

curriculum vitae of  
Logan G. Wright

🏠 My website    ✉️ logan.wright@yale.edu  
🔍 Google scholar profile  
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## EDUCATION

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2012 – 2018	<b>Ph.D.</b> in Applied Physics	CORNELL UNIVERSITY, ITHACA, NY, USA
2008 – 2012	<b>BSc. (Eng.)</b> in Engineering Physics (first class honors)	QUEEN'S UNIVERSITY, KINGSTON, ON, CANADA

## RESEARCH EXPERIENCE

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July 2023 – present	Assistant professor of applied physics	YALE UNIVERSITY
2022 – 2023	Senior research scientist	NTT RESEARCH, INC.
2019 – 2023	Postdoctoral research scientist Advisors: Peter L. McMahon and Yoshihisa Yamamoto	CORNELL UNIVERSITY AND NTT RESEARCH, INC.
2018 – 2019	Postdoctoral research scientist Advisors: Hideo Mabuchi and Yoshihisa Yamamoto	STANFORD UNIVERSITY
2013 – 2018	Graduate research assistant Advisor: Frank W. Wise. Committee members: Alexander L. Gaeta, Clifford R. Pollock	CORNELL UNIVERSITY
Summer 2012	Undergraduate research assistant in Physics Advisor: James M. Fraser	QUEEN'S UNIVERSITY
Summer 2011	Undergraduate research assistant in Physics Advisor: Kevin J. Resch	INSTITUTE FOR QUANTUM COMPUTING
Summer 2010	Undergraduate research assistant in Physics Advisor: James M. Fraser	QUEEN'S UNIVERSITY
Summer 2009	Undergraduate research assistant in Chemistry Advisor: Simon A.M. Hesp	QUEEN'S UNIVERSITY

## PUBLICATIONS

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Authors who equally contributed to a publication are marked with a †.

### PREPRINTS

1. A. Momeni, B. Rahmani, B. Scellier, **L.G. Wright** *et al.*, “Training of Physical Neural Networks”, arXiv:2406.03372
2. T. Onodera<sup>†</sup>, M.M. Stein<sup>†</sup>, B.A. Ash, M.M. Sohoni, M. Bosch, R. Yanagimoto, M. Jankowski, T.P. McKenna, T. Wang, G. Shvets, M.R. Shcherbakov, **L.G. Wright** and P.L. McMahon “Scaling on-chip photonic neural processors using arbitrarily programmable wave propagation”, arXiv:2402.17750
3. A. Senanian, S. Prabhu, V. Kremenetski, S. Roy, Y. Cao, J. Kline, T. Onodera, **L.G. Wright**, X. Wu, V. Fatemi and P.L. McMahon. “Microwave signal processing using an analog quantum reservoir computer”, arXiv:2312.16166

4. F. Presutti, **L.G. Wright**, S.Y. Ma, T. Wang, B.K. Malia, T. Onodera, and P.L. McMahon. “Highly multimode visible squeezed light with programmable spectral correlations through broadband up-conversion”, arXiv:2401.06119
5. R. Yanagimoto<sup>†</sup>, E. Ng<sup>†</sup>, M. Jankowski, R. Nehra, T.P. McKenna, T. Onodera, **L.G. Wright**, R. Hamerly, A. Marandi, M.M. Fejer, and H. Mabuchi. “Mesoscopic ultrafast nonlinear optics—The emergence of multimode quantum non-Gaussian physics”, arXiv:2311.13775
6. S.-Y. Ma, T. Wang, J. Laydevant, **L.G. Wright**, and P.L. McMahon “Quantum-noise-limited optical neural networks operating at a few quanta per activation”, arXiv: 2302.10360
7. M.G. Anderson, S.-Y. Ma, T. Wang, **L.G. Wright**, and P.L. McMahon “Optical Transformers”, arXiv: 2302.10360

## PEER-REVIEWED PUBLICATIONS (AS FIRST AUTHOR)

1. J. Laydevant<sup>†</sup>, **L.G. Wright**<sup>†</sup>, T. Wang, and P.L. McMahon. “The hardware is the software”, *Neuron* **112** (2024).
2. **L.G. Wright**, F.O. Wu, D.N. Christodoulides, and F.W. Wise (2022) “Physics of highly multimode nonlinear optical systems”, *Nature Physics* **18**, 1018–1030.
3. **L.G. Wright**, W.H. Renninger, D.N. Christodoulides, and F.W. Wise (2022) “Nonlinear multimode photonics: nonlinear optics with many degrees of freedom”, *Optica* **9**, 824–841.
4. **L.G. Wright**<sup>†</sup>, T. Onodera<sup>†</sup>, M.M. Stein, T. Wang, D.T. Schachter, Z. Hu, and P.L. McMahon (2022) “Deep physical neural networks trained with backpropagation”, *Nature* **601**, 549–555.
5. **L.G. Wright**, P. Sidorenko, H. Pourbeyram, Z.M. Ziegler, A. Isichenko, B.A. Malomed, C.R. Menyuk, D.N. Christodoulides and F.W. Wise (2020) “Mechanisms of Spatiotemporal Mode-Locking”, *Nature Physics* **16**, 565–570
6. **L.G. Wright**, Z.M. Ziegler, P.M. Lushnikov, Z. Zhu, M.A. Eftekhari, D.N. Christodoulides, and F.W. Wise (2018) “Multimode Nonlinear Fiber Optics: Massively Parallel Numerical Solver, Tutorial and Outlook,” *IEEE Journal of Selected Topics in Quantum Electronics* **24** (3), 1–16
7. **L.G. Wright**, D.N. Christodoulides, and F.W. Wise (2017) “Spatiotemporal mode-locking in multimode fiber lasers,” *Science* **358** (6359), 94–97
8. **L.G. Wright**, Z. Liu, D.A. Nolan, M.-J. Li, D.N. Christodoulides, and F.W. Wise (2016) “Self-organized instability in graded-index multimode fibres,” *Nature Photonics* **10**, 771–776.
9. **L.G. Wright**, S. Wabnitz, D.N. Christodoulides, and F.W. Wise (2015) “Ultrabroadband Dispersive Radiation by Spatiotemporal Oscillation of Multimode Waves,” *Physical Review Letters* **115** (22), 223902
10. **L.G. Wright**, D.N. Christodoulides, and F.W. Wise (2015) “Controllable spatiotemporal nonlinear effects in multimode fibres,” *Nature Photonics* **9** (5), 306–310
11. **L.G. Wright**, W.H. Renninger, D.N. Christodoulides, and F.W. Wise (2015) “Spatiotemporal dynamics of multimode optical solitons,” *Optics Express* **23** (3), 3492–3506
12. **L.G. Wright**, A. Kanabar, E. Moulton, S. Rubab and S.A.M. Hesp (2011) “Chemical Aging of Asphalt Cements from a Northern Ontario Pavement Trial,” *International Journal of Pavement Research and Technology* **4**, 259–268

## PEER-REVIEWED PUBLICATIONS (AS SECONDARY AUTHOR)

13. Y. Shen., Q. Zhan, **L.G. Wright et al.** (2023) “Roadmap on spatiotemporal light fields”, *J. Opt.*, **25** 093001
14. A. Senanian, **L.G. Wright**, P.F. Wade, H.K. Doyle, and P.L. McMahon (2023) “Programmable large-scale simulation of bosonic transport in optical synthetic frequency lattices”, *Nature Physics*.

15. T. Wang<sup>†</sup>, M.M. Sohoni<sup>†</sup>, **L.G. Wright**, M.M. Stein, S.-Y. Ma, T. Onodera, M.G. Anderson, P.L. McMahon (2023) “Image sensing with multilayer, nonlinear optical neural networks”, *Nature Photonics* **17**, 408–415.
16. H. Pourbeyram<sup>†</sup>, P. Sidorenko<sup>†</sup>, F.O. Wu<sup>†</sup>, N. Bender, **L.G. Wright**, D.N. Christodoulides, and F.W. Wise (2022) “Direct observations of thermalization to a Rayleigh–Jeans distribution in multimode optical fibres”, *Nature Physics* **18**, 695–690.
17. R. Yanagimoto<sup>†</sup>, E. Ng<sup>†</sup>, A. Yamamura, T. Onodera, **L.G. Wright**, M. Jankowski, M. M. Fejer, P.L. McMahon, H. Mabuchi (2022) “Onset of non-Gaussian quantum physics in pulsed squeezing with mesoscopic fields”, *Optica* **9** (4), 379–390.
18. T. Wang, S. Ma, **L.G. Wright**, T. Onodera, B. Richards, and P. L. McMahon (2022) “A photonic neural network using less than 1 photon per weight multiplication,” *Nature Communications* **13**, 123.
19. R. Yanagimoto, E. Ng, **L.G. Wright**, T. Onodera, and H. Mabuchi (2021) “Efficient simulation of ultrafast quantum nonlinear optics with matrix product states,” *Optica* **8**, 1306–1315
20. R. Yanagimoto<sup>†</sup>, T. Onodera<sup>†</sup>, E. Ng, **L.G. Wright**, P.L. McMahon, and H. Mabuchi (2020) “Engineering a Kerr-based Deterministic Cubic Phase Gate via Gaussian Operations”, *Physical Review Letters* **124**, 240503
21. P. Sidorenko, W. Fu, **L.G. Wright**, M. Olivier, and F.W. Wise (2018) “Self-seeded, multi-megawatt, Mamyshv oscillators,” *Optics Letters* **43** (11), 2672–2675
22. W. Fu, **L.G. Wright**, P. Sidorenko, S. Backus, and F.W. Wise (2018) “Several new directions for ultrafast fiber lasers,” *Optics Express* **26** (8), 9432–9463
23. W. Fu, **L.G. Wright**, and F.W. Wise (2017) “High-power femtosecond pulses without a modelocked laser,” *Optica* **4** (7), 831–834
24. Z. Liu, Z. Ziegler, **L.G. Wright**, and F.W. Wise (2017) “Megawatt peak power from a Mamyshv oscillators,” *Optica* **4** (6), 649–654
25. M. A. Eftekhari, **L.G. Wright**, M. S. Mills, M. Kolesik, R. Amezcua Correa, F. W. Wise, and D. N. Christodoulides (2017) “Versatile supercontinuum generation in parabolic multimode optical fibers,” *Optics Express* **25**, 9078–9087
26. Y. Tang, **L.G. Wright**, K. Charan, T. Wang, C. Xu, and F.W. Wise (2016) “Generation of intense 100 fs solitons tunable from 2 to 4.3  $\mu\text{m}$  in fluoride fiber,” *Optica* **3** (9), 948–951
27. Z. Zhu, **L.G. Wright**, D.N. Christodoulides, and F.W. Wise (2016) “Observation of multimode solitons in few-mode fiber,” *Optics Letters* **41** (20), 4819–4822
28. A. Fusaro, J. Garnier, C. Michel, G. Xu, J. Fatome, **L.G. Wright**, F.W. Wise, and A. Picozzi (2016) “Decoupled polarization dynamics of incoherent waves and bimodal spectral incoherent solitons,” *Optics Letters* **41** (17), 3992–3995
29. Z. Liu, **L.G. Wright**, D.N. Christodoulides, and F.W. Wise (2016) “Kerr self-cleaning of femtosecond-pulsed beams in graded-index multimode fiber,” *Optics Letters* **41** (16), 3675–3678
30. G. Lopez-Galmiche, Z.S. Eznaveh, M.A. Eftekhari, J.A. Lopez, **L.G. Wright**, F.W. Wise, D.N. Christodoulides, and R. Amezcua Correa (2016) “Visible supercontinuum generation in a graded index multimode fiber pumped at 1064 nm,” *Optics Letters* **41** (11), 2553–2556
31. A. Chong, **L.G. Wright**, and F.W. Wise (2015) “Ultrafast fiber lasers based on self-similar pulse evolution: a review of current progress,” *Reports on Progress in Physics* **78** (11), 113901
32. E.S. Lamb, **L.G. Wright**, and F.W. Wise (2014) “Divided-pulse lasers,” *Optics Letters* **39** (9), 2775–2777
33. P.J.L. Webster, **L.G. Wright**, Y. Ji, C.M. Galbraith, A.W. Kinross, C. Van Vlack, and J.M. Fraser (2014) “Automatic laser welding and milling with in situ inline coherent imaging,” *Optics Letters* **39** (21), 6217–6220

34. K.X.Z. Yu, **L.G. Wright**, P.J.L. Webster, and J.M. Fraser (2013) “Deep nonlinear ablation of silicon with a quasi-continuous wave fiber laser at 1070 nm,” *Optics Letters* **38** (11), 1799-1801
35. J. Lavoie, J.M. Donohue, **L.G. Wright**, A. Fedrizzi, and K.J. Resch (2013) “Spectral compression of single photons,” *Nature Photonics* **7** (5), 363-366
36. S. Rubab, K. Burke, **L.G. Wright**, S.A.M. Hesp (2011) “Effects of Engine Oil Residues on Asphalt Cement Quality,” *Proceedings of the 56th Annual Conference of the Canadian Technical Asphalt Association*, 01368658
37. P.J.L. Webster, **L.G. Wright**, K.D. Mortimer, B.Y.C. Leung, J.X.Z. Yu and J.M. Fraser (2011) “Automatic real-time guidance of laser machining with inline coherent imaging,” *Journal of Laser Applications* **23**, 022001

#### OTHER PUBLICATIONS

1. **L.G. Wright** and F.W. Wise (2020) “Exotic waves in multimode hollow-core fibres,” *Nature Photonics* **14** (12), 713-714
2. **L.G. Wright** and P.L. McMahon “The Capacity of Quantum Neural Networks”, arXiv:1908.01364
3. **L.G. Wright**, W.H Renninger, and F.W. Wise (2014) “Universal Three-Dimensional Optical Logic,” arXiv:1407.4947
4. 1001 Inventions that Changed the World, 2009 Cassell Illustrated, ISBN-10: 0764161369
5. Defining Moments in Science: Over a Century of the Greatest Discoveries, Experiments, Inventions, People, Publications, and Events that Rocked the World, 2008 Cassell Illustrated, ISBN-10:1844035891

#### HONORS

2018 and 2019	Senior Mong Fellowships	CORNELL NEUROTECH
2018	William Nichols Findley Award for “most exceptional research paper in 2017-2018”, for “Spatiotemporal mode-locking in multimode fiber lasers”.	CORNELL APPLIED PHYSICS
2018	Tingye Li Innovation Prize for innovative research, for “Spatiotemporal Mode-Locking”. 1 award to an author under the age 39 submitting a paper to CLEO (1000-1500 papers).	OPTICAL SOCIETY (OSA)
2017	Outstanding Reviewer Recognition given to the top ~15 reviewers for OSA journals based on editor recommendations.	OPTICAL SOCIETY (OSA)
2017	DJ Lovell Scholarship “The largest and most prestigious scholarship of SPIE”, 1 award.	SPIE
2015	William Nichols Findley Award for “most exceptional research paper in 2014-2015”, for “Controllable spatiotemporal nonlinear effects in multimode fibres”.	CORNELL APPLIED PHYSICS
2013 – 2016	Sage Postgraduate Fellowship	CORNELL UNIVERSITY
2012 – 2016	Postgraduate Fellowship	NSERC
2012	Olin Postgraduate Fellowship	CORNELL UNIVERSITY
2012	University Medal in Engineering Physics for top-ranked student.	QUEEN'S UNIVERSITY
2012	Engineering Physics Design Award for top-ranked undergraduate thesis.	QUEEN'S UNIVERSITY
2011	Harold Arthur Cohen Prize for “student with most promise for inventiveness and discovery”.	QUEEN'S UNIVERSITY

2010	1st place in poster competition for “Automatic real-time guidance of laser machining with inline coherent imaging”.	ICALEO
2010, 2011, 2012	Undergraduate research awards in physics	NSERC
2009	Undergraduate research award in chemistry	NSERC
2008	Highest Honors	CANADA-WIDE VIRTUAL SCIENCE FAIR

#### SERVICE TO THE SCIENTIFIC COMMUNITY

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2023 – 2024	IEEE Summer Topicals Meeting	PROGRAM SUBCOMMITTEE
2023 – 2024	CLEO	PROGRAM SUBCOMMITTEE
2023 – 2024	IEEE Photonics Conference	PROGRAM SUBCOMMITTEE
2022 – 2023	CLEO	PROGRAM SUBCOMMITTEE
2022 – 2023	IEEE Photonics Conference	PROGRAM SUBCOMMITTEE
2021 – 2022	Nonlinear Photonics Conference	PROGRAM SUBCOMMITTEE
2021 – 2022	CLEO	PROGRAM SUBCOMMITTEE
2020 – 2021	CLEO	PROGRAM SUBCOMMITTEE
2019 – 2020	Nonlinear Photonics Conference	PROGRAM SUBCOMMITTEE
2019 – 2020	CLEO Pacific Rim	PROGRAM SUBCOMMITTEE