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### Research Areas

Materials Science, Measurement Science, General Laboratory Techniques, and Metrology, Optical Properties, Spectroscopy of Matter

### Advising Theses

PAVLOV I., 3D-microstructuring of silicon induced by nanosecond pulsed infrared fiber laser for potential solar cell applications, Postgraduate, B.BÜLBÜL(Student), 2022

### Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Single-beam low-frequency loss modulation technique for two-photon absorption measurement**  
Kadan V., PAVLOV I., Dmytruk A., Blonskyi I., Pavlova T., Serozhkin Y., Goodarzi A., Bondar M.  
Optics Communications, vol.569, 2024 (SCI-Expanded)
- II. **Development of a selective wet-chemical etchant for precise 3D sculpting of silicon enabled by infrared non-linear laser modification**  
Zolfaghari Borra M., Radfar B., Nasser H., Çolakoğlu T., Tokel O., Turnalı A., DEMİRTAŞ M., Işık Taşgın D., TOFFOLI H., Toffoli D., et al.  
Optics and Laser Technology, vol.176, 2024 (SCI-Expanded)
- III. **Electrical Properties of Laser Patterned Schottky Diode with ALD-Grown TiO<sub>2</sub> Interlayer**  
Dikicioğlu E., Balı M. B., SAĞLAM S., Berberoğlu H., PAVLOV I., GOODARZİ A., ORHAN E.  
ACS Omega, vol.9, no.19, pp.21346-21352, 2024 (SCI-Expanded)
- IV. **LIPSS for SERS: Metal Coated Direct Laser Written Periodic Nanostructures for Surface Enhanced Raman Spectroscopy**  
Erkizan S. N., İDİKUT F., Demirtas O., Goodarzi A., Demir A. K., Borra M., PAVLOV I., BEK A.  
ADVANCED OPTICAL MATERIALS, vol.10, no.22, 2022 (SCI-Expanded)
- V. **Time-resolved microscopy of femtosecond laser filaments in fused quartz**  
Kadan V., Blonskyi I., Pavlov I.  
OPTICS COMMUNICATIONS, vol.505, 2022 (SCI-Expanded)
- VI. **Azimuthal and polar anchoring energies of aligning layers structured by nonlinear laser lithography**

Pavlov I., Candemir O., Rybak A., Dobrovolskiy A., Kadan V., Blonskiy I., Lytvyn P., Korchovy A., Tytarenko P., Kazantseva Z., et al.

Liquid Crystals, vol.48, no.1, pp.131-149, 2021 (SCI-Expanded)

VII. **3D-graphene-laser patterned p-type silicon Schottky diode**

Orhan E. O., Efil E., Bayram O., Kaymak N., Berberoğlu H., Candemir O., PAVLOV I., Ocak S. B.

Materials Science in Semiconductor Processing, vol.121, 2021 (SCI-Expanded)

VIII. **High power microsecond fiber laser at 1.5  $\mu\text{m}$**

Pavlova S., Yagci M. E., Eken S. K., Tunckol E., Pavlov I.

Optics Express, vol.28, no.12, pp.18368-18375, 2020 (SCI-Expanded)

IX. **Upconversion fluorescence assisted visualization of femtosecond laser filaments in Er-doped chalcogenide  $65\text{GeS}(2)-25\text{Ga}(2)\text{S}(3)-10\text{CsCl}$  glass**

Blonskiy I., Kadan V., Shpotyuk O., Calvez L., Pavlov I., Pavlova S., Dmytruk A., Rybak A., Korenyuk P.

OPTICS AND LASER TECHNOLOGY, vol.119, 2019 (SCI-Expanded)

X. **Generation of 2- $\mu\text{J}$  410-fs pulses from a single-mode chirped-pulse fiber laser operating at 1550 nm**

Pavlova S., Rezaei H., Pavlov I., Kalaycioglu H., Ilday F. O.

APPLIED PHYSICS B-LASERS AND OPTICS, vol.124, no.10, 2018 (SCI-Expanded)

XI. **High-quality alignment of nematic liquid crystals using periodic nanostructures created by nonlinear laser lithography**

Pavlov I., Rybak A. S., Dobrovolskiy A. M., Kadan V. M., Blonskiy I. V., Kazantseva Z. I., Gvozдовskyy I. A.

JOURNAL OF MOLECULAR LIQUIDS, vol.267, pp.212-221, 2018 (SCI-Expanded)

XII. **Spatio-temporal dynamics of femtosecond laser pulses at 1550 nm wavelength in crystal silicon**

Kadan V., Pavlova S., Pavlov I., Rezaei H., Ilday O., Blonskiy I.

APPLIED PHYSICS A-MATERIALS SCIENCE & PROCESSING, vol.124, no.8, 2018 (SCI-Expanded)

XIII. **NLL-Assisted Multilayer Graphene Patterning**

Kovalska E., Pavlov I., Deminskyi P., Baldycheva A., Ilday F. O., Kocabas C.

ACS OMEGA, vol.3, no.2, pp.1546-1554, 2018 (SCI-Expanded)

XIV. **The alignment of nematic liquid crystal by the Ti layer processed by nonlinear laser lithography**

Pavlov I., Rybak A., Dobrovolskiy A., Kadan V., Blonskiy I., Ilday F. O., Kazantseva Z., Gvozдовskyy I.

LIQUID CRYSTALS, vol.45, no.9, pp.1265-1271, 2018 (SCI-Expanded)

XV. **In-chip microstructures and photonic devices fabricated by nonlinear laser lithography deep inside silicon**

Tokel O., Turnali A., Makey G., Elahi P., Colakoglu T., Ergecen E., Yavuz O., Hubner R., Borra M. Z., Pavlov I., et al.

NATURE PHOTONICS, vol.11, pp.639-646, 2017 (SCI-Expanded)

XVI. **Femtosecond laser written waveguides deep inside silicon**

Pavlov I., Tokel O., Pavlova S., Kadan V., Makey G., Turnali A., Yavuz O., Ilday F. O.

OPTICS LETTERS, vol.42, no.15, pp.3028-3031, 2017 (SCI-Expanded)

XVII. **Rich complex behaviour of self-assembled nanoparticles far from equilibrium**

Ilday S., Makey G., Akguc G. B., Yavuz O. N., Tokel O., Pavlov I., Gulseren O., Ilday F. O.

NATURE COMMUNICATIONS, vol.8, 2017 (SCI-Expanded)

XVIII. **Nano patterning of AISI 316L stainless steel with Nonlinear Laser Lithography: Sliding under dry and oil-lubricated conditions**

Gnilitskiy I., Rotundo F., Martini C., Pavlov I., Ilday S., Vovk E., Ilday F. O., Orazi L.

TRIBOLOGY INTERNATIONAL, vol.99, pp.67-76, 2016 (SCI-Expanded)

XIX. **Nonlinear laser lithography to control surface properties of stainless steel**

Orazi L., Gnilitskiy I., Pavlov I., Serro A. P., Ilday S., Ilday F. O.

CIRP ANNALS-MANUFACTURING TECHNOLOGY, vol.64, no.1, pp.193-196, 2015 (SCI-Expanded)

XX. **Diffraction-limited, 10-W, 5-ns, 100-kHz, all-fiber laser at 1.55  $\mu\text{m}$**

Pavlov I., Dulgergil E., Ilbey E., Ilday F. O.

OPTICS LETTERS, vol.39, no.9, pp.2695-2698, 2014 (SCI-Expanded)

XXI. **Nonlinear laser lithography for indefinitely large-area nanostructuring with femtosecond pulses**

Oktem B., Pavlov I., İlday S., Kalaycioglu H., Rybak A., Yavas S., Erdogan M., İLDAY F. Ö.  
NATURE PHOTONICS, vol.7, no.11, pp.897-901, 2013 (SCI-Expanded)

XXII. **High-power high-repetition-rate single-mode Er-Yb-doped fiber laser system**

Pavlov I., İlbey E., Dulgergil E., Bayri A., İLDAY F. Ö.  
OPTICS EXPRESS, vol.20, no.9, 2012 (SCI-Expanded)

XXIII. **Femtosecond filamentation in chalcogenide glasses limited by two-photon absorption**

Blonskyi I., Kadan V., Shpotyuk O., Iovu M., Pavlov I.  
OPTICAL MATERIALS, vol.32, no.11, pp.1553-1557, 2010 (SCI-Expanded)

## Articles Published in Other Journals

I. **ULTRASHORT LIGHT PULSES IN TRANSPARENT SOLIDS: PROPAGATION PECULIARITIES AND PRACTICAL APPLICATIONS**

Blonskyi I., Kadan V. M., Pavlova S., Pavlov I., Shpotyuk O., Khasanov O. K.  
UKRAINIAN JOURNAL OF PHYSICS, vol.64, no.6, pp.457-463, 2019 (ESCI)

## Refereed Congress / Symposium Publications in Proceedings

I. **Low ASE Er-Yb Laser with Single Amplification Stage**

Sungur E. İ., PAVLOV I.  
Fiber Lasers XX: Technology and Systems 2023, California, United States Of America, 30 January - 02 February 2023, vol.12400

II. **Nanosecond Laser-Induced Micro-Modifications in Bulk of Crystal Silicon**

Kadan V., Pavlova S., Bek A., Aydin Y., Blonskyi I., Pavlov I.  
2023 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference, CLEO/Europe-EQEC 2023, Munich, Germany, 26 - 30 June 2023

III. **Laser Induced Periodic Surface Structured c-Si Solar Cell with more than 16% efficiency**

GOODARZİ A., Candemir O., Nasser H., Borra M. Z., Genc E., ÇİFTPİNAR E. H., BEK A., TURAN R., PAVLOV I.  
2021 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference, CLEO/Europe-EQEC 2021, Munich, Germany, 21 - 25 June 2021, vol.2021-January

IV. **Laser induced periodic surface structured c-Si solar cell with more than 16% efficiency**

Goodarzi A., Candemir O., Nasser H., Borra M. Z., Genc E., ÇİFTPİNAR E. H., BEK A., TURAN R., PAVLOV I.  
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V. **Laser induced periodic surface structured c-Si solar cell with more than 16% efficiency**

GOODARZİ A., Candemir O., Nasser H., Borra M. Z., Genc E., ÇİFTPİNAR E. H., BEK A., TURAN R., PAVLOV I.  
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VI. **The behaviour of neuro-2A cells on silicon substrates with various topographies generated by femtosecond laser micromachining**

Mingu S., PAVLOV I., SON Ç. D., BEK A.  
7th International Conference on Bioimaging, BIOIMAGING 2020 - Part of 13th International Joint Conference on Biomedical Engineering Systems and Technologies, BIOSTEC 2020, Valletta, Malta, 24 - 26 February 2020, pp.192-199

VII. **Laser-induced periodic nano-patterning of solar cell surfaces for low-cost and low material loss fabrication of light management interfaces**

PAVLOV I., Çolakoğlu T., genç e., abak m. k., Nasser H., TURAN R., BEK A.  
2019 Annual Nanotechnology Conference, 11 - 13 September 2019

VIII. **Evaluation of Cell Response to Femtosecond-Laser Induced Substrate Topography**

Mingu S., İDİKUT F., PAVLOV I., SON Ç. D., BEK A.

21. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, İstanbul, Turkey, 06 September 2019

- IX. Liquid crystal alignment on the patterns produced by nonlinear laser lithography**  
PAVLOV I., Rybak A., Dobrovolskiy A., Kazantseva Z., BEK A., Candemir O., Gvozдовskyy I.  
2019 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference, CLEO/Europe-EQEC 2019, Munich, Germany, 23 - 27 June 2019
- X. Slicing Crystalline Silicon Wafer by Deep Subsurface Laser Processing and Selective Chemical Etching**  
zolfaghari borra m., Nasser H., ÇİFTPINAR E. H., turnalı a., deminsky p., Çolakoğlu T., TOKEL O., İLDAY F. Ö., PAVLOV I., TURAN R., et al.  
Conference on Lasers and Electro-Optics Europe / European Quantum Electronics Conference (CLEO/Europe-EQEC), Munich, Germany, 23 - 27 June 2019
- XI. Optical Waveguides Written Deep Inside Silicon by Femtosecond Laser**  
Pavlov I., TOKEL O., Pavlova S., Kadan V., Makey G., Turnali A., Colakoglu T., Yavuz O., İLDAY F. Ö.  
Conference on Lasers and Electro-Optics Europe / European Quantum Electronics Conference (CLEO/Europe-EQEC), Munich, Germany, 25 - 29 June 2017
- XII. Laser-slicing of silicon with 3D nonlinear laser lithography**  
TOKEL O., Turnali A., Colakoglu T., Ilday S., Borra M. Z., Pavlov I., BEK A., TURAN R., İLDAY F. Ö.  
Conference on Lasers and Electro-Optics Europe / European Quantum Electronics Conference (CLEO/Europe-EQEC), Munich, Germany, 25 - 29 June 2017
- XIII. Laser Assisted Sculpting of Silicon**  
BEK A., çolakoğlu t, ihor p., zolfaghari borra m.  
Medinano-8 konferansı, 29 - 30 June 2016
- XIV. Periodic Surface Texturing by Nonlinear LaserLithography for Enhanced Si Solar CellPerformance**  
pavlov I., çolakoğlu t, ES F., gnilitzky i., İLDAY F. Ö., TURAN R., BEK A.  
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- XV. Nonlinear Laser Lithography for Photonic Texturing of Si Solar Cells**  
pavlov i., çolakoğlu t, es f., BEK A., TURAN R., GNİLİTSKY İ., İLDAY Ö.  
cleo europe 2015, Munich, Germany, 21 - 25 June 2015

## Metrics

Publication: 39

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