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Publications

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 MoS2 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

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, Ilia M. Fradkin, Kirill V. Voronin, Maksim R. Povolotskiy, Olga G. Matveeva,
Alexander V. Syuy, Dmitry I. Yakubovsky, Dmitry M. Tsymbarenko, Ivan Kruglov, Davit A. Ghazaryan,
Sergey M. Novikov, Andrey A. Vyshnevyy, Aleksey V. Arsenin, Valentyn S. Volkov, Kostya S. Novoselov
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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 Grudinin, 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
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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 Grudinin, 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

Article

Broadband optical properties of Ti3C2 MXene revisited

Aleksey V. Arsenin, Valentyn S. Volkov, Daria A. Panova, Gleb I. Tselikov, Georgy A. Ermolaev, Alexander V. Syuy, Dmitrii S. Zimbovskii, Olesya O. Kapitanova, Dmitry I. Yakubovsky, Arslan B. Mazitov, Ivan A. Kruglov, Andrey A. Vyshnevyy

Optics Letters 2024 25-28

Article

Crystallinity as a factor of SERS stability of silver nanoparticles formed by Ar+ irradiation

Aleksey V. Arsenin, Valentyn S. Volkov, Natalia V. Doroshina, Oleg A. Streletskiy, Ilya A. Zavidovskiy, Mikhail K. Tatmyshevskiy, Gleb I. Tselikov, Olesya O. Kapitanova, Alexander V. Syuy, Roman Romanov, Prabhash Mishra, Vjaceslavs Bobrovs, Andrey M. Markeev, Dmitry I. Yakubovsky, Irina A. Veselova, Sergey M. Novikov

Heliyon 2024 e27538

Article

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

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

Advanced Science 2024 2404694

Article

Polarization control of lasing from few-layer MoTe2 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

Article

Anisotropic Optical Properties of Monolayer Aligned Single-Walled Carbon Nanotubes
Aleksey V. Arsenin, Valentyn S. Volkov, Georgy A. Ermolaev, Ying Xie, Liu Qian,

Mikhail K. Tatmyshevskiy, Aleksandr S. Slavich, Jin Zhang, Alexander I. Chernov

Physica Status Solidi - Rapid Research Letters 2024 2300199

Article

Exploring stable hot carrier multiplication in filled carbon nanotubes
Aleksey V. Arsenin, Maksim I. Paukov, Shuang Sun, Anna A. Vorfolomeeva, Alexander V. Syuy,

Roman I. Romanov, Mikhail S. Mironov, Andrey A. Vyshnevyy, Gennadiy A. Komandin,

Lyubov G. Bulusheva, Alexander V. Okotrub, Valentyn Volkov, Yan Zhang, Maria G. Burdanova

Carbon 2024 119580

Article

Laser-synthesized TiN-based nanoparticles as novel efficient electrostatic nanosorbent for environmental water cleaning
Aleksey V Arsenin, Valentyn S Volkov, Alexander V Syuy, Ilya V Martynov, Ilya A Zavidovskiy,

Dmitry V Dyubo, Qingjiang Sun, Xi Yang, Gleb V Tikhonowski, Daniil I Tselikov, Maxim S Savinov,

Islam V Sozaev, Anton A Popov, Sergey M Klimentov, Gleb I Tselikov, Sergey M Novikov, Xiangwei Zhao,

Andrei V Kabashin

Physica Scripta 2024 115914

Article

Leveraging Femtosecond Laser Ablation for Tunable Near-Infrared Optical Properties in MoS2-Gold Nanocomposites
Aleksey V. Arsenin, Alexey D. Bolshakov, Ilya A. Zavidovskiy, Ilya V. Martynov, Daniil I. Tselikov,

Alexander V. Syuy, Anton A. Popov, Sergey M. Novikov, Andrei V. Kabashin, Gleb I. Tselikov,

Valentyn S. Volkov

Nanomaterials 2024 1961

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Unveiling the broadband optical properties of Bi2Te3: Ultrahigh refractive index and promising applications
Aleksey V. Arsenin, Valentyn S. Volkov, Georgy A. Ermolaev, et al.

Applied Physics Letters 2024 241101

Article

SERS analysis of single cells and subcellular components: A review
A. Arsenin, V. Volkov, M. Barshutina

Heliyon 2024 e37396

Article

Graphene on SiO2/Si and Al2O3 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

Article

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

Article
Hexagonal boron nitride nanophotonics: a record-breaking material for the ultraviolet and visible spectral ranges
D. V. Grudinin, 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

Article
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
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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

Article
Optical Nanoimaging of Surface Plasmon Polaritons Supported by Ultrathin Metal Films
Aleksey V. Arsenin, Valentyn S. Volkov, Dmitriy I. Yakubovsky, Dmitriy V. Grudinin, Georgy A. Ermolaev, Kirill Voronin, Dmitry A. Svintsov, Andrey A. Vyshnevyy, Mikhail S. Mironov
Nano Letters 2023 9461-9467

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Physisorption-Mediated Charge Transfer in TiS2 Nanodiscs: A Room Temperature Sensor for Highly Sensitive and Reversible Carbon Dioxide Detection
Aleksey V. Arsenin, Valentyn S. Volkov, Samrah Manzoor, Mohammad Talib, Sergey M. Novikov, Prabhash Mishra
ACS Sensors 2023 3435-3447

Article
van der Waals Materials for Overcoming Fundamental Limitations in Photonic Integrated Circuitry
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Nano Letters 2023 8057-8064

Article

Elastic Gallium Phosphide Nanowire Optical Waveguides—Versatile Subwavelength Platform for Integrated Photonics

Alexey Kuznetsov, Eduard Moiseev, Artem N. Abramov, Nikita Fominykh, Vladislav A. Sharov, Valeriy M. Kondratev, Ivan I. Shishkin, Konstantin P. Kotlyar, Demid A. Kirilenko, Vladimir V. Fedorov, Svetlana A. Kadinskaya, Alexandr A. Vorobyev, Ivan S. Mukhin, Aleksey V. Arsenin, Valentyn S. Volkov, Vasily Kravtsov, Alexey D. Bolshakov

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Article

Self-assembled photonic structure: a Ga optical antenna on GaP nanowires

Alexey Kuznetsov, Prithu Roy, Dmitry V. Grudinin, Valeriy M. Kondratev, Svetlana A. Kadinskaya, Alexandr A. Vorobyev, Konstantin P. Kotlyar, Evgeniy V. Ubyivovk, Vladimir V. Fedorov, George E. Cirlin, Ivan S. Mukhin, Aleksey V. Arsenin, Valentyn S. Volkov, Alexey D. Bolshakov

Nanoscale 2023 2332 - 2339

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

Article

Temperature-dependent Raman spectroscopy and thermal conductivity of TiS2 hexagonal nanodiscs

Mohammad Talib, Samrah Manzoor, Davit A. Ghazaryan, Aleksey V. Arsenin, Valentyn S. Volkov, Prabhash Mishra

Materials Science in Semiconductor Processing 2022 107084

Article

High-refractive index and mechanically cleavable non-van der Waals InGaS3

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

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
