Leslie Ann Rusch
Canada Research Chair in *Communications Systems Enabling the Cloud*

Université Laval
Department of Electrical and Computer Engineering
1065 avenue de la Médecine
Québec, Qc G1V 0A6 CANADA

http://www.ocl.ulaval.ca
rusch@gel.ulaval.ca
office: (418) 656-2906
fax: (418) 656-3159

EDUCATION

1990-1994 **Princeton University**
Ph.D., Electrical Engineering, June 1994, M.A., Electrical Engineering, Oct. 1992

1976-80 **California Institute of Technology**
B.S., Electrical Engineering, June 1980, with honors

EXPERIENCE

1994- **Université Laval**
Full Professor 2005-, Associate Prof. 1998-2005, Assistant Prof. 1994-1998
Research in wireless and optical communications within the Department of Electrical and Computer Engineering and within the Center for Optics, Photonics and Lasers.

2000-2002 **Intel Corporation**
Manager, Wireless Communications Research

Established first communications research group in the Intel Architecture Group; senior manager in newly formed Corporate Technology Group, Communications and Interconnect Lab; several key presentations on communications research priorities to CTO of Intel; Intel representative to the Berkeley Wireless Research Center at Univ. of Cal. Berkeley; two patents awarded

1980-82, 85-90 **Department of the Army** (Pentagon)
Project Management Engineer

Management of classified communications systems. Work involved liaison between research and development centers and end users, as well as identification of commercial equipment suitable for deployment. Supervised a 1.8 million dollar budget over two years and a group of six programmers and engineers.

1982-83 **College of Arts, Science and Technology** (Kingston, JaMayca)
Visiting Professor

Development and teaching of a course in digital electronics for fourth year students, as well as continuing education courses in digital electronics for telecom engineers.

HONORS AND AWARDS

2017	Summa Research Award *Recognizing exceptional research, one award per year across all science and engineering disciplines, Univ. Laval*
2017	OSA Fellow *For research in optical communications including code division multiple access technologies, ultrawide band signal generation, transient gain effects in optical amplifiers, and exploitation of orbital angular momentum in fiber communications*
2017	IEEE Canada R.A. Fessenden Award *For important contributions to the field of telecommunications engineering*
2015-2022	Canada Research Chairholder
2015	Elected, Board of Governors, Photonics Society, IEEE
2013	IEEE Canada J.M. Ham Outstanding Engineering Educator Award *For excellence in graduate supervision*
2012	Le prix Encadrement aux cycles supérieurs de l'UL
2010	IEEE Fellow *For contributions in optical and wireless communications systems.*
2009	Graduate Supervision Award, SYTACom Research Network
2008, 2010	Professeur étoile
1999	Mention, Prix du ministre
1998	Prix d'enseignement, AESGUL
1990-93	National Science Foundation, USA, Graduate Fellowship
1979	Society of Women Engineers, USA, Scholastic Award
1976-80	National Merit Scholarship, USA

PUBLICATIONS

All publications listed are in international journals and conferences with wide readership and peer-review. Over 90% of publications (journal and conference) are published by the IEEE/IEE/OSA. ResearcherID: A-2769-2008. ORCID: 0000-0002-3888-3596

Journal publications	150
Conference publications	211
Patents	5 awarded
Google Scholar	7184 citations, h-index of 42

MOST SIGNIFICANT RESEARCH CONTRIBUTIONS

Wireless communications research at Intel Corp.
272 citations, patent referenced in 471 other patents, shaped IEEE standards on UWB

Orbital Angular Momentum for Spatial Multiplexing
220 citations, greatest number of supported OAM modes in a fiber

FFH-Optical Code Division Multiple Access
463 citations, $168,000 licensing fee, inspired spin-off research at multiple universities

Optical pulse shaping for ultra wideband (UWB)
207 citations, best reported power efficiency for UWB

Transient gain effects in optical amplifiers

175 citations, first examination of gain dynamics for packet networks, now widespread

Multi-user Detection Theory

407 citations, novel use of multi-user detection theory for interference rejection

PARTICIPATION IN RESEARCH NETWORKS

National Consortia

1999-2013	Canadian Institute for Photonic Innovation NCE (founding member)
2009-2014	Healthcare Support through Information Technology Enhancements NSERC, Strategic Research Network (founding member)
2010-2016	Training Program for Next Generation Optical Networks NSERC, CREATE (founding member)
2011-2016	Smart Applications on Virtual Infrastructures NSERC, Strategic Research Network (founding member)
2017-	Training Program for Network Softwarization NSERC, CREATE (founding member)

Provincial Consortia

1994-	Center for Optics, Photonics and Lasers (COPL)
2004-	Centre for Advanced Systems and Technologies in Communications (SYTACom)

SELECTED RESEARCH GRANTS

2020-2024	NSERC, CRD Research grant	$390,000 per year (three professors)
2020-2024	NSERC, CRD Research grant	$306,000 per year (three professors)
2019-2024	NSERC, Ind. Research Chair	$527,000 per year
2018-2023	NSERC, Discovery Grant	$64,000 per year
2017-2020	NSERC, CRD Research grant	$500,000 per year (three professors)
2016-2019	NSERC, Prompt CRD Research grant	$215,700 per year (two professors)
2017-2021	NSERC, CREATE, NetSoft	$40,000 per year
2012-2015	NSERC, Research grant	$55,000 per year
2011-2016	Smart Applications for Virtual Infrastructures	$60,000 per year
2010-2015	Cand. Found. for Innovation, Operating grant	$80,000 per year (two professors)
2010-2011	Cand. Found. for Innovation, Equipment grant	$3,800,000 (two professors)
2010-2015	NSERC, CREATE, NGON	$40,000 per year
2011-2015	NSERC, Strategic Network, SAVI	$60,000 per year
2009-2013	NSERC, Strategic Network, hSite	$40,000 per year
2008-2011	NSERC, Strategic Grant - *Principal researcher*	$155,000 per year
2007-2008	NSERC, Idea to Innovation Grant	$119,390
2005-2007	Research Grant	$80,000 per year
2002-2005	APN Inc., Research Grant (patent license)	$75,000 per year
2002-2003	Cisco Corp., Research Grant	$109,000
1998-2001	NSERC, Industrial Oriented Research	$150,000 per year

GRADUATE SUPERVISION

	Current		Completed	
	Supervisor	Co-super.	Supervisor	Co-super.
MSc	2		20	5
PhD	7	2	19	5
PostDoc	2		11	2

Current employment		in Canada	examples
University professors	4	1	McGill Univ., KSU, Alexandria U., SupCom
Researchers	12	7	Bell Labs Paris, Ciena, INO, TeraXion
Engineers	13	11	Ciena, EXFO, Tyco Submarine Sys., Google
Managers	5	2	PriceWaterhouseCooper, Lambda Photonix
Postdocs	3	1	MIT, Ericcson
PhD students	5	4	UL

EXTERNAL REPRESENTATION AND LEADERSHIP

International

Vice President, Technical Affairs, Board of Governors, IEEE Photonics Society, 2018-2020

Member, elected, Board of Governors, IEEE Photonics Society, 2015-2018

Assistant editor for the *OSA/IEEE Journal of Optical Communications Networks*, 2011-2014

Member of the *IEEE Teaching Awards* Committee, 2015-2018

Member of the *IEEE Communications Society Awards* Committee, 2011-2014

Member of the *IEEE Prize Paper/Scholarships* Committee, 2011-2014

Technical program committee of *IEEE Microwave Photonics Conf. 2014*, *IEEE/OSA OFC Technical Program Committee, 2011-2014, IEEE LEOS Summer Topicals 2009, IEEE LEOS Annual Mtg. 2008* and *2009*, and *2009 IEEE Int'l Conference on Ultra-Wideband*

Assistant editor for the *IEEE Communications Letters*, 1997-2000

Federal

Member of the NSERC Advisory Committee on University - Industry Grants, 2014-2017

Member of Board of Directors SAVI Canadian Strategic Network, 2011-2014

Co-chair, NSERC Discovery Grant Evaluation Committee for ECE, 2008-2011

Chair, NSERC Strategic Grant Evaluation Committee, 2002-2004

Provincial

Member of the Jury, Prix Lionel-Boulet (Les Prix du Québec), 2009, 2004

Member, Executive Council, Center for Adv. Systems & Technologies in Comm., 2006-2008

Media Attention

IEEE Photonics Society Newsletter, *Get to know you Society Leadership*, February 2018

Catherine Lachaussée, "*Le WiFi détrôné?, "* Radio Canada, 25 Jan 2016, entrevu, radio.

F.O. Roberge, "La fibre optique offre une pluie de possibilités," *Le Soleil*, February 22, 2013.

S. Gall, "Leslie Rusch: la tête dans le nuage," *Le Soleil*, October 4, 2012.

P. Asselin, "3,75 millions $ pour améliorer la vitesse en communications optiques," *Le Soleil*, September 23, 2009.

INVITED TALKS AT INTERNATIONAL VENUES

"Research in Optical Communications at UL," **Israel** Center for Advanced Photonics, invited by Ariel Bruner, 18 July 2019.

"Transporting Data on the Orbital Angular Momentum of Light," Tel Aviv University, **Israel**, invited by Prof. Ady Arie, 17 July 2019.

"An ISI Aware Design Processfor SiP Modulators," Roma Tre University, **Italy**, invited by Prof. Gabriella Cincotti, 19 October 2018.

"Spatial Multipexing with Orbital Angular Momentum Modes," Universita di Parma, **Italy**, invited by Prof. Alberto Bononi, 17 October 2018.

"An ISI Aware Design Process for SiP Modulators," in *Pacific Rim Conference on Lasers and Electro-Optics (CLEO PR 2018)*, **Hong Kong**, August 2018.

"Meeting Capacity Demands through Space Division Multiplexing and New Fibers," in *Rank Prize Optoelectronics Symposium*, Windermere, **UK**, June 2018.

"Meeting Capacity Demands through Space Division Multiplexing and New Fibers," in *Huawei Strategy and Technology Workshop 2018*, Shenzhen, **Chine**, May 2018.

"Virtualizing Cloud RAN by piggybacking on WDM-PON channels," in 2017 International Topical Meeting on Microwave Photonics (MWP), **Beijing**, 26 October 2017.

"IEEE Women in Engineering," at *IEEE Conf. on Optical Fiber Communication*, **Los Angeles**, mars 2017.

"Enabling 5G over PON with Radio over Fiber", IEEE 5G Summit, Toronto, November 2015.

"Designing optical fiber for OAM mode transmission," in International Conf. on Orbital Angular Momentum (ICOAM), **New York**, pp. OAM01-62, August 2015.

"Spatial Division Multiplexing using Ring Core Fibers for OAM," in IEEE European Conf. on Network and Optical Communications (NOC), **London**, **keynote**, July 2015.

"Coherent Optical Systems & Radio over Fiber …," **Japan National Institute of Information and Communication Technology**, invited by Tetsuya Kawanishi, 28 June 2013.

"Performance of Carrier Phase Recovery for electronically dispersion compensated...," Roma Tre University, **Italy**, invited by Prof. Gabriella Cincotti, 23 November 2012.

"Numerical Analysis of Noise Mitigation via Nonlinear Dynamics in …," IDA Center for Communications Research, **Princeton**, invited by Dr. Laurie Nelson, 11 April 2011.

"Optical Processing to Enhance UWB Transmission and Reception," in *2009 Conf. on Lasers & Electro-Optics*, **Baltimore**, May 2009.

"Novel Optically Generated Ultra Wideband (UWB) Signals," in *2009 IEEE Conf. on Optical Fiber Communication*, **San Diego**, mars 2009.

"Silicon Photonics – Enabling Emerging Broadband Services," Intel Research Labs, invited by Dr. Mario Paniccia, Sunnyvale, **California**, 28 mars 2008.

"SAC OCDMA pour le routage toute-optique et RoF pour la …", École Supérieure de Télécommunications in **Tunis**, invited by Prof. M. Mourad, septembre 2007.

"Incoherent to Coherent Conversion in a SOA: Experiment, Simulation …," CNIT and Scuola Superiore Sant'Anna, Pisa, **Italy**, invited by Dr. Luca Poti, 17 May 2005.

"Incoherent to Coherent Conversion in a SOA…," PhotonLab, Scuola Politecnico di Torino, **Italy**, invited by Prof. Roberto Gaudino, 6 June 2005.

« Performance des Systèmes CDMA Optique à encodage de l'amplitude … », École National Supérieure de Télécom, **Paris**, invited by Prof. Philipe Gallion, 4 July 2005.

"Ultra-Wideband Research at Intel," **Berkeley** Wireless Research Center, invited by Prof. Rob Robertson, 7 December 2001.

"Narrowband Interference Suppression in Spread Spectrum CDMA," University of California, **San Diego**, invited by Prof. Larry Milstein, 1 April 1994.

"Narrowband Interference Suppression in Spread Spectrum CDMA," Notre Dame University, **Notre Dame, Indiana**, invited by Prof. Leo Costello, 4 March 1994.

"Narrowband Interference Suppression in Spread Spectrum CDMA," Northeastern University, **Boston**, invited by Prof. John Proakis, 28 February 1994.

"Multiuser Detection Techniques for Narrowband Interference Suppression," WINLAB, Rutgers University, **New Jersey**, invited by Prof. David Goodman, 1 April 1993.