Publications in peer reviewed journals

2024

[1] S. Čindrak, B. Donvil, K. Lüdge, and L. Jaurigue *Enhancing the performance of quantum reservoir computing and solving the time-complexity problem by artificial memory restriction*, Phys. Rev. Res. **6**, 013051, (2024), DOI: 10.1103/physrevresearch.6.013051 .

[2] L. Jaurigue and K. Lüdge, *Reducing hyperparameter dependence by external timescale tailoring*, Neuromorphic Computing and Engineering, *in press*, (2024), DOI: 10.1088/2634-4386/ad1d32.

[3] E. Picco, L. Jaurigue, K. Lüdge, and S. Massar, *Efficient Optimisation of Physical Reservoir Computers using only a Delayed Input*, Opt. Express, *submitted*, (2024)

2023

[4] A. Thurn, J. Bissinger, S. Meinecke, P. Schmiedeke, S. S. Oh, W. W. Chow, K. Lüdge, G. Koblmüller, and J. J. Finley, *Observation of ultrafast electron-hole plasma temperature oscillations in nanowire lasers*, Phys. Rev. Appl. **20**, 034045 (2023), DOI: 10.1103/PhysRevApplied.20.034045.

[5] F. Köster, D. Patel, A. Wikner, L. Jaurigue, and K. Lüdge, *Data-Informed Reservoir Computing for Efficient Time Series Prediction*, Chaos **33**, 073109 (2023), DOI: 10.1063/5.0152311.

[6] S. Meinecke, F. Köster, D. Christiansen, A. Knorr, M. Selig, and K. Lüdge, *Data-Driven Forecasting of Non-Equilibrium Solid-State Dynamics*, Phys. Rev. B **107**, 184306 (2023), DOI: 10.1103/physrevb.107.184306.

[7] A. Roos, S. Meinecke and K. Lüdge, *Spontaneous Emission Noise Resilience of Coupled Nanolasers*, Front. Photon. **4**, 1169988 (2023), DOI 10.3389/fphot.2023.1169988.

[8] L. Meßner, E. Robertson, L. Esguerra, K. Lüdge and J. Wolters, *Multiplexed random-access optical memory in warm cesium vapor*, Opt. Express **31**, 10150 (2023), DOI:10.1364/OE.483642.

[9] T. Hülser, F. Köster, K. Lüdge, and L. C. Jaurigue, *Deriving task specific performance from the information processing capacity of a reservoir computer*, Nanophotonics **12**, 937 (2023), DOI:10.1515/nanoph-2022-0415.

2022

[10] S. Meinecke, and K. Lüdge, *Optimizing the cavity-arm ratio of V-shaped semiconductor disk lasers*, Phys. Rev. Appl. **18**, 064070(2022), DOI: 10.1103/physrevapplied.18.064070.

[11] F. Köster, S. Yanchuk, and K. Lüdge, *Master memory function for delay-based reservoir computers with single-variable dynamics*, IEEE Trans. Neural Netw. Learn. Syst. (2022), DOI:10.1109/tnnls.2022.3220532.

[12] T. Hülser, F. Köster, L. C. Jaurigue, and K. Lüdge, *Role of delay-times in delay-based Photonic Reservoir Computing*, Opt. Mater. Express **12**, 1214 (2022), DOI: 10.1364/ome.451016.

[13] L. C. Jaurigue, and K. Lüdge, *Connecting Reservoir Computing with Statistcal Forecasting and Deep Neural Networks*, Nat. Commun. **13** 227 (2022), DOI: 10.1038/s41467-021-27715-5.

2021

[14] L.C. Jaurigue, E. Robertson, J. Wolters, and K. Lüdge, *Reservoir Computing with Delayed Input for Fast and Easy Optimization*, Entropy **23**, 1560 (2021), DOI: 10.3390/e23121560.

[15] F. Köster, B. Lingnau, A. Krimlowski, P. Hövel, and K. Lüdge, *Collective coherence resonance*, Phys. Status Solidi B, 2100345 **2021** (2021), DOI:10.1002/pssb.202100345.

[16] A. Roos, S. Meinecke, and K. Lüdge, *Stabilizing Delay-Coupled Nanolasers via Polarization Lifetime Tuning*, Sci. Rep. **11**, 18558 (2021), DOI: 10.1038/s41598-021-97757-8.

[17] M Galler, K. Lüdge, R. Humphries, K. Mulchrone, and P. Hövel, *Deterministic and stochastic effects in spreading dynamics: A case study of bovine viral diarrhea*, Chaos **31**, 093129 (2021).

[18] P. M. Müller, J. Heitzig, J. Kurths, K. Lüdge, M. Wiedermann, *Anticipation-induced social tipping – Can the environment be stabilised by social dynamics?*, Eur. Phys. J. Spec. Top. **2021**, (2021).

[19] F. Köster, S. Yanchuk, and K. Lüdge, *Improving Delay Based Reservoir Computing via Eigenvalue Analysis*, J. Phys. Photonics **3**, 024011 (2021), DOI: 10.1088/2515-7647/abf237.

[20] S. Meinecke, and K. Lüdge, *Efficient timing jitter simulation for passively mode-locked semiconductor lasers*, App. Phys. Lett. **118**, 011104 (2021).

[21] J. Hausen, B. Herzog, A. Nelde, S. Meinecke, N. Owschimikow, K. Lüdge, *Feedback induced locking in semiconductor lasers with strong amplitude-phase coupling*, Phys. Rev. A **103**, 043511 (2021).

2020

[22] J. Hausen, S. Meineck, J. Javaloyes, S. V. Gurevich, and K. Lüdge, *Phase incoherent photonic molecules in V-shaped mode-locked VECSELs*, Phys. Rev. Appl. **14**, 044059 (2020).

[23] K. Lüdge, B. Lingnau, *Laser Dynamics and Delayed Feedback*, Encyclopedia of Complexity and Systems Science (Ed. Meyers), Springer, **DOI** 10.1007/978-3-642-27737-5_729-1 (2020).

[24] F. Köster, J. Duan, B. Dong, H. Huang, F. Grillot, K. Lüdge, *Temperature Dependent Linewidth Rebroadening in Quantum Dot Semiconductor Lasers*, J. Phys. D **53**, 235106 (2020).

[25] F. Köster, D. Ehlert, K. Lüdge:, *Limitations of the recall capabilities in delay based reservoir computing systems*, Cogn. Comput. **2020** ISSN 1866-9956, (2020).

[26] B. Lingnau, D. Schicke, M. Eichelmann, and K. Lüdge, *Dynamic Signatures of Mode Competition in Optically Injected High-β Lasers*, New J. Phys. **22**, 073052 (2020).

[27] S. Meinecke, L. Kluge, J. Hausen, B. Lingnau, and K. Lüdge, *Optical Feedback Induced Oscillation Bursts In Two-State Quantum-Dot Lasers*, Opt. Express **28**, 3361 (2020).

[28] M. Goldmann, F. Köster, K. Lüdge, and S. Yanchuk, *Deep Time-Delay Reservoir Computing: Dynamics and Memory Capacity*, Chaos, **30**, 093124 (2020).

[29] J. Hausen, K. Lüdge, S. V. Gurevich, and J. Javaloyes, *How carrier memory enters the Haus master equation of mode-locking*, Opt. Lett. **45** 6210 (2020).

[30] F. Stelzer, A. Röhm, K. Lüdge, and S. Yanchuk, *Performance boost of time-delay reservoir computing by non-resonant clock cycle*, Neural Networks **124**, 158 (2020).

2019

[31] K. Lüdge, and A. Röhm, *Computing with a camera*, Nat. Mach. Intell. **1**, 12, 551 (2019).

[32] A. Röhm, L. C. Jaurigue, K. Lüdge: *Reservoir Computing Using Laser Networks* IEEE J. Sel. Top. Quantum Electron. **26**, 7700108 (2019) .

[33] E. Schlottmann, D. Schicke, F. Krüger, B. Lingnau, C. Schneider, S. Höfling, K. Lüdge, X. Porte, S. Reitzenstein, *Stochastic polarization switching induced by optical injection in bimodal quantum-dot micropillar lasers,* Opt. Express **27**, 28816 (2019).

[34] K. Lüdge, L. C. Jaurigue, B. Lingnau, S. Terrien, and B. Krauskopf, *Semiconductor mode-locked laser with external feedback: emergence of multi-frequency pulse trains with an increasing number of modes,* Eur. Phys. J. B **92**, 4, 89 (2019).

[35] J. Hausen, S. Meinecke, B. Lingnau, and K. Lüdge, *Pulse Cluster Dynamics in Passively Mode-Locked Semiconductor Vertical-External-Cavity Surface-Emitting Lasers,* Phys. Rev. Appl. **11**, 044055 (2019).

[36] S. Kreinberg, X. Porte, D. Schicke, B. Lingnau, C. Schneider, S. Höfling, I. Kanter, K. Lüdge, and S. Reitzenstein, *Mutual coupling and synchronization of optically coupled quantum-dot micropillar lasers at ultra-low light levels*, Nat. Commun. **10**, 1539 (2019).

[37] S. Meinecke, L. Drzewietzki, C. Weber, B. Lingnau, S. Breuer, and K. Lüdge, *Ultra-Short Pulse Generation in a Three Section Tapered Passively Mode-Locked Quantum-Dot Semiconductor Laser*, Sci. Rep. **9**,1783 (2019).

[38] B. Herzog, B. Lingnau, M. Kolarczik, S. Helmrich, A. Achtstein, K. Thommes, F. Alhussein, D. Quandt, A. Strittmatter, U. W. Pohl, O. Brox, M. Weyers, U. Woggon, K. Lüdge, and N. Owschimikow, *Broadband semiconductor light sources operating at 1060 nm based on InAsSb/GaAs submonolayer quantum dots,* IEEE J. Sel. Top. Quantum Electron. **25**, 1900310 (2019) .

[39] B. Lingnau, J. Turnwald, and K. Lüdge, *Class-C semiconductor lasers with time-delayed optical feedback*, Phil. Trans. R. Soc. A **377**, 20180124 (2019) .

2018

[40] S. Terrien, B. Krauskopf, N. G. R. Broderick, L. C. Jaurigue, and K. Lüdge, *Q-switched pulsing lasers subject to delayed feedback: A model comparison*, Phys. Rev. A **98**, 043819 (2018).

[41] A. Röhm, K. Lüdge, *Multiplexed networks: reservoir computing with virtual and real nodes*, J. Phys. Commun. **2**, 085007 (2018).

[42] A. Röhm, K. Lüdge, I. Schneider, *Bistability in two simple symmetrically coupled oscillators with symmetry-broken amplitude-and phase-locking*, Chaos **28**, 063114 (2018)

[43] C. G. E. Alfieri, D. Waldburger, R. Nürnberg, M. Golling, L. C. Jaurigue, K. Lüdge, and U. Keller, *Modelocking instabilities for high-gain semiconductor disk lasers based on active submonolayer quantum dots*, Phys. Rev. Appl. **10**, 044015 (2018).

[44] S. Holzinger, C. Redlich, B. Lingnau, M. Schmidt, M. von Helversen, J. Beyer, C. Schneider, M. Kamp, S. Höfling, K. Lüdge, X. Porte, S. Reitzenstein, *Tailoring the mode-switching dynamics in quantum-dot micropillar lasers via time-delayed optical feedback*, Opt. Express **26**, 22457 (2018).

[45] D. Waldburger, C. G. E. Alfieri, S. M. Link, S. Meinecke, L. Jaurigue, K. Lüdge, U. Keller, *Multipulse instabilities of a femtosecond SESAM-modelocked VECSEL*, Opt. Express **26**, 21872 (2018).

[46] B. Lingnau, K. Lüdge, *Rabi-oscillation-enhanced frequency conversion in quantum-dot semiconductor optical amplifiers*, Opt. Quantum Electron. **50**, 111 (2018)

2017

[47] L. C. Jaurigue, B. Krauskopf, and K. Lüdge, *Multipulse dynamics of a passively mode-locked semiconductor laser with delayed optical feedback*, Chaos **27**, 11, 114301 (2017).

[48] C. Redlich, B. Lingnau, H. Huang, R. Raghunathan, K. Schires, P. J. Poole, F. Grillot, K. Lüdge, *Linewidth rebroadening in quantum dot semiconductor lasers*, IEEE J. Sel. Top. Quantum Electron. **23**, 6, 1901110 (2017).

[49] B. Lingnau, B. Herzog, M. Kolarczik, U. Woggon, K. Lüdge, and N. Owschimikow, *Dynamic phase response and amplitude-phase coupling of self-assembled semiconductor quantum dots*, Appl. Phys. Lett. **110**, 241102 (2017).

[50] S. Meinecke, B. Lingnau, A. Röhm, and K. Lüdge, *Stability in Optically Injected Two-State Quantum-Dot Lasers*, Ann. Phys. (Berlin) **529**, 1600279 (2017).

[51] B. Mayer, A. Regler, S. Sterzl, T. Stettner, G. Koblmüller, M. Kaniber, B. Lingnau, K. Lüdge and J. J. Finley, *Long-term mutual phase locking of picosecond pulse pairs generated by a semiconductor nanowire laser*, Nature Comm. **8**,15521(2017)

[52] M. Zajnulina, B. Lingnau, K. Lüdge, *Four-wave Mixing in Quantum Dot Semiconductor Optical Amplifiers: A Detailed Analysis of the Nonlinear Effects*, IEEE J. Sel. Top. Quantum Electron. **23**, 3000112(2017).

[53] P. Munnelly, B. Lingnau, M. M. Karow, T. Heindel, M. Kamp, S. Höfling, K. Lüdge, C. Schneider, S. Reitzenstein, *On-chip optoelectronic feedback in a micropillar laser-detector assembly*, Optica **4** (3), 303-306 , (2017).

2016

[54] E. Schlottmann, S. Holzinger, B. Lingnau, K. Lüdge, C. Schneider, M. Kamp, S. Höfling, J. Wolters, S. Reitzenstein, *Injection Locking of Quantum-Dot Microlasers Operating in the Few-Photon Regime*, Phys. Rev. Appl. **6**, 044023 (2016).

[55] B. Herzog, B. Lingnau, M. Kolarczik, Y. Kaptan, D. Bimberg, A. Maaßorf, U. W. Pohl, R. Rosales, J.-H. Schulze, A. Strittmatter, M. Weyers, U. Woggon, K. Lüdge, N. Owschimikow, *Strong amplitude-phase coupling in submonolayer quantum dots*, Appl. Phys. Lett. **109,** 201102 (2016).

[56] B. Lingnau, K. Lüdge, B. Herzog, M. Kolarczik, Y. Kaptan, U. Woggon and N. Owschimikow, *Ultrafast gain recovery and large nonlinear optical response in submonolayer quantum dots*, Phys. Rev. B **94**, 014305 (2016).

[57] A. Röhm, F. Böhm and K. Lüdge, *Small chimera states without multistability in a globally delay-coupled network of four lasers*, Phys. Rev. E **94**, 042204 (2016).

[58] L. C. Jaurigue, E. Schöll and K. Lüdge, *Suppression of Noise-Induced Modulations in Multidelay Systems*, Phys. Rev. Lett. **117**, 154101 (2016).

[59] C. Redlich, B. Lingnau, S. Holzinger, E. Schlottmann, S. Kreinberg, C Schneider, M. Kamp, S. Höfling, J. Wolters, S. Reitzenstein, and K. Lüdge, *Mode-switching induced super-thermal bunching in quantum-dot microlasers*, New J. Phys. **18**, 063011 (2016).

[60] O. Nikiforov, L. Jaurigue, L. Drzewietzki, K. Lüdge, and S. Breuer, *Experimental demonstration of change of dynamical properties of a passively mode-locked semiconductor laser subject to dual optical feedback by dual full delay-range tuning*, Opt. Express **24**, 14301 (2016).

[61] L. C. Jaurigue, O. Nikiforov, E. Schöll, S. Breuer, K. Lüdge, *Dynamics of a passively mode-locked semiconductor laser subject to dual-cavity optical feedback*, Phys. Rev. E **93**, 022205 (2016).

[62] R. Aust, T. Kaul, C.-Z. Ning, B. Lingnau, and K. Lüdge, *Modulation response of nanolasers: What rate equation approaches miss*, Opt. Quantum Electron. **48**, 109 (2016).

2015

[63] L. C. Jaurigue, A. Pimenov, D. Rachinskii, E. Schöll, K. Lüdge, and A. G. Vladimirov, *Timing jitter of passively mode-locked semiconductor lasers subject to optical feedback; a semi-analytic approach*, Phys. Rev. A **92**, 053807 (2015).

[64] B. Lingnau, and K. Lüdge, *Analytic Characterization of the Dynamic Regimes of Quantum-Dot Lasers*, Photonics **2**, 402 (2015).

[65] F. Böhm, A. Zakharova, E. Schöll, and K. Lüdge, *Amplitude-phase coupling drives chimera states in globally coupled laser networks*, Phys. Rev. E **91**, 040901 (R) (2015).

[66] A. Röhm, B. Lingnau, and K. Lüdge,*Understanding Ground-State Quenching in Quantum-Dot Lasers*, IEEE J. Quantum Electron. **51**, 2000211 (2015).

[67] A. Röhm, B. Lingnau, and K. Lüdge, *Ground-state modulation-enhancement by two-state lasing in quantum-dot laser devices*, Appl. Phys. Lett. **106**, 191102 (2015).

2014

[68] Y. Kaptan, A. Röhm, B. Herzog, B. Lingnau, H. Schmeckebier, D. Arsenijević, V. Mikhelashvili, O. Schops, M. Kolarczik, G. Eisenstein, D. Bimberg, U. Woggon, N. Owschimikow, and K. Lüdge, *Stability of a quantum dot excited state laser during simultaneous ground state amplification*, Appl. Phys. Lett. **105**, 191105-1 (2014).

[69] N. B. Grosse, N. Owschimikow, R. Aust, B. Lingnau, A. Koltchanov, M. Kolarczik, K. Lüdge, and U. Woggon, *Pump-probe quantum state tomography in a semiconductor optical amplifier*, Opt. Express **22**, 26, 32520 (2014).

[70] C. Otto, L. Jaurigue, E. Schöll, and K. Lüdge, *Optimization of timing jitter reduction by optical feedback for a passively mode-locked laser*, IEEE Photonics Journal **6**, 1501814 (2014).

[71] C. Wang, B. Lingnau, K. Lüdge, J. Even, and F. Grillot , *Enhanced Dynamic Performance of Quantum Dot Semiconductor Lasers Operating on the Excited State*, IEEE J. Quantum Electron. **50** ,723 (2014).

[72] C. Otto, B. Lingnau, E. Schöll, and K. Lüdge, *Manipulating coherence resonance in a quantum dot semiconductor laser via electrical pumping*, Opt. Express **22**, 13288 (2014).

[73] B. Lingnau, W. W. Chow, and K. Lüdge, *Amplitude-phase coupling and chirp in quantum-dot lasers: influence of charge carrier scattering dynamics*, Opt. Express **22**, 4867 (2014).

[74] F. Schulze, B. Lingnau, S.M. Hein, A. Carmele, E. Schöll, K. Lüdge, A. Knorr, *Feedback-Induced Steady-State Light Bunching Above the Lasing Threshold*, Phys. Rev. A **89**, 4, 041801(R) (2014).

[75] M. Wegert, D. Schwochert, E. Schöll, and K. Lüdge, *Integrated quantum-dot laser devices: Modulation stability with electro-optic modulator*, Opt. Quantum Electron. **46**, 1337 (2014).

2013

[76] M. Kolarczik, N. Owschimikow, J. Korn, B. Lingnau, Y. Kaptan, D. Bimberg, E. Schöll, K. Lüdge, and U. Woggon, *Quantum coherence induces pulse shape modification in a semiconductor optical amplifier at room temperature*, Nat. Commun. **4**, 2953 (2013).

[77] B. Lingnau, W. W. Chow, E. Schöll, K. Lüdge, *Feedback and injection locking instabilities in quantum-dot lasers: a microscopically based bifurcation analysis*, New J. Phys. **15**, 093031 (2013).

[78] D. Ziemann, R. Aust, B. Lingnau, E. Schöll, and K. Lüdge, *Optical injection enables coherence resonance in quantum-dot lasers*, Europhys. Lett. **103**, 14002 (2013).

[79] S. Wilkinson, B. Lingnau, J. Korn, E. Schöll, and K. Lüdge, *Influence of Noise on Quantum-Dot Semiconductor Optical Amplifiers*, IEEE J. Sel. Top. Quantum Electron. **19**, 1900106 (2013).

2012

[80] B. Lingnau, W. W. Chow, E. Schöll, and K. Lüdge, *Failure of the α-factor in describing quantum-dot laser dynamical instabilities and chaos*, Phys. Rev. **E** 86, 065201(R) (2012).

[81] C. Otto, K. Lüdge, A. Vladimirov, M. Wolfrum, and E. Schöll, *Delay induced dynamics and jitter reduction of passively mode-locked semiconductor laser subject to optical feedback*, New J. Phys **14**, 113033 (2012).

[82] D. Puris, C. Schmidt-Langhorst, K. Lüdge, N. Majer, E. Schöll, and K. Petermann, *Time-domain Model of Quantum-Dot Semiconductor Optical Amplifiers for Wideband Optical Signals*, Opt. Express **20**, 27265 (2012).

[83] B. Globisch, C. Otto, E. Schöll, and K. Lüdge, *Influence of carrier lifetimes on the dynamical behavior of quantum-dot lasers subject to optical feedback,* Phys. Rev. E **86**, 046201 (2012).

[84] C. Otto, B. Globisch, K. Lüdge, E. Schöll, T. Erneux, *Complex Dynamics of Semiconductor Quantum Dot Lasers Subject to Delayed Optical Feedback*, Int. J. Bif. Chaos **22**, 10, 1250246 (2012).

[85] B. Lingnau, K. Lüdge, W. W. Chow and E. Schöll, *Influencing modulation properties of quantum-dot semiconductor lasers by electron lifetime engineering.* Appl. Phys. Lett. **101**, 131107 (2012).

[86] K. Lüdge, B. Lingnau, C. Otto, and E. Schöll, *Understanding electrical and optical modulation properties of semiconductor quantum-dot lasers in terms of their turn-on dynamics*, Nonlinear Phenom. Complex Syst. **15**, 350 (2012).

[87] J. Pausch, C. Otto, E. Tylaite, N. Majer, E. Schöll and K. Lüdge, *Optically injected quantum dot lasers - impact of nonlinear carrier lifetimes on frequency locking dynamics*, New J. Phys. **14**, 053018 (2012).

2011

[88] K. Lüdge, E. Schöll, E. A. Viktorov, and T. Erneux, *Analytic approach to modulation properties of quantum dot lasers*, J. Appl. Phys. **109**(9), 103112 (2011).

[89] N. Majer, S. Dommers-Völkel, J. Gomis-Bresco, U. Woggon, K. Lüdge and E. Schöll, *Impact of carrier-carrier scattering and carrier heating on pulse train dynamics of quantum dot semiconductor optical amplifiers*, Appl. Phys. Lett. **99**, 131102 (2011).

[90] M. Wegert, N. Majer, K. Lüdge, S. Dommers-Völkel, J.Gomis-Bresco, A. Knorr, U. Woggon, and E. Schöll, *Nonlinear Gain Dynamics of Quantum Dot Optical Amplifiers*, Semicond. Sci. Technol. **26**, 014008 (2011).

[91] Y. Su, A. Carmele, M. Richter, K. Lüdge, E. Schöll, D. Bimberg, A. Knorr, *Theory of single quantum dot lasers: Pauli-blocking enhanced anti-bunching*, Semicond. Sci. Technol. **26**, 014015 (2011).

2010

[92] K. Lüdge, R. Aust, G. Fiol, M. Stubenrauch, D. Arsenijevic, D. Bimberg and E. Schöll, *Large Signal Response of Semiconductor Quantum-Dot Lasers*,
IEEE J. Quantum Electron. **46**(12), 1755 (2010).

[93] N. Majer, K. Lüdge, and E. Schöll, *Cascading enables ultrafast gain recovery dynamics of quantum dot semiconductor optical amplifiers*. Phys. Rev. B, **82**, 235 301 (2010).

[94] B. Lingnau, K. Lüdge, E. Schöll, and W. W. Chow, *Many-body and nonequilibrium effects on relaxation oscillations in a quantum-dot microcavity laser*, Appl. Phys. Lett. **97**(11), 111102 (2010).

[95] K. Lüdge and E. Schöll, *Nonlinear dynamics of doped semiconductor quantum dot lasers*,
Eur. Phys. J. D **58**, 167 (2010).

[96] C. Otto, K. Lüdge, and E. Schöll, *Modeling quantum dot lasers with optical feedback: sensitivity of bifurcation scenarios*, phys. stat. sol. (b) **247**(4), 829 (2010).

2009–2000

[97] K. Lüdge and E. Schöll, *Quantum-dot lasers – desynchronized nonlinear dynamics of electrons and holes,* IEEE J. Quantum Electron. **45**(11), 1396 (2009).

[98] K. Lüdge, M. J. P. Bormann, E. Malić, P. Hövel, M. Kuntz, D. Bimberg, A. Knorr, and E. Schöll, *Turn-on dynamics and modulation response in semiconductor quantum dot lasers*,
Phys. Rev. B **78**(3), 035316 (2008).

[99] T. Herrmann, K. Lüdge, W. Richter, K. G. Georgarakis, P. Poulopoulos, R. Nunthel, J. Lindner, M. Wahl and N. Esser, *Optical anisotropy and magneto-optical properties of Ni on preoxidized Cu(110)*, Phys. Rev. B **73**(13), 134408 (2006).

[100] K. Lüdge, P. Vogt, W. Richter, B. O. Fimland, W. Braun and N. Esser, *Metallic nanostructures on Co/GaAs(001)(4×2) surfaces*, J. Vac. Sci. Technol. B **22**(4), 2008 (2004).

[101] K. Lüdge, P. Vogt, W. Braun,W. Richter, and N. Esser, *Cobalt growth on InGaP(001)(2×4): Interface formation*, J. Vac. Sci. Technol. B **21**(4), 1749 (2003)

[102] H. H. Farrell, R. A. LaViolette,B. D. Schultz, K. Lüdge, C. J. Palmstrom, *Self-assembled CoAs nanostructures*, J. Vac. Sci. Technol. B **21**(4), 1760 (2003)

[103] K. Lüdge, B. D. Schultz, P. Vogt, M. M. R. Evans, W. Braun, C. J. Palmstrom, W. Richter and N. Esser, *Structure and interface composition of Co layers grown on As-rich GaAs(001) c(4×4) surfaces*, J. Vac. Sci. Technol. B **20**(4), 1591(2002).

[104] B. D. Schultz, H. H. Farrell, M. M. R. Evans, K. Lüdge and C. J. Palmstrom, *ErAs interlayers for limiting interfacial reactions in Fe/GaAs(100) heterostructures*,
J. Vac. Sci. Technol. B **20**(4) ,1600 (2002).

[105] O. Pulci, K. Lüdge, P. Vogt, N. Esser, W. G. Schmidt, W. Richter, F. Bechstedt, *First-principles study of InP and GaP(001) surfaces*, Comp. Mat. Science 22, 32 (2001).

[106] T. Herrmann, K. Lüdge, W. Richter, N. Esser, P. Poulopoulos, J. Lindner, K. Baberschke, *Growth phases and optical anisotropy of Co on preoxidized Cu(110)*,
Phys. Rev. B **64**(13), 184424 (2001).

[107] P. Vogt, K. Lüdge, M. Zorn, M. Zorn, M. Pristovsek, W. Braun, W. Richter, N. Esser, *Surface structure of ordered InGaP(001): The (2×4) reconstruction*, Phys. Rev. B **62**, 12601 (2000).

[108] K. Lüdge, P. Vogt, O. Pulci, N. Esser, F. Bechstedt and W. Richter, *Clarification of the GaP(001) (2×4) Ga-rich reconstruction by scanning tunneling microscopy and ab initio theory*,
Phys. Rev. B **62**(16), 11046 (2000).

[109] O. Pulci, K. Lüdge, P. Vogt, N. Esser, W. G. Schmidt, W. Richter, F. Bechstedt, *First-principles study of (2×1) and (2×2) phosphorus-rich InP(001) surfaces*, Surf. Sci. **464**, 272-282 (2000).

[110] P. Vogt, K. Lüdge, M. Zorn, M. Pristovsek, W. Braun, W. Richter, N. Esser, N , *Atomic structure and composition of the (2X4) reconstruction of InGaP(001)*, J. Vac. Sci. Technol. B **18**, 2210 (2000)

Book chapters

[111] M. Kolarczik, F. Böhm, U. Woggon, N. Owschimikow, A. Pimenov, M. Wolfrum, A. Vladimirov, S. Meinecke, B. Lingnau, L. C. Jaurigue, and K. Lüdge, *Coherent and incoherent dynamics in quantum dots and nanophotonic devices*, in Semiconductor Nanophotonics (Ed.: M. Kneissl, A. Knorr, S. Reitzenstein, A. Hoffmann), Chapter 4, **ISBN** 978-3-030-35655-2 Springer, (2020).

[112] N. Owschimikow, B. Herzog, B. Lingnau, K. Lüdge, A. Lenz, H. Eisele, M. Dähne, T. Niermann, M. Lehmann, A. Schliwa, A. Strittmatter, U. W. Pohl, *Submonolayer Quantum Dots*, in Semiconductor Nanophotonics (Ed.: M. Kneissl, A. Knorr, S. Reitzenstein, A. Hoffmann), Chapter 2, **ISBN** 978-3-030-35655-2 Springer, (2020).

[113] K. Lüdge, B. Lingnau *Laser Dynamics and Delayed Feedback* Encyclopedia of Complexity and Systems Science , Living Ed, Editors: Robert A. Meyers, Section Editors: Dr. Axel Hutt, Prof. Hermann Haken, **ISBN** 978-1-07-160420-5, Springer Berlin Heidelberg(2020).

[114] K. Lüdge *Strukturbildung im Laserlicht*, in: Vielfältige Physik, Hrsg. Cornelia Denz, Deborah Duchardt, Andrea Bossmann; Verlag: Springer-Spektrum, **ISBN** 978-3-662-58035-6 239 (2019).

[115] B. Lingnau and K. Lüdge, *Quantum Dot Semiconductor Optical Amplifiers* , Handbook of Optoelectronic Device Modeling and Simulation, **ISBN** 9781498749466, Taylor & Francis, (2017).

[116] F. Böhm, and K. Lüdge, *Exploiting multi-stability to stabilize chimera states in all-to-all coupled laser networks*, Control of Self-Organizing Nonlinear Systems, Springer, **ISBN** 978-3-319-28027-1, (2016).

[117] B. Lingnau, and K. Lüdge, *Quantenpunktlaser - Laserlicht auf den Punkt gebracht*, Physik unserer Zeit **45**, 3, 140 (2014).

[118] K. Lüdge, *Modeling Quantum Dot based Laser Devices*, Chap. 1 in *Nonlinear Laser Dynamics - From Quantum Dots to Cryptography* (Ed. K. Lüdge), WILEY-VCH Weinheim, **ISBN** 978-3-527-41100-9, (2011)

[119] C. Otto, K. Lüdge, E. Viktorov, and T. Erneux, *Quantum dot laser tolerance to optical feedback*, Chap. 6 in *Nonlinear Laser Dynamics- From Quantum Dots to Cryptography* (Ed. K. Lüdge), WILEY-VCH Weinheim, **ISBN** 978-3-527-41100-9, (2011)

Editorship

[120] *Nonlinear Laser Dynamics- From Quantum Dots to Cryptography*, edited by K. Lüdge (WILEY-VCH Weinheim, 2011), **ISBN** 978-3-527-41100-9

Publications in Conference-Proceedings

[121] L. C. Jaurigue, E. Robertson, J. Wolters, and K. Lüdge, *Photonic reservoir computing with nonlinear memory cells: interplay between topology, delay and delayed input*, Proc. SPIE **12204** *Emerging Topics in Artificial Intelligence (ETAI)*, 1220408 (2022).

[122] E. Robertson, L. C. Jaurigue, L. Esguerra-Rodriguez, Guillermo Gallego, K. Lüdge and J. Wolters, *A Scheme for Optical Reservoir Computers with Atomic Memory*, in: 2021 Conference on Lasers and Electro-Optics Europe European Quantum Electronics Conference (CLEO/Europe-EQEC) (2021).

[123] J. Hausen, S. Meinecke, and K. Lüdge, *Bifurcation scenario leading to multiple pulse emission in VECSELs*, Proc. SPIE **10901**, *Vertical External Cavity Surface Emitting Lasers IX*, 109010F (2019).

[124] L. C. Jaurigue, B. Lingnau, S. Meinecke, and K. Lüdge, *Passive mode-locking in a V-shaped cavity*, Proc. SPIE **10515**, *Vertical External Cavity Surface Emitting Lasers VIII*, 1051505 (2018).

[125] A. Röhm, and K. Lüdge, *Reservoir computing with delay in structured networks*, Proc. SPIE **10689**: Neuro-inspired Photonic Computing, (2018).

[126] S. Meinecke, B. Lingnau, K. Lüdge, *Increasing stability by two-state lasing in quantum-dot lasers with optical injection*, in Proceedings of SPIE **10098**: Physics and Simulation of Optoelectronic Devices XXV, (2017).

[127] B. Lingnau, K. Lüdge, N. Owschimikow, *Submonolayer quantum-dot lasers*, in Proceedings of SPIE **10098**: Physics and Simulation of Optoelectronic Devices XXV, (2017).

[128] R. Aust, T. Kaul, B. Lingnau, and K. Lüdge, *Modulation response of nanolasers: What rate equation approaches miss*, Proceedings of the 15th international conference on Numerical Simulation of Optoelectronic Devices, 125 IEEE Conference Publications Group, Piscataway, NJ, USA, (2015).

[129] L. C. Jaurigue, E. Schöll, and K. Lüdge, *The role of optical delays for the dynamic behavior of passively mode-locked lasers*, in Proceedings of SPIE **9382**, Novel In-Plane Semiconductor Lasers XIV, (2015).

[130] H. Schmeckebier, B. Lingnau, S. König, K. Lüdge, C. Meuer, A. Zeghuzi, D. Arsenijević, M. Stubenrauch, R. Bonk, C. Koos, C. Schubert, T. Pfeiffer, and D. Bimberg, *Ultra-Broadband Bidirectional Dual-Band Quantum-Dot Semiconductor Optical Amplifier* , Optical Fiber Communication Conference and Exposition Tu3I.7 , ISSN ISBN 978-1-55752-937-4, (2015).

[131] L. C. Jaurigue, F. Grillot, E. Schöll, and K. Lüdge, *Predicting modes of operation in quantum dot mode-locked lasers using a delay differential equation model*, in Proceedings of SPIE **9134**, Semiconductor Lasers and Laser Dynamics VI, (2014).

[132] L. Jaurigue, E. Schöll, and K. Lüdge, *Ground and Excited-State Performance of a Quantum-Dot Semiconductor Amplifier,* Proceedings of the 14th international conference on Numerical Simulation of Optoelectronic Devices, 121 IEEE Photonics Society, Piscataway, NJ, USA, (2014).

[133] B. Lingnau, E. Schöll, and K. Lüdge, *Passively mode-locked lasers subject to optical feedback: the role of amplitude-phase coupling,* Proceedings of the 14th international conference on Numerical Simulation of Optoelectronic Devices, 121 IEEE Photonics Society, Piscataway, NJ, USA, (2014).

[134] B. Lingnau, K. Lüdge, E. Schöll, and W. W. Chow, *Microscopic versus α-factor descriptions of dynamics in quantum-dot lasers*, Photonics Conference, IEEE 81 ISSN 978-1-4577-1507-5, (2013).

[135] M. Wegert, D. Schwochert, E. Schöll, and K. Lüdge, *Nonlinear dynamics of a quantum-dot laser coupled to an electro-optic modulator*, in 13th Internat. Conf. on Numerical Simulation of Optical Devices (NUSOD), Vancouver 2013, edited by J. Piprek, IEEE Proc. (2013).

[136] K. Lüdge and E. Schöll, *Temperature dependent two-state lasing in quantum dot lasers*, in IEEE Proceedings: Laser Dynamics and Nonlinear Photonics, 2011 Fifth Rio De La Plata Workshop on 6-9 Dec. 2011, 1-6 (2012).

[137] B. Lingnau, K. Lüdge, W. W. Chow and E. Schöll, *Many-body effects and self-contained phase dynamics in an optically injected quantum-dot laser*, in Proceedings of SPIE **8432**, Semiconductor Lasers and Laser Dynamics, (2012)

[138] N. Majer, K. Lüdge and E. Schöll, *Maxwell-Bloch approach to Four-Wave Mixing in quantum dot semiconductor optical amplifiers*, in 11th Internat. Conf. on Numerical Simulation of Optical Devices (NUSOD), Rome 2011, edited by J. Piprek, IEEE Proceedings, 153-154 (2011).

[139] B. Lingnau, K. Lüdge, E. Schöll, and W. W. Chow, *Dynamic many-body and nonequilibrium effects in a quantum dot microcavity laser*, in Proceedings of SPIE, **7720**, (2010).

[140] K. Lüdge, E. Malić, and E. Schöll, *The Role of Decoupled Electron and Hole Dynamics in the Turn-on Behavior of Semiconductor Quantum-Dot Lasers*, Int. Conference on Physics of Semiconductors (ICPS-29), Rio de Janeiro, AIP Conf. Proc.**1199**, 475 (2009).

[141] K. Lüdge and E. Schöll, *Current instabilities in resonant tunneling quantum dot structures*, Int. Conference on Physics of Semiconductors (ICPS-28), Vienna, AIP Conf. Proc. **893**, 835 (2007).