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|-----------------------|---|--|---|--|---|
| EDUCATION             | <b>Ph.D.</b> Paris, France<br>PARIS SACLAY UNIVERSITY 2012 - 2016   | <b>M.S.</b> Grenoble, France<br>GRENOBLE INP - PHELMA 2009 - 2012  |   |  |   |
| RESEARCH EXPERIENCES  | <b>University of Maryland - National Institute of Standards and Technology</b><br>ASSISTANT RESEARCH SCIENTIST<br><ul style="list-style-type: none"><li>Study of chip-scale integrated micro-resonators made <math>\chi^{(3)}</math> susceptible material for non-linear optics applications.</li><li>Study of novel dispersion designs for broader, shorter wavelength, and new state of frequency combs in pulse regime</li><li>Mentoring of students</li></ul> <b>University of Maryland - National Institute of Standards and Technology</b><br>POSTDOCTORAL ASSOCIATE<br><ul style="list-style-type: none"><li>Study of chip-scale integrated micro-resonators made of Silicon Nitride for <math>\chi^{(3)}</math> frequency comb applications.</li><li>Development of in-house modelling tools, fabrication in clean-room, development of new experimental setups</li></ul> <b>Thales Research and Technology</b><br>PHD CANDIDATE<br><ul style="list-style-type: none"><li>Study of carrier dynamics generated through <math>\chi^{(3)}</math> non-linearity in III-V photonic crystals cavities</li><li>Development of in-house computational solver (FDTD, FEM, CMT), fabrication and characterization through custom developed setups</li></ul> | Maryland, USA<br>Jul. 2021 - present<br><br><br><br><br><br><br><br><br><br><br>Maryland, USA<br>Feb. 2017 - Jun. 2021<br><br><br><br><br><br><br><br><br><br><br>Palaiseau, France<br>Dec. 2012 - Dec. 2016 |   |  |   |
| ACADEMIC EXPERIENCE   | <b>Teaching</b> <ul style="list-style-type: none"><li>Teaching assistant – 1<sup>st</sup> and 2<sup>nd</sup> year undergraduate student – UNIVERSITY PARIS SACLAY – 2014</li></ul> <b>Mentoring</b> <ul style="list-style-type: none"><li>Graduate Students: Edgar Perez – U.M.D – 2018 → present<br/>Tahmid Raman – U.M.D – 2019→present<br/>Khoi Tuan Hoang – U.M.D – 2020→present</li><li>Undergrad. Students: Dillion Cottrill – UNIVERSITY OF WEST VIRGINA – 2020<br/>Kristiana Ramos – U.M.D – 2021→present</li></ul> <b>Contribution to Funded Projects</b> <ul style="list-style-type: none"><li>Agence National de la Recherche (France): <i>AUCTOPUSS (2013-2015) – ETHAN (2015-2016)</i></li><li>DARPA (USA): <i>DODOS (2017-present) – ACES (2017-present) – APhi (2019-present) – LUMOS (2021-present) – SAVaNT (2021-present)</i></li><li>Space Force &amp; Air Force Research Laboratory (USA): <i>PICs for SCPNT (2022-present)</i></li></ul>   | Rahul Shrestha – U.M.D – 2020→present<br>Pradyoth Shandilya – U.M.B.C. – 2021→present<br>Michal Chojnacky – U.M.D – 2022→present   |   |  |   |
| SELECTED PUBLICATIONS | <b>Articles</b> <ul style="list-style-type: none"><li>X. Lu, G. Moille, et al. <i>Efficient photoinduced second-harmonic generation in silicon nitride photonics</i>. NATURE PHOTONICS (2020).</li><li>G. Moille, L. Chang, et al. <i>Dissipative Kerr Solitons in a III-V Microresonator</i>. LASERS &amp; PHOTONICS REVIEWS 14 (2020).</li></ul> <b>Book Chapter</b> <ul style="list-style-type: none"><li>G. Moille et al. Green Photonics and Electronics. “<i>Nanophotonic Approach to Energy-Efficient Ultra-Fast All-Optical Gates</i>”, pp. 107–137 . Springer, Cham, 2017.</li></ul> <b>Conferences</b> <ul style="list-style-type: none"><li>G. Moille et al. “<i>Post-Processing Dispersion Engineering of Frequency Combs In Microresonator Addressing Atomic Clock</i>”. 2020 Conference on Lasers and Electro-Optics (CLEO). (2020).</li><li>G. Moille et al. “<i>Chip-Integrated Soliton Microcombs at Cryogenic Temperatures</i>”. <i>Frontiers in Optics</i>. (2019).</li><li>G. Moille et al. “<i>Phase-locked two-color soliton microcombs</i>”. 2018 Conference on Lasers and Electro-Optics (CLEO). (2018).</li></ul>  |  |   |  |   |
| SERVICE TO COMMUNITY  | <b>Outreach</b> <ul style="list-style-type: none"><li>Maintaining and updating an active github profile to share scripts for experiment control and in-house developed simulations tools. Combined, they account for 22 forks, 28 stars and an average of 25 unique views per week.</li></ul> <b>Peer Reviewing</b> <ul style="list-style-type: none"><li>Referee for <i>Nature Communications, Physical Review Letters, Physical Review Applied, Physical Review A, Physical Review Research, Laser and Photonics Reviews, Optica, Optics Letters, Optics Express, OSA Continuum, ACS Photonics, Applied Physics Letters Photonics, Micromachine, SPIE Advanced Photonics</i></li></ul> <b>Review Committee Member</b> <ul style="list-style-type: none"><li>Review applications for the Siegman international school on laser for the 2019 and 2020 editions</li></ul>  |  |   |  |   |
| SKILLS SUMMARY        | <b>Relevant Work</b><br>Electromagnetism ●●●●●<br>Non-Linear Optics ●●●●●<br>Optoelectronics ●●●●●<br>Quantum Physics ●●●●●   | <b>Experimental Skills</b><br>Photonics Charac. ●●●●●<br>Non-Linear Optics ●●●●●<br>Radio Freq. ●●●●●<br>Metrology ●●●●●   | <b>NanoFab</b><br>Design Layout ●●●●●<br>EBL ●●●●●<br>Dy Etching ●●●●●<br>Wet Etching ●●●●● | <b>E.M. Modeling</b><br>Comsol ●●●●●<br>Lumerical ●●●●●<br>Mathematica ●●●●●<br>HFSS ●●●●● | <b>Languages</b><br>French ●●●●●<br>English ●●●●●<br>Italian ●●●●●<br>Russian ●●●●● |

# Complete list of publications

## POPULAR WRITING

G. Moille and K. Srinivasan. **Small Cavities Make Noisy Homes for Light**. *American Physical Society* VOL. 13 (2020). URL: [HTTPS://PHYSICS.APS.ORG/ARTICLES/V13/192](https://physics.aps.org/articles/v13/192) (VISITED ON 12/12/2020)URL: [HTTPS://PHYSICS.APS.ORG/ARTICLES/V13/192](https://physics.aps.org/articles/v13/192) .

## JOURNAL ARTICLES

- F. Zhou, X. Lu, A. Rao, J. Stone, G. Moille, E. Perez, D. Westly, and K. Srinivasan. *Hybrid-Mode-Family Kerr Optical Parametric Oscillation for Robust Coherent Light Generation on Chip*. *LASER & PHOTONICS REVIEWS* N/A ().
- J. R. Stone, G. Moille, X. Lu, and K. Srinivasan. *Conversion efficiency in Kerr-microresonator optical parametric oscillators: From three modes to many modes*. *PHYSICAL REVIEW APPLIED* 17 (2022).
- T. C. Briles, S.-P. Yu, L. Chang, C. Xiang, J. Guo, D. Kinghorn, G. Moille, K. Srinivasan, J. E. Bowers, and S. B. Papp. *Hybrid InP and SiN Integration of an Octave-Spanning Frequency Comb*. *APL PHOTONICS* 6 (2021).
- S.-P. Yu, D. C. Cole, H. Jung, G. T. Moille, K. Srinivasan, and S. B. Papp. *Spontaneous Pulse Formation in Edgeless Photonic Crystal Resonators*. *NATURE PHOTONICS* 15 (2021).
- S. Mittal, G. Moille, K. Srinivasan, Y. K. Chembo, and M. Hafezi. *Topological Frequency Combs and Nested Temporal Solitons*. *NATURE PHYSICS* 17 (2021).
- X. Lu, G. Moille, A. Rao, and K. Srinivasan. *Proposal for Noise-Free Visible-Telecom Quantum Frequency Conversion through Third-Order Sum and Difference Frequency Generation*. *OPTICS LETTERS* 46 (2021).
- G. Moille, D. Westly, N. G. Orji, and K. Srinivasan. *Tailoring Broadband Kerr Soliton Microcombs via Post-Fabrication Tuning of the Geometric Dispersion*. *APPLIED PHYSICS LETTERS* 119 (2021).
- Q. Li, G. Moille, H. Taheri, A. Adibi, and K. Srinivasan. *Improved coupled-mode theory for high-index-contrast photonic platforms*. *PHYS. REV. A* 102 (6 2020).
- X. Lu, G. Moille, A. Rao, and K. Srinivasan. *Proposal for noise-free visible-telecom quantum frequency conversion through third-order sum and difference frequency generation*. *ARXIV PREPRINT ARXIV:2010.06811* (2020).
- X. Lu, G. Moille, A. Rao, D. A. Westly, and K. Srinivasan. *Efficient photoinduced second-harmonic generation in silicon nitride photonics*. *NATURE PHOTONICS* (2020).
- X. Lu, A. Rao, G. Moille, D. A. Westly, and K. Srinivasan. *Universal frequency engineering tool for microcavity nonlinear optics: multiple selective mode splitting of whispering-gallery resonances*. *PHOTONICS RESEARCH* 8 (2020).
- G. Moille, L. Chang, W. Xie, A. Rao, X. Lu, M. Davanco, J. E. Bowers, and K. Srinivasan. *Dissipative Kerr Solitons in a III-V Microresonator*. *LASERS & PHOTONICS REVIEWS* 14 (2020).
- L. Chang, W. Xie, H. Shu, Q.-F. Yang, B. Shen, A. Boes, J. D. Peters, W. Jin, C. Xiang, S. Liu, et al. *Ultra-efficient frequency comb generation in AlGaAs-on-insulator microresonators*. *NATURE COMMUNICATIONS* 11 (2020).
- E. Perez, G. Moille, X. Lu, D. Westly, and K. Srinivasan. *Automated On-Axis Direct Laser Writing of Coupling Elements for Photonic Chips*. *OPTICS EXPRESS* 28 (2020).
- G. Moille, Q. Li, L. Xiyuan, and K. Srinivasan. *pyLLE: A Fast and User Friendly Lugiato-Lefever Equation Solver*. *JOURNAL OF RESEARCH OF THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY* 124 (2019).
- I. Ghorbel, F. Swiadek, R. Zhu, D. Dolfi, G. Lehoucq, A. Martin, G. Moille, L. Morvan, R. Braive, S. Combr  , et al. *Optomechanical gigahertz oscillator made of a two photon absorption free piezoelectric III/V semiconductor*. *APL PHOTONICS* 4 (2019).
- X. Lu, G. Moille, A. Singh, Q. Li, D. A. Westly, A. Rao, S.-P. Yu, T. C. Briles, S. B. Papp, and K. Srinivasan. *Milliwatt-threshold visible-telecom optical parametric oscillation using silicon nanophotonics*. *OPTICA* 6 (2019).
- S.-P. Yu, T. C. Briles, G. T. Moille, X. Lu, S. A. Diddams, K. Srinivasan, and S. B. Papp. *Tuning Kerr-soliton frequency combs to atomic resonances*. *PHYSICAL REVIEW APPLIED* 11 (2019).
- G. Moille, X. Lu, A. Rao, Q. Li, D. A. Westly, L. Ranzani, S. B. Papp, M. Soltani, and K. Srinivasan. *Kerr-Microresonator Soliton Frequency Combs at Cryogenic Temperatures*. *PHYSICAL REVIEW APPLIED* 12 (2019).
- X. Lu, G. Moille, Q. Li, D. A. Westly, A. Singh, A. Rao, S.-P. Yu, T. C. Briles, S. B. Papp, and K. Srinivasan. *Efficient telecom-to-visible spectral translation through ultralow power nonlinear nanophotonics*. *NATURE PHOTONICS* 13 (2019).
- X. Lu, Q. Li, D. A. Westly, G. Moille, A. Singh, V. Anant, and K. Srinivasan. *Chip-integrated visible-telecom entangled photon pair source for quantum communication*. *NATURE PHYSICS* 15 (2019).
- G. Moille, Q. Li, T. C. Briles, S.-P. Yu, T. Drake, X. Lu, A. Rao, D. Westly, S. B. Papp, and K. Srinivasan. *Broadband resonator-waveguide coupling for efficient extraction of octave-spanning microcombs*. *OPTICS LETTERS* 44 (2019).
- C. Husko, J. Kang, G. Moille, J. D. Wood, Z. Han, D. Gosztola, X. Ma, S. Combr  , A. De Rossi, M. C. Hersam, et al. *Silicon-Phosphorene Nanocavity-Enhanced Optical Emission at Telecommunications Wavelengths*. *NANO LETTERS* 18 (2018).

- G. Moille, S. Combrié, L. Morgenroth, G. Lehoucq, S. Sauvage, M. El Kurdi, P. Boucaud, A. de Rossi, and X. Checoury. *Nonlinearities in gaas cavities with high cw input powers enabled by photo-oxidation quenching through ald encapsulation*. OPTICS EXPRESS 26 (2018).
- G. Moille, Q. Li, S. Kim, D. Westly, and K. Srinivasan. *Phased-locked two-color single soliton microcombs in dispersion-engineered Si 3 N 4 resonators*. OPTICS LETTERS 43 (2018).
- S. Combrié, G. Lehoucq, G. Moille, A. Martin, and A. De Rossi. *Comb of high-Q Resonances in a Compact Photonic Cavity*. LASER & PHOTONICS REVIEWS 11 (2017).
- G. Moille, S. Combrié, K. Fuchs, M. Yacob, J. P. Reithmaier, and A. de Rossi. *Acceleration of the nonlinear dynamics in p-doped indium phosphide nanoscale resonators*. OPTICS LETTERS 42 (2017).
- G. Moille, S. Combrié, L. Morgenroth, G. Lehoucq, F. Neuilly, B. Hu, D. Decoster, and A. de Rossi. *Integrated all-optical switch with 10 ps time resolution enabled by ALD*. LASER & PHOTONICS REVIEWS 10 (2016).
- M. Gay, L. Bramerie, L. A. Neto, S. D. Le, J.-C. Simon, C. Peucheret, Z. Han, X. Checoury, G. Moille, J. Bourderionnet, et al. *Silicon-on-insulator RF filter based on photonic crystal functions for channel equalization*. IEEE PHOTONICS TECHNOLOGY LETTERS 28 (2016).
- G. Moille, S. Combrié, and A. De Rossi. *Modeling of the carrier dynamics in nonlinear semiconductor nanoscale resonators*. PHYSICAL REVIEW A 94 (2016).
- Z. Han, G. Moille, X. Checoury, J. Bourderionnet, P. Boucaud, A. De Rossi, and S. Combrié. *High-performance and power-efficient 256 times 2 optical switch on silicon-on-insulator*. OPTICS EXPRESS 23 (2015).
- D. Fowler, S. Boutami, M. Duperron, G. Moille, G. Badano, F. Boulard, J. Rothman, O. Gravrand, and R. E. de Lamaestre. *Partially localized hybrid surface plasmon mode for thin-film semiconductor infrared photodetection*. OPTICS LETTERS 38 (2013).

#### BOOK CHAPTERS

- P. Colman, S. Combrié, A. De Rossi, A. Martin, and G. Moille. *Nonlinear Meta-Optics. "Nonlinear Photonic Crystals", pp. 199–250*. CRC Press, 2020.
- G. Moille, S. Combrié, and A. De Rossi. *Green Photonics and Electronics. "Nanophotonic Approach to Energy-Efficient Ultra-Fast All-Optical Gates", pp. 107–137*. Springer, Cham, 2017.

#### CONFERENCE PROCEEDINGS

- G. Moille et al. *"Ultra-Broadband Dissipative Kerr Soliton Microcomb through Dual Pumping Operation"*. CLEO: Science and Innovations. (2021).
- G. Moille et al. *"Impact of Stoichiometric Silicon Nitride Growth Conditions on Dispersion and Broadband Kerr Microcombs in the Near-Visible"*. 2021 Conference on Lasers and Electro-Optics (CLEO). (2021).
- A. Rao et al. *"Up to 50 dB Extinction in Broadband Single-Stage Thermo-Optic Mach-Zehnder Interferometers for Programmable Low-Loss Silicon Nitride Photonic Circuits"*. 2021 Conference on Lasers and Electro-Optics (CLEO). (2021).
- S. Mittal et al. *"Topological optical frequency combs and dissipative Kerr super-solitons"*. European Quantum Electronics Conference. (2021).
- X. Lu et al. *"Efficient widely-separated optical parametric oscillation"*. 2020 Conference on Lasers and Electro-Optics (CLEO). (2020).
- S.-P. Yu et al. *"Spontaneous Soliton Formation in Photonic-Crystal Ring Resonators"*. 2020 Conference on Lasers and Electro-Optics (CLEO). (2020).
- T. Briles et al. *"Semiconductor laser integration for octave-span Kerr-soliton frequency combs"*. 2020 Conference on Lasers and Electro-Optics (CLEO). (2020).
- A. Rao et al. *"Integrated photonic interposers for processing octave-spanning microresonator frequency combs"*. CLEO: Science and Innovations. (2020).
- G. Moille et al. *"Stable Dissipative Kerr Solitons in a AlGaAs Microresonator Through Cryogenic Operation"*. 2020 Conference on Lasers and Electro-Optics (CLEO). (2020).
- J. A. Black et al. *"Optical synthesis by spectral translation"*. 2020 Conference on Lasers and Electro-Optics (CLEO). (2020).
- X. Lu et al. *"Efficient second harmonic generation in a Si3 N4 microring"*. CLEO: Science and Innovations. (2020).
- G. Moille et al. *"Post-Processing Dispersion Engineering of Frequency Combs In Microresonator Addressing Atomic Clock"*. 2020 Conference on Lasers and Electro-Optics (CLEO). (2020).
- S.-P. Yu et al. *"Direct Mode-Frequency Control for Nonlinear Optics in Photonic-Crystal Ring Resonators"*. CLEO: Science and Innovations. (2019).
- X. Lu et al. *"Efficient telecom-to-visible spectral translation using silicon nanophotonics"*. CLEO: Science and Innovations. (2019).
- G. Moille et al. *"Broadband Resonator-Waveguide Coupling for Octave-Spanning Microresonator Frequency Combs"*. Frontiers in Optics. (2019).
- X. Lu et al. *"Sub-mW optical parametric oscillation across visible and telecommunications bands using silicon nanophotonics"*. Laser Science. (2019).

- G. Moille et al. “*pyLLE: a Fast and User Friendly Software Package for Microcomb Simulations*”. *Frontiers in Optics*. (2019).
- G. Moille et al. “*Chip-Integrated Soliton Microcombs at Cryogenic Temperatures*”. *Frontiers in Optics*. (2019).
- T. C. Briles et al. “*Generation of Octave-Spanning Microresonator Solitons with a Self Injection-Locked DFB Laser*”. *2019 IEEE Avionics and Vehicle Fiber-Optics and Photonics Conference (AVFOP)*. (2019).
- X. Lu et al. “*Visible-telecom photon pair generation with silicon nitride nanophotonics*”. *CLEO: QELS\_Fundamental Science*. (2018).
- G. Moille et al. “*Phase-locked two-color soliton microcombs*”. *2018 Conference on Lasers and Electro-Optics (CLEO)*. (2018).
- S.-P. Yu et al. “*Bridging Telecom Wavelengths to Alkali Atomic Transitions with Tunable Kerr Frequency Combs*”. *Frontiers in Optics*. (2018).
- S. Combrié et al. “*High-Q optical comb based on a photonic harmonic potential (Conference Presentation)*”. *Quantum Sensing and Nano Electronics and Photonics XV*. (2018).
- G. Moille. “*Parametric Interactions with Microwatt Pump In III/V Resonators*”. *Integrated Photonics Research, Silicon and Nanophotonics*. (2017).
- C. Husko et al. “*A hybrid silicon-phosphorene nanolaser*”. *Frontiers in Optics*. (2017).
- G. Moille, A. De Rossi, and S. Combrié. “*All-optical gates based on photonic crystal resonators*”. *SPIE Photonics Europe*. (2016).
- G. Moille et al. “*GaAs photonic crystal switch for electro-optic sampling*”. *2016 Conference on Lasers and Electro-Optics (CLEO)*. (2016).
- A. De Rossi. “*High-Q photonic crystal resonators for nonlinear optics*”. *Frontiers in Optics*. (2016).
- J. Bourderionnet et al. “*Silicon-on-Insulator photonic crystal multi-tap microwave photonics filter*”. *2016 IEEE Photonics Conference (IPC)*. (2016).
- A. Martin et al. “*Triply-resonant continuous wave parametric source with a microwatt pump*”. *2016 Conference on Lasers and Electro-Optics (CLEO)*. (2016).
- G. Moille et al. “*Recovery time control in a nanophotonic nonlinear gate using atomic layer deposition*”. *CLEO: Science and Innovations*. (2015).
- Z. Han et al. “*High contrast and power-efficient thermally-controlled optical switch on Silicon-on-Insulator*”. *CLEO: Science and Innovations*. (2015).
- G. Moille et al. “*Towards faster InP photonic crystal all-optical-gates*”. *2015 International Conference on Photonics in Switching (PS)*. (2015).
- G. Moille et al. “*A Highly Linear All Optical Gate Based on Coupled Photonic Crystal Cavities*”. *Nonlinear Photonics*. (2014).
- S. Combrié et al. “*An efficient all-optical gate based on photonic crystals cavities and applications*”. *2014 16th International Conference on Transparent Optical Networks (ICTON)*. (2014).
- G. Moille et al. “*Photo-commutateur hyperfréquence à base de cristaux photoniques*”. *Assemblée Générale du GdR Ondes 2451” Interférences d’ondes*. (2013).

## OTHERS

- J. E. Bowers, A. Beling, S. M. Bowers, T. C. Briles, L. Chang, J. Chiles, R. Costanzo, M. Davanco, S. A. Diddams, T. E. Drake, et al. **Chip-scale optical resonator enabled synthesizer (CORES)** Tech. Report . 2019.
- G. Moille. “*Non-Linear Dynamics in Semiconductor Nano-Structures for Signal Processing*” PhD Thesis . 2016.

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