

Professor Sophie LaRoche
Canada Research Chair APTEC

Advanced Photonics Technologies for Communications

Department of Electrical and Computer Engineering
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Education

Ph. D. in Optics,
College of Optical Sciences
University of Arizona, 1989-1992

Thesis: "Origin and applications of photosensitivity in germanium-doped silica optical fibers"
Supervisor: Prof. G. I. Stegman

M. Sc. in Physics
Université Laval
1987-1988

"Non-linéarités d'origine thermique dans des couches minces de verre dopé au CdS pouvant être utilisées comme guides d'onde"
Supervisor: Prof. R. Tremblay

B. Sc. in Engineering Physics
Université Laval, 1983-1987

Professional experience

1996- **Professor**, Department of Electrical and Computer Engineering, Université Laval
Member of the Center for Optics, Photonics and Lasers (COPL)

2012- **Holder of the Canada Research Chair (Tier 1) in
Advanced Photonics Technologies for Communications**

2000-2010 **Holder of the Canada Research Chair (Tier 2) in
Optical Fiber Communications and Components**

1997-2005 **Associate Researcher**, Institut National d'Optique (INO)

- Collaborative research on FBGs, PPLN-based devices and high power fiber lasers. Co-supervision of three graduate students with INO researchers.

2003&2011 **Invited Professor**, École Nationale Supérieure des Sciences Appliquées et de Technologie (ENSSAT), Université de Rennes 1, Lannion, France.

- Co-supervision of two Ph.D. students, several student exchanges.
- Collaborative work on laser physics and high speed optical communications.

2002&2013 **Visiting Researcher**, TeraXion inc., Québec, Canada

- Research on chromatic dispersion compensation with fiber Bragg gratings.

1992-1996 **Defence Scientist**, Defence Research and Development Canada - Valcartier

- Research and development in electro-optics countermeasures, participation in TTCP international panels.

AWARDS

- 2015, OSA Fellow.
- 2010, Summa Research Award, Faculty of Science and Engineering, Université Laval in recognition of career accomplishments in research.
- 2010, LeSoleil-Radio-Canada, personality of the week in recognition of leadership in the Québec City community.
- 2010, Science and technology award, YWCA, Québec in recognition of excellence in a non-traditional career for women.
- 2009, NSERC Discovery Accelerator Supplement, Canada, in recognition of outstanding accomplishments in research (national competition).
- 2005, 2011, 2012, 2013, 2014 Professeur étoile, Faculté des sciences et de génie, Université Laval in recognition of excellence in teaching (based on student evaluations).
- 1991, CAP-Newport award, Canadian Association of Physics.
- 1988, Prix d'excellence étudiant-chercheur de l'ACFAS.
- 1987, John H Chapman award, SPAR Aerospace.
- 1987, OIQ outstanding student award, Ordre des ingénieurs du Québec.
- 1986, Julian C. Smith award, Canadian institute of engineers.

Expertise

More than 20 years of experience in: fiber optics propagation and components, fiber optics communications, fiber Bragg gratings and their applications, fiber amplifiers and lasers (tunable, multiwavelength, high power, narrow frequency or pulsed), all-optical signal processing (dispersion compensation, photonic code identification, pulse rate multiplication, pulse shaping and beam forming), analog optical transmissions (radio-over-fiber, GPS-over-fiber, ultra-wideband), high speed optical transmissions, optical packet switching and routing, semiconductor devices (amplifiers and lasers), optical code-division-multiple-access and integrated optics (silicon photonics).

External representation and leadership

- Canadian project leader (principal investigator) of 4 multi-university projects of the CIPI Network of Centers of Excellence (Canadian Institute for Photonic Innovations): Fiber Optics Components and Devices, 1999-2002; Advanced Fibre Laser Systems, 2002-2005; Packet Switched Networks with Photonic Code-Based Processing, 2004-2009; Optical Packet-Switched Architecture and Technologies for Data Centers, 2009-2012.
- Canadian representative on the The Technical Cooperation Program (TTCP), subgroup Q panel (EO countermeasures for infrared guided missiles), 1995-1996.
- Member of technical committees of major international conferences:
 - *IEEE summer topical meeting, Space-Division Multiplexing and Multimode Photonics (SDMP'2016)*
 - *CLEO'2014, CLEO'2015, Science and innovation subcommittee 12: Lightwave*

- Communications and Optical Networks.
- *Asia Communications and Photonics Conference 2012*, Subcommittee SC1 Novel Fibers and Fiber-Based Devices, Guangzhou, China, 7 - 9 November 2012.
 - *Optical Fiber Communication Conference (OFC)*, Sub-committee C: Gratings, photonic band-gap and signal conditioning devices, in 2003 and 2004; Sub-committee G: Optical Processing and Analog Subsystems in 2009 and 2010.
 - *Bragg Grating, Photosensitivity and Poling in Glass Waveguides (BGPP)*, an OSA topical meeting, in 2001, 2003, 2005, 2010 & 2012. Chair of the Applications of Gratings and Poled Glass subcommittee in 2010 & 2012.
 - *Photonics in Switching*, an OSA topical meeting, 2008.
 - *Photonics North SPIE meeting* in 2007, 2008 and 2012. Chair of the Fiber Lasers and Amplifiers Conference, 2007 and 2008.
 - President of Québec's OSA local section in 1994-1995; member of the executive committee from 1991 to 1996.
 - Member of advisory boards :
 - Advisory committee to Quebec's Minister of *Développement économique, Innovation et Exportation*, M. Clément Gignac, for the revision of Québec investment policy in research and innovation (Groupe-conseil sur la Stratégie québécoise de la recherche et de l'innovation, SQRI), 2009-2010.
 - Technical Advisory Committee of CMC Microsystem, 2011-2014.
 - Member of the Board of Directors, CMC microsystems, 2014-present.
 - Technical Users Committee of the Canadian Photonics Fabrication Centre (CPFC), 2002-2005.
 - Evaluation Committee of the EO warfare research program of DRDC-Valcartier, 2005.
 - Université Laval's representative to the Centre de Collaboration MiQro Innovation (C2MI), a partnership between Université de Sherbrooke, IBM and Teledyne Dalsa.
 - Member of award selection committees, promotion committees and technical committees of grant agencies, including
 - Member of the 2016 Esther Hoffman Beller Medal Committee, OSA.
 - European Physical Society (EPS), Quantum Electronics and Optics Division (QEOD), selection committee for the Prize for Research in Laser Science and Applications 2015.
 - OSA Richardson Medal Award Committee 2005-2007.
 - FQRNT evaluation committees: team grant committee 210 (Imaging Systems) in 2006 and committee 314 (Photonics and Plasmas) in 2007; post-doctoral scholarships B3 committee 14 (Information technologies and communications) in 2010 and committee 05A (Information technologies and communications) in 2011 and 2012.
 - Undergraduate scholarship competition, concours Chapeau les filles, Ministère de l'éducation du Québec, 2003-2004.
 - Scholarship selection committees at Université Laval including: Graduate scholarships and excellence awards in 2005-2007, Tuition scholarships for foreign students in 2006 and Scholarships of the Université Laval Foundation in 1997 and 2007, NSRC master scholarship in 2016.

- Regular referee for major international publications including, but not exclusively, *Optics Letters*, *Optics Express*, *Photonics Technology Letters*, and *Journal of Lightwave Technology*.
- Regular referee for faculty member promotions at many Canadian and foreign universities.

Research grants and contracts

At the COPL, Université Laval, I have having been awarded more than \$5 million in equipment grants to built a state-of-the-art experimental research facility. The laboratory includes a world class fiber Bragg grating writing facility, a very high bit rate (115 Gb/s) optical transmission testbed for advanced modulation formats and a full suite of test and measurement equipment for the characterization of active and passive devices.

I regularly obtain operating funds from major Canadian grant agencies. I have been the principal investigator on research grants totalling more than \$6 million and I have been a co-researcher on grants totalling \$4.8 million. I have been the principal investigator on several industry sponsored projects, including collaborative research on fiber Bragg gratings and silicon photonics with TeraXion inc. and on fiber lasers with Coractive Hightech.

Publications

During my career, **I have published 150 papers** in peer-reviewed journals, almost all IEEE or OSA, and **more than 200 papers in highly selective conferences** such as OFC (Optical Fiber Communications Conference), ECOC (European Conference on Optical Communications), and CLEO (Conference on Lasers and Electro Optics). All students under my direct supervision, including a large number of undergraduate students, have conducted original research that has led to scientific publications in peer-reviewed journals or international conferences. As per **Google scholar**, my work as received **more than 4300 citations (h-index=33)**. I am the co-author of 6 patents, 3 of which have been transferred to the industry. Two articles had received **more than 350 citations**.

Teaching and supervision

My team is typically composed of 8 graduate students and 2 post-doctoral researchers and some undergraduate research assistants. More than 30 students and researchers have graduated from my laboratory and found employment in the industry, research institutes and universities. Some have done post-doctoral internships in prestigious laboratories and several past graduates now hold tenure track positions. My students acquire a broad vision of the photonics/communication fields by participating in the activities of the Province of Quebec's research centers COPL (Center for Optics, Photonics and Lasers) and SytaCom (Center for Advanced Systems and Technologies in Communications). Students trained in my laboratory acquire a mix of theoretical and practical knowledge, and their research always involve both simulations and experimental work. They participate in the definition of research objectives and are involved in discussions with industrial partners. These skills

make them extremely attractive either for academic positions or for research positions in the photonic industry.

At Université Laval, in addition to teaching regular courses of the Electrical Engineering curriculum, I have developed three new courses in the field of optics and photonics including a graduate course on optical fiber components, an undergraduate course on optical communications that includes 6 laboratory sessions, and a continuing education course on fiber optic communications that was given more than twelve times to engineers and professionals in the industry. I am also participated in an online course on simulations of optical communication systems in collaborations with colleagues from Queen's University, McGill University, and Université Laval.

Professional Societies

- 2000-present, IEEE (Institute of Electrical and Electronics Engineers), senior member.
- 1994-present, OIQ (Ordre des ingénieurs du Québec).
- 1989-present, OSA (Optical Society of America), senior member.

Publications : journals

- J1. A. D. Simard, B. Filion, D. Patel, D. Plant, and S. LaRoche, "Segmented Silicon MZM for Pam-8 Transmissions at 114 Gb/S with Binary Signaling," *Opt. Express* **24**, no. 17, pp.19467-194672 (2016). DOI: 10.1364/OE.24.019467.
- J2. R. Mirzaei Nejad, K. Allahverdyan, P. Vaity, S. Amiralizadeh, C. Brunet, Y. Messaddeq, S. LaRoche, and L. A. Rusch, "Orbital Angular Momentum Mode Division Multiplexing over 1.4 km Ring Core Fiber," *IEEE/OSA J. Lightwave Technol.*, vol.34, no.18, pp. 4252 – 4258 (July 2016). DOI: 10.1109/jlt.2016.2594698
- J3. H. Chen, C. Jin, B. Huang, N. K. Fontaine, R. Ryf, K. Shang, N. Grégoire, S. Morency, R.-J. Essiambre, G. Li, Y. Messaddeq, and S. LaRoche, "Spatially Integrated Optical Fiber Amplifier," *Nature Photonics* vol.10, no.8 pp.529-533 (August 2016). DOI: 10.1038/nphoton.2016.125
- J4. A. D. Simard and S. LaRoche, "A Dynamic Model of Silicon Bragg Grating Modulators," *IEEE Journal of Selected Topics in Quantum Electronics*, vol.22, no.6, #3400109 (Nov-Dec 2016). DOI: 10.1109/JSTQE.2016.2555979
- J5. K. Bédard, A. D. Simard, B. Filion, Y. Painchaud, L. A. Rusch, and S. LaRoche, "Dual phase-shift Bragg grating silicon photonic modulator operating up to 60 Gb/s," *Opt. Express.*, vol. 24, no 3, pp.2413-2419 (January 2016). DOI:10.1364/OE.24.002413
- J6. B. Filion, A. Nguyen, L. A. Rusch, and S. LaRoche, "Post-Compensation of Nonlinear Distortions of 64-QAM Signals in a Semiconductor Based Wavelength Converter," *IEEE/OSA J. Lightwave Technol.*, vol. 34, no 9, pp.2127-2138 (May 2016). DOI: 10.1109/JLT.2016.2523680
- J7. Y. Xu, M. Ren, Y. Lu, P. Lu, X. Bao, L. Wang, Y. Messaddeq, and S. LaRoche, "Multi-parameter sensor based on the intramodal stimulated Brillouin scattering of higher-order acoustic modes in inverse-parabolic graded index," *Opt. Lett.*, vol.41, no. 6,

pp.1138-1142 (Mars 2016). DOI: 10.1364/OL.41.001138

- J8. R. Dubé-Demers, S. LaRoche, and W. Shi, "Ultra-Fast Pulse-Amplitude Modulation with a Femtojoule Silicon Photonic Modulator," *Optica*, vol.3, no.6, pp.622-627, (June 2016). DOI: 10.1364/OPTICA.3.000622
- J9. H. Chen, N. K. Fontaine, R. Ryf, C. Jin, B. Huang, K. Shang, R.-J. Essiambre, L. Wang, T. Hayashi, T. Nagashima, T. Sasaki, Y. Messaddeq and S. LaRoche, "Demonstration of Cladding-Pumped Six-Core Erbium-Doped Fiber Amplifier," **Top-scored paper in IEEE/OSA J. Lightwave Technol.**, vol.34, no.8, pp.1654-1660, (April 2016). DOI: 10.1109/JLT.2016.2515053
- J10. B. Filion, J. Lin, A. Nguyen, X. Zhang, S. LaRoche, and Leslie A. Rusch, "Semiconductor Optical Amplifier Based Wavelength Conversion of Nyquist-16QAM for Flex-grid Optical Networks," *IEEE/OSA J. Lightwave Technol.*, vol. 34, no 11, pp.2724-2729 (June 2016). DOI: 10.1109/JLT.2016.2547894
- J11. L. Wang, P. Vaity, S. Chatigny, Y. Messaddeq, L. A. Rusch, and S. LaRoche, "Orbital-Angular-Momentum Polarization Mode Dispersion in Optical Fibers," **Top-scored paper in IEEE/OSA J. Lightwave Technol.**, vol.34, no.8, pp.1661-1671, (April 2016). DOI: 10.1109/JLT.2015.2506461
- J12. J. St-Yves, H. Bahrami, P. Jean, S. LaRoche, and W. Shi, "Ultra-compact, widely bandwidth-tunable silicon filter with an unlimited free-spectral range" *Opt. Lett.*, vol. 40, no. 23, pp.5471-5474, (December 2015). DOI: 10.1364/OL.40.005471 .
- J13. S. Gorgutsa, M. Khalil, V. Bélanger-Garnier, J. Viens, B. Gosselin, S. LaRoche, and Y. Messaddeq, "Emissive Properties of Wearable Wireless-Communicating Textiles Made from Multi-Material Fibers," *IEEE Transactions on Antennas and Propagation (TAP)*, vol. 64 (2016). DOI: 10.1109/TAP.2016.2546959 (pages and month to come)
- J14. L. Wang and S. LaRoche, "Design of 8-Mode Polarization-Maintaining Few-Mode Fiber for MIMO-free Spatial Division Multiplexing," *Opt. Lett.*, vol.40, no.24, pp. 5846-5849 (December 2015). DOI: 10.1364/OL.40.005846
- J15. C. Jin, B. Ung, Y. Messaddeq, and S. LaRoche, "Annular-cladding erbium doped multicore fiber for SDM amplification," *Opt. Express.*, vol.23, no.23, pp. 26947-29659 (Novembre 2015). DOI:10.1364/OE.23.029647, open access.
- J16. J.-M. Sarraute, K. Schires, S. LaRoche, and F. Grillot, "Enhancement of the Modulation Dynamics of an Optically Injection-Locked Semiconductor Laser Using Gain Lever," *IEEE J. of Selected Topics in Quantum Electronics*, vol.21, no.6, pp.1-8, (Nov.-Dec. 2015). DOI: 10.1109/JSTQE.2015.2445876,
- J17. A. Malacarne, Y. Park, M. Li, S. LaRoche, and J. Azaña, "Real-time Fourier transformation of lightwave spectra and application in optical reflectometry," *Opt. Express*, vol.23, no. 25, pp.32516-32527 (December 2015). DOI:10.1364/OE.23.032516, open access.
- J18. A. Bois, A. D. Simard, W. Shi, and S. LaRoche, "Design of Polarization-Insensitive Demultiplexing Lattice Filters in SOI," *IEEE/OSA J. Lightwave Technol.*, vol.23, no.24, pp. 5227-5234, (December 2015). DOI: 10.1109/JLT.2015.2498401
- J19. A. D. Simard, and S. LaRoche, "Complex Apodized Bragg Grating Filters without circulators in Silicon-on-Insulator," *Opt. Express*, vol. 23, no.13, pp-16662-16675 (June 2015). DOI:10.1364/OE.23.016662, open access.

- J20. Y. Ben M'Sallem, C. S. Park, S. LaRoche, and L. Rusch, "Multi-Format Wavelength Conversion using Quantum Dash Mode-Locked Laser Pumps," *Photonics*, vol.2, pp. 527-539 (May 2015). DOI:10.3390/photonics2020527
- J21. R. Dubé-Demers, J. St-Yves, A. Bois, Q. Zhong, M. Caverley, Y. Wang, L. Chrostowski, S. LaRoche, D. V. Plant and W. Shi, "Analytical Modeling of Silicon Microring and Microdisk Modulators with Electrical and Optical Dynamics," *IEEE/OSA J. Lightwave Technol.*, vol. 33, no. 20, pp. 4240-4252 (March 2015). DOI 10.1109/JLT.2015.2462804
- J22. B. Filion, A.T. Nguyen, L. A. Rusch, and S. LaRoche, "Digital Post-Compensation of Nonlinear Distortions in Wavelength Conversion Based on Four-Wave Mixing in a Semiconductor Optical Amplifier," *IEEE/OSA J. Lightwave Technol.*, vol.33, no.15, pp.3254-3264, (August 2015). DOI: 10.1109/JLT.2015.2436812
- J23. R. Gabet, E. Le Cren, C. Jin, M. Gadonna, B. Ung, P. Sillard, H. G. Nguyen, Y. Jaouën, M. Thual and S. LaRoche, "Complete dispersion characterization of Few Mode Fibers by OLCI Technique," *invited paper in IEEE/OSA J. Lightwave Technol.*, vol. 33, no.6, pp.1155-1160, (March 2015). DOI: 10.1109/JLT.2014.2376702
- J24. N. Ayotte, A. D. Simard, and S. LaRoche, "Long integrated Bragg gratings for SOI wafer metrology," *IEEE Photon. Technol. Lett.*, vol. 27, no. 7, pp. 755-758 (April 2015). DOI: 10.1109/LPT.2015.2391174
- J25. M. R. Fernández-Ruiz, L. Wang, A. Carballar, M. Burla, J. Azaña and S. LaRoche, "THz-bandwidth photonic Hilbert transformers based on fiber Bragg gratings in transmission," *Opt. Lett.*, vol. 40, no. 1, pp.41-44 (January 2015). DOI: 10.1364/OL.40.000041
- J26. A. D. Simard, M. J. Strain, L. Meriggi, M. Sorel, and S. LaRoche, "Narrow bandpass filters in silicon-on-insulator with phase-apodized integrated Bragg gratings," *Opt. Lett.*, vol. 40, no. 5, pp.736-739 (March 2015). DOI: 10.1364/OL.40.000736
- J27. C. Brunet, B. Ung, P. Vaity, L. Wang, Y. Messaddeq, S. LaRoche and L. A. Rusch, "Design of a family of ring-core fibers for OAM transmission studies," *Opt. Express*, vol. 22, no.21, pp. 26117-26127 (October 2014). DOI:10.1364/OE.22.026117, open access.
- J28. S. Gorgutsa, V. Bélanger-Garnier, B. Ung, J. Viens, B. Gosselin, S. LaRoche, and Y. Messaddeq, "Novel wireless-communicating textiles made from multi-material and minimally-invasive fibers," *Sensors*, Special Issue - Miniaturized Wireless Biosensors, vol. 14, no.10, pp.19260-19274 (October 2014). DOI:10.3390/s141019260. Open access.
- J29. J. Zheng, L. Wang, Z. Dong, M. Xu, X. Wang, J. Liu, N. Zhu, S. LaRoche, and G.-K. Chang, "Orthogonal Optical Single-Sideband Modulation Using an Improved Sagnac-loop-based Modulator," *IEEE Photon. Technol. Lett.*, vol.26, no.22, pp.2229-2231 (November 2014). DOI: 10.1109/LPT.2014.2351402
- J30. C. Brunet, B. Ung, P.-A. Bélanger, Y. Messaddeq, S. LaRoche, and L. A. Rusch, "Vector mode analysis of annular fibers: design tools for spatial division multiplexing," *IEEE/OSA J. Lightwave Technol.*, vol.32, no.23, pp.4046-4057, (December 2014). DOI: 10.1109/JLT.2014.2361432
- J31. C. Brunet, P. Vaity, Y. Messaddeq, S. LaRoche, and L. A. Rusch, "Design, fabrication and validation of an OAM fiber supporting 36 states," *Opt. Express* vol. 22, no 21, pp.26117-26127 (October 2014). DOI: 10.1364/OE.22.026117
- J32. B. Ung, P. Vaity, L. Wang, Y. Messaddeq, L. A. Rusch and S. LaRoche, "Few-mode

- fiber with inverse-parabolic graded-index profile for transmission of OAM-carrying modes," *Opt. Express*, vol. 22, no. 15, pp. 18044-18055 (July 2014). DOI:10.1364/OE.22.018044.
- J33. L. Wang, C. Jin, Y. Messaddeq and S. LaRochelle, "Microwave Interferometric Technique for Characterizing Few Mode Fibers," *IEEE Photon. Technol. Lett.*, vol. 26, no. 17, pp.1695-1698, (September 2014). DOI: 10.1109/LPT.2014.2330758
- J34. L. Wang, B. Ung, P. Vaity, Y. Messaddeq, L. A. Rusch, and S. LaRochelle, "Characterization of OAM Fibers using Fiber Bragg Gratings," *Opt. Express*, vol. 22, no. 13, pp. 15653-15661 (June 2014). DOI:10.1364/OE.22.015653
- J35. A. D. Simard, M. J. Strain, V. Pusino, M. Sorel and S. LaRochelle, "Multiwavelength laser based on super-structured Bragg gratings on multiquantum well AlGaInAs-InP," *Opt. Express*, vol. 22, no. 14, pp. 17050-17062 (July 2014). DOI:10.1364/OE.22.017050
- J36. M. A. Jebali, J.-N. Maran, and S. LaRochelle, "264 W output power at 1585 nm in erbium-doped fiber laser using in-band pumping," *Opt. Lett.*, vol.39, no.13, pp.3974-3977, (July 2014).
- J37. A. D. Simard, G. Beaudin, V. Aimez, Y. Painchaud, and S. LaRochelle, "Characterization and reduction of spectral distortions in Silicon-on-Insulator integrated Bragg gratings," *Opt. Express* vol. 21, no. 20, pp.23145-23159 (2013).
- J38. B. Fillion, W. C. Ng, An. T. Nguyen, L. A. Rusch and S. LaRochelle, "Wideband wavelength conversion of 16 Gbaud 16-QAM and 5 Gbaud 64-QAM signals in a semiconductor optical amplifier," *Opt. Express* vol. 21, no. 17, pp. 19825–19833 (2013).
- J39. Y. Ben M'Sallem, C. S. Park, S. LaRochelle and L. A. Rusch, "Efficient, Widely-Tunable Wavelength Conversion for Packets with in-band Labels," *IEEE Photon. Technol. Lett.* 25, no.24, pp.2470-2473 (2013). DOI 10.1109/LPT.2013.2285341.
- J40. R. Ashrafi, M. Li, N. Belhadj, M. Dastmalchi, S. LaRochelle, and J. Azaña, "Experimental demonstration of superluminal space-to-time mapping in long period gratings," *Opt. Lett.*, vol. 38, no. 9, pp.1419-1421 (2013).
- J41. M. R. Fernández-Ruiz, M. Li, M. Dastmalchi, A. Carballar, S. LaRochelle and J. Azaña, "Picosecond optical signal processing based on transmissive fiber Bragg gratings," *Opt. Lett.*, vol. 38, no.8, pp. 1247-1249 (2013).
- J42. A.D. Simard, Y. Painchaud and S. LaRochelle, "Integrated Bragg Gratings in Spiral Waveguides," *Optics Express*, vol.21, no.7, pp. 8953-8963 April 2013.
- J43. R. Ashrafi, M. Li, S. LaRochelle, and J. Azaña, "Superluminal Space-to-Time Mapping in Grating-Assisted Co-directional Couplers," *Optics Express*, vol.21, no. 5, pp.6249-6256 (2013).
- J44. H. Rastegarfar, A. Leon-Garcia, S. LaRochelle and L. A. Rusch, "Cross-Layer Performance Analysis of Recirculation Buffers for Optical Data Centers," *IEEE/OSA J. Lightwave Technol.*, vol.31, no.3, pp.432-445 (2013).
- J45. M. Dastmalchi, and S. LaRochelle, "Optical Generation of Microwave Passband Signals," *Microw. Opt. Technol. Lett.*, vol.55, no.3, pp. 656-660 (2013).
- J46. M. Dastmalchi, M. Abtahi, D. Lemus, L. A. Rusch, and S. LaRochelle, "Reconfigurable UWB Waveform Generation with Simple Photonic Devices," *SPIE Opt. Engineering*

- vol.51, no. 8, 085002 (2012).
- J47. Y. Ben M'Sallem, A. Shen, F. Lelarge, F. Pommereau, D. Make, S. LaRochelle and L. A. Rusch, "Quantum-Dash Mode-Locked Lasers for Tunable Wavelength Conversion on a 100 GHz Frequency Grid," *IEEE/OSA J. of Opt. Commun. Netw.*, special issue on Enabling Optical Devices for Scalable Networks, vol.4, no. 9, pp. A69-A76 (2012).
- J48. M. Dastmalchi, S. Doucet, L. A. Rusch, and S. LaRochelle, "FBG-Based Matched Filters for Optical Processing of RF Signals," *IEEE Photonics Journal*, vol.4, no. 3, pp.832-843 (2012).
- J49. M. Mirshafiei, S. LaRochelle, and L. A. Rusch, "Optical UWB waveform generation using a micro-ring resonator," *IEEE Photon. Technol. Lett.*, vol.24, no.15, pp.1316-1318 (2012).
- J50. A. D. Simard, N. Belhadj, Y. Painchaud and S. LaRochelle, "Apodized Silicon-on-Insulator Bragg Gratings," *IEEE Photon. Technol. Lett.*, vol. 24, no.12, pp.1033-1035 (2012).
- J51. Q. Xu, H. Rastegarfar, Y. Ben M'Sallem, A. Leon-Garcia, S. LaRochelle, and L. A. Rusch, "System Performance Analysis for Large Scale Multi-stage All-Optical Packet Switching Router," *IEEE/OSA J. of Opt. Commun. Netw.*, vol. 4, no.5, pp.412-425 (2012).
- J52. A. Malacarne, R. Ashrafi, M. Li, S. LaRochelle, J. Yao, and J. Azaña, "Single-shot photonic time-intensity integration based on a time-spectrum convolution system," *Opt. Lett.*, vol. 37, no.8, pp.1355-1357 (2012).
- J53. A. D. Simard and S. LaRochelle, "Semi-analytical modeling of distributed phase-shifts applied on chirped fiber Bragg gratings," *IEEE/OSA J. Lightwave Technol.*, vol.30, no.1, pp.184-191 (2012).
- J54. M. Mirshafiei, A. Ghazisaeidi, D. Lemus, S. LaRochelle, and L. A. Rusch, "Upconversion of Gain-Switched Laser Pulses for Optical Generation of UWB Signals," *IEEE/OSA J. of Lightwave Technol.*, vol.30, no.2, pp.207-214 (2012).
- J55. A. D. Simard, N. Ayotte, Y. Painchaud, S. Bédard and S. LaRochelle, "Impact of Sidewall Roughness on Integrated Bragg Gratings," *IEEE/OSA J. of Lightwave Technol.*, vol. 29, no.24, pp.3693-3704 (2011).
- J56. D. Macias-Valadez, R. Santerre, S. LaRochelle, and R. Landry Jr., "Improvement of vertical GPS precision with a GPS-over-fiber architecture and real-time relative delay calibration," *GPS Solutions* by Springer, published online DOI 10.1007/s10291-011-0244-6, November (2011); and in print vol.16, no. 4, pp.449-462 (2012).
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Publications: international conference proceedings

My team regularly publishes in the main international conferences of the field. Some of the common abbreviations used in the list below are:

- *OFC*: Optical Fiber Communications conference
- *ECOC*: European Conference on Optical Communications
- *CLEO*: Conference on Lasers and Electro Optics
- *BGPP*: Bragg Gratings, Photosensitivity and Poling in Glass Waveguides, an OSA Topical meeting.

- C1. S. LaRochelle and A. D. Simard, "Silicon Photonic Bragg Grating Devices," **invited paper**, *Optical Fiber Communications conference (OFC'2016)*, Los Angeles, USA, 17th-23rd March 2017.
- C2. S. LaRochelle, R. Dubé-Demers, A. D. Simard, D. Patel, D. V. Plant and W. Shi, "Silicon photonic modulators for PAM transmissions," **invited paper** *SPIE Photonics West'2017, conference OE111, Silicon Photonics XII*, San Francisco, USA, 28th January-2nd February 2017.
- C3. S. LaRochelle and A. D. Simard, "Integrated Bragg grating filters and modulators in SOI," **invited paper** *SPIE Photonics West'2017, conference OE110, Smart Photonic and Optoelectronic Integrated Circuits XIX*, San Francisco, USA, 28th January-2nd February 2017.
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- C9. S. LaRochelle, "Novel optical fibers enabling space division multiplexing," **invited paper**, *Photonics North*, paper 15-7, Québec, Canada, 24th -26th May 2016.
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