

# Preprints

- [1] D. Zezyulin, S. Kolodny, O. Kibis, I. Tokatly, and I. Iorsh. Dynamical stabilization by vacuum fluctuations in a cavity: Resonant electron scattering in the ultrastrong light-matter coupling regime. *arXiv*, 2022.
- [2] D. Sedov, V. Shirobokov, I. Iorsh, and I. Tokatly. Cavity induced chiral edge currents and spontaneous magnetization in two-dimensional electron systems. *arXiv*, 2022.
- [3] M. Masharin, V. Shahnazaryan, F. Benimetsky, D. Krizhanovskii, I. Shelykh, I. Iorsh, S. Makarov, and A. Samusev. Polaron-enhanced polariton nonlinearity in lead halide perovskites. *arXiv*, 2022.
- [4] D. Ilin, A. Poshakinskiy, A. Poddubny, and I. Iorsh. Frequency combs with parity-protected cross-correlations from dynamically modulated qubit arrays. *arXiv*, 2022.
- [5] F. Benimetskiy, A. Yulin, A. Mikhin, V. Kravtsov, I. Iorsh, M. Skolnick, I. Shelykh, D. Krizhanovskii, and A. Samusev. Nonlinear self-action of ultrashort guided exciton-polariton pulses in dielectric slab coupled to 2d semiconductor. *arXiv*, 2022.

# Complete list of publications of Ivan Iorsh

- [1] D. Zvyagintseva, H. Sigurdsson, V. Kozin, I. **Iorsh**, I. Shelykh, V. Ulyantsev, and O. Kyriienko. Machine learning of phase transitions in nonlinear polariton lattices. *Communications Physics*, 5(1), 2022.
- [2] H. Shan, I. **Iorsh**, B. Han, C. Rupprecht, H. Knopf, F. Eilenberger, M. Esmann, K. Yumigeta, K. Watanabe, T. Taniguchi, S. Klemmt, S. Höfling, S. Tongay, C. Antón-Solanas, I. Shelykh, and C. Schneider. Brightening of a dark monolayer semiconductor via strong light-matter coupling in a cavity. *Nature Communications*, 13(1), 2022.
- [3] G. Rakhmanova, A. Osipov, D. Ilyin, I. Shushakova, I. Ado, I. **Iorsh**, and M. Titov. Signatures of quartic asymmetric exchange in a class of two-dimensional magnets. *Physical Review B*, 105(2), 2022.
- [4] A. Kudlis, I. **Iorsh**, and I. Tokatly. Dissipation and spontaneous emission in quantum electrodynamical density functional theory based on optimized effective potential: A proof of concept study. *Physical Review B*, 105(5), 2022.
- [5] V. Kravtsov, T. Ivanova, A. Abramov, P. Shilina, P. Kapralov, D. Krizhanovskii, V. Berzhansky, V. Belotelov, I. Shelykh, A. Chernov, and I. **Iorsh**. Valley polarization of trions in monolayer mose2 interfaced with bismuth iron garnet. *2D Materials*, 9(1), 2022.
- [6] I. **Iorsh**, D. Zezyulin, S. Kolodny, R. Sinitskiy, and O. Kibis. Floquet engineering of excitons in semiconductor quantum dots. *Physical Review B*, 105(16), 2022.
- [7] A. Belogur, D. Baghdasaryan, I. **Iorsh**, I. Shelykh, and V. Shahnazaryan. Theory of nonlinear excitonic response of hybrid organic perovskites in the regime of strong light-matter coupling. *Physical Review Applied*, 17(4), 2022.
- [8] D. Baghdasaryan, E. Hakobyan, D. Hayrapetyan, I. **Iorsh**, I. Shelykh, and V. Shahnazaryan. Tunable strongly interacting dipolar excitons in hybrid perovskites. *Physical Review Materials*, 6(3), 2022.
- [9] C. Whittaker, T. Isoniemi, S. Lovett, P. Walker, S. Kolodny, V. Kozin, I. **Iorsh**, I. Farrer, D. Ritchie, M. Skolnick, and D. Krizhanovskii. Exciton-polaritons in gaas-based slab waveguide photonic crystals. *Applied Physics Letters*, 119(18), 2021.
- [10] I. Tokatly, D. Gulevich, and I. **Iorsh**. Vacuum anomalous hall effect in gyrotropic cavity. *Physical Review B*, 104(8), 2021.
- [11] G. Rakhmanova, D. Ilin, A. Osipov, I. Shushakova, I. **Iorsh**, I. Ado, and M. Titov. Helical phase in two-dimensional magnets due to four-spin interactions. volume 2086, 2021.
- [12] A. Poshakinskiy, I. **Iorsh**, and A. Poddubny. Localized multiphonon states in waveguide quantum optomechanics with spontaneously broken pt symmetry. *Physical Review A*, 104(6), 2021.
- [13] F. Nigmatulin, I. Shelykh, and I. **Iorsh**. Quantum spin compass models in two-dimensional electronic topological metasurfaces. *Physical Review Research*, 3(4), 2021.
- [14] Y. Marques, I. Shelykh, and I. **Iorsh**. Bound photonic pairs in 2d waveguide quantum electrodynamics. *Physical Review Letters*, 127(27), 2021.
- [15] A. Kudlis, I. **Iorsh**, and I. Shelykh. All-optical resonant magnetization switching in monolayers. *Physical Review B*, 104(2), 2021.
- [16] Y. Krivosenko, I. **Iorsh**, and I. Shelykh. Bosonic hofstadter butterflies in the presence of phonon modes. volume 2015, 2021.

- [17] V. Kravtsov, A. Liubomirov, R. Cherbunin, A. Catanzaro, A. Genco, D. Gillard, E. Alexeev, T. Ivanova, E. Khestanova, I. Shelykh, A. Tartakovskii, M. Skolnick, D. Krizhanovskii, and I. **Iorsh**. Spin-valley dynamics in alloy-based transition metal dichalcogenide heterobilayers. *2D Materials*, 8(2), 2021.
- [18] S. Kolodny, V. Kozin, and I. **Iorsh**. Second-harmonic generation enhancement in high-contrast micropillar algaas resonator in bound states in the continuum regime. volume 2015, 2021.
- [19] S. Kolodny, V. Kozin, and I. **Iorsh**. Enhancement of second-harmonic generation in a micropillar resonator due to the engineered destructive interference. *JETP Letters*, 114(3):124–128, 2021.
- [20] O. Kibis, S. Kolodny, and I. **Iorsh**. Fano resonances in optical spectra of semiconductor quantum wells dressed by circularly polarized light. *Optics Letters*, 46(1):50–53, 2021.
- [21] I. **Iorsh** and O. Kibis. Optically induced kondo effect in semiconductor quantum wells. *Journal of Physics Condensed Matter*, 33(49), 2021.
- [22] F. Benimetskiy, A. Yulin, V. Kravtsov, A. Mikhin, I. **Iorsh**, A. Samusev, and D. Krizhanovskii. Guided exciton-polaritons in a subwavelength dielectric slab integrated with a 2d semiconductor. volume 2015, 2021.
- [23] O. Yermakov, A. Hurshkainen, D. Dobrykh, P. Kapitanova, I. **Iorsh**, S. Glybovski, and A. Bogdanov. Polarization hybridization of surface waves on anisotropic metasurface. volume 1461, 2020.
- [24] I. Sinev, F. Komissarenko, I. **Iorsh**, D. Permyakov, A. Samusev, and A. Bogdanov. Steering of guided light with dielectric nanoantennas. *ACS Photonics*, 7(3):680–686, 2020.
- [25] A. Shubnic, R. Polozkov, I. Shelykh, and I. **Iorsh**. High refractive index and extreme biaxial optical anisotropy of rhenium diselenide for applications in all-dielectric nanophotonics. *Nanophotonics*, 9(16):4737–4742, 2020.
- [26] V. Shahnazaryan, V. Kozin, I. Shelykh, I. **Iorsh**, and O. Kyriienko. Tunable optical nonlinearity for transition metal dichalcogenide polaritons dressed by a fermi sea. *Physical Review B*, 102(11), 2020.
- [27] D. Sedov, V. Kozin, and I. **Iorsh**. Chiral waveguide optomechanics: First order quantum phase transitions with z3 symmetry breaking. *Physical Review Letters*, 125(26), 2020.
- [28] M. Sasin, R. Seisyan, M. Kaliteevski, S. Brand, R. Abram, J. Chamberlain, I. **Iorsh**, I. Shelykh, A. Yu Egorov, A. Vasil’ev, V. Mikhlin, and A. Kavokin. Retraction notice to “tamm plasmon-polaritons: First experimental observation” [superlattice. microst., 47 (2010) 44–49] (superlattices and microstructures (2010) 47(1) (44–49), (s0749603609001955), (10.1016/j.spmi.2009.09.003)). *Superlattices and Microstructures*, 2020.
- [29] G. Rakhmanova and I. **Iorsh**. Topological plasmon polariton on a dirac magnet helical state: The second harmonic generation enhancement. volume 2300, 2020.
- [30] G. Rakhmanova and I. **Iorsh**. Broadband enhancement of second-harmonic generation at the domain walls of magnetic topological insulators. *Nanophotonics*, 9(15):4489–4495, 2020.
- [31] A. Kudlis, G. Rakhmanova, and I. **Iorsh**. Many-body phenomena in semiconductors and cluster expansion approach. volume 2300, 2020.
- [32] Y. Krivosenko, I. **Iorsh**, and I. Shelykh. Midgap edge states in polaritonic graphene with

zero average magnetic field. volume 2241, 2020.

- [33] V. Kravtsov, E. Khestanova, F. Benimetskiy, T. Ivanova, A. Samusev, I. Sinev, D. Pidgayko, A. Mozharov, I. Mukhin, M. Lozhkin, Y. Kapitonov, A. Brichkin, V. Kulakovskii, I. Shelykh, A. Tartakovskii, P. Walker, M. Skolnick, D. Krizhanovskii, and I. **Iorsh**. Nonlinear polaritons in a monolayer semiconductor coupled to optical bound states in the continuum. *Light: Science and Applications*, 9(1), 2020.
- [34] V. Kondratyev, F. Benimetskiy, T. Ivanova, A. Samusev, K.-D. Park, D. Krizhanovskii, M. Skolnick, E. Khestanova, V. Kravtsov, and I. **Iorsh**. Electrically tunable trion-polaritons in mose2/hbn heterostructure integrated with a photonic crystal slab. volume 2300, 2020.
- [35] S. Kolodny and I. **Iorsh**. Q/v enhancement of si micropillar resonator with bragg reflectors in bic regime. volume 1461, 2020.
- [36] S. Kolodny and I. **Iorsh**. Q/v enhancement of micropillar resonator in bound states in the continuum regime. *Optics Letters*, 45(1):181–183, 2020.
- [37] O. Kibis, S. Kolodny, and I. **Iorsh**. Fano resonances in quantum well absorption induced by electromagnetic dressing. volume 2300, 2020.
- [38] I. **Iorsh**, A. Poshakinskiy, and A. Poddubny. Waveguide quantum optomechanics: Parity-time phase transitions in ultrastrong coupling regime. *Physical Review Letters*, 125(18), 2020.
- [39] K. Danil, P. Mihail, and I. Ivan. Chiral coupling of dipole transitions in a v-type atom using a plasmonic dimer. volume 2300, 2020.
- [40] F. Benimetskiy, V. Sharov, P. Alekseev, V. Kravtsov, K.-D. Park, A. Samusev, and I. **Iorsh**. Measurement of local optomechanical properties of mose2monolayers. volume 2300, 2020.
- [41] H. Sigurdsson, Y. Krivosenko, I. **Iorsh**, I. Shelykh, and A. Nalitov. Spontaneous topological transitions in a honeycomb lattice of exciton-polariton condensates due to spin bifurcations. *Physical Review B*, 100(23), 2019.
- [42] N. Olekhno, M. Petrov, I. **Iorsh**, A. Sukhorukov, and A. Solntsev. Generating quantum states of surface plasmon-polariton pairs with a nonlinear nanoparticle. 2019.
- [43] A. Nalitov, H. Sigurdsson, S. Morina, Y. Krivosenko, I. **Iorsh**, Y. Rubo, A. Kavokin, and I. Shelykh. Optically trapped polariton condensates as semiclassical time crystals. *Physical Review A*, 99(3), 2019.
- [44] D. Kornovan, M. Petrov, and I. **Iorsh**. Noninverse dynamics of a quantum emitter coupled to a fully anisotropic environment. *Physical Review A*, 100(3), 2019.
- [45] S. Kolodny, D. Yudin, and I. **Iorsh**. Resonant spin wave excitation in magnetoplasmonic bilayers using short laser pulses. *Nanoscale*, 11(4):2003–2007, 2019.
- [46] V. Kožin, A. Yulin, A. Nalitov, I. **Iorsh**, and I. Shelykh. Acoustic waves in polariton wires. volume 1331, 2019.
- [47] I. **Iorsh**, G. Rakhmanova, and M. Titov. Topological plasmon-polariton on a dirac magnet helical state. volume 1410, 2019.
- [48] I. **Iorsh**, G. Rahmanova, and M. Titov. Plasmon-polariton from a helical state in a dirac magnet. *ACS Photonics*, 6(10):2450–2454, 2019.
- [49] A. Foster, D. Hallett, I. **Iorsh**, S. Sheldon, M. Godsland, B. Royall, E. Clarke, I. Shelykh, A. Fox, M. Skolnick, I. Itskevich, and L. Wilson. Tunable photon statistics exploiting the fano effect in a waveguide. *Physical Review Letters*, 122(17), 2019.

- [50] G. Christmann, A. Trifonov, A. Tzimis, Z. Hatzopoulos, I. **Iorsh**, J. Baumberg, and P. Savvidis. High-angle optically accessible brewster cavity exciton-polaritons. *Physical Review B*, 99(24), 2019.
- [51] P. Buslaev, I. **Iorsh**, I. Shadrivov, P. Belov, and Y. Kivshar. Reply to comment on “plasmons in waveguide structures formed by two graphene layers”. *JETP Letters*, 109(11):770, 2019.
- [52] A. Berestennikov, Y. Li, I. **Iorsh**, A. Zakhidov, A. Rogach, and S. Makarov. Beyond quantum confinement: Excitonic nonlocality in halide perovskite nanoparticles with mie resonances. *Nanoscale*, 11(14):6747–6754, 2019.
- [53] F. Benimetskiy, V. Sharov, P. Alekseev, V. Kravtsov, K. Agapev, I. Sinev, I. Mukhin, A. Catanzaro, R. Polozkov, E. Alexeev, A. Tartakovskii, A. Samusev, M. Skolnick, D. Krizhanovskii, I. Shelykh, and I. **Iorsh**. Measurement of local optomechanical properties of a direct bandgap 2d semiconductor. *APL Materials*, 7(10), 2019.
- [54] A. Yulin, I. **Iorsh**, and I. Shelykh. Resonant interaction of slow light solitons and dispersive waves in nonlinear chiral photonic waveguide. *New Journal of Physics*, 20(5), 2018.
- [55] O. Yermakov, D. Permyakov, F. Porubaev, P. Dmitriev, A. Samusev, I. **Iorsh**, R. Malureanu, A. Lavrinenko, and A. Bogdanov. Effective surface conductivity of optical hyperbolic metasurfaces: from far-field characterization to surface wave analysis. *Scientific Reports*, 8(1), 2018.
- [56] C. Whittaker, E. Cancellieri, P. Walker, D. Gulevich, H. Schomerus, D. Vaitiekus, B. Royall, D. Whittaker, E. Clarke, I. **Iorsh**, I. Shelykh, M. Skolnick, and D. Krizhanovskii. Exciton polaritons in a two-dimensional lieb lattice with spin-orbit coupling. *Physical Review Letters*, 120(9), 2018.
- [57] S. Sychev, K. Koshelev, Z. Sadrieva, A. Bogdanov, and I. **Iorsh**. Strong coupling between excitons in transition metal dichalcogenides and optical bound states in the continuum. volume 1124, 2018.
- [58] I. Sinev, A. Bogdanov, F. Komissarenko, I. Mukhin, A. Samusev, I. **Iorsh**, and A. Lavrinenko. 2 steering of surface plasmon polaritons with silicon nanoantennas. volume 1092, 2018.
- [59] I. Shelykh, A. Nalitov, and I. **Iorsh**. Optical analog of rashba spin-orbit interaction in asymmetric polariton waveguides. *Physical Review B*, 98(15), 2018.
- [60] N. Olekhno, M. Petrov, and I. **Iorsh**. Spontaneous parametric downconversion of light by a dielectric nanoparticle. volume 993, 2018.
- [61] S. Morina, K. Dini, I. **Iorsh**, and I. Shelykh. Optical trapping of electrons in graphene. *ACS Photonics*, 5(4):1171–1175, 2018.
- [62] S. Makarov, I. Sinev, V. Milichko, F. Komissarenko, D. Zuev, E. Ushakova, I. Mukhin, Y. Yu, A. Kuznetsov, P. Belov, I. **Iorsh**, A. Poddubny, A. Samusev, and Y. Kivshar. Nanoscale generation of white light for ultrabroadband nanospectroscopy. *Nano Letters*, 18(1):535–539, 2018.
- [63] Y. Krivosenko, I. **Iorsh**, and I. Shelykh. Resonant edge-site pumping of polaritonic su-schrieffer-heeger lattices. *Physical Review A*, 98(2), 2018.
- [64] S. Krasikov, A. Bogdanov, and I. **Iorsh**. Nonlinear bound states in the continuum of a one-dimensional photonic crystal slab. *Physical Review B*, 97(22), 2018.
- [65] V. Kozin, I. Shelykh, A. Nalitov, and I. **Iorsh**. Topological metamaterials based on

- polariton rings. *Physical Review B*, 98(12), 2018.
- [66] K. Koshelev, S. Sychev, Z. Sadrieva, A. Bogdanov, and I. **Iorsh**. Strong coupling between excitons in transition metal dichalcogenides and optical bound states in the continuum. *Physical Review B*, 98(16), 2018.
  - [67] D. Kornovan, I. Toftul, A. Chebykin, M. Petrov, and I. **Iorsh**. Temporal dynamics of a quantum emitter with multiple excited states in the vicinity of an anisotropic metasurface. volume 1092, 2018.
  - [68] D. Kornovan, M. Petrov, and I. **Iorsh**. Strong coupling and non-reciprocity in the dynamics of a v-atom placed near an anisotropic metasurface. pages 228–230, 2018.
  - [69] S. Kolodny, D. Yudin, and V. **Iorsh**. Resonant excitation of spin waves in hybrid nanostructures via frequency combs. volume 1092, 2018.
  - [70] O. Kibis, V. Kozin, I. **Iorsh**, and I. Shelykh. Quantum rings dressed by a high-frequency electromagnetic field. *Semiconductors*, 52(14):1806–1808, 2018.
  - [71] O. Kibis, V. Kozin, I. **Iorsh**, and I. Shelykh. Electronic properties of quantum rings dressed by a high-frequency electromagnetic field. volume 1092, 2018.
  - [72] O. Kibis, K. Dini, I. **Iorsh**, and I. Shelykh. Floquet engineering of gapped 2d materials. *Semiconductors*, 52(4):523–525, 2018.
  - [73] O. Kibis, K. Dini, I. **Iorsh**, V. Dragunov, and I. Shelykh. Electromagnetic dressing of graphene. *Journal of Structural Chemistry*, 59(4):867–869, 2018.
  - [74] A. Berestennikov, I. **Iorsh**, and S. Makarov. Optical properties of spatially dispersive mie-resonant halide perovskite nanoparticles. volume 1092, 2018.
  - [75] O. Yermakov, F. Porubaev, A. Bogdanov, A. Samusev, and I. **Iorsh**. Retrieval procedure of effective conductivity for plasmonic resonant anisotropic metasurface. volume 1874, 2017.
  - [76] O. Yermakov, I. Mukhin, A. Samusev, A. Bogdanov, and I. **Iorsh**. Effective conductivity tensor of plasmonic anisotropic metasurface: Theory and experiment. pages 1524–1528, 2017.
  - [77] I. Sinev, A. Bogdanov, F. Komissarenko, M. Petrov, K. Frizyuk, S. Makarov, I. Mukhin, A. Samusev, A. Lavrinenko, and I. **Iorsh**. Demultiplexing surface waves with silicon nanoantennas. volume 1874, 2017.
  - [78] V. Shahnazaryan, I. **Iorsh**, I. Shelykh, and O. Kyriienko. Exciton-exciton interaction in transition-metal dichalcogenide monolayers. *Physical Review B*, 96(11), 2017.
  - [79] A. Samusev, I. Mukhin, R. Malureanu, O. Takayama, D. Permyakov, I. Sinev, D. Baranov, O. Yermakov, I. **Iorsh**, A. Bogdanov, and A. Lavrinenko. Polarization-resolved characterization of plasmon waves supported by an anisotropic metasurface. *Optics Express*, 25(26):32631–32639, 2017.
  - [80] Z. Sadrieva, I. Sinev, A. Samusev, I. **Iorsh**, K. Koshelev, O. Takayama, R. Malureanu, A. Lavrinenko, and A. Bogdanov. Effect of substrate on optical bound states in the continuum in 1d photonic structures. volume 1874, 2017.
  - [81] Z. Sadrieva, I. Sinev, A. Samusev, I. **Iorsh**, A. Bogdanov, K. Koshelev, O. Takayama, R. Malureanu, and A. Lavrinenko. Optical bound state in the continuum in the one-dimensional photonic structures: Transition into a resonant state. pages 2817–2824, 2017.
  - [82] Z. Sadrieva, I. Sinev, K. Koshelev, A. Samusev, I. **Iorsh**, O. Takayama, R. Malureanu, A. Bogdanov, and A. Lavrinenko. Transition from optical bound states in the continuum

to leaky resonances: Role of substrate and roughness. *ACS Photonics*, 4(4):723–727, 2017.

- [83] Y. Krivosenko and I. **Iorsh**. Rydberg exciton-exciton interaction in real space. volume 1874, 2017.
- [84] D. Kornovan, A. Sheremet, I. **Iorsh**, and M. Petrov. Light interaction and quantum transport in atomic chain chirally coupled to a waveguide. pages 262–264, 2017.
- [85] D. Kornovan, M. Petrov, and I. **Iorsh**. Transport and collective radiance in a basic quantum chiral optical model. *Physical Review B*, 96(11), 2017.
- [86] O. Kibis, K. Dini, I. **Iorsh**, and I. Shelykh. All-optical band engineering of gapped dirac materials. *Physical Review B*, 95(12), 2017.
- [87] I. **Iorsh**, K. Dini, O. Kibis, and I. Shelykh. Optically induced lifshitz transition in bilayer graphene. *Physical Review B*, 96(15), 2017.
- [88] M. Hasan, D. Yudin, I. **Iorsh**, O. Eriksson, and I. Shelykh. Topological edge-state engineering with high-frequency electromagnetic radiation. *Physical Review B*, 96(20), 2017.
- [89] D. Gulevich, D. Yudin, D. Skryabin, I. **Iorsh**, and I. Shelykh. Topological edge solitons in polaritonic lattice. pages 118–121, 2017.
- [90] D. Gulevich, D. Yudin, D. Skryabin, I. **Iorsh**, and I. Shelykh. Exploring nonlinear topological states of matter with exciton-polaritons: Edge solitons in kagome lattice. *Scientific Reports*, 7(1), 2017.
- [91] A. Bogdanov, Z. Sadrieva, I. Sinev, A. Samusev, I. **Iorsh**, K. Koshelev, O. Takayama, R. Malureanu, and A. Lavrinenko. Destruction of symmetry protected optical bound state in the continuum by high-index substrate and roughnesses. pages 34–36, 2017.
- [92] A. Bhattacharya, M. Baten, I. **Iorsh**, T. Frost, A. Kavokin, and P. Bhattacharya. Room-temperature spin polariton diode laser. *Physical Review Letters*, 119(6), 2017.
- [93] A. Bhattacharya, M. Baten, I. **Iorsh**, T. Frost, A. Kavokin, and P. Bhattacharya. Linearly and circularly polarized ultraviolet gan microcavity polariton lasers. pages 315–316, 2017.
- [94] K. Arnardottir, I. **Iorsh**, T. Liew, and I. Shelykh. Hyperbolic region in an array of quantum wires in a planar cavity. *ACS Photonics*, 4(5):1165–1171, 2017.
- [95] O. Yermakov, A. Ovcharenko, A. Bogdanov, I. **Iorsh**, A. Lavrinenko, and A. Babaieva. New degrees of freedom of spin-optonics implemented by using hybrid surface waves localized at hyperbolic metasurface. pages 449–454, 2016.
- [96] O. Yermakov, A. Ovcharenko, A. Bogdanov, I. **Iorsh**, K. Bliokh, and Y. Kivshar. Spin control of light with hyperbolic metasurfaces. *Physical Review B*, 94(7), 2016.
- [97] O. Yermakov, A. Ovcharenko, A. Bogdanov, I. **Iorsh**, and A. Babaieva. Hybrid surface plasmon polaritons localized at anisotropic metasurface. pages 73–76, 2016.
- [98] H. Song, J. Zhang, G. Fei, J. Wang, K. Jiang, P. Wang, Y. Lu, I. **Iorsh**, W. Xu, J. Jia, L. Zhang, Y. Kivshar, and L. Zhang. Near-field coupling and resonant cavity modes in plasmonic nanorod metamaterials. *Nanotechnology*, 27(41), 2016.
- [99] I. Sinev, I. **Iorsh**, A. Bogdanov, D. Permyakov, F. Komissarenko, I. Mukhin, A. Samusev, V. Valuckas, A. Kuznetsov, B. Luk’yanchuk, A. Miroshnichenko, and Y. Kivshar. Polarization control over electric and magnetic dipole resonances of dielectric nanoparticles on metallic films. *Laser and Photonics Reviews*, 10(5):799–806, 2016.
- [100] Z. Sadrieva, I. Sinev, A. Samusev, I. **Iorsh**, A. Bogdanov, R. Malureanu, and A. Lavrinenko. Optical bound state in the continuum in the one-dimensional photonic crystal

slab: Theory and experiment. pages 356–360, 2016.

- [101] A. Poddubny, I. **Iorsh**, and A. Sukhorukov. Generation of photon-plasmon quantum states in nonlinear hyperbolic metamaterials. *Physical Review Letters*, 117(12), 2016.
- [102] S. Krasikov and I. **Iorsh**. Self-consistent purcell factor and spontaneous topological transition in hyperbolic metamaterials. *Physica Status Solidi - Rapid Research Letters*, 10(10):769–773, 2016.
- [103] V. Kovalev, I. Savenko, and I. **Iorsh**. Ultrafast exciton-polariton scattering towards the dirac points. *Journal of Physics Condensed Matter*, 28(10), 2016.
- [104] P. Kapitanova, M. Song, I. **Iorsh**, and P. Belov. Wireless power transfer system based on ceramic resonators. pages 151–153, 2016.
- [105] I. **Iorsh**, A. Alodjants, and I. Shelykh. Microcavity with saturable nonlinearity under simultaneous resonant and nonresonant pumping: Multistability, hopf bifurcations and chaotic behaviour. *Optics Express*, 24(11):11505–11514, 2016.
- [106] M. Hasan, I. **Iorsh**, and I. Shelykh. Topological properties of the illuminated arrays of mesoscopic rings. pages 188–192, 2016.
- [107] M. Hasan, I. **Iorsh**, O. Kibis, and I. Shelykh. Optically controlled periodical chain of quantum rings. *Physical Review B*, 93(12), 2016.
- [108] D. Gulevich, D. Yudin, I. **Iorsh**, and I. Shelykh. Kagome lattice from an exciton-polariton perspective. *Physical Review B*, 94(11), 2016.
- [109] D. Filonov, A. Shalin, I. **Iorsh**, P. Belov, and P. Ginzburg. Controlling electromagnetic scattering with wire metamaterial resonators. *Journal of the Optical Society of America A: Optics and Image Science, and Vision*, 33(10):1910–1916, 2016.
- [110] A. Chebykin, V. Babicheva, I. **Iorsh**, A. Orlov, P. Belov, and S. Zhukovsky. Enhancement of the purcell factor in multiperiodic hyperboliclike metamaterials. *Physical Review A*, 93(3), 2016.
- [111] A. Bogdanov, O. Yermakov, A. Ovcharenko, M. Song, D. Baranov, I. Sinev, I. Mukhin, A. Samusev, I. **Iorsh**, A. Lavrinenko, and Y. Kivshar. Hybrid localized waves supported by resonant anisotropic metasurfaces. 2016.
- [112] A. Bhattacharya, M. Baten, I. **Iorsh**, T. Frost, A. Kavokin, and P. Bhattacharya. Output polarization characteristics of a gan microcavity diode polariton laser. *Physical Review B*, 94(3), 2016.
- [113] M. Baten, A. Bhattacharya, T. Frost, I. **Iorsh**, A. Kavokin, and P. Bhattacharya. The role of defects in lowering the effective polariton temperature in electric and optically pumped polariton lasers. *Applied Physics Letters*, 108(4), 2016.
- [114] M. Zunaid Baten, T. Frost, I. **Iorsh**, S. Deshpande, A. Kavokin, and P. Bhattacharya. Small-signal modulation characteristics of a polariton laser. *Scientific Reports*, 5, 2015.
- [115] O. Yermakov, A. Ovcharenko, M. Song, A. Bogdanov, I. **Iorsh**, and Y. Kivshar. Hybrid waves localized at hyperbolic metasurfaces. *Physical Review B - Condensed Matter and Materials Physics*, 91(23), 2015.
- [116] O. Yermakov, A. Ovcharenko, I. **Iorsh**, A. Bogdanov, and Y. Kivshar. New types of surface waves on hyperbolic metasurface. pages 371–375, 2015.
- [117] I. Yagupov, D. Filonov, A. Ageyskiy, S. Kosulnikov, M. Hasan, I. **Iorsh**, and P. Belov. Diamagnetism in wire medium metamaterials: Theory and experiment. *Physical Review B - Condensed Matter and Materials Physics*, 92(4), 2015.
- [118] Y. Trushkov and I. **Iorsh**. Graphene based anisotropic metasurface. pages 347–353, 2015.

- [119] I. Trushkov and I. **Iorsh**. Two-dimensional hyperbolic medium for electrons and photons based on the array of tunnel-coupled graphene nanoribbons. *Physical Review B - Condensed Matter and Materials Physics*, 92(4), 2015.
- [120] M. Song, P. Kapitanova, I. **Iorsh**, and P. Belov. Metamaterials for wireless power transfer. pages 323–326, 2015.
- [121] A. Slobozhanyuk, P. Ginzburg, D. Powell, I. **Iorsh**, A. Shalin, P. Segovia, A. Krasavin, G. Wurtz, V. Podolskiy, P. Belov, and A. Zayats. Purcell effect in hyperbolic metamaterial resonators. *Physical Review B - Condensed Matter and Materials Physics*, 92(19), 2015.
- [122] A. Shalin, P. Ginzburg, A. Orlov, I. **Iorsh**, P. Belov, Y. Kivshar, and A. Zayats. Scattering suppression from arbitrary objects in spatially dispersive layered metamaterials. *Physical Review B - Condensed Matter and Materials Physics*, 91(12), 2015.
- [123] A. Shalin, P. Ginzburg, A. Orlov, I. **Iorsh**, P. Belov, Y. Kivshar, and A. Zayats. Optical cloaking with enz-metamaterials. pages 487–489, 2015.
- [124] E. Sedov, I. **Iorsh**, S. Arakelian, A. Alodjants, and A. Kavokin. Hyperbolic metamaterials with bragg polaritons. *Physical Review Letters*, 114(23), 2015.
- [125] E. Sedov, A. Alodjants, I. **Iorsh**, and A. Kavokin. Quantum hyperbolic metamaterials with exciton-polaritons in semiconductor bragg mirrors. pages 285–288, 2015.
- [126] P. Kapitanova, M. Song, I. **Iorsh**, and P. Belov. Metamaterials and resonators for wireless power transfer. 2015.
- [127] I. **Iorsh**, I. Trushkov, O. Yermakov, A. Ovcharenko, A. Bogdanov, P. Belov, and Y. Kivshar. Dyakonov-like plasmonic localized waves on graphene metasurfaces. volume 2015-January, pages 2347–2351, 2015.
- [128] I. **Iorsh**, A. Poddubny, P. Ginzburg, P. Belov, and Y. Kivshar. Compton-like polariton scattering in hyperbolic metamaterials. *Physical Review Letters*, 114(18), 2015.
- [129] M. Hasan and I. **Iorsh**. Interaction of light with a hyperbolic cavity in the strong-coupling regime with fano resonance. pages 140–145, 2015.
- [130] P. Belov, M. Song, I. **Iorsh**, and P. Kapitanova. Application of high-q dielectric resonators for wireless power transfer system. volume 2015-December, 2015.
- [131] A. Alodjants, E. Sedov, M. Charukhchyan, I. **Iorsh**, and A. Kavokin. Bose-einstein condensates as quantum nonlinear hyperbolic ‘metamaterials’. pages 10–12, 2015.
- [132] Y. Tyshetskiy, S. Vladimirov, A. Ageyskiy, I. **Iorsh**, A. Orlov, and P. Belov. Guided modes in a spatially dispersive wire medium slab. *Journal of the Optical Society of America B: Optical Physics*, 31(8):1753–1760, 2014.
- [133] D. Smirnova, I. **Iorsh**, I. Shadrivov, and Y. Kivshar. Multilayer graphene waveguides. *JETP Letters*, 99(8):456–460, 2014.
- [134] D. Smirnova, P. Buslaev, I. **Iorsh**, I. Shadrivov, P. Belov, and Y. Kivshar. Deeply subwavelength electromagnetic tamm states in graphene metamaterials. *Physical Review B - Condensed Matter and Materials Physics*, 89(24), 2014.
- [135] A. Poddubny, I. **Iorsh**, P. Belov, and Y. Kivshar. Erratum: Hyperbolic metamaterials (nature photonics (2013) 7 (948-957)). *Nature Photonics*, 8(1):78, 2014.
- [136] A. Orlov, S. Zhukovsky, I. **Iorsh**, and P. Belov. Controlling light with plasmonic multilayers. *Photonics and Nanostructures - Fundamentals and Applications*, 12(3):213–230, 2014.
- [137] A. Orlov, E. Yankovskaya, S. Zhukovsky, V. Babicheva, I. **Iorsh**, and P. Belov. Retrieval of effective parameters of subwavelength periodic photonic structures. *Crystals*, 4(3):417–

- [138] S. Krasikov, I. **Iorsh**, A. Shalin, and P. Belov. Levitation of finite-size electric dipole over epsilon-near-zero metamaterial. *Physica Status Solidi - Rapid Research Letters*, 8(12):1015–1018, 2014.
- [139] I. **Iorsh**, M. Glauser, G. Rossbach, J. Levrat, M. Cobet, R. Butté, N. Grandjean, M. Kaliteevski, R. Abram, and A. Kavokin. Erratum: Generic picture of the emission properties of iii-nitride polariton laser diodes: Steady state and current modulation response (physical review b - condensed matter and materials physics (2012) 86 (125308)). *Physical Review B - Condensed Matter and Materials Physics*, 90(11), 2014.
- [140] V. Babicheva, I. **Iorsh**, A. Orlov, P. Belov, A. Lavrinenko, A. Andryieuski, and S. Zhukovsky. Multi-periodic photonic hyper-crystals: Volume plasmon polaritons and the purcell effect. 2014.
- [141] A. Ageyskiy, Y. Tyshetskiy, I. **Iorsh**, A. Orlov, R. Dubrovka, S. Vladimirov, P. Belov, and Y. Kivshar. Theoretical and experimental study of guided modes of the wire medium slab. pages 52–54, 2014.
- [142] D. Smirnova, A. Gorbach, I. **Iorsh**, I. Shadrivov, and Y. Kivshar. Nonlinear switching with a graphene coupler. *Physical Review B - Condensed Matter and Materials Physics*, 88(4), 2013.
- [143] I. Savenko, I. **Iorsh**, M. Kaliteevski, and I. Shelykh. Spatial coherence of polaritons in a 1d channel. *Journal of Experimental and Theoretical Physics*, 116(1):32–38, 2013.
- [144] Y. Rapoport, V. Grimalsky, I. **Iorsh**, N. Kalinich, S. Koshevaya, C. Castrejon-Martinez, and Y. Kivshar. Nonlinear reshaping of terahertz pulses with graphene metamaterials. *JETP Letters*, 98(8):503–506, 2013.
- [145] A. Poddubny, I. **Iorsh**, P. Belov, and Y. Kivshar. Hyperbolic metamaterials. *Nature Photonics*, 7(12):958–967, 2013.
- [146] A. Orlov, I. **Iorsh**, P. Belov, and Y. Kivshar. Complex band structure of nanostructured metal-dielectric metamaterials. *Optics Express*, 21(2):1593–1598, 2013.
- [147] I. **Iorsh**, I. Shadrivov, P. Belov, and Y. Kivshar. Tunable hybrid surface waves supported by a graphene layer. *JETP Letters*, 97(5):249–252, 2013.
- [148] I. **Iorsh**, I. Shadrivov, P. Belov, and Y. Kivshar. Cavity-enhanced absorption and fano resonances in graphene nanoribbons. *Physical Review B - Condensed Matter and Materials Physics*, 88(19), 2013.
- [149] I. **Iorsh**, M. Kaliteevski, K. Ivanov, and K. Kavokin. Mixing of states in quantum wells for terahertz polariton emitters. *Technical Physics Letters*, 39(8):694–697, 2013.
- [150] P. Ginzburg, F. Rodríguez Fortuño, G. Wurtz, W. Dickson, A. Murphy, F. Morgan, R. Pollard, I. **Iorsh**, A. Atrashchenko, P. Belov, Y. Kivshar, A. Nevet, G. Ankonina, M. Orenstein, and A. Zayats. Manipulating polarization of light with ultrathin epsilon-near-zero metamaterials. *Optics Express*, 21(12):14907–14917, 2013.
- [151] P. Buslaev, I. **Iorsh**, I. Shadrivov, P. Belov, and Y. Kivshar. Plasmons in waveguide structures formed by two graphene layers. *JETP Letters*, 97(9):535–539, 2013.
- [152] P. Belov, R. Dubrovka, I. **Iorsh**, I. Yagupov, and Y. Kivshar. Single-mode subwavelength waveguides with wire metamaterials. *Applied Physics Letters*, 103(16), 2013.
- [153] I. Savenko, N. Gordeev, I. **Iorsh**, M. Kaliteevski, M. Maximov, and A. Zhukov. Spectral selection of spatial modes in edge-emitting lasers. *Physica Status Solidi (C) Current Topics in Solid State Physics*, 9(5):1292–1295, 2012.

- [154] A. Orlov, A. Chebykin, I. **Iorsh**, A. Poddubny, P. Voroshilov, Y. Kivshar, and P. Belov. Purcell effect, surface modes and nonlocality in hyperbolic metamaterials. 2012.
- [155] C. Little, R. Anufriev, I. **Iorsh**, M. Kaliteevski, R. Abram, and S. Brand. Tamm plasmon polaritons in multilayered cylindrical structures. *Physical Review B - Condensed Matter and Materials Physics*, 86(23), 2012.
- [156] I. **Iorsh**, I. Shadrivov, P. Belov, and Y. Kivshar. Nonlinear tamm states in layered metal-dielectric metamaterials. *Physica Status Solidi - Rapid Research Letters*, 6(1):43–45, 2012.
- [157] I. **Iorsh**, A. Poddubny, A. Orlov, P. Belov, and Y. Kivshar. Spontaneous emission enhancement in metal-dielectric metamaterials. *Physics Letters, Section A: General, Atomic and Solid State Physics*, 376(3):185–187, 2012.
- [158] I. **Iorsh**, P. Panicheva, I. Slovinskii, and M. Kaliteevski. Coupled tamm plasmons. *Technical Physics Letters*, 38(4):351–353, 2012.
- [159] I. **Iorsh**, M. Glauser, G. Rossbach, J. Levrat, M. Cobet, R. Butté, N. Grandjean, M. Kaliteevski, R. Abram, and A. Kavokin. Generic picture of the emission properties of iii-nitride polariton laser diodes: Steady state and current modulation response. *Physical Review B - Condensed Matter and Materials Physics*, 86(12), 2012.
- [160] R. Brückner, M. Sudzius, S. Hintschich, H. Fröb, V. Lyssenko, M. Kaliteevski, I. **Iorsh**, R. Abram, A. Kavokin, and K. Leo. Parabolic polarization splitting of tamm states in a metal-organic microcavity. *Applied Physics Letters*, 100(6), 2012.
- [161] G. Swift, A. Gallant, N. Kaliteevskaya, M. Kaliteevski, S. Brand, D. Dai, A. Baragwanath, I. **Iorsh**, R. Abram, and J. Chamberlain. Negative refraction and the spectral filtering of terahertz radiation by a photonic crystal prism. *Optics Letters*, 36(9):1641–1643, 2011.
- [162] M. Kaliteevski, S. Brand, R. Abram, I. **Iorsh**, A. Kavokin, T. Liew, and I. Shelykh. Hybrid states of tamm plasmons and exciton-polaritons. *Superlattices and Microstructures*, 49(3):229–232, 2011.
- [163] I. **Iorsh**, A. Orlov, P. Belov, and Y. Kivshar. Interface modes in nanostructured metal-dielectric metamaterials. *Applied Physics Letters*, 99(15), 2011.
- [164] I. **Iorsh**, M. Kaliteevski, S. Brand, R. Abram, and N. Kaliteevskaya. An ‘electromagnetic wiggler’ originating from refraction of waves at the side edge of a bragg reflector. *Journal of Modern Optics*, 58(8):686–693, 2011.
- [165] A. Askitopoulos, L. Mouchliadis, I. **Iorsh**, G. Christmann, J. Baumberg, M. Kaliteevski, Z. Hatzopoulos, and P. Savvidis. Bragg polaritons: Strong coupling and amplification in an unfolded microcavity. *Physical Review Letters*, 106(7), 2011.
- [166] M. Sasin, R. Seisyan, M. Kaliteevski, S. Brand, R. Abram, J. Chamberlain, I. **Iorsh**, I. Shelykh, A. Egorov, A. Vasil’ev, V. Mikhlin, and A. Kavokin. Tamm plasmon-polaritons: First experimental observation. *Superlattices and Microstructures*, 47(1):44–49, 2010.
- [167] I. **Iorsh**, A. Koreshkova, N. Kaliteevskaya, A. Kavokin, R. Abram, S. Brand, and M. Kaliteevski. Polarization beats in a pillar microcavity. *Superlattices and Microstructures*, 47(1):24–28, 2010.
- [168] C. Platts, M. Kaliteevski, S. Brand, R. Abram, I. **Iorsh**, and A. Kavokin. Whispering-gallery exciton polaritons in submicron spheres. *Physical Review B - Condensed Matter and Materials Physics*, 79(24), 2009.
- [169] M. Kaliteevski, S. Brand, R. Abram, I. **Iorsh**, A. Kavokin, and I. Shelykh. Hybrid states

of tamm plasmons and exciton polaritons. *Applied Physics Letters*, 95(25), 2009.

- [170] M. Kaliteevski, I. **Iorsh**, S. Brand, R. Abram, J. Chamberlain, A. Kavokin, and I. Shelykh. Tamm plasmon-polaritons: Possible electromagnetic states at the interface of a metal and a dielectric bragg mirror. *Physical Review B - Condensed Matter and Materials Physics*, 76(16), 2007.