Institut im Forschungsverbund, Berlin e.V.)
2019 1-10

Article

МЕХАНИЗМ ЗАРОДЫШЕОБРАЗОВАНИЯ И РАСЧЕТ ПОЛНОЙ ЭНЕРГИИ НАНОСТРУКТУР В МАТЕРИАЛЬНОЙ СИСТЕМЕ CdTe-ZnTe-HgTe

К.М. ГАМБАРЯН, В.М. АРУТЮНЯН, Г.А. АВЕТИСЯН, А.К. СИМОНЯН, М.К. ГАМБАРЯН

Proceedings of NAS RA Physics 2019 478–484

Article

Nucleation Mechanism and Nanostructures Total Energy Calculation in CdTe-ZnTe-HgTe Material System

K. M. Gambaryan, V. M. Aroutiounian, G. A. Avetisyan, A. K. Simonyan, M. K. Gambaryan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2019 351–355

Conference

Growth and Characterization of InAsSbP Composition Conic Quantum Dots

Karen M. Gambaryan

2019 51

https://scientificfederation.com/gcemse-2019/

Article

Narrow bandgap quantum dot diode structures and photoresistors for thermo-photovoltaic and infrared applications

Karen M. Gambaryan

Advanced Materials Letters 2018 112-115

Article

Fabrication and Investigation of Photovoltaic Converters Based on Polycrystalline Silicon Grown on Borosilicate Glass

K. M. Gambaryan, V. G. Harutyunyan, V. M. Aroutiounian, T. Boeck, R. Bansen, C. Ehlers

Journal of Contemporary Physics (Armenian Academy of Sciences) 2018 351–357

Article

Узкозонные фотодетекторы среднего инфракрасного диапазона на основе квантовых точек InAsSbP

Հարությունյան Վ.Գ., Ղամբարյան Կ.Մ., Հարությունյան Վ.Մ.

Proceedings of NAS RA Physics 2017 60-67

http://www.flib.sci.am/eng/Fizika/Frame.html

Article

Narrow Bandgap Mid-Infrared Photodetectors Based on InAsSbP Quantum Dots

K.M.Gambaryan, V.G.Harutyunyan, V.M.Aroutiounian

Journal of Contemporary Physics (Armenian Academy of Sciences) 2017 43-48

http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958

Article

Magnetoresistance Aharonov–Bohm (MAB) oscillations in elongated quantum dots

Ղամբարյան Կարեն Մարտինի, Հարությունյան Վարդան Գագիկի,

Հարությունյան Վլադիմիր Միքայելի, Երանյան Լիլիթ Սուրենի

Journal of Physics Conference Series 2017 012021

http://iopscience.iop.org/journal/1742-6596

Article

Magnetoresistance Aharonov–Bohm oscillations in oblate ellipsoidal quantum dots
K.M.Gambaryan, V.G.Harutyunyan, V.M.Aroutiounian, L.S.Yeranyan

Вестник Российско-Армянского Университета: Физико-математические и естественные науки 2017

85-90

http://science.rau.am/rus/50/701

Article

Nanostructures Nucleation Features and Miscibility Analysis in Zinc-Blend and Wurtzite GaN-InN-AlN Material System
A.K. Simonya, K.M. Gambaryan, V.M. Aroutiounian

Journal of Nanoscience and Technology 2017 253-255

http://www.jacsdirectory.com/jnst

Article

Growth features and nucleation mechanism of Ga1-x-yInxAlyN material system on GaN substrate
Arpine K. Simonyan, Karen M. Gambaryan, Vladimir M. Aroutiounian

Advances in Nano Research 2017 303-311

Conference

Optoelectronic properties of InAsSbP quantum dot photoconductive cells
Ղամբարյան Կարեն, Հարությունյան Վարդան, Հարությունյան Վլադիմիր

2017 23-26

Conference

Competing nucleation of islands and nanopits in zinc-blend and wurtzit GaN-InN-AlN quaternary material system
Ղամբարյան Կարեն, Սիմոնյան Արփինե, Բաղիյան Երան

2017 19-22

Conference

Narrow bandgap diode heterostructures and photoconductive cells with quantum dots for thermophotovoltaic and other mid-infrared applications
Ղամբարյան Կ.Մ.

2017 15-16

Article

Silicon on glass grown from indium and tin solutions
R. Bansen, C. Ehlers, T. Teubner, K. Böttcher, K. Gambaryan, J. Schmidtbauer, T. Boeck

Journal of Photonics for Energy 2016 025501 (10 pages

https://spie.org/publications/journals/journal-of-photonics-for-energy

---

Article

The Growth and Characterization of InAsSbP Composition Semiconductor Epitaxial Strain-Induced Islands and Quantum Dots
Հարությունյան Վ.Մ., Ղամբարյան Կ.Մ.

Հայաստանի ճարտարագիտական ակադեմիայի լրաբեր 2016 96-103

Article

Competing nucleation of islands and nanopits in zinc-blend III-nitride quaternary material system
K M Gambaryan, V M Aroutiounian, A.K. Simonyan, L S Yeranyan

Journal of Physics Conference Series 2016 012009 (4 pages)

http://iopscience.iop.org/journal/1742-6596

Conference

Narrow bandgap quantum dot mid-infrared photodetectors
V.G. Harutyunyan, K.M. Gambaryan, V.M. Aroutiounian

2016 19-20

Conference

Magnetoresistance Aharonov–Bohm oscillations in type-II InAsSbP ellipsoidal quantum dots
Ղամբարյան Կ.Մ.
2016 160

Article

Investigation of InAsSbP quantum dot mid-infrared sensors
V.G. Harutyunyan, K.M. Gambaryan, V.M. Aroutiounian, I.G. Harutyunyan

Journal of Sensors and Sensor Systems 2015 249–253

http://www.j-sens-sens-syst.net

Article

Magnetoresistance and capacitance oscillations and hysteresis in type-II InAsSbP ellipsoidal quantum dots
K.M. Gambaryan, V.G. Harutyunyan, V.M. Aroutiounian, Y. Ai, E. Ashalley, Z.M. Wang

Journal of Physics D Applied Physics 2015 275302 (7pp)

http://iopscience.iop.org/journal/0022-3727;jsessionid=38695B064D0A9864CCBDED1A...

Article

InAsSbP Quantum Dot Mid-IR Photodetectors Operating at Room Temperature
V.G. Harutyunyan, K.M. Gambaryan, V.M. Aroutiounian, I.G. Harutyunyan

INFRARED PHYSICS & TECHNOLOGY 2015 12-14

http://www.journals.elsevier.com/infrared-physics-and-technology

---

Conference

GaInAlN material system: nanostructures growth features and immiscibility analysis
A.K. Simonyan, K.M. Gambaryan, V.M. Aroutiounian

2015 400

Conference

Aharonov-Bohm oscillations in type-II InAsSbP ellipsoidal quantum dots
K.M. Gambaryan, V.G. Harutyunyan, V.M. Aroutiounian, L.S. Yeranyan

2015 17-19

Conference

Nanostructures Growth Features in GaInAlN Quasiternary Material System
K.M. Gambaryan, A.K. Simonyan

2015 101-103

Study manual

ԿԻՍԱՀԱՂՈՐԴՉԱՅԻՆ ՆԱՆՈԿԱՌՈՒՑՎԱԾՔՆԵՐԻ ԱՃԵՑՄԱՆ ՏԵԽՆՈԼՈԳԻԱԿԱՆ ՄԵԹՈԴՆԵՐԸ

Ղամբարյան Կարեն Մարտինի

2015 59

Article

Strain-induced islands and nanostructures shape transition’s chronology on InAs (100) surface

K.M. Gambaryan, V.M. Aroutiounian, A.K. Simonyan, Y. Ai, E. Ashalley, Z.M. Wang

Advances in Nano Research 2014 211-217

http://www.techno-press.org/?journal=anr&subpage=1

Study manual

Կիսահաղորդչային էպիտաքսիալ թաղանթների աճեցման տեխնոլոգիական մեթոդները

Ղամբարյան Կարեն Մարտինի

2008 42

Patent

Метод выращивания полупроводниковых структур A3B5 из жидкой фазы

Հարությունյան Վ.Մ., Գևորգյան Վ.Ա., Ղամբարյան Կ.Մ.

1990

Patent

Метод электрожидкофазной эпитаксии

Հարությունյան Վ.Մ., Գևորգյան Վ.Ա., Ղամբարյան Կ.Մ.

1985
