

## Research Institute of Physics

Ֆոտոնիկայի և արհեստական բանականության լաբորատորիա  
Leading researcher

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## Publications

*Article*

### **A Dynamic Analysis of Toron Formation in Chiral Nematic Liquid Crystals Using a Polarization Holographic Microscope**

Tikhon V. Reztsov, Aleksey V. Chernykh, Tetiana Orlova, Nikolay V. Petrov

Polymers MDPI 2025 1849

*Article*

### **Polarization-controlled orbital angular momentum of light passing through a cholesteric spherulite**

A. N. Shalev, A. A. Misura, A. O. Georgieva, A. V. Chernykh, N. V. Petrov, T. Orlova, I. S. Lobanov, E. V. Aksenova, V. M. Uzdin, A. D. Kiselev

Optics Letters 2025 4866-4869

*Article*

### **Rewritable Binary Recording of the Photon Spin State in Chiral Liquid Crystals**

Nicolas Bruni, Charles Loussert, Mushegh Rafayelyan, Tetiana Orlova, Delphine Coursault,

Etienne Brasselet

Physical Review Letters 2025 223804

*Article*

### **Fine Tuning of the Rotational Speed of Light-Driven, Second-Generation Molecular Motors by Fluorine Substitution**

Ivan Tambovtsev, Yorick L. A. Schmerwitz, Gianluca Levi, Darina D. Darmoroz, Pavel V. Nesterov, Tetiana Orlova, Hannes Jónsson

Journal of Physical Chemistry Letters 2025 4014 - 4020

*Article*

### **Microsecond-scale observation of phase transition and diffusion in 5CB liquid crystal at the molecular level**

N. Kasapenko, T. Orlova, N. Kondratyuk

Journal of Chemical Physics 2025 154901

*Article*

### **Light-Induced Heating of Microsized Nematic Volumes**

Dmitrii Shcherbinin, Denis A. Glukharev, Semyon Rudyi, Anastasiia Piven, Tetiana Orlova, Izabela Sliwa,

Alex Zakharov

Crystals 2025 822

*Article*

### **Light-induced isotropic pen for generation of topological solitons and hopfion-toron transition in frustrated chiral nematic films**

Sergey A. Shvetsov, Darina D. Darmoroz, Alexey Vasil'ev, Tetiana Orlova, Igor S. Lobanov,  
Mushegh Rafayelyan  
Chaos, Solitons and Fractals 2025 116905

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*Article*

**On-Demand Photopatterned Twisted Nematics for Generation of Polychromatic Vector Fields**

Edvard Grigoryan, Hayk H. Harutyunyan, Hrayr Hakobyan, Sergey A. Shvetsov, Tetiana Orlova,

Mushegh Rafayelyan, Vahram L. Grigoryan

Crystals 2025 877

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*Article*

**Nanostructured Material Design via a Retrieval-Augmented Generation (RAG) Approach: Bridging Laboratory Practice and Scientific Literature**

Nikita A. Krotkov, Dmitrii A. Sbytov, Anna A. Chakhoyan, Polina I. Kornienko, Anna A. Starikova,

Maxim G. Stepanov, Anastasiia O. Piven, Timur A. Aliev, Tetiana Orlova, Mushegh S. Rafayelyan,

Ekaterina V. Skorb

Journal of Chemical Information and Modeling 2025 11064-11078

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*Article*

**Large Supramolecular Patterns in Photoactive Chiral Liquid Crystals for Light-Controllable Soft Micromechanical Systems**

Darina Darmoroz, Tetiana Orlova, Anastasiia Piven

Small Structures 2025 e202500506

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*Article*

**Machine learning methods for liquid crystal research: phases, textures, defects and physical properties**

Anastasiia Piven, Darina Darmoroz, Ekaterina Skorb, Tetiana Orlova

Soft Matter 2024 1380 - 1391

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*Article*

**Topological Learning for the Classification of Disorder: An Application to the Design of Metasurfaces**

Tristan Madeleine, Nina Podoliak, Oleksandr Buchnev, Ingrid Membrillo Solis, Tetiana Orlova,

Maria van Rossem, Malgosia Kaczmarek, Giampaolo D'Alessandro, Jacek Brodzki

ACS Nano 2024 630–640

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*Article*

**Reactions of 5-(Trialkyl)silylpent-1-en-4-yn-3-ones with Hydrazines: Original Synthetic Routes to Luminescent Substances Containing Azole Motifs**

Ivan S. Odin, Kareem V. Gordon, Radik N. Itakhunov, Dmitry M. Gusev, Sergey A. Sokov,

Anna V. Vologzhanina, Stanislav A. Grabovskiy, Ilya M. Sosnin, Anton I. Ukolov, Olga I. Orlova,

Vladimir A. Lazarenko, Pavel V. Dorovatovskii, Darina D. Darmoroz, Anastasiia O. Piven, Tetiana Orlova,

Alexander A. Golovanov

SYNTHESIS 2024 243-266

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*Article*

**МЕТОД ОПТИЧЕСКОЙ МОЛЕКУЛЯРНОЙ ГЕНЕРАЦИИ ЛОКАЛИЗОВАННЫХ ХИРАЛЬНЫХ СТРУКТУР В ФОТОАКТИВНЫХ ЖИДКОКРИСТАЛЛИЧЕСКИХ ПЛЕНКАХ**

*Article*

**Machine learning for soft and liquid molecular materials**

Tetiana Orlova, Anastasiia Piven, Darina Darmoroz, Timur Aliev, Tamer Mahmoud Tamer Abdel Razik, Anton Boitsev, Natalia Grafeeva, Ekaterina Skorb

Digital Discovery 2023 298-315

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*Article*

**Optical nonlinearity of a dual-frequency nematic liquid crystal via temperature-mediated mapping of dielectric anisotropy**

S. A. Shvetsov, T. Orlova, A. V. Emelyanenko, A. S. Zolot'ko, H. L. Ong

Optics Express 2022 47909-47920

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*Article*

**Optical Imaging and Analytical Design of Localized Topological Structures in Chiral Liquid Crystals**

Igor Lobanov, Elena Aksenova, Tetiana Orlova, Darina Darmoroz, Valery Uzdin, Alexei D. Kiselev

Symmetry 2022 2476

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*Article*

**Light-Induced Structures and Microparticle Transportation in a Free-Surface Frustrated Chiral Nematic Film**

Sergey A. Shvetsov, Tetiana Orlova, Alexander V. Emelyanenko

Crystals 2022 549

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*Article*

**Nanoparticle-Induced Property Changes in Nematic Liquid Crystals**

Nicolas Brouckaert, Nina Podoliak, Tetiana Orlova, Denitsa Bankova, Angela F. De Fazio,

Antonios G. Kanaras, Ondrej Hovorka, Giampaolo D'Alessandro, Malgosia Kaczmarek

Nanomaterials 2022 341

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*Article*

**When Bubbles Are Not Spherical: Artificial Intelligence Analysis of Ultrasonic Cavitation Bubbles in Solutions of Varying Concentrations**

Ilya Korolev, Timur A. Aliev, Tetiana Orlova, Sviatlana A. Ulasevich, Michael Nosonovsky,

Ekaterina V. Skorb

Journal of Physical Chemistry B 2022 3161 - 3169

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*Article*

**Tracking the time evolution of soft matter systems via topological structural heterogeneity**

Ingrid Membrillo Solis, Tetiana Orlova, Karolina Bednarska, Piotr Lesiak, Tomasz R. Woliński,

Giampaolo D'Alessandro, Jacek Brodzki, Malgosia Kaczmarek

Communications Materials 2022 1

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