

Journal publications (clickable)

- [44] I. A. Williamson, **M. Minkov**, A. Dutt, J. Wang, A. Y. Song, and S. Fan, “Integrated nonreciprocal photonic devices with dynamic modulation,” *Proceedings of the IEEE* *108*, 1759–1784 (2020).
- [43] A. Y. Song, X.-Q. Sun, A. Dutt, **M. Minkov**, C. Wojcik, H. Wang, I. A. Williamson, M. Orenstein, and S. Fan, “P t-symmetric topological edge-gain effect,” *Physical Review Letters* *125*, 033603 (2020).
- [42] **M. Minkov**, I. A. Williamson, L. C. Andreani, D. Gerace, B. Lou, A. Y. Song, T. W. Hughes, and S. Fan, “Inverse design of photonic crystals through automatic differentiation,” *ACS Photonics* (2020).
- [41] S. Pai, I. Williamson, T. W. Hughes, **M. Minkov**, O. Solgaard, S. Fan, and D. A. Miller, “Parallel programming of an arbitrary feedforward photonic network,” *IEEE JSTQE* (2020).
- [40] A. Dutt, **M. Minkov**, I. A. Williamson, and S. Fan, “Higher-order topological insulators in synthetic dimensions,” *Light: Science & Applications* *9*, 1–9 (2020).
- [39] M. M. P. Fard, I. A. Williamson, M. Edwards, K. Liu, S. Pai, B. Bartlett, **M. Minkov**, T. W. Hughes, S. Fan, and T.-A. Nguyen, “Experimental realization of arbitrary activation functions for optical neural networks,” *Optics Express* *28*, 12138 (2020).
- [38] S. Buddhiraju, Y. Shi, A. Song, C. Wojcik, **M. Minkov**, I. A. D. Williamson, A. Dutt, and S. Fan, “Absence of unidirectionally propagating surface plasmon-polaritons in nonreciprocal plasmonics,” *Nature Comm.* *11*, 674.
- [37] T. W. Hughes, I. A. D. Williamson, **M. Minkov**, and S. Fan, “Forward-mode differentiation of maxwell’s equations,” *ACS Photonics* *6*, 3010–3016 (2019).
- [36] T. W. Hughes, I. A. D. Williamson, **M. Minkov**, and S. Fan, “Wave physics as an analog recurrent neural network,” *Science Advances* *5*, eaay6946 (2019).
- [35] A. Dutt, Q. Lin, L. Yuan, **M. Minkov**, M. Xiao, and S. Fan, “A single photonic cavity with two independent physical synthetic dimensions,” *Science* *10.1126/science.aaz3071* (2019).
- [34] **M. Minkov**, D. Gerace, and S. Fan, “Doubly resonant $\chi^{(2)}$ nonlinear photonic crystal cavity based on a bound state in the continuum,” *Optica* *8*, 1039 (2019). Featured online: [Stanford](#), [phys.org](#), [LFW](#).
- [33] A. Dutt, **M. Minkov**, Q. Lin, L. Yuan, D. A. B. Miller, and S. Fan, “Experimental band structure spectroscopy along a synthetic dimension,” *Nature Comm.* *10*, 3122 (2019).
- [32] I. A. D. Williamson, T. W. Hughes, **M. Minkov**, B. Bartlett, S. Pai, and S. Fan, “Re-programmable electro-optic nonlinear activation functions for optical neural networks,” *IEEE JSTQE* *26*, 7700412 (2019).
- [31] **M. Minkov**, M. Pinkwart, and P. Schupp, “Entropy methods for CMB analysis of anisotropy and non-Gaussianity,” *Phys. Rev. D* *99*, 103501 (2019).

- [30] X. Ge, **M. Minkov**, S. Fan, X. Li, and W. Zhou, “Laterally confined photonic crystal surface emitting laser incorporating monolayer tungsten disulfide,” *npj 2D Materials and Applications* **3**, 16 (2019).
- [29] A. Dutt, **M. Minkov**, Q. Lin, L. Yuan, D. A. Miller, and S. Fan, “Experimental demonstration of dynamical input isolation in nonadiabatically modulated photonic cavities,” *ACS Photonics* **6**, 162–169 (2018).
- [28] **M. Minkov**, I. A. D. Williamson, M. Xiao, and S. Fan, “Zero-index bound states in the continuum,” *Phys. Rev. Lett.* **121**, 263901 (2018).
- [27] T. W. Hughes[†], **M. Minkov**[†], I. A. D. Williamson, and S. Fan, “Adjoint method and inverse design for nonlinear nanophotonic devices,” *ACS Photonics* **5**, 4781–4787 (2018). [†]authors contributed equally.
- [26] M. S. Mohamed, Y. Lai, **M. Minkov**, V. Savona, A. Badolato, and R. Houdré, “Influence of disorder and finite-size effects on slow light transport in extended photonic crystal coupled-cavity waveguides,” *ACS Photonics* **5**, 4846–4853 (2018).
- [25] **M. Minkov** and S. Fan, “Unidirectional light transport in dynamically modulated waveguides,” *Phys. Rev. Applied* **10**, 044028 (2018).
- [24] Y. Lai, M. S. Mohamed, B. Gao, **M. Minkov**, R. W. Boyd, V. Savona, R. Houdré, and A. Badolato, “Ultra-wide-band structural slow light,” *Sci. Rep.* **8**, 14811 (2018).
- [23] C. Guo, M. Xiao, **M. Minkov**, Y. Shi, and S. Fan, “Isotropic wavevector domain image filters by a photonic crystal slab device,” *J. Opt. Soc. Am. A* **35**, 1685–1691 (2018).
- [22] T. W. Hughes, **M. Minkov**, Y. Shi, and S. Fan, “Training of photonic neural networks through *in situ* backpropagation and gradient measurement,” *Optica* **5**, 864–871 (2018). Featured online: [OSA](#), [Stanford](#), [phys.org](#).
- [21] **M. Minkov** and S. Fan, “Localization and time-reversal of light through dynamic modulation,” *Phys. Rev. B* **97**, 060301 (2018).
- [20] Y. Shi, Q. Lin, **M. Minkov**, and S. Fan, “Nonreciprocal Optical Dissipation Based on Direction-Dependent Rabi Splitting,” *IEEE JSTQE* **24**, 3500107 (2018).
- [19] C. Guo, M. Xiao, **M. Minkov**, Y. Shi, and S. Fan, “Photonic crystal slab Laplace operator for image differentiation,” *Optica* **5**, 251–256 (2018).
- [18] X. Ge, **M. Minkov**, S. Fan, X. Li, and W. Zhou, “Low index contrast heterostructure photonic crystal cavities with high quality factors and vertical radiation coupling,” *Appl. Phys. Lett.* **112**, 141105 (2018).
- [17] **M. Minkov**, V. Savona, and D. Gerace, “Photonic crystal slab cavity simultaneously optimized for ultra-high Q/V and vertical radiation coupling,” *Appl. Phys. Lett.* **111**, 131104 (2017).
- [16] **M. Minkov**, Y. Shi, and S. Fan, “Exact solution to the steady-state dynamics of a periodically modulated resonator,” *APL Photonics* **2**, 076101 (2017).
- [15] M. S. Mohamed, A. Simbula, J.-F. Carlin, **M. Minkov**, D. Gerace, V. Savona, N. Grandjean, M. Galli, and R. Houdré, “Efficient continuous-wave nonlinear frequency

- conversion in high-Q gallium nitride photonic crystal cavities on silicon,” *APL Photonics* *2*, 031301 (2017).
- [14] **M. Minkov** and V. Savona, “Haldane quantum Hall effect for light in a dynamically modulated array of resonators,” *Optica* *3*, 200–206 (2016).
- [13] **M. Minkov** and V. Savona, “A compact, integrated silicon device for the generation of spectrally filtered, pair-correlated photons,” *Journal of Optics* *18*, 054012 (2016).
- [12] **M. Minkov** and V. Savona, “Wide-band slow light in compact photonic crystal coupled-cavity waveguides,” *Optica* *2*, 631–634 (2015).
- [11] H. Flayac, **M. Minkov**, and V. Savona, “Remote macroscopic entanglement on a photonic crystal architecture,” *Phys. Rev. A* *92*, 043812 (2015).
- [10] N. Vico Triviño, **M. Minkov**, G. Urbinati, M. Galli, J.-F. Carlin, R. Butté, V. Savona, and N. Grandjean, “Gallium nitride L3 photonic crystal cavities with an average quality factor of 16 900 in the near infrared,” *Appl. Phys. Lett.* *105*, 231119 (2014).
- [9] U. P. Dharanipathy, **M. Minkov**, M. Tonin, V. Savona, and R. Houdré, “High-Q silicon photonic crystal cavity for enhanced optical nonlinearities,” *Appl. Phys. Lett.* *105*, 101101 (2014). On the [cover of APL](#).
- [8] Y. Lai, S. Pirotta, G. Urbinati, D. Gerace, **M. Minkov**, V. Savona, A. Badolato, and M. Galli, “Genetically designed L3 photonic crystal nanocavities with measured quality factor exceeding one million,” *Appl. Phys. Lett.* *104*, 241101 (2014). On the [cover of APL](#). Featured online: [TechTimes](#), [Science Daily](#).
- [7] **M. Minkov** and V. Savona, “Automated optimization of photonic crystal slab cavities.” *Sci. Rep.* *4*, 5124 (2014). Featured online: [EPFL](#), [Science Daily](#).
- [6] **M. Minkov**, U. P. Dharanipathy, R. Houdré, and V. Savona, “Statistics of the disorder-induced losses of high-Q photonic crystal cavities,” *Opt. Express* *21*, 28233–28245 (2013).
- [5] **M. Minkov** and V. Savona, “Radiative coupling of quantum dots in photonic crystal structures,” *Phys. Rev. B* *87*, 125306 (2013).
- [4] **M. Minkov** and V. Savona, “Long-distance radiative excitation transfer between quantum dots in disordered photonic crystal waveguides,” *Phys. Rev. B* *88*, 081303 (2013).
- [3] **M. Minkov** and V. Savona, “Effect of hole-shape irregularities on photonic crystal waveguides,” *Opt. Lett.* *37*, 3108–3110 (2012).
- [2] Y. Brihaye, T. Caebergs, B. Hartmann, and **M. Minkov**, “Symmetry breaking in (gravitating) scalar field models describing interacting boson stars and Q-balls,” *Phys. Rev. D* *80*, 064014 (2009).
- [1] B. Hartmann and **M. Minkov**, “p-q superstrings in anti-de-Sitter spacetime,” *J. Phys. A* *42*, 035401 (2009).