This document gives a list of my publications and conferences. It includes the peer-reviewed articles I contributed to, and my theses. Also included are my conference presentations, proceedings, and posters. Each section is listed chronologically. Publications related to work done before my postdoc are separated. My five most relevant publications are indicated below with the special symbol '☞', and their respective abstract is included.

In addition to my group webpage, my profiles on Google Scholar, ResearchGate and LinkedIn can be consulted.

PEER-REVIEWED ARTICLES

25. E. J. Stanton, J. Chiles, N. Nader, G. Moody, **N. Volet**, L. Chang, J. E. Bowers, S. W. Nam, and R. P. Mirin, "Efficient second harmonic generation in nanophotonic GaAs-on-insulator waveguides", *Opt. Express* **28**, 9521–9532 (2020.03.30).

24. A. S. Raja, J. Liu, **N. Volet**, R. N. Wang, J. He, E. Lucas, R. Bouchand, P. Morton, J. Bowers, and T. J. Kippenberg, "Chip-based soliton microcomb module using a hybrid semiconductor laser", *Opt. Express* **28**, 2714–2721 (2020.01.21).

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23. L. Chang, A. Boes, P. Pintus, J. D. Peters, MJ Kennedy, X.-W. Guo, **N. Volet**, S.-P. Yu, S. B. Papp, and J. E. Bowers, "Strong frequency conversion in heterogeneously integrated GaAs resonators", *APL Photonics* **4**, 036103 (2019.03.15).

22. E. J. Stanton, A. Spott, J. Peters, M. L. Davenport, A. Malik, **N. Volet**, J. Liu, C. D. Merritt, I. Vurgaftman, C. S. Kim, J. R. Meyer, and J. E. Bowers, "Multi-spectral quantum cascade lasers on silicon with integrated multiplexers", *Photonics* **6**, 6 (2019.01.24).

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21. L. Chang, A. Boes, X. Guo, D. T. Spencer, MJ Kennedy, J. D. Peters, **N. Volet**, J. Chiles, A. Kowligy, N. Nader, D. Hickstein, E. J. Stanton, S. A. Diddams, S. B. Papp, and J. E. Bowers, "Heterogeneously integrated GaAs waveguides on insulator for efficient frequency conversion", *Laser Photon. Rev.* **12**, 1800149 (2018.08.14).

20. ☞ D. T. Spencer, T. Drake, T. C. Briles, J. Stone, L. C. Sinclair, C. Fredrick, Q. Li, D. Westly, B. R. Ilic, A. Bluestone, **N. Volet**, T. Komljenovic, L. Chang, S. H. Lee, D. Y. Oh, M.-G. Suh, K. Y. Yang, M. H. P. Pfeiffer, T. J. Kippenberg, E. Norberg, L. Theogarajan, K. Vahala, N. R. Newbury, K. Srinivasan, J. E. Bowers, S. A. Diddams, and S. B. Papp, "An optical-frequency synthesizer using integrated photonics", *Nature* **557**, 81–85 (2018.04.25).

    Abstract: *"Optical-frequency synthesizers, which generate frequency-stable light from a single microwave-frequency reference, are revolutionizing ultrafast science and metrology, but their size, power requirement and cost need to be reduced if they are to be more widely used. Integrated-photonics microchips can be used in high-coherence applications, such as data transmission, highly optimized physical sensors and harnessing quantum states, to lower cost and increase efficiency and portability. Here we describe a method for synthesizing the absolute frequency of a lightwave signal, using integrated photonics to create a phase-coherent microwave-to-optical link. We use a heterogeneously integrated III–V/silicon tunable laser, which is guided by nonlinear frequency combs fabricated on separate silicon chips and pumped by off-chip lasers. The laser frequency output of our optical-frequency synthesizer can be programmed by a microwave clock across 4 terahertz near 1,550 nanometres (the telecommunications C-band) with 1 hertz resolution. Our measurements verify that the output of the synthesizer is exceptionally stable across this region (synthesis error of* 7.7×10^{-15} *or below). Any application of an optical-frequency source could benefit from the high-precision optical synthesis presented here. Leveraging high-volume semiconductor processing built around advanced materials could allow such low-cost, low-power and compact integrated-photonics devices to be widely used."*

19. ☞ **N. Volet**, X. Yi, Q.-F. Yang, E. J. Stanton, P. A. Morton, K. Y. Yang, K. J. Vahala, and J. E. Bowers, "Micro-resonator soliton generated directly with a diode laser", *Laser Photon. Rev.* **12**, 1700307 (2018.04.17).

    Abstract: *"An external-cavity diode laser for 1550-nm wavelength is reported with ultra-low noise, high power coupled to a fiber, and fast tunability. These characteristics enable the generation of an optical frequency comb in a silica micro-resonator with a single-soliton state. Neither an optical amplifier nor a modulator is used in the experiment. This demonstration greatly simplifies the soliton generation setup and represents a significant step forward to a fully integrated soliton comb system."*

18. E. J. Stanton, **N. Volet**, and J. E. Bowers, "Silicon arrayed waveguide gratings at 2.0-µm wavelength characterised with an on-chip resonator", *Opt. Lett.* **43**, 1135–1138 (2018.03.01).

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17. A. S. P. Khope, T. Hirokawa, A. M. Netherton, M. Saeidi, Y. Xia, **N. Volet**, C. Schow, R. Helkey, L. Theogarajan, A. A. M. Saleh, J. E. Bowers, and R. C. Alferness, "On-chip wavelength locking for photonic switches", *Opt. Lett.* **42**, 4934–4937 (2017.11.27).

16. E. J. Stanton, **N. Volet**, and J. E Bowers, "Low-loss demonstration and refined characterization of silicon arrayed waveguide gratings in the near-infrared", *Opt. Express* **25**, 30651–30663 (2017.11.22).

15. A. Bluestone, A. Jain, **N. Volet**, D. T. Spencer, S. B. Papp, S. A. Diddams, J. E. Bowers, and L. Theogarajan, "Heterodyne-based hybrid controller for wide dynamic range optoelectronic frequency synthesis", *Opt. Express* **25**, 29086–29097 (2017.11.08).

14. A. Spott, E. J. Stanton, **N. Volet**, J. D. Peters, J. R. Meyer, and J. E. Bowers, "Heterogeneous Integration for Mid-Infrared Silicon Photonics", *IEEE J. Sel. Top. Quantum Electron.* **23**, 8200810 (2017.04.24). ***Invited review paper***.

13. ☞ **N. Volet**, A. Spott, E. J. Stanton, M. L. Davenport, L. Chang, J. D. Peters, T. C. Briles, I. Vurgaftman, J. R. Meyer, and J. E. Bowers, "Semiconductor optical amplifier at 2.0-µm wavelength on silicon", *Laser Photon. Rev.* **11**, 1600165 (2017.03.01).

    Abstract: *"The first semiconductor optical amplifier at 2.0-µm wavelength is reported. This device is heterogeneously integrated by directly bonding an InP-based active region to a silicon substrate. It is therefore compatible with low-cost and high-volume fabrication infrastructures, and can be efficiently coupled to other active and passive devices in a photonic integrated circuit. On-chip gain larger than 13 dB is demonstrated at 20°C, with a 3-dB bandwidth of 75 nm centered at 2.01 µm. No saturation of the gain is observed for an on-chip input power up to 0 dBm, and on-chip gain is demonstrated for temperatures up to at least 50°C. This technology paves the way to chip-level applications for industrial or medical monitoring, optical communication and non-linear optics."*

12. L. Chang, M. H. P. Pfeiffer, **N. Volet**, M. Zervas, J. D. Peters, C. L. Manganelli, E. J. Stanton, Y. Li, T. J. Kippenberg, and J. E. Bowers, "Heterogeneous integration of lithium niobate and silicon nitride waveguides for wafer-scale photonic integrated circuits on silicon", *Opt. Lett.* **42**, 803–806 (2017.02.13).

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11. M. L. Davenport, S. Skendžić, **N. Volet**, J. C. Hulme, M. J. R. Heck, and J. E. Bowers, "Heterogeneous Silicon/III-V Semiconductor Optical Amplifiers", *IEEE J. Sel. Top. Quantum Electron.* **22**, 3100111 (2016.07.19). ***Invited review paper***.

10. L. Wang, L. Chang, **N. Volet**, M. H. P. Pfeiffer, M. Zervas, H. Guo, T. J. Kippenberg, and J. E. Bowers, "Frequency comb generation in the green using silicon nitride microresonators", *Laser Photon. Rev.* **10**, 631–638 (2016.06.28).

9. ☞ L. Chang, Y. Li, **N. Volet**, L. Wang, J. D. Peters, and J. E. Bowers, "Thin film wavelength converters for photonic integrated circuits", *Optica* **3**, 531–535 (2016.05.13).

    Abstract: *"Quasi-phase-matched (QPM) wavelength converters are highly desirable for emerging nonlinear optics applications in photonic integrated circuits, but available waveguide and quasi-phase-matching technologies have so far constrained their realization. In this work, we present a periodically poled lithium niobate (LN) waveguide on a silicon nitride-thin film LN platform. It contains a submicrometer waveguide core for enhancing nonlinear interactions that is more than one order of magnitude smaller than those of previous QPM waveguides. Periodic poling was applied directly to the thin film LN for quasi-phase-matching by a new surface poling technology. We demonstrated 160 % $W^{-1} \cdot cm^{-2}$ normalized efficiency for second harmonic generation at 1530 nm with ultralow propagation loss (0.3 dB/cm) in the telecom band. This highly efficient and compact wavelength converter has the potential for straightforward integration with various photonic platforms, e.g., on-chip microsystems such as optical communication networks, quantum storage, and optical frequency referencing."*

8. E. J. Stanton, A. Spott, M. L. Davenport, **N. Volet**, and J. E. Bowers, "Low-loss arrayed waveguide grating at 760 nm", *Opt. Lett.* **41**, 1785–1788 (2016.04.11).

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7. A. Sirbu, A. Rantamäki, E. J. Saarinen, V. Iakovlev, J. Lyytikäinen, A. Mereuta, A. Caliman, **N. Volet**, O. G. Okhotnikov, and E. Kapon, "High performance wafer-fused semiconductor disk lasers emitting in the 1300 nm waveband", *Opt. Express* **22**, 29398–29403 (2014.11.17).

6. T. Czyszanowski, **N. Volet**, J. Walczak, M. Dems, R. P. Sarzała, V. Iakovlev, A. Sirbu, A. Mereuta, A. Caliman, and E. Kapon, "Numerical Analysis of Mode Discrimination by Intracavity Patterning in Long-Wavelength Wafer-Fused Vertical-Cavity Surface-Emitting Lasers", *IEEE J. Quantum Electron.* **50**, 732–740 (2014.06.18).

5. T. Czyszanowski, **N. Volet**, J. Walczak, M. Dems, and R. Sarzała, "Intra-cavity patterning – a new method of single mode emission enhancement", *Photon. Lett. Poland* **6**, 26–28 (2014.03.31).

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4. ☞ **N. Volet**, T. Czyszanowski, J. Walczak, L. Mutter, B. Dwir, Z. Micković, P. Gallo, A. Caliman, A. Sirbu, A. Mereuta, V. Iakovlev, and E. Kapon, "Transverse mode discrimination in long-wavelength wafer-fused vertical-cavity surface-emitting lasers by intra-cavity patterning", *Opt. Express* **21**, 26983–26989 (2013.10.31).

   Abstract: *"Transverse mode discrimination is demonstrated in long-wavelength wafer-fused vertical-cavity surface-emitting lasers using ring-shaped air gap patterns at the fused interface between the cavity and the top distributed Bragg reflector. A significant number of devices with varying pattern dimensions was investigated by on-wafer mapping, allowing in particular the identification of a design that reproducibly increases the maximal single-mode emitted power by about 30 %. Numerical simulations support these observations and allow specifying optimized ring dimensions for which higher-order transverse modes are localized out of the optical aperture. These simulations predict further enhancement of the single-mode properties of the devices with negligible penalty on threshold current and emitted power."*

3. T. Czyszanowski, R. P. Sarzała, M. Dems, J. Walczak, M. Wasiak, W. Nakwaski, V. Iakovlev, **N. Volet**, and E. Kapon, "Spatial-Mode Discrimination in Guided and Antiguided Arrays of Long-Wavelength VCSELs", *IEEE J. Sel. Top. Quantum Electron.* **19**, 1702010 (2013.03.07).

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2. A. Sirbu, **N. Volet**, A. Mereuta, J. Lyytikäinen, J. Rautiainen, O. Okhotnikov, J. Walczak, M. Wasiak, T. Czyszanowski, A. Caliman, Q. Zhu, V. Iakovlev, and E. Kapon, "Wafer-Fused Optically Pumped VECSELs Emitting in the 1310-nm and 1550-nm Wavebands", *Adv. Opt. Technol.* **2011**, 209093 (2011.08). ***Review paper***.

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1. **N. Volet**, and E. Kapon, "Turn-on delay and Auger recombination in long-wavelength vertical-cavity surface-emitting lasers", *Appl. Phys. Lett.* **97**, 131102 (2010.09.27).

ORAL PRESENTATIONS AT CONFERENCES

50. **N. Volet**, "Chip-based soliton microcomb using an ultralow-noise diode laser", in *SPIE Photonics Europe*, Strasbourg, France (2020.03.30). Paper 11364-20. ***Invited talk***.

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49. A. S. Raja, J. Liu, **N. Volet**, R. Ning Wang, J. He, E. Lucas, R. Bouchand, P. Morton, J. Bowers, and T. J. Kippenberg, "Photonic Chip-based Soliton Microcomb Driven by a Compact Ultra-low-noise Laser", in *Conference on Lasers and Electro-Optics* (CLEO) Europe, Munich, Germany (2019.06.26). Paper CD-7.4.

48. A. S. Raja, J. Liu, **N. Volet**, R. Ning Wang, J. He, E. Lucas, R. Bouchand, P. Morton, J. Bowers, and T. J. Kippenberg, "Integrated Si_3N_4 Soliton Microcomb Driven by a Compact Ultra-low-noise Laser", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2019.05.07). Paper STu3J.2.

47. J. E. Bowers, **N. Volet**, *et al.*, "Chip-Scale Optical Resonator Enabled Synthesizer (CORES)", in *GOMACTech Conference*, Albuquerque, NM, USA (2019.03.25-28). Paper 15-4. ***Invited talk***.

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46. L. Chang, A. Boes, P. Pintus, J. D. Peters, MJ Kennedy, X. Guo, **N. Volet**, S. Yu, S. A. Diddams, S. B. Papp, and J. E. Bowers, "High efficiency SHG in heterogeneous integrated GaAs ring resonators", in *IEEE Photonics Conference* (IPC), Reston, VA, USA (2018.10.04). ***Post-deadline paper***.

45. **N. Volet**, X. Yi, Q.-F. Yang, E. J. Stanton, P. A. Morton, K. Y. Yang, K. J. Vahala, and J. E. Bowers, "Temporal soliton generated in a micro-resonator directly with a diode laser", in *OSA Advanced Photonics Congress* (APC), Zurich, Switzerland (2018.07.05). Paper ITh2J.3. ***Invited talk***.

44. E. J. Stanton, A. Spott, J. D. Peters, M. L. Davenport, **N. Volet**, A. Malik, J. Liu, C. Merritt, W. Bewley, I. Vurgaftman, C. S. Kim, J. Meyer, and J. E. Bowers, "Quantum cascade multi-spectral laser with integrated beam combiner on silicon", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2018.05.17). Paper STh1B.7.

43. L. Chang, X. Guo, D. Spencer, J. Chiles, A. Kowligy, N. Nader, D. Hickstein, MJ Kennedy, A. Boes, **N. Volet**, S. Diddams, S. Papp, and J. E. Bowers, "A gallium arsenide nonlinear platform on silicon", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2018.05.15). Paper STu3F.5. ***Invited talk***.

42. **N. Volet**, X. Yi, Q.-F. Yang, E. J. Stanton, P. A. Morton, K. Y. Yang, K. J. Vahala, and J. E. Bowers, "Temporal soliton locked in a micro-resonator pumped by a diode laser without an amplifier", in *Optical Fiber Communication* (OFC), San Diego, CA, USA (2018.03.15). Paper Th1I.3.

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41. D. T. Spencer, T. C. Briles, T. Drake, J. Stone, R. Ilic, Q. Li, L. Sinclair, D. Westly, N. Newbury, K. Srinivasan, S. A. Diddams, and S. Papp, A. Bluestone, T. Komljenovic, **N. Volet**, L. Theogarajan, and J. E. Bowers, M.-G. Suh, K. Y. Yang, S. H. Lee, D. Y. Oh, and K. Vahala, M. H. P. Pfeiffer and T. J. Kippenberg, E. Norberg, "Full Stabilization and Control of an Integrated Photonics Optical Frequency Synthesiser", in *IEEE Photonics Conference* (IPC), Lake Buena Vista, FL, USA (2017.10.03). Paper TuB3.3.

40. W. Jin, E. J. Stanton, **N. Volet**, R. G. Polcawich, D. Baney, P. Morton, and J. E. Bowers, "Piezoelectric tuning of a suspended silicon nitride ring resonator", in *IEEE Photonics Conference* (IPC), Lake Buena Vista, FL, USA (2017.10.02). Paper MD3.2.

39. A. S. P. Khope, A. M. Netherton, T. Hirokawa, **N. Volet**, E. J. Stanton, C. Schow, R. Helkey, A. A. M. Saleh, J. E. Bowers, and R. C. Alferness, "Elastic WDM optoelectronic crossbar switch with on-chip wavelength control", in *OSA Advanced Photonics Congress* (APC), New Orleans, LA, USA (2017.07.27). Paper PTh1D.3.

38. **N. Volet**, "Heterogeneous integration of photonics integrated circuits on silicon" in *Light Science Workshop*, UCSB, CA, USA (2017.05.10).

37. E. J. Stanton, **N. Volet**, and J. E. Bowers, "Low-loss arrayed waveguide grating at 2.0 µm", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2017.05.18). Paper STh1M.7.

36. E. J. Stanton, **N. Volet**, T. Komljenovic, and J. E. Bowers, "Star coupler for high-etendue LIDAR", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2017.05.18). Paper STh1M.4.

35. L. Chang, M. H. P. Pfeiffer, **N. Volet**, M. Zervas, J. D. Peters, C. L. Manganelli, E. J. Stanton, Y. Li, T. J. Kippenberg, and J. E. Bowers, "A lithium niobate-Si_3N_4 platform on silicon by heterogeneous wafer bonding", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2017.05.15). Paper SM4O.2.

34. D. T. Spencer, A. Bluestone, J. E. Bowers, T. C. Briles, S. A. Diddams, T. Drake, R. Ilic, T. J. Kippenberg, T. Komljenovic, S. Hoon Lee, Q. Li, N. Newbury, E. Norberg, D. Yoon Oh, S. Papp, M. H. P. Pfeiffer, L. Sinclair, K. Srinivasan, J. Stone, M.-G. Suh, L. Theogarajan, K. Vahala, **N. Volet**, D. Westly, K. Y. Yang, "Towards an Integrated-Photonics Optical-Frequency Synthesizer With <1 Hz Residual Frequency Noise", in *Optical Fiber Communication* (OFC), Los Angeles, CA, USA (2017.03.20). Paper M2J.2.

33. E. J. Stanton, A. Spott, **N. Volet**, and J. E. Bowers, "High-brightness lasers on silicon by beam combining", in *SPIE Photonics West*, San Francisco, CA, USA (2017.01.31). Paper 10108-19. ***Invited talk***.

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32. L. Chang, **N. Volet**, Y. Li, J. D. Peters, and J. E. Bowers, "A thin-film PPLN waveguide for second-harmonic generation at 2-µm", in *IEEE Photonics Conference* (IPC), Waikoloa, HI, USA (2016.10.05). Paper WE2.4.

31. **N. Volet**, E. J. Stanton, M. L. Davenport, A. Spott, L. Chang, and J. E. Bowers, "Refined procedure for gain measurement in Fabry-Perot semiconductor lasers", in *IEEE Photonics Conference* (IPC), Waikoloa, HI, USA (2016.10.05). Paper WC1.2.

30. M. L. Davenport, L. Chang, D. Huang, **N. Volet**, and J. E. Bowers, "Heterogeneous Photonic Integration By Direct Wafer Bonding", in *Pacific Rim Meeting* (PRiME), Honolulu, HI, USA (2016.10.04). Paper MA2016-02. ***Invited talk***.

29. E. J. Stanton, **N. Volet**, and J. E. Bowers, "Ring resonator with cascaded arrayed waveguide gratings for accurate insertion loss measurement", in *IEEE Photonics Conference* (IPC), Waikoloa, HI, USA (2016.10.03). Paper MB3.4.

28. **N. Volet**, "Multi-spectral optical frequency combs generated with micro-ring resonators integrated on silicon", in *Workshop of the Centre for Silicon Photonics for Optical Communications* (SPOC), Ringsted, Denmark (2016.08.24). ***Invited talk***.

27. L. Chang, Y. Li, **N. Volet**, L. Wang, J. D. Peters, and J. E. Bowers, "Sub-micron periodically-poled lithium niobate waveguide for integrated nonlinear optics", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2016.06.09). Paper STh3P.2.

26. **N. Volet**, L. Chang, L. Wang, M. H. P. Pfeiffer, M. Zervas, H. Guo, T. J. Kippenberg, and J. E. Bowers, "Generation of an optical frequency comb in the green with silicon nitride microresonators", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2016.06.08). Paper SW1E.4.

25. **N. Volet**, A. Spott, E. J. Stanton, M. L. Davenport, J. D. Peters, J. R. Meyer, and J. E. Bowers, "Semiconductor optical amplifiers at 2.0-µm wavelength heterogeneously integrated on silicon", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2016.06.06). Paper SM4G.4.

24. M. L. Davenport, S. Skendžić, **N. Volet**and J. E. Bowers, "Heterogeneous Silicon/InP Semiconductor Optical Amplifiers with High Gain and High Saturation Power", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2016.06.06). Paper SM4G.3.

23. E. J. Stanton, A. Spott, M. L. Davenport, **N. Volet**, and J. E. Bowers, "Arrayed waveguide grating near 760 nm wavelength for integrated spectral beam combining applications", in *Conference on Lasers and Electro-Optics* (CLEO), San Jose, CA, USA (2016.06.06). Paper SM1F.1.

22. J. E. Bowers, **N. Volet**, *et al.*, "Chip-Scale Optical Resonator Enabled Synthesizer (CORES): Miniature systems for Optical Frequency Synthesis", in *IEEE International Frequency Control Symposium* (IFCS), New Orleans, LA, USA (2016.05.11). ***Invited talk***.

2015

21. **N. Volet**, "Heterogeneous Silicon III-V Photonic Integrated Circuits", in *Workshop of the Centre for Silicon Photonics for Optical Communications* (SPOC), Funen, Denmark (2015.08.18). ***Invited talk***.

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20. E. Kapon, A. Sirbu. V. Iakovlev, A. Mereuta, A. Caliman, G. Suruceanu, C. Long, **N. Volet**, and D. Ellafi, "Recent Progress in Long-Wavelength Vertical Cavity Lasers Made by Wafer Fusion", in *International Conference and Exhibition on Optics and Electro-Optics* (OASIS), Tel Aviv, Israel (2015.03.03). ***Invited talk***.

19. **N. Volet**, "Theory and characterization of elliptically polarized modes in vertical-cavity surface-emitting Lasers", in *SPIE Photonics West*, San Francisco, CA, USA (2015.02.12). Paper 93810U.

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18. **N. Volet**, B. Dwir, L. Mutter, V. Iakovlev, A. Caliman, A. Mereuta, A. Sirbu, G. Suruceanu, and E. Kapon, "Stokes parameters and hybridization of optical modes in long-wavelength VCSELs", in *IEEE Photonics Conference* (IPC), San Diego, CA, USA (2014.10.13). Paper ME2.3.

17. A. Sirbu, V. Iakovlev, A. Mereuta, A. Caliman, **N. Volet**, E. Kapon, A. Rantamäki, E. Saarinen, J. Lyytikäinen, and O. Okhotnikov, "High power 1300 nm semiconductor disk lasers", in *IEEE International Semiconductor Laser Conference* (ISLC), Palma de Mallorca, Spain (2014.09.10). Paper WA6.

16. T. Czyszanowski, M. Dems, V. Iakovlev, **N. Volet**, and E. Kapon, "Spatial mode discrimination in anti-guided arrays of long-wavelength VCSELs", in *SPIE Photonics West*, San Francisco, CA, USA (2014.02.06). Paper 90010H.

15. A. Sirbu, K. Pierscinski, A. Mereuta, V. Iakovlev, A. Caliman, Z. Micovic, **N. Volet**, J. Rautiainen, J. Heikkinen, J. Lyytikäinen, A. Rantamäki, O. Okhotnikov, and E. Kapon, "Wafer-fused VECSELs emitting in the 1310nm waveband", in *SPIE Photonics West*, San Francisco, CA, USA (2014.02.02). Paper 89660G. ***Invited talk***.

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14. T. Czyszanowski, M. Dems, V. Iakovlev, **N. Volet**, and E. Kapon, "Spatial mode discrimination in anti-guided arrays of long wavelength VCSELs", in *European VCSEL Day*, Lausanne, Switzerland (2013.05.31).

13. **N. Volet**, T. Czyszanowski, J. Walczak, L. Mutter, B. Dwir, Z. Micković, P. Gallo, V. Iakovlev, A. Caliman, A. Sirbu, A. Mereuta, and E. Kapon, "Transverse mode discrimination in long-wavelength wafer-fused vertical-cavity surface-emitting lasers by intra-cavity patterning", in *European VCSEL Day*, Lausanne, Switzerland (2013.05.31).

12. Ch. M. Long, **N. Volet**, B. Dwir, V. Iakovlev, A. Sirbu, A. Mereuta, A. Caliman, G. Suruceanu, and E. Kapon, "Optical Injection of a 1.3 µm Wavelength VCSEL with Intracavity Patterning", in *Conference on Lasers and Electro-Optics* (CLEO) Europe, Munich, Germany (2013.05.16). Paper CB-8.5.

11. T. Czyszanowski, M. Dems, M. Wasiak, R. P. Sarzała, E. Lamothe, **N. Volet**, V. Iakovlev, and E. Kapon, "How to control single mode emission of VCSEL arrays?", in *Conference on Lasers and Electro-Optics* (CLEO) Europe, Munich, Germany (2013.05.13). Paper CB-P.34.

10. **N. Volet**, T. Czyszanowski, J. Walczak, L. Mutter, B. Dwir, Z. Micković, P. Gallo, V. Iakovlev, A. Sirbu, A. Caliman, A. Mereuta, and E. Kapon, "Spatial mode discrimination using intra-cavity patterns in long-wavelength wafer-fused vertical-cavity surface-emitting lasers", in *SPIE Photonics West*, San Francisco, CA, USA (2013.02.07). Paper 86390S.

9. A. Sirbu, A. Caliman, A. Mereuta, K. Pierscinski, A. Rantamäki, J. Lyytikäinen, J. Rautiainen, V. Iakovlev, **N. Volet**, O. Okhotnikov, and E. Kapon, "Recent progress in wafer-fused VECSELs emitting in the 1310-nm and 1550-nm bands", in *SPIE Photonics West*, San Francisco, CA, USA (2013.02.04). Paper 86060F. ***Invited talk***.

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8. A. Sirbu, A. Mereuta, A. Caliman, G. Suruceanu, V. Iakovlev, K. Pierscinski, **N. Volet**, J. Lyytikäinen, J. Rautiainen, O. Okhotnikov, J. Walczak, M. Wasiak, T. Czyszanowski, and E. Kapon, "Wafer fusion technology for optically and electrically pumped 1310 nm and 1550 nm bands VECSELs", in *European Workshop on VeCSELs*, Montpellier, France (2012.10.17).

7. **N. Volet**, L. Mutter, T. Czyszanowski, B. Dwir, J. Walczak, V. Iakovlev, A. Sirbu, A. Caliman, P. Gallo, A. Mereuta, and E. Kapon, "Spatial mode discrimination using intra-cavity patterns in long-wavelength wafer-fused vertical-cavity surface-emitting lasers", in *European Semiconductor Laser Workshop* (ESLW), Brussels, Belgium (2012.09.21).

6. A. Sirbu, V. Iakovlev, D. Ellafi, Z. Micković, **N. Volet**, A. Mereuta, A. Caliman, G. Suruceanu, and E. Kapon, "1310 nm fused VCSELs performance and reliability", in *European VCSEL Day*, Berlin, Germany (2012.06.01).

5. A. Sirbu, A. Mereuta, A. Caliman, V. Iakovlev, G. Suruceanu, **N. Volet**, J. Rautiainen, J. Lyytikäinen, O. Okhotnikov, and E. Kapon, "Long wavelength VCSELs and VECSELs fabricated by wafer fusion: technology and fabrication", in *SPIE Photonics Europe*, Brussels, Belgium (2012.04.17).

4. **N. Volet**, V. Iakovlev, A. Mereuta, A. Caliman, A. Sirbu, G. Suruceanu, and E. Kapon, "Polarization mode structure in long-wavelength wafer-fused vertical-cavity surface-emitting lasers", in *SPIE Photonics Europe*, Brussels, Belgium (2012.04.16). Paper 84320B. ***Best student presentation award***.

2011

3. A. Sirbu, A. Mereuta, A. Caliman, **N. Volet**, Q. Zhu, V. Iakovlev, J. Rautiainen, J. Lyytikäinen, O. Okhotnikov, J. Walczak, M. Wasiak, T. Czyszanowski, and E. Kapon, "High-power optically-pumped VECSELs emitting in the 1310-nm and 1550-nm wavebands", in *SPIE Photonics West*, San Francisco, CA, USA (2011.01.24). Paper 7919-02. ***Invited talk***.

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2. A. Sirbu, **N. Volet**, A. Mereuta, J. Lyytikäinen, J. Rautiainen, O. Okhotnikov, J. Walczak, M. Wasiak, T. Czyszanowski, A. Caliman, Q. Zhu, V. Iakovlev, and E. Kapon, "Recent progress in long-wavelength wafer-fused VCSELs and VECSELs", in *European VCSEL Day*, Turin, Italy (2010.05.07).

1. **N. Volet**, and E. Kapon, "Turn-on delay and Auger recombination in long-wavelength vertical-cavity surface-emitting lasers", in *SPIE Photonics Europe*, Brussels, Belgium (2010.04.12). Paper 772009.

PROCEEDINGS AT CONFERENCES

14. **N. Volet**, "Chip-based soliton microcomb using an ultralow-noise diode laser", *Proc. SPIE* **11364**, 113640K (2020.04). ***Invited paper***.

13. J. E. Bowers, **N. Volet**, *et al.*, "Chip-Scale Optical Resonator Enabled Synthesizer (CORES)", in *GOMACTech Conference* (2019.03). ***Invited paper***.

12. E. J. Stanton, A. Spott, **N. Volet**, M. L. Davenport, and J. E. Bowers, "High-brightness lasers on silicon by beam combining", *Proc. SPIE* **10108**, 101080K (2017.02). ***Invited paper***.

11. M. L. Davenport, L. Chang, D. Huang, **N. Volet**, and J. E. Bowers, "Heterogeneous Photonic Integration by Direct Wafer Bonding", *ECS Trans.* **75**, 179-183 (2016.10). ***Invited paper***.

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9. **N. Volet**, "Theory and characterization of elliptically polarized modes in vertical-cavity surface-emitting lasers", *Proc. SPIE* **9381**, 93810U (2015.02).

8. T. Czyszanowski, M. Dems, R. P. Sarzała, V. Iakovlev, **N. Volet**, and E. Kapon, "Spatial mode discrimination in anti-guided arrays of long-wavelength VCSELs", *Proc. SPIE* **9001**, 90010H (2014.02).

7. A. Sirbu, K. Pierscinski, A. Mereuta, V. Iakovlev, A. Caliman, Z. Micković, **N. Volet**, J. Rautiainen, J. Heikkinen, J. Lyytikainen, A. Rantamäki, O. Okhotnikov, and E. Kapon, "Wafer-fused VECSELs emitting in the 1310 nm waveband", *Proc. SPIE* **8966**, 89660G (2014.02). ***Invited paper***.

6. **N. Volet**, T. Czyszanowski, J. Walczak, L. Mutter, B. Dwir, Z. Micković, P. Gallo, V. Iakovlev, A. Sirbu, A. Caliman, A. Mereuta, and E. Kapon, "Improved single-mode emission characteristics of long-wavelength wafer-fused vertical-cavity surface-emitting lasers by intra-cavity patterning", *Proc. SPIE* **8639**, 86390S (2013.02).

5. A. Sirbu, A. Caliman, A. Mereuta, K. Pierscinski, A. Rantamäki, J. Lyytikäinen, J. Rautiainen, V. Iakovlev, **N. Volet**, O. Okhotnikov, and E. Kapon, "Recent progress in wafer-fused VECSELs emitting in the 1310 nm and 1550 nm bands", *Proc. SPIE* **8606**, 86060F (2013.02). ***Invited paper***.

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3. **N. Volet**, V. Iakovlev, A. Sirbu, A. Caliman, G. Suruceanu, A. Mereuta, and E. Kapon, "Polarization mode structure in long-wavelength wafer-fused vertical-cavity surface-emitting lasers", *Proc. SPIE* **8432**, 84320B (2012.04). ***Best student paper award***.

2. A. Sirbu, A. Mereuta, A. Caliman, **N. Volet**, Q. Zhu, V. Iakovlev, J. Rautiainen, J. Lyytikäinen, O. Okhotnikov, J. Walczak, M. Wasiak, T. Czyszanowski, and E. Kapon, "High-power optically-pumped VECSELs emitting in the 1310-nm and 1550-nm wavebands", *Proc. SPIE* **7919**, 791903 (2011.01). ***Invited paper***.

1. **N. Volet**, and E. Kapon, "Turn-on delay and Auger recombination in long-wavelength vertical-cavity surface-emitting lasers", *Proc. SPIE* **7720**, 772009 (2010.04).

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9. N. Volet, B. Dwir, P. Gallo, A. Sirbu, V. Iakovlev, and E. Kapon, "Handedness properties of telecom VCSELs", in *IEEE International Semiconductor Laser Conference* (ISLC), Palma de Mallorca, Spain (2014.09.07-10). ***Invited poster***.

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7. N. Volet, V. Iakovlev, A. Mereuta, A. Caliman, A. Sirbu, G. Suruceanu, and E. Kapon, "Polarization mode structure in long-wavelength wafer-fused vertical-cavity surface-emitting lasers (VCSELs)", in *Nano-Tera Annual Plenary Meeting*, Zurich, Switzerland (2012.04.26-27).

6. N. Volet, A. Sirbu, A. Mereuta, A. Caliman, V. Iakovlev, and E. Kapon, "Electroplated Cu-substrate: an efficient solution for heat dissipation in 1500-nm VECSELs", in *Nano-Tera Annual Plenary Meeting*, Zurich, Switzerland (2012.04.26-27).

5. A. Sirbu, A. Caliman, A. Mereuta, V. lakovlev, N. Volet, and E. Kapon, "Electroplated Copper Heatsink For Electrically Pumped Vertical External Cavity Laser (E-VECSEL)", in *EPFL MicroNanoFabrication Annual Review Meeting*, EPFL, Switzerland (2012.03.23).

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Theses (before postdoc)

- N. Volet and E. Kapon, "Optical mode control in long-wavelength vertical-cavity surface-emitting lasers", *Ph.D. thesis*, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland (2014.04.04). [URL]
- N. Volet, N. Grandjean, and A. Freundlich, "Solar cells based on quantum confinement", *M.Sc. thesis*, EPFL, Switzerland and University of Houston, TX, USA (2009.02.05).
- N. Volet, G. Christmann, and N. Grandjean, "Exciton-polaritons in GaN Microcavities", *B.Sc. thesis*, EPFL, Switzerland (2008.08).
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