

## Publications

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*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. Cirlin, Vladislav O. Gridchin  
Materials Science in Semiconductor Processing 2026 110293

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*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*

### **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*

### **Leveraging Femtosecond Laser Ablation for Tunable Near-Infrared Optical Properties in MoS<sub>2</sub>-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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*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

Small 2023 2301660

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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

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*Article*

**Numerical Study of GaP Nanowires: Individual and Coupled Optical Waveguides and Resonant Phenomena**

Maria A. Anikina, Prithu Roy, Svetlana A. Kadinskaya, Alexey Kuznetsov, Valeriy M. Kondratev,

Alexey D. Bolshakov

Nanomaterials 2023 56

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*Article*

**Deep-Level Emission Tailoring in ZnO Nanostructures Grown via Hydrothermal Synthesis**

Alexey D. Bolshakov, Svetlana A. Kadinskaya, Valeriy M. Kondratev, Ivan K. Kindyushov, Olga Yu. Koval,

Dmitry I. Yakubovsky, Alexey Kusnetsov, Alexey I. Lihachev, Alexey V. Nashchekin, Irina Kh. Akopyan,

Alexey Yu. Serov, Mariana E. Labzovskaya, Sergey V. Mikushev, Boris V. Novikov, Igor V. Shtrom

Nanomaterials 2023 58

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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*

**Si Nanowire-Based Schottky Sensors for Selective Sensing of NH<sub>3</sub> and HCl via Impedance Spectroscopy**

Valeriy M. Kondratev, Ekaterina A. Vyacheslavova, Talgat Shugabaev, Demid A. Kirilenko,

Alexey Kuznetsov, Svetlana A. Kadinskaya, Zamir V. Shomakhov, Artem I. Baranov,

Svetlana S. Nalimova, Vyacheslav A. Moshnikov, Alexander S. Gudovskikh, Alexey D. Bolshakov

ACS Applied Nano Materials 2023 11513 - 11523

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*Article*

**Single GaP nanowire nonlinear characterization with the aid of an optical trap**

Alexey D. Bolshakov, Ivan Shishkin, Andrey Machnev, Mihail Petrov, Demid A. Kirilenko,

Vladimir V. Fedorov, Ivan S. Mukhin, Pavel Ginzburg

Nanoscale 2022 993 - 1000

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*Article*

**Anisotropic Radiation in Heterostructured "Emitter in a Cavity" Nanowire**

Alexey D. Bolshakov, Alexey Kuznetsov, Prithu Roy, Valeriy M. Kondratev, Vladimir V. Fedorov,

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**Silicon Nanowire-Based Room-Temperature Multi-environment Ammonia Detection**

Alexey D. Bolshakov, Valeriy M. Kondratev, Ivan A. Morozov, Ekaterina A. Vyacheslavova,  
Demid A. Kirilenko, Alexey Kuznetsov, Svetlana A. Kadinskaya, Vyacheslav A. Moshnikov,  
Alexander S. Gudovskikh, Svetlana S. Nalimova

ACS Applied Nano Materials 2022 9940 - 9949

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**XRD Evaluation of Wurtzite Phase in MBE Grown Self-Catalyzed GaP Nanowires**

Alexey D. Bolshakov, Olga Yu. Koval, Vladimir V. Fedorov, Igor E. Eliseev, Sergey V. Fedina,  
Georgiy A. Sapunov, Stanislav A. Udoenko, Liliia N. Dvoretckaia, Demid A. Kirilenko,  
Roman G. Burkovsky, Ivan S. Mukhin

Nanomaterials 2021 960

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*Article*

**Work function tailoring in gallium phosphide nanowires**

Alexey Bolshakov, Vladislav Sharov, Prokhor Alekseev, Vladimir Fedorov, Mikhail Nestoklon,  
Alexander Ankudinov, Demid Kirilenko, Georgiy Sapunov, Olga Koval, George Cirlin, Ivan Mukhin

Applied Surface Science 2021 150018

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*Article*

**Tailoring Morphology and Vertical Yield of Self-Catalyzed GaP Nanowires on Template-Free Si Substrates**

Alexey D. Bolshakov, Vladimir V. Fedorov, Yury Berdnikov, Nickolay V. Sibirev, Sergey V. Fedina,  
Georgiy A. Sapunov, Liliia N. Dvoretckaia, George Cirlin, Demid A. Kirilenko, Maria Tchernycheva,  
Ivan S. Mukhin

Nanomaterials 2021 1949

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*Article*

**Gallium Phosphide Nanowires in a Free-Standing, Flexible, and Semitransparent Membrane for Large-Scale Infrared-to-Visible Light Conversion**

Alexey Bolshakov, Vladimir V. Fedorov, Sergey V. Makarov, Olga Sergaeva, Vladimir Neplokh,  
Daria Markina, Stephanie Bruyere, Grégoire Saerens, Mihail I. Petrov, Rachel Grange, Maria Timofeeva,

Ivan S. Mukhin

ACS Nano 2020 10624 - 10632

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*Article*

**Perovskite-Gallium Phosphide Platform for Reconfigurable Visible-Light Nanophotonic Chip**

Alexey Bolshakov, Pavel Trofimov, Anatoly P. Pushkarev, Ivan S. Sinev, Vladimir V. Fedorov,  
Stéphanie Bruyère, Ivan S. Mukhin, Sergey V. Makarov

ACS Nano 2020 8126 - 8134

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