

# Davit Armen Ghazaryan

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## Research Institute of Physics

Laboratory of Advanced Functional Materials

Head of laboratory

## Language skills

English Русский

## Publications

*Article*

### **Topographically-guided van der Waals epitaxy: Selective growth of AlN nanowalls on h-BN step edges**

Albert M. Dautov, Vladimir G. Dubrovskii, Talgat Shugabaev, Vera V. Lendyashova, Konstantin P. Kotlyar, Alexey Kuznetsov, Prokhor A. Alekseev, Mikhail E. Popov, Igor V. Shtrom, Adilet Toksumakov, Davit Ghazaryan, Alesya V. Parfeneva, Aleksey V. Arsenin, Alexey D. Bolshakov, George E. Cirilin, Vladislav O. Gridchin  
Materials Science in Semiconductor Processing 2026 110293

*Article*

### **Inelastic resonant tunnelling through adjacent localised electronic states in van der Waals heterostructures**

E. E. Vdovin, K. Kapralov, Yu. N. Khanin, A. Margaryan, K. Watanabe, T. Taniguchi, C. Yang, S. V. Morozov, D. A. Svintsov, K. S. Novoselov, D. A. Ghazaryan  
npj 2D Materials and Applications 2025 7

*Article*

### **Artificial intelligence guided search for van der Waals materials with high optical anisotropy**

Liudmila A. Bereznikova, Ivan A. Kruglov, Georgy A. Ermolaev, Ivan Trofimov, Congwei Xie, Arslan Mazitov, Gleb Tselikov, Anton Minnekhanov, Alexey P. Tsapenko, Maxim Povolotsky, Davit A. Ghazaryan, Aleksey V. Arsenin, Valentyn S. Volkov, Kostya S. Novoselov  
Materials Horizons 2025 1953 - 1961

*Article*

### **Optical Properties of Biaxial van der Waals Crystals for Photonic Applications**

A. Slavich, G. Ermolaev, I. Zavidovskiy, D. Grudinin, M. Tatmyshevskiy, A. Toksumakov, A. Syuy, A. Vyshnevyy, D. Yakubovsky, S. Novikov, D. Ghazaryan, A. Arsenin, V. Volkov  
Bulletin of the Russian Academy of Sciences: Physics 2025 S433 - S438

*Article*

### **In-Plane Directional MoS<sub>2</sub> Emitter Employing Dielectric Nanowire Cavity**

Alexey Kuznetsov, Maria Aleksandrovna Anikina, Adilet Nurlanbekovich Toksumakov, Artem Nikolaevich Abramov, Vyacheslav Vsevolodovich Dremov, Eseniya Zavyalova, Valeriy Mikhailovich Kondratev, Vladimir Victorovich Federov, Ivan Sergeevich Mukhin, Vasily Kravtsov,

Kostya Sergeevich Novoselov, Aleksey Vladimirovich Arsenin, Valentyn Sergeevich Volkov,  
Davit Armenovich Ghazaryan, Alexey Dmitrievich Bolshakov  
Small Structures 2025 2400476

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*Article*

**Stacking and Layer Parity Dependent Photoluminescence in ReS<sub>2</sub>**

Saroj Poudyal, Prahalad Kanti Barman, Rabindra Biswas, Konstantin Kravtsov, Bubunu Biswal,  
Renu Yadav, Varun Raghunathan, Ivan Kruglov, Davit A. Ghazaryan, Abhishek Misra  
Advanced Optical Materials 2025 2403265

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*Article*

**Germanium disulfide as an alternative high refractive index and transparent material for UV-visible nanophotonics**

Aleksandr S. Slavich, Georgy A. Ermolaev, Ilya A. Zavidovskiy, Dmitriy V. Grudinin,  
Konstantin V. Kravtsov, Mikhail K. Tatmyshevskiy, Mikhail S. Mironov, Adilet N. Toksumakov,  
Gleb I. Tselikov, Iliia M. Fradkin, Kirill V. Voronin, Maksim R. Povolotskiy, Olga G. Matveeva,  
Alexander V. Syuy, Dmitry I. Yakubovsky, Dmitry M. Tsybarenko, Ivan Kruglov, Davit A. Ghazaryan,  
Sergey M. Novikov, Andrey A. Vyshnevyy, Aleksey V. Arsenin, Valentyn S. Volkov, Kostya S. Novoselov  
Light: Science and Applications 2025 213

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*Article*

**L-cysteine polymorph coatings for THz sensing metasurfaces**

M. Zhezhu, A. Vasil'ev, H. Parsamyan, T. Abrahamyan, G. Baghdasaryan, S. Gyozyalyan, D. Ghazaryan,  
H. Gharagulyan  
Results in Physics 2025 108351

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*Article*

**Chemical vapor deposition synthesis of (GeTe)<sub>n</sub>(Sb<sub>2</sub>Te<sub>3</sub>) gradient crystalline films as promising planar heterostructures**

M. Zhezhu, A. Vasil'ev, M. Yapryntsev, E. Ghalumyan, D.A. Ghazaryan, H. Gharagulyan  
Materials Science in Semiconductor Processing 2025 109863

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*Article*

**Revisiting THz absorption in GO and rGO liquid crystalline films**

A. Vasil'ev, M. Zhezhu, H. Parsamyan, G. Baghdasaryan, M. Sargsyan, D.A. Ghazaryan, H. Gharagulyan  
Optics and Laser Technology 2025 113628

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*Article*

**Epitaxial Growth of AlN Nanowires on Two-Dimensional h-BN Flakes Transferred Onto SiO<sub>2</sub>/Si Substrate**

Albert Dautov, Talgat Shugabaev, Alexey Kuznetsov, Konstantin Kotlyar, Davit Ghazaryan,  
Adilet Toksumakov, Alexey Bolshakov, Alesya Parfeneva, George Cirlin, Vladislav Gridchin  
International Conference of Young Specialists on Micro/Nanotechnologies and Electron Devices, EDM  
2025 100-103

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*Article*

**Probing the features of electron dispersion by tunneling between slightly twisted bilayer graphene sheets**

Alexey A. Sokolik, Azat F. Aminov, Evgenii E. Vdovin, Yurii N. Khanin, Mikhail A. Kashchenko,

Denis A. Bandurin, Davit A. Ghazaryan, Sergey V. Morozov, Kostya S. Novoselov  
Applied Physics Letters 2025 233101

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*Article*

**E-beam induced micropattern generation and amorphization of L-cysteine-functionalized graphene oxide nano-composites**

Y. Melikyan, H. Gharagulyan, A. Vasil'ev, V. Hayrapetyan, M. Zhezhu, A. Simonyan, D.A. Ghazaryan, M.S. Torosyan, A. kharatyan, J. Michalicka, M. Yerosyan  
Colloids and Interface Science Communications 2024 100766-7

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*Article*

**Exploring van der Waals materials with high anisotropy: geometrical and optical approaches**

Aleksandr S Slavich, Georgy A Ermolaev, Mikhail K Tatmyshevskiy, Adilet N Toksumakov, Olga G Matveeva, Dmitriy V Grudin, Kirill V Voronin, Arslan Mazitov, Konstantin V Kravtsov, Alexander V Syuy, Dmitry M Tsymbarenko, Mikhail S Mironov, Sergey M Novikov, Ivan Kruglov, Davit A Ghazaryan, Andrey A Vyshnevyy, Aleksey V Arsenin, Valentyn S Volkov, Kostya S Novoselov  
Light: Science and Applications 2024 68

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*Article*

**Wandering principal optical axes in van der Waals triclinic materials**

Georgy A Ermolaev, Kirill V Voronin, Adilet N Toksumakov, Dmitriy V Grudin, Ilia M Fradkin, Arslan Mazitov, Aleksandr S Slavich, Mikhail K Tatmyshevskiy, Dmitry I Yakubovsky, Valentin R Solovey, Roman V Kirtaev, Sergey M Novikov, Elena S Zhukova, Ivan Kruglov, Andrey A Vyshnevyy, Denis G Baranov, Davit A Ghazaryan, Aleksey V Arsenin, Luis Martin-Moreno, Valentyn S Volkov, Kostya S Novoselov  
Nature Communications 2024 1552

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*Article*

**Infrared photodetection in graphene-based heterostructures: bolometric and thermoelectric effects at the tunneling barrier**

Dmitry A. Mylnikov, Mikhail A. Kashchenko, Kirill N. Kapralov, Davit A. Ghazaryan, Evgenii E. Vdovin, Sergey V. Morozov, Kostya S. Novoselov, Denis A. Bandurin, Alexander I. Chernov, Dmitry A. Svintsov  
npj 2D Materials and Applications 2024 34

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**Chiral Photonic Super-Crystals Based on Helical van der Waals Homostructures**

Kirill V. Voronin, Adilet N. Toksumakov, Georgy A. Ermolaev, Aleksandr S. Slavich, Mikhail K. Tatmyshevskiy, Sergey M. Novikov, Andrey A. Vyshnevyy, Aleksey V. Arsenin, Kostya S. Novoselov, Davit A. Ghazaryan, Valentyn S. Volkov, Denis G. Baranov  
Laser and Photonics Reviews 2024 2301113

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*Article*

**Programmable Carbon Nanotube Networks: Controlling Optical Properties Through Orientation and Interaction**

Kirill V. Voronin, Georgy A. Ermolaev, Maria G. Burdanova, Aleksandr S. Slavich, Adilet N. Toksumakov, Dmitry I. Yakubovsky, Maksim I. Paukov, Ying Xie, Liu Qian, Daria S. Kopylova, Dmitry V. Krasnikov, Davit A. Ghazaryan, Denis G. Baranov, Alexander I. Chernov, Albert G. Nasibulin, Jin Zhang, Aleksey V. Arsenin, Valentyn Volkov

*Article*

**Polarization control of lasing from few-layer MoTe<sub>2</sub> coupled with the optical metasurface supporting quasi-trapped modes**

A. V. Prokhorov, A. N. Toksumakov, A. V. Shesterikov, F. M. Maksimov, M. K. Tatmyshevskiy, M. Yu. Gubin, R. V. Kirtaev, E. I. Titova, D. I. Yakubovsky, E. S. Zhukova, V. V. Burdin, S. M. Novikov, A. I. Chernov, D. A. Ghazaryan, A. V. Arsenin, V. S. Volkov

Applied Physics Letters 2024 041702

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*Article*

**Improving the electro-optical properties of MoS<sub>2</sub>/rGO hybrid nanocomposites using liquid crystals**

A. Vasil'ev, Y. Melikyan, M. Zhezhu, V. Hayrapetyan, M.S. Torosyan, D.A. Ghazaryan, M. Yeranosyan, H. Gharagulyan

Materials Research Bulletin 2024 113036

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*Article*

**Essential L-Amino Acid-Functionalized Graphene Oxide for Liquid Crystalline Phase Formation**

H. Gharagulyan, Y. Melikyan, V. Hayrapetyan, Kh. Kirakosyan, D.A. Ghazaryan, M. Yeranosyan

Materials Science and Engineering: B 2023 116564

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*Article*

**Graphene on SiO<sub>2</sub>/Si and Al<sub>2</sub>O<sub>3</sub> under thermal annealing and electric current: Competition of dopant desorption and conformation to substrate**

E.A. Kolesov, M.S. Tivanov, O.V. Korolik, I.A. Svito, A.S. Antonovich, Yu. Klishin, D.A. Ghazaryan, A.V. Arsenin, V.S. Volkov, O.O. Kapitanova, G.N. Panin

Diamond and Related Materials 2023 110362

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**Dry Assembly of van der Waals Heterostructures Using Exfoliated and CVD-Grown 2D Materials**

Adilet N. Toksumakov, M. N. Sidorova, A. S. Slavich, M. K. Tatmyshevskiy, I. A. Zavidovskiy, G. A. Ermolaev, V. S. Volkov, D. A. Ghazaryan, A. V. Arsenin

Bulletin of the Russian Academy of Sciences: Physics 2023 S453-S457

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**Hexagonal boron nitride nanophotonics: a record-breaking material for the ultraviolet and visible spectral ranges**

D. V. Grudin, G. A. Ermolaev, D. G. Baranov, A. N. Toksumakov, K. V. Voronin, A. S. Slavich, A. A. Vyshnevyy, A. B. Mazitov, I. A. Kruglov, D. A. Ghazaryan, A. V. Arsenin, K. S. Novoselov, V. S. Volkov

Materials Horizons 2023 2427-2435

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**Anomalous optical response of graphene on hexagonal boron nitride substrates**

Adilet N Toksumakov, Georgy A Ermolaev, Mikhail K Tatmyshevskiy, Yuri A Klishin, Aleksandr S Slavich, Ilya V Begichev, Dusan Stosic, Dmitry I Yakubovsky, Dmitry G Kvashnin, Andrey A Vyshnevyy, Aleksey V Arsenin, Valentyn S Volkov, Davit A. Ghazaryan

Communications Physics 2023 13

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Article

**Tunable THz flat zone plate based on stretchable single-walled carbon nanotube thin film**

Gleb M Katyba, Nikita I Raginov, Eldar M Khabushev, Vladislav A Zhelnov, Andrei Gorodetsky, Davit A Ghazaryan, Mikhail S Mironov, Dmitriy V Krasnikov, Yuri G Gladush, James Lloyd-Hughes, Albert G Nasibulin, Aleksey V Arsenin, Valentyn S Volkov, Kirill I Zaytsev, Maria G Burdanova  
Optica 2023 53-61

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Article

**Photoluminescence anisotropy in hybrid nanostructures based on gallium phosphide nanowire and 2D transition metal dichalcogenides**

MA Anikina, A Kuznetsov, AN Toksumakov, VV Dremov, DA Ghazaryan, VV Fedorov, AV Arsenin, VS Volkov, AD Bolshakov  
St. Petersburg State Polytechnical University Journal: Physics and Mathematics 2023 3.2

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Article

**Temperature-dependent Raman spectroscopy and thermal conductivity of TiS<sub>2</sub> hexagonal nanodiscs**

Mohammad Talib, Samrah Manzoor, Davit A. Ghazaryan, Aleksey V. Arsenin, Valentyn S. Volkov, Prabhash Mishra  
Materials Science in Semiconductor Processing 2022 107084

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Article

**High-refractive index and mechanically cleavable non-van der Waals InGaS<sub>3</sub>**

Adilet N. Toksumakov, Georgy A. Ermolaev, Aleksandr S. Slavich, Natalia V. Doroshina,, Ekaterina V. Sukhanova, Dmitry I. Yakubovsky, Alexander V. Syuy, Sergey M. Novikov,, Roman I. Romanov, Andrey M. Markeev, Aleksandr S. Oreshonkov, Dmitry M. Tsymbarenko, Zakhar I. Popov, Dmitry G. Kvashnin, Andrey A . Vyshnevyy, Aleksey V. Arsenin, Davit A. Ghazaryan, Valentyn S. Volkov  
npj 2D Materials and Applications 2022 85

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Article

**Broadband optical and terahertz properties of 1D van der Waals heteronanotubes**

Maria G. Burdanova, Yongjia Zheng, Maksim I. Paukov, Georgy A. Ermolaev, Gennady A. Komandin, Davit Ghazaryan, Sergey Novikov, Rong Xiang, Shohei Chiashi, Shigeo Maruyama, James Lloyd-Hughes, Alexey V. Arsenin, Valentin Volkov  
IEEE Photonics Journal 2022 182243

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Article

**Twisted monolayer and bilayer graphene for vertical tunneling transistors**

Davit A. Ghazaryan, Abhishek Misra, Evgenii E. Vdovin,, Kenji Watanabe, Takashi Taniguchi, Sergei V. Morozov, Artem Mishchenko, Kostya S. Novoselov  
Applied Physics Letters 2021 183106

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Article

**On the Role of Structural Imperfections of Graphene in Resonant Tunneling through Localized States in the h-BN Barrier of van-der-Waals Heterostructures**

M. V. Grigoriev, D. A. Ghazaryan, E. E. Vdovin, Yu. N. Khanin, S. V. Morozov, K. S. Novoselov  
Физика и техника полупроводников (Semiconductors) 2020 291-296

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Article

**High-temperature electronic devices enabled by hBN-encapsulated graphene**

Makars Šiškins, Ciaran Mullan, Seok-Kyun Son, Jun Yin, Kenji Watanabe, Takashi Taniguchi,

Davit Ghazaryan, Kostya S. Novoselov, Artem Mishchenko

Applied Physics Letters 2019 123104

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Article

**Engineering Graphene Flakes for Wearable Textile Sensors via Highly Scalable and Ultrafast Yarn Dyeing Technique**

Shaila Afroj, Nazmul Karim, Zihao Wang, Sirui Tan, Pei He, Matthew Holwill, Davit Ghazaryan,

Anura Fernando, Kostya S. Novoselov

ACS Nano 2019 3847-3857

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Article

**Field-induced insulating states in a graphene superlattice**

S. Pezzini, S. Wiedmann, A. Mishchenko, M. Holwill, R. Gorbachev, D. Ghazaryan, K.S. Novoselov,

U. Zeitler

Physical Review B 2019 045440

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Article

**Planar and van der Waals heterostructures for vertical tunnelling single electron transistors**

Gwangwoo Kim, Sung-Soo Kim, Jonghyuk Jeon, Seong In Yoon, Seokmo Hong, Young Jin Cho,

Abhishek Misra, Servet Ozdemir, Jun Yin, Davit Ghazaryan, Matthew Holwill, Artem Mishchenko,

Daria V. Andreeva, Yong-Jin Kim, Hu Young Jeong, A-Rang Jang, Hyun-Jong Chung, Andre K. Geim,

Kostya S. Novoselov, Byeong-Hyeok Sohn, Hyeon Suk Shin

Nature Communications 2019 230

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Conference

**TERAHERTZ RESPONSE OF GRAPHENE-LIKE STRUCTURES**

L. Avanesyan, A. Vasil'ev, M. Zhezhu, H. Parsamyan, G. Baghdasaryan, M. Sargsyan, D. A. Ghazaryan,

H. Gharagulyan

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Conference

**Ge-Sb-Te Gradient Crystalline Films for Potential Optical Filtering**

Marina Zhezhu, Alexey Vasil'ev, Maxim Yaprntsev, Davit Ghazaryan, Hermine Gharagulyan

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Conference

**Resonances Induced by Structural Asymmetry in the THz Domain and Their Applications**

Sara Gyoalyan, Marina Zhezhu, Alexey Vasil'ev, Henrik Parsamyan, Tigran Abrahamyan,

Gayane Baghdasaryan, Davit A. Ghazaryan, Hermine Gharagulyan

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Conference

**Terahertz Response of Liquid Crystalline GO and rGO Thin Films**

Lilit Avanesyan, Alexey Vasil'ev, Marina Zhezhu, Henrik Parsamyan, Gayane Baghdasaryan,

Maksim Sargsyan, Davit A. Ghazaryan, Hermine Gharagulyan

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