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Ведущий научный сотрудник

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Образование

Учреждение	Ереванский государственный университет
Факультет	Физический факультет, кафедра теоретической физики, физика плазмы
Дата	1989 - 1994
Степень / Звание	Квалифицированный специалист

Ученое звание/Ученая степень

Учреждение	Ереванский государственный университет
Дата	2009
Степень / Звание	Доктор наук
Научная тема	Исследование некоторых индуцированных процессов на электронных/ионных пучках и атомах

Знание языков

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Опыт работы

Учреждение	Научно-исследовательский институт физики, Центр физики сильных полей
Период времени	2015 до настоящего времени
Звание/степень	Ведущий научный сотрудник

Государственные награды и почетные звания

2003 Премия Президента РА

Публикации

Статья

High harmonic generation and wave mixing in graphene quantum dots by bichromatic laser fields of circular polarization
H. K. Avetissian, A. G. Ghazaryan, G. F. Mkrtchian, Kh. V. Sedrakian

Results in Physics 2026 108579

https://www.sciencedirect.com/science/article/pii/S2211379726000057

Статья

Zeptosecond electron pulse train via multiphoton inelastic Cherenkov diffraction
H. K. Avetissian, G. F. Mkrtchian

Scientific Reports 2026 13939

https://doi.org/10.1038/s41598-026-44500-w

Статья

Berry curvature and shift vector effects at high-order wave mixing in biased bilayer graphene
H.K. Avetissian, H.H. Matevosyan, G.F. Mkrtchian

Physical review. B./Physical review. B 2025 045415

Статья

High-harmonic spectroscopy of mobility edges in one-dimensional quasicrystals
H. K. Avetissian, B. R. Avchyan, A. Brown, G. F. Mkrtchian

New Journal of Physics 2025 124101

https://iopscience.iop.org/article/10.1088/1367-2630/ae298a

Конференция

High-Order Harmonics Generation in Graphene Quantum Dots by Bichromatic Laser Fields of Circular Polarization
Kh. V. Sedrakian, H. K. Avetissian, A. G. Ghazaryan, G. F. Mkrtchian

2025 364-364

https://www.grapheneconf.com/2025/posters.php

Конференция

High Harmonic Generation and Wave Mixing in Graphene Quantum Dots by Bichromatic Laser Fields of Circular Polarization
H. K. Avetissian, A. G. Ghazaryan, G. F. Mkrtchian, Kh. V. Sedrakian

2025 16 - 16

https://flatlands2025.org/

Конференция

Symmetrically driven enhancement of high harmonic generation in graphene quantum dots
Armenuhi Gevorg Ghazaryan, Hamlet Karo Avetissian, Garnik Felix Mkrtchian, Khachik Vazgen Sedrakian

2025 ID#: 1486

https://ieeenap.org/scientific-program/

Статья

Интенсивная генерация высших гармоник в молекуле фуллерена C180 (INTENSE HIGH HARMONIC GENERATION IN FULLERENE MOLECULE C180)
Аветисян Г.К., Казарян А.Г., Матевосян Г.Г., Мкртчян Г.Ф.

Журнал Экспериментальной и Теоретической Физики 2024 25-31

Статья

Intense high-order harmonic generation in the giant fullerene molecule C240
H. K. Avetissian, S. Sukiasyan, T. M. Markosyan, G. F. Mkrtchian

Physical review. B./Physical review. B 2024 085401

Статья

Intense anomalous high harmonics in graphene quantum dots caused by disorder or vacancies
H. K. Avetissian, G. A. Musayelyan, G. F. Mkrtchian

Physical review. B./Physical review. B 2024 085417

Конференция

Berry curvature effects in high-order wave mixing in biased bilayer graphene
H. K. Avetissian, H. H. Matevosyan, G. F. Mkrtchian

2024 1

https://www.grapheneconf.com/2024/index.php

Конференция

High-order Harmonic Generation in the Giant Fullerene Molecules
H. K. Avetissian, A. G. Ghazaryan, H. H. Matevosyan, G. F. Mkrtchian

2024 E-FMN-1

https://nanomatsci-com-dot-radiant-century-424110-p9.uc.r.appspot.com/?c=1AZVXZ...

Конференция

HIGH HARMONIC GENERATION BY STRONG LASER RADIATION IN FULLERENE MOLECULE C180
H. K. Avetissian, A. G. Ghazaryan, H. H. Matevosyan, G. F. Mkrtchian

2024 25-25

https://nano2024.gtu.ge/

Статья

Graphene valley polarization as a function of carrier-envelope phase in few-cycle laser pulses and its footprints in harmonic signals
H. K. Avetissian, V. A. Sedrakyan, Kh. V. Sedrakian, G. F. Mkrtchian

Physical review. B./Physical review. B 2023 205403

Статья

Disorder-induced effects in high-harmonic generation process in fullerene molecules
H.K. Avetissian, S. Sukiasyan, H.H. Matevosyan, G.F. Mkrtchian

Results in Physics 2023 106951/8

Статья

Long-range correlation-induced effects at high-order harmonic generation on graphene quantum dots
H. K. Avetissian, A. G. Ghazaryan, Kh. V. Sedrakian, G. F. Mkrtchian

Physical review. B./Physical review. B 2023 165410

Конференция

Disorder-Induced Effects in High-Harmonic Generation Process in Fullerene Molecules
H. K. Avetissian, S. Sukiasyan, H. H. Matevosyan, G. F. Mkrtchian

2023 125 - 125

https://flatlands2023.com/

Статья

High-order harmonic generation in three-dimensional Weyl semimetals with broken time-reversal symmetry
H. K. Avetissian, V. N. Avetisyan, B. R. Avchyan, G. F. Mkrtchian

Physical review. A/Physical review, A 2022 033107/1-8

Статья

Efficient high-harmonic generation in graphene with two-color laser field at orthogonal polarization
Hamlet K. Avetissian, Andreas Knorr, Garnik F. Mkrtchian

Physical review. B./Physical review. B 2022 195405

Статья

Saddle-point exciton signature on high-order harmonic generation in two-dimensional hexagonal nanostructures
H. K. Avetissian, S. S. Israelyan, H. H. Matevosyan, G. F. Mkrtchian

Physical review. A/Physical review, A 2022 063504/1-9

Конференция

High Harmonic Generation in (3+1)-dimensional Weyl Semimetals
Hamlet Avetissian Karo, Vagharshak Avetisyan Narek, Babken Avchyan Ruben, Garnik Mkrtchian Felix

2022 187 - 187

https://ieeenap.org/ieee-nap22/#:~:text=The%202022%20IEEE%2012th%20Internationa...

Статья

Free-electron nanolaser based on graphene plasmons
H. K. Avetissian, B. R. Avchyan, H. H. Matevosyan, G.F. Mkrtchian

Laser Physics 2021 055801

Статья

High harmonic generation in fullerene molecules
H. K. Avetissian, A. G. Ghazaryan, G. F. Mkrtchian

Physical review. B./Physical review. B 2021 125436

Конференция

High harmonic generation at particle-hole multiphoton excitation in gapped bilayer graphene
H. Avetissian, A. Avetissian, A. Ghazaryan, G. Mkrtchian, Kh. Sedrakian

2021 10

http://www.nano2020.gtu.ge/

Статья

High-harmonic generation at particle–hole multiphoton excitation in gapped bilayer graphene
Hamlet K. Avetissian, Ara K. Avetissian, Armenuhi G. Ghazaryan, Garnik F. Mkrtchian,

Khachik V. Sedrakian
Journal of Nanophotonics 2020 026004(1-15)

Статья

Many-body effects for excitonic high-order wave mixing in monolayer transition metal dichalcogenides
H. K. Avetissian, G. F. Mkrtchian, K. Z. Hatsagortsyan

Physical Review Research 2020 023072(1-9)

Статья

Suppression of intervalley exchange coupling in the presence of momentum-dark states in transition metal dichalcogenides
Malte Selig, Florian Katsch, Samuel Brem, Garnik F. Mkrtchian, Ermin Malic, Andreas Knorr

Physical Review Research 2020 023322(1-17)

Статья

On the extreme nonlinear optics of graphene nanoribbons in the strong coherent radiation fields
Hamlet K. Avetissian, Babken R. Avchyan, Garnik F. Mkrtchian, Karine A. Sargsyan

Journal of Nanophotonics 2020 026018(1-9)

Статья

High laser harmonics induced by the Berry curvature in time-reversal invariant materials
H. K. Avetissian, G. F. Mkrtchian

Physical review. B./Physical review. B 2020 245422

Статья

Microscopic quantum description of second-order nonlinearities in two-dimensional hexagonal nanostructures beyond the Dirac cone approximation
H. K. Avetissian, G. F. Mkrtchian, K. G. Batrakov, S. A. Maksimenko

Physical review. B./Physical review. B 2020 165406

Статья

Higher harmonic generation by massive carriers in buckled two-dimensional hexagonal nanostructures
H. K. Avetissian, G. F. Mkrtchian

Physical review. B./Physical review. B 2019 085432(1-10)

Статья

Wave mixing and high harmonic generation at two-color multiphoton excitation in two-dimensional hexagonal nanostructures
H. K. Avetissian, A. K. Avetissian, B. R. Avchyan, G. F. Mkrtchian

Physical review. B./Physical review. B 2019 035434(1-8)

Статья

Theory of second-order excitonic nonlinearities in transition metal dichalcogenides
Garnik F. Mkrtchian, Andreas Knorr, Malte Selig

Physical review. B./Physical review. B 2019 125401(1-14)

Статья

Impact of electron-electron Coulomb interaction on the high harmonic generation process in graphene
H. K. Avetissian, G. F. Mkrtchian

Physical review. B./Physical review. B 2018 115454(1-9)

Статья

Multiphoton excitation and high-harmonics generation in topological insulator

H. K. Avetissian, A. K. Avetissian, B. R. Avchyan, G. F. Mkrtchian

JOURNAL OF PHYSICS-CONDENSED MATTER 2018 185302(1-7)

Статья

Multiphoton excitation and harmonic generation from the quantum electrodynamic vacuum
H. K. Avetissian, A. K. Avetissian, B. R. Avchyan, G. F. Mkrtchian

Laser Physics Letters 2018 126003(1-7)

Конференция

High harmonics generation with 2D metallic carriers of topological insulators
H. K. Avetissian, A. K. Avetissian, B. R. Avchyan, G. F. Mkrtchian

2018 38

https://indico.jinr.ru/internalPage.py?pageId=10&confId=468

Статья

High harmonic generation in Landau-quantized graphene subjected to a strong electromagnetic radiation
Hamlet K. Avetissian, Armenuhi G. Ghazaryan, Garnik F. Mkrtchian, Khachik V. Sedrakian

Journal of Nanophotonics 2017 016004: 1- 9

https://spie.org/publications/journals/journal-of-nanophotonics

---

Статья

Collective two-boson decay of excitons in a Bose-Einstein condensate and generation of coherent photon-phonon radiation
H. K. Avetissian, A. K. Avetissian, G. F. Mkrtchian, B. R. Avchyan

Physical review. B./Physical review. B 2017 045206/6

http://journals.aps.org/prb/

Статья

Coherent nonlinear optical response of graphene in the quantum Hall regime
H.K. Avetissian, G.F. Mkrtchian

Physical review. B./Physical review. B 2016 045419/7

http://journals.aps.org/prb/

Статья

Enhanced high-order-harmonic generation and wave mixing via two-color multiphoton excitation of atoms and molecules
H.K. Avetissian, B.R. Avchyan, G.F. Mkrtchian

Physical review. A/Physical review, A 2016 013856/7

http://journals.aps.org/pra/

Статья

Generation of high energy electron and positron beams in solid-plasma-nanolayers under relativistic laser pulses
H.K. Avetissian, A.K. Avetissian, H.H. Matevosyan, G.F. Mkrtchian, Kh.V. Sedrakian

News and Reports from High Energy Density generated by Heavy Ion and Laser Beams 2015 2016 էջ-77

https://repository.gsi.de/record/194814/files/HEDP_report__2k15_web-version.pdf

---

Статья

Nonlinear absorption of high-intensity x-ray radiation in ultradense plasma

H.K. Avetissian, A.K. Avetissian, A.G. Ghazaryan, H.H. Matevosyan, G.F. Mkrtchian

News and Reports from High Energy Density generated by Heavy Ion and Laser Beams 2015 2016 Ҍ -78

https://repository.gsi.de/record/194814/files/HEDP_report__2k15_web-version.pdf

---

Статья

Nonlinear response of the quantum Hall system to a strong electromagnetic radiation
H.K. Avetissian, G. F. Mkrtchian

Physics Letters A 2016 3924–3927

http://www.journals.elsevier.com/physics-letters-a

Конференция

X-ray Absorption via Electron-ion SB in Maxwellian Plasma at the Exact Consideration of Coulomb Potential
H.K. Avetissian, A.K. Avetissian, A.G. Ghazaryan, G.F. Mkrtchian

2016 1P- 1

http://icops2016.ece.ualberta.ca/

Конференция

Landau-quantized graphene in strong radiation field and high harmonic generation
H.K. Avetissian, A.G. Ghazaryan, G.F. Mkrtchian, Kh.V. Sedrakian

2016 78

http://www.nano2016.gtu.ge/

Конференция

Influence of excitonic effects on high harmonic generation by strong laser field in gated graphene
H.K. Avetissian, G.F. Mkrtchian

2016 1

Конференция

Nonlinear response of graphene quantum Hall system to a strong laser radiation
H.K. Avetissian, G.F. Mkrtchian

2016 1

http://iht.univ.kiev.ua/nanoqt2016/

Конференция

Role of Coulomb Forces and Radiation Friction in Laser Production of High Density Electron Beams from Solid-Plazma-Targets
H.K. Avetissian, S. S. Israelyan, G. F. Mkrtchian, Kh. V. Sedrakian

2016 3P-41

http://icops2016.ece.ualberta.ca/

Статья

Microscopic nonlinear relativistic quantum theory of absorption of powerful x-ray radiation in plasma
H. K. Avetissian, A. G. Ghazaryan, H. H. Matevosyan, G. F. Mkrtchian

Physical review. E 2015 043103/8

https://journals.aps.org/pre/

Статья

Multiphoton interaction of a qutrit with single-mode quantized field in the ultrastrong and deep strong coupling regimes
H.K. Avetissian, A.K. Avetissian, G. F. Mkrtchian, O.V. Kibis

Journal of Nanophotonics 2015 093064/14

https://spie.org/publications/journals/journal-of-nanophotonics

---

Статья

Gamma-ray laser based on the collective decay of positronium atoms in a Bose-Einstein condensate
H.K. Avetissian, A.K. Avetissian, G. F. Mkrtchian

Physical review. A/Physical review, A 2015 023820/10

http://journals.aps.org/pra/

Статья

Multiphoton dynamics of qutrits in the ultrastrong coupling regime with a quantized photonic field
H.K. Avetissian, A. K. Avetissian, G.F. Mkrtchian, O.V. Kibis

Journal of Experimental and Theoretical Physics 2015 925-933

http://link.springer.com/journal/11447

Статья

Production of high energy-solid density electron bunches and hard γ-quanta and positron fluxes by ultrarelativistic lasers in solid-plasma targets
H.K. Avetissian, H. H. Matevosyan, G. F. Mkrtchian, Kh. V. Sedrakian

Physical Review Special Topics-Accelerators and Beams 2015 121301/7

http://journals.aps.org/prab/about

Статья

Multiphoton Excitations and Harmonics Generation in Quantum Electrodynamic Vacuum
Avetissian H.K., Avetissian A.K., Avchyan B.R., Mkrtchian G.F.

News and Reports from High Energy Density generated by Heavy Ion and Laser Beams 2015 2015 62

https://repository.gsi.de/record/194814/files/HEDP_report__2k15_web-version.pdf

---

Статья

Intense Coherent Gamma-Ray Source Based on the Collective Radiation of Positronium Atoms in a Bose-Einstein Condensate
Avetissian H.K., Avetissian A.K., Mkrtchian G.F.

News and Reports from High Energy Density generated by Heavy Ion and Laser Beams 2015 2015 61

https://repository.gsi.de/record/194814/files/HEDP_report__2k15_web-version.pdf

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