

Ioannis Roudas

Professor, Gilhousen Telecommunications Chair
Montana State University
Electrical & Computer Engineering

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Education

- 1991-1995 **Ecole Nationale Supérieure des Télécommunications**, Paris, France
Ph.D. in Optical Communications (Graduated with highest honors)
- 1990-1991 **Ecole Nationale Supérieure des Télécommunications**, Paris, France
M.Sc. in Components and Devices of Optical & Microwave Communications
- 1988-1990 **University of Athens**, Athens, Greece
M.Sc. in Electronics and Radio-engineering
- 1984-1988 **University of Athens**, Athens, Greece
B.Sc. in Physics (Graduated with highest honors)

Employment

- 2016-present **Montana State University**, Bozeman, MT
Professor, Gilhousen Telecommunications Chair
Department of Electrical and Computer Engineering
- 2011-2016 **Corning Inc.**, Corning, NY
Research Associate
Optical Physics and Transmission Technologies Department
- 2003-2011 **University of Patras**, Patras, Greece
Associate Professor of Optical Communications
Department of Electrical and Computer Engineering
- 1999-2002 **Corning Inc.**, Somerset, NJ
Senior Research Scientist
Photonic Modeling and Process Engineering Department
- 1995-1998 **Bell Communications Research (Bellcore)**, Red Bank, NJ
Technical Staff Member
Optical Networking Research Department

Visiting Positions

- 7/05-3/11 **Corning Inc.**, Corning, NY
Visiting Scholar
Optical Physics Department (7/10-9/10, 7/05-9/05, 7/10-3/11)
Modeling and Simulation Department (7/08-9/08, 7/07-9/07, 7/06-2/07)
- 7/09-9/09 **City University of New York**, College of Staten Island, Staten Island, NY
Adjunct Associate Professor
Department of Engineering Science and Physics
- 9/09-7/10 **Hellenic Open University**, Patras, Greece
Adjunct Associate Professor
School of Science and Technology, Computer Science Department
- 1996-1998 **Columbia University**, New York, NY
Adjunct Assistant Professor
Department of Electrical Engineering

Teaching Experience

- 2016-present **Montana State University**, Bozeman, MT
Professor, Gilhousen Telecommunications Chair
Department of Electrical and Computer Engineering
- Undergraduate course EELE 445: Telecommunications Systems (Sp17-23).
Undergraduate course EELE 448: Optical Communications Systems (Sp18-23)
Undergraduate course EELE 447: Mobile Wireless Communications (Fa20, Fa22)
Undergraduate course EELE 482: Introduction to Electro-Optics (Fa19).
Undergraduate course EELE 491: Special Topics: Optical Communications (Fa17).
- Graduate course EELE 543: Advanced Telecom Systems (Fa21)
Graduate course EELE 548: Optical Communications Systems (Sp19-23).
Graduate course EELE 541: Advanced Communication Theory (Fa18).
- Supervision of 1 post-doc, 3 Ph.D./4 M.S./1 B.S. theses, 3 Capstone, and 2 REU projects (Fa16-present)
- 2003-2011 **University of Patras**, Patras, Greece
Associate Professor of Optical Communications
Department of Electrical and Computer Engineering
- Undergraduate course EE 22Y601: Electromagnetic fields II (Sp04-09).
Graduate course EE 22A001: Optical communications (Sp04-11).
Graduate course EE 22Γ909: Optoelectronics (Fa04-10, Sp11).
Supervision of 5 Ph.D. theses and over 15 B.Sc. theses
- 9/09-7/10 **Hellenic Open University**, Patras, Greece
Adjunct Associate Professor
School of Science and Technology
Computer Science Department
Undergraduate course PLI 36: Modern Networks and Services
- 7/09 **City University of New York**, College of Staten Island, Staten Island, NY
Adjunct Associate Professor
Department of Engineering Science and Physics
Summer undergraduate course PHY 114: Introduction to Physics
- 1996-1998 **Columbia University**, New York, NY
Adjunct Assistant Professor
Department of Electrical Engineering
Graduate course EE E6413: Lightwave systems (Fa97, 98)
Co-supervision of one Ph.D. thesis (1996-98) & one M.Sc. thesis (1997-98)
- 1/95-8/95 **University of Athens**, Athens, Greece
Visiting Researcher
Department of Informatics
Co-supervision of one M.Sc. thesis.
- 1991-1994 **Ecole Nationale Supérieure des Télécommunications**, Paris, France
Teaching Assistant
Co-supervision of two BS theses, undergraduate projects & lab work.

Awards

2020	Charles Kao best paper award WOCC'20
2011-2016	Various monetary awards, Corning Inc.
2005	Corning award for the OSMOSIS project
2001	Corning outstanding paper award
2001	Corning award for the design of a coherent polarimeter
1999	Corning award for the development of the MetroCor™ fiber
1998	Bellcore CEO Award
1998	Bellcore award for the PCAD project
1997	Bellcore award for the MONET project

Scholarships

1991-1995	Ecole Nationale Supérieure des Télécommunications, Paris, France
1990-1991	North Atlantic Treaty Organization (NATO)/Greek government
1989-1990	State Scholarships Foundation, Greece

Publications

Books

- [1] N. Antoniadis, G. Ellinas, and I. Roudas, Eds., *WDM systems and networks: Modeling, simulation, design and engineering*, Springer, 2012 (ISBN 978-1-4614-1092-8).

Book Chapters

- [1] I. Roudas, "Coherent optical communications systems," Ch. 10, in *WDM systems and networks: Modeling, simulation, design and engineering*, N. Antoniadis, G. Ellinas, and I. Roudas, Eds., Springer, 2012 (ISBN 978-1-4614-1092-8).

Archival Journals

- [1] M. Dadras, I. Roudas, and J. Kwapisz, "Characterization of fiber modal impairments using direct-detection methods," *Optics Communications*, Vol. 523, 128735, Nov. 15, 2022.
- [2] I. Roudas, J. Kwapisz, and X. Jiang, "Revisiting the nonlinear Gaussian noise model for hybrid fiber spans (Invited paper)," *Intelligent and Converged Networks*, Vol. 2, No. 1, pp. 30-49, Mar. 2021.
- [3] I. Roudas, J. Kwapisz, and D. A. Nolan, "Optimal launch states for the measurement of principal modes in optical fibers," *IEEE/OSA J. Lightwave Tech.*, vol. 36, no. 20, pp. 4915-4931, Oct. 2018. (IF 3.652)
- [4] V. Vgenopoulou, M. Song, E. Pincemin, Y. Jaouën, S. Sygletos, and I. Roudas, "Comparison of nonlinear compensation techniques for 400-Gb/s coherent multi-band OFDM super-channels," *Applied Sciences*, vol. 8, p. 447, Mar. 2018. (IF 1.689)
- [5] I. Roudas and J. Kwapisz, "Stokes space representation of modal dispersion," *IEEE Phot. J.*, vol. 9, no. 5, pp. 1–15, Oct. 2017. (IF 2.627)
- [6] J. D. Downie, M. Mlejnek, I. Roudas, W. A. Wood, A. Zakharian, J. Hurley, S. Mishra, F. Yaman, S. Zhang, E. Ip, and Y.-K. Huang, "Quasi-single-mode fiber transmission for optical communications (Invited paper)," *IEEE J. Select. Top. Quantum Elec.*, vol. 23, no. 3, pp. 1–12, May-June 2017. (IF 3.367)
- [7] S. Makovejs, J. D. Downie, J. E. Hurley, J. S. Clark, I. Roudas, C. C. Roberts, H. B. Matthews, F. Palacios, D. A. Lewis, D. T. Smith, P. G. Diehl, J. J. Johnson, C. R. Towery, and S. Y. Ten, "Towards superior transmission performance in submarine systems: Leveraging ultralow attenuation and large effective area," *IEEE/OSA J. Lightwave Tech.*, vol. 34, no. 1, pp. 114–120, Jan. 2016. (IF 3.652)
- [8] B. R. S. Makovejs, C. Behrens, R.-P. Braun, S. Ten, C. Towery, I. Roudas, K. Koreshkov, T. Nath, and A. Gladisch, "Impact of adaptive-rate transponders and fiber attributes on the achievable capacity," *J. Opt. Comm. Netw.*, vol. 7, no. 3, pp. 172–175, Mar. 2015. (IF 2.742)
- [9] M. Mlejnek, I. Roudas, J. D. Downie, N. Kaliteevskiy, and K. Koreshkov, "Coupled-mode theory of multipath interference in quasi-single-mode fibers," *IEEE Phot. J.*, vol. 7, no. 1, pp. 1–16, Feb. 2015. (IF 2.627)
- [10] J. D. Downie, J. Hurley, I. Roudas, D. Pikula, and J. A. Garza-Alanis, "Unrepeated 256 Gb/s PM-16QAM transmission over up to 304 km with simple system configurations," *Opt. Expr.*, Vol. 22, No. 9, pp. 10256–10261, May 2014. (IF 3.356)
- [11] F. Karinou, R. Borkowski, D. Zibar, I. Roudas, K. Vlachos, and I. T. Monroy, "Advanced modulation techniques for high performance computing optical interconnects," *IEEE J. Select. Top. Quantum Elec.*, Vol. 19, No. 2, pp. 324–337, Mar. 2013. (IF 3.367)

- [12] I. Roudas, B. R. Hemenway, R. R. Grzybowski, and F. Karinou, "Optimal wavelength-space crossbar switches for supercomputer optical interconnects," *Opt. Expr.*, Vol. 20, No. 18, pp. 20407–20426, Aug. 2012. (IF 3.356)
- [13] J. C. Cartledge, J. D. Downie, J. E. Hurley, X. Zhu, and I. Roudas, "Bit error ratio performance of 112 Gb/s PM-QPSK transmission systems," *IEEE/OSA J. Lightwave Tech.*, Vol. 30, No. 10, pp. 1475–1479, May 2012. (IF 3.652)
- [14] F. Karinou, I. Roudas, K. G. Vlachos, B. R. Hemenway, and R. R. Grzybowski, "Influence of transmission impairments on the OSMOSIS HPC optical interconnect architecture," *IEEE/OSA J. Lightwave Tech.*, Vol. 29, No. 21, pp. 3167–3177, Nov. 2011. (IF 3.652)
- [15] N. Mantzoukis, C. S. Petrou, A. Vgenis, I. Roudas, T. Kamalakis, and L. Raptis, "Comparison of electronic equalizers for coherent PDM QPSK systems based on outage probability," *IEEE/OSA J. Lightwave Tech.*, Vol. 29, No. 11, pp. 1721–1728, Jun. 2011. (IF 3.652)
- [16] N. Mantzoukis, C. S. Petrou, A. Vgenis, T. Kamalakis, I. Roudas, and L. Raptis, "Outage probability due to PMD in coherent PDM QPSK systems with electronic equalization," *IEEE Phot. Tech. Lett.*, Vol. 22, No. 16, pp. 1247–1249, Aug. 2010. (IF 2.446)
- [17] I. Roudas, A. Vgenis, C. S. Petrou, D. Toumpakaris, J. Hurley, M. Sauer, J. Downie, Y. Mauro, and S. Raghavan, "Optimal polarization demultiplexing for coherent optical communications systems," *IEEE/OSA J. Lightwave Tech.*, Vol. 28, No. 7, pp. 1121–1134, Apr. 2010. (IF 3.652)
- [18] A. Vgenis, C. S. Petrou, C. B. Papadias, I. Roudas, and L. Raptis, "Non-singular constant modulus equalizer for PDM-QPSK coherent optical receivers," *IEEE Phot. Tech. Lett.*, Vol. 22, No. 1, pp. 45–47, Jan. 2010. (IF 2.446)
- [19] C. S. Petrou, A. Vgenis, I. Roudas, and L. Raptis, "Quadrature imbalance compensation for PDM QPSK coherent optical systems," *IEEE Phot. Tech. Lett.*, Vol. 21, No. 24, pp. 1876 – 1878, Dec. 2009. (IF 2.446)
- [20] I. Roudas and N. Antoniadis, "Performance outages in CWDM optical networks due to the polarization-dependent gain of semiconductor optical amplifiers," *IEEE Phot. Tech. Lett.*, Vol. 18, No. 1, pp. 48–50, Jan. 2007. (IF 2.446)
- [21] N. Antoniadis, K. C. Reichmann, P. P. Iannone, N. J. Frigo, A. M. Levine, and I. Roudas, "The impact of polarization-dependent gain on the design of cascaded semiconductor optical amplifier CWDM systems," *IEEE Phot. Tech. Lett.*, Vol. 18, No. 20, pp. 2099–2101, Oct. 2006. (IF 2.446)
- [22] N. Antoniadis, I. Roudas, G. Ellinas, and J. Amin, "Transport metropolitan optical networking: Evolving trends in the architecture design and computer modeling," *IEEE/OSA J. Lightwave Tech.*, Vol. 22, No. 11, pp. 2653–2670, Nov. 2004. (IF 3.652)
- [23] I. Roudas, G. Piech, M. Mlejnek, Y. Zhu, D. Q. Chowdhury and M. Vasilyev, "Coherent frequency-selective polarimeter for polarization mode dispersion monitoring," *IEEE/OSA J. Lightwave Tech.*, Vol. 22, No. 4, pp. 953–967, Apr. 2004. (IF 3.652)
- [24] N. Antoniadis, N. Madamopoulos, I. Roudas, M. D. Vaughn, R. E. Wagner, "Engineering an 11 Tb/s U.S. mesh metro network: Design and transport performance," *Optical Networks Magazine*, Vol. 4, No. 4, pp 92–100, July/August 2003.
- [25] I. Roudas, N. Antoniadis, T. Otani, T. E. Stern, R. E. Wagner, and D. Q. Chowdhury, "Accurate modeling of optical multiplexers/demultiplexers concatenation in multiwavelength optical networks," *IEEE/OSA J. Lightwave Tech.*, Vol. 20, No. 6, pp. 921–936, Jun. 2002. (IF 3.652)
- [26] N. Antoniadis, A. Boskovic, I. Tomkos, N. Madamopoulos, M. Lee, I. Roudas, D. Pastel, M. Sharma, and M. J. Yadlowsky, "Performance engineering and topological design of metro WDM optical networks using computer simulation," *IEEE J. Select. Areas Comm.*, Vol. 20, No. 1, pp. 149–165, Jan. 2002. (IF 7.172)
- [27] I. Roudas, N. Antoniadis, T. Otani, T. E. Stern, R. E. Wagner, and D. Q. Chowdhury, "Error probability of transparent optical networks with optical multiplexers/demultiplexers," *IEEE Phot. Tech. Lett.*, Vol. 13, No. 11, pp. 1254–1256, Nov. 2001. (IF 2.446)
- [28] I. Tomkos, I. Roudas, R. Hesse, N. Antoniadis, A. Boskovic, and R. Vodhanel, "Extraction of laser rate equations parameters for representative simulations of metropolitan area transmission systems and networks," *Optics Comm.*, Vol. 194, pp. 109–129, Jul. 2001. (IF 1.887)

- [29] I. Tomkos, B. Hallock, I. Roudas, R. Hesse, A. Boskovic, J. Nakano, and R. Vodhanel, “10-Gb/s transmission of 1.55- μ m directly modulated signal over 100 km of negative dispersion fiber,” *IEEE Phot. Tech. Lett.*, Vol. 13, No. 7, pp. 735–737, Jul. 2001. (IF 2.446)
- [30] I. Tomkos, D. Chowdhury, J. Conradi, D. Culverhouse, K. Enns, C. Giroux, B. Hallock, T. Kennedy, A. Kruse, S. Kumar, N. Lascar, I. Roudas, M. Sharma, R. S. Vodhanel, and C.-C. Wang, “Demonstration of negative dispersion fibers for DWDM metropolitan area networks,” *IEEE J. Select. Top. Quantum Elec.*, Vol. 7, No. 3, pp. 439–460, May/Jun. 2001. (IF 3.367)
- [31] X. Jiang and I. Roudas, “Asymmetric probability density function of a signal with interferometric crosstalk,” *IEEE Phot. Tech. Lett.*, Vol. 13, No. 2, pp. 160–162, Feb. 2001. (IF 2.446)
- [32] I. Roudas, N. Antoniadis, D. H. Richards, R. E. Wagner, J. L. Jackel, S. F. Habiby, T. E. Stern, and A. F. Elrefaie, “Wavelength-domain simulation of multiwavelength optical networks (Invited paper),” *IEEE J. Select. Top. Quantum Elec.*, Vol. 6, No. 2, pp. 348–362, Mar. /Apr. 2000. (IF 3.367)
- [33] T. Otani, N. Antoniadis, I. Roudas, and T. E. Stern, “Cascadability of passband flattened arrayed waveguide grating filters in WDM optical networks,” *IEEE Phot. Tech. Lett.*, Vol. 11, No. 11, pp. 1414–1416, Nov. 1999. (IF 2.446)
- [34] I. Roudas, D. H. Richards, N. Antoniadis, J. L. Jackel, and R. E. Wagner, “An efficient simulation model of the Erbium-doped fiber for the study of multiwavelength optical networks (Invited paper),” *Opt. Fiber Tech.*, Vol. 5, No. 4, pp. 363–389, Oct. 1999. (IF 1.350)
- [35] N. Antoniadis, I. Roudas, R. E. Wagner, T. E. Stern, J. L. Jackel, and D. H. Richards, “Use of wavelength- and time-domain simulation to study performance degradations due to linear optical crosstalk in WDM networks,” *Opt. Networks and Appl. (TOPS)*, Vol. 20, pp. 288–293, 1998.
- [36] N. Antoniadis, I. Roudas, R. E. Wagner and S. F. Habiby, “Simulation of ASE noise accumulation in a wavelength add-drop multiplexer cascade,” *IEEE Phot. Tech. Lett.*, Vol. 9, No. 9, pp. 1274–1276, Sept. 1997. (IF 2.446)
- [37] I. Roudas, Y. Jaouen, J. Prado, R. Vallet, and P. Gallion, “Recursive simulation models of the semiconductor laser modulation characteristics for accurate performance evaluation of coherent optical CPFSK systems,” *IEEE/OSA J. Lightwave Tech.*, Vol. 13, pp. 2258–2269, Nov. 1995. (IF 3.652)
- [38] I. Roudas, Y. Jaouen, J. Prado, R. Vallet, and P. Gallion, “Accurate model of the semiconductor laser nonuniform FM response for the study of coherent optical systems,” *IEEE Phot. Tech. Lett.*, Vol. 6, pp. 1389–1391, Nov. 1994. (IF 2.446)
- [39] Y. Jaouen, I. Roudas, and P. Gallion, “Experimental reduction of phase-noise influence for an optical CPFSK system with I. F. filtering,” *Microwave and Opt. Tech. Lett.*, Vol. 6, No. 16, pp. 903–905, Dec. 1993. (IF 0.948)

Peer-Reviewed Conference Proceedings

- [1] I. Roudas, E. Fink, and J. Kwapisz, “Mode vector modulation: Optimal signal sets with geometric shaping,” *IEEE/OSA Optical Fiber Communication Conference (OFC’23)*, paper Th3E.4, San Diego, CA, Mar. 2023.
- [2] J. Kwapisz, I. Roudas, E. Fink, and A. Biswas, “Mode vector modulation direct-detection receivers with linear hardware complexity,” *IEEE Photonics Conference (IPC’22)*, paper TuF1.3, Vancouver, CA, Oct. 2022.
- [3] J. Kwapisz, I. Roudas, and E. Fink, “Polarimetric direct-detection for spatial superchannels,” *Asia Communications and Photonics Conference (ACP’22)*, paper 367, Shenzhen, China, Nov. 2022.
- [4] J. Kwapisz, I. Roudas, and E. Fink, “Error probability of mode vector modulation optically-preamplified direct-detection receivers,” *IEEE/OSA Conference on Lasers and Electro-Optics (CLEO’22)*, paper SM4J.1, San Jose, CA, May 2022.
- [5] E. Fink, J. Kwapisz, and I. Roudas, “Optimized SVM constellations for SDM fibers,” *IEEE Photonics Conference (IPC’21)*, paper TuE3.2, Oct. 2021.

- [6] I. Roudas, J. Kwapisz, and E. Fink, "Mode vector modulation," *European Conference on Optical Communication (ECOC'21)*, paper Tu2D.5, Bordeaux, France, Sept. 2021.
- [7] I. Roudas, X. Jiang, and J. Kwapisz, "Nonlinear GN model for coherent optical communications systems with hybrid fiber spans (Invited paper)," *Wireless and Optical Communications Conference (WOCC)*, Newark, NJ, May 2020.
- [8] X. Jiang, I. Roudas, L. Miranda, and S. Ezquerro, "Hybrid fiber links using quasi-single-mode fibers," *IEEE Photonics Conference (IPC'19)*, paper MC2.2, San Antonio, TX, Sept. 2019.
- [9] I. Roudas, X. Jiang, and L. Miranda, "Modeling long-haul optical networks with quasi-single-mode fibers (Invited paper)," *Optical Network Design and Modeling (ONDM'19)*, Athens, Greece, May 2019.
- [10] V. Vgenopoulou, N. P. Diamantopoulos, I. Roudas, and S. Sygletos, "MIMO nonlinear equalizer based on inverse Volterra series transfer function for coherent SDM systems," *IEEE/OSA Optical Fiber Communication Conference (OFC'19)*, paper Th2A.50, San Diego, CA, Mar. 2019.
- [11] M. Dadras, I. Roudas, and J. Kwapisz, "Mode selection for measuring modal dispersion in Stokes space," *IEEE Photonics Conference (IPC'18)*, Reston, VA, Oct. 2018.
- [12] I. Roudas and J. Kwapisz, "Optimization of the mode-dependent signal delay method for the measurement of modal dispersion," *IEEE Photonics Society Summer Topicals*, Waikoloa, Hawaii, Jul. 2018.
- [13] I. Roudas and J. Kwapisz, "Accurate modal dispersion measurements using maximally-orthogonal Stokes vectors," *IEEE/OSA Conference on Lasers and Electro-Optics (CLEO'18)*, paper SM3C.3, San Jose, CA, May 2018.
- [14] I. Roudas, "Modal dispersion characterization of multimode fibers," *IEEE Photonics Conference (IPC'17)*, paper WD1.1, Lake Buena Vista, FL, Oct. 2017.
- [15] L. Miranda, I. Roudas, J. D. Downie, and M. Mlejnek, "Performance of coherent optical communication systems with hybrid fiber spans," *European Conference on Optical Communication (ECOC'17)*, paper P2.SC6.18, Gothenburg, Sweden, Sept. 2017.
- [16] I. Roudas, "Modeling of modal dispersion in multimode and multicore optical fibers (Invited paper)," *Wireless and Optical Communication Conference (WOCC)*, Newark, NJ, 2017.
- [17] V. Vgenopoulou, M. S. Erkilinc, R. I. Killey, Y. Jaouën, I. Roudas, and I. Tomkos, "Comparison of multi-channel nonlinear equalization using inverse Volterra series versus digital backpropagation 400 Gb/s coherent superchannel," *IEEE European Conference on Optical Communication (ECOC'16)*, Düsseldorf, Germany, Sept. 2016.
- [18] J. D. Downie, M. Mlejnek, W. Wood, J. Hurley, A. Zakharian, I. Roudas, S. Mishra, F. Yaman, S. Zhang, E. Ip, and Y. Huang, "Quasi-single-mode transmission for long-haul and submarine optical communications," *IEEE/OSA Conference on Lasers and Electro-Optics (CLEO'16)*, paper SM4F.6, San Jose, CA, Jun. 2016.
- [19] J. D. Downie, W. A. Wood, J. Hurley, M. Mlejnek, I. Roudas, A. Zakharian, S. Mishra, E. Ip, F. Yaman, and S. Zhang, "Quasi-single-mode fiber transmission for submarine systems," *SubOptic 2016*, Dubai, United Arab Emirates, Apr. 2016.
- [20] X. Chen, J. Hurley, J. Stone, J. Downie, I. Roudas, D. Coleman, and M.-J. Li, "Universal fiber for both short-reach VCSEL transmission at 850 nm and single-mode transmission at 1310 nm," *IEEE/OSA Optical Fiber Communication Conference (OFC'16)*, paper Th4E.4, Anaheim, CA, Mar. 2016.
- [21] J. D. Downie, J. Hurley, I. Roudas, K. Koreshkov, and M. Mlejnek, "Multi-path interference characterization of quasi-single-mode fibers," *IEEE Photonics Conference*, Reston, VA, Oct. 2015.
- [22] M. Song, E. Pincemin, V. Vgenopoulou, I. Roudas, E.-M. Ahmoud, and Y. Jaouen, "Transmission performances of 400 Gbps coherent 16-QAM multi-band OFDM adopting nonlinear mitigation techniques," *Tyrrhenian International Workshop on Digital Communications (TIWDC 2015) - Fiber Nonlinearities in Coherent Optical Communication*, Photonics in Switching, Florence, Italy, Sept. 2015.

- [23] V. Vgenopoulou, A. Amari, M. Song, E. Pincemin, I. Roudas, and Y. Jaouen, "Volterra-based nonlinear compensation in 400 Gb/s WDM multiband coherent optical OFDM systems," *Asia Communications and Photonics Conference (ACP)*, paper AF1E.4, Shanghai, China, Nov. 2014.
- [24] I. Roudas, N. Kaliteevskiy, P. Sterlingov, and W. A. Wood, "Comparison of analytical models for the nonlinear noise in dispersive coherent optical communications systems," *IEEE Photonics Conference*, paper MG3.4, Bellevue, WA, Sept. 2013.
- [25] I. Roudas, B. R. Hemenway, M. S. Whiting, and R. R. Grzybowski, "Differential signaling for low optical energy consumption in datacom optical interconnects," *IEEE Optical Interconnects Conference*, paper WC3, Santa Fe, NM, May 2013.
- [26] W. A. Wood, S. Y. Ten, I. Roudas, P. M. Sterlingov, N. A. Kaliteevskiy, J. D. Downie, and M. Rukosueva, "Relative importance of optical fiber effective area and attenuation in span length optimization of ultra-long 100Gb/s PM-QPSK systems," *SubOptic*, paper Tu1C.3, Paris, France, Apr. 2013.
- [27] F. Karinou, R. Rodes, K. Prince, I. Roudas, and I. T. Monroy, "IM/DD vs. 4-PAM using a 1550-nm VCSEL over short-range SMF/MMF links for optical interconnects," *IEEE/OSA Optical Fiber Communication Conference (OFC'13)*, paper OW4A.2, Anaheim, CA, Mar. 2013.
- [28] F. Karinou, R. Borkowski, D. Zibar, I. Roudas, and I. T. Monroy, "Coherent 40 Gb/s SP-16QAM and 80 Gb/s PDM-16QAM in an optimal supercomputer optical switch fabric," *IEEE/OSA Optical Fiber Communication Conference (OFC'13)*, paper JTh2A.77, Anaheim, CA, Mar. 2013.
- [29] F. Karinou, R. Borkowski, K. Prince, I. Roudas, I. T. Monroy, and K. Vlachos, "Performance evaluation of a SOA-based rack-to-rack switch for optical interconnects exploiting NRZ-DPSK," *IEE European Conference on Optical Communication (ECOC'12)*, paper P3.05, Amsterdam, Netherlands, Sept. 2012.
- [30] G. A. Rodes, J. J. V. Olmos, F. Karinou, I. Roudas, L. Deng, X. Pang, and I. T. Monroy, "Optical switching for dynamic distribution of wireless-over-fiber signals," *Optical Network Design and Modeling (ONDM)*, Colchester, UK, Apr. 2012.
- [31] I. Roudas, "Constrained LMS phase noise estimation algorithm for coherent optical M-QAM intradyne receivers," *IEEE/OSA Optical Fiber Communication Conference (OFC'12)*, paper JW2A.62, Los Angeles, CA, Mar. 2012.
- [32] J. C. Cartledge, J. D. Downie, J. E. Hurley, A. S. Karar, J. H. Ke, I. Roudas, and K. Roberts, "Performance of PM QPSK and PM 16-QAM coherent optical fiber communication systems," *SPIE Photonics West*, Vol. 8284, pp. 82840C–82840C-8, 2012.
- [33] X. Zhu, I. Roudas, and J. C. Cartledge, "Error probability estimation for coherent optical PDM-QPSK communications systems," *Proc. SPIE*, Vol. 8309, p. 830939, Shanghai, China, Nov. 2011.
- [34] F. Karinou, I. Roudas, K. Vlachos, B. R. Hemenway, and R. R. Grzybowski, "Performance assessment of an optimized optical supercomputer interconnect architecture," *IEEE/OSA Optical Fiber Communication Conference (OFC'11)*, paper JWA86, Los Angeles, CA, Mar. 2011.
- [35] N. Mantzoukis, A. Vgenis, C. S. Petrou, I. Roudas, T. Kamalakis, and L. Raptis, "Design guidelines for electronic PMD equalizers used in coherent PDM QPSK systems," *IEE European Conference on Optical Communication (ECOC'10)*, paper P4.16, Torino, Italy, Sept. 2010.
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Patents

- [1] D. A. Nolan, V. Ravichandran, I. Roudas, and C.C. Wolcott, “Textured surfaces for display applications,” U.S. Patent 9,952,375, Apr. 24, 2018.
- [2] M. Etienne, I. Roudas, A. Tandia, and A. R. Zakharian, “Texture gradient for uniform light output from a transparent backlight,” U.S. Patent Application 15/564,986, Apr. 5, 2018.
- [3] J. D. Downie, M.-J. Li, M. Mlejnek, I. Roudas, W. A. Wood, and A. R. Zakharian, “Optical transmission systems and methods using a QSM large-effective-area optical fiber,” U.S. Patent 9,841,555, Dec. 12, 2017.
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Ph.D. Dissertation

I. Roudas, Conception optimale d’un système optique cohérent CPFSK avec récepteur différentiel, Ecole Nationale Supérieure des Télécommunications, Paris, France, Jan. 1995.

Research grants at MSU

External

- Ioannis Roudas (Principal Investigator)

Title: "Prototype quantum communication network for entanglement distribution"

Sponsor: Air Force Research Laboratory (AFRL)

Award FA8750-20-1-1004

Duration: October 1, 2020 - September 30, 2024.

Award Amount: \$12M (for MSU)

Optical Communications Group Funding: \$2,961,600

- Ioannis Roudas (Principal Investigator with MSU and project leader)
In collaboration with CUNY, College of Staten Island (CSI), NY

Title: "CNS Core: Small: Collaborative research: Multi-dimensional all-optical networking"

Sponsor: National Science Foundation (NSF)

Award #1911183

Duration: October 1, 2019 - September 30, 2022.

Award Amount: \$500,000 (for MSU and CUNY CSI together)

Current MSU Funding: \$250,000

- Participants:

Ioannis Roudas (Principal Investigator with MSU)

In collaboration with CUNY, College of Staten Island (CSI), NY

Title: "GOALI: Collaborative Research: An Experimentally Validated Simulation Framework for Next-Generation Plastic Optical Fiber-based Systems on Airplanes"

Sponsor: National Science Foundation (NSF)

Award #1809043

Duration: October 1, 2018 - September 30, 2021.

Award Amount: \$450,000 (for CUNY CSI and MSU together)

Current MSU Funding: \$100,000

- Participants:

Wataru Nakagawa (Principal Investigator)

Philip Battle (Co-Principal Investigator)

Wm Randall Babbitt (Co-Principal Investigator)

Phillip Himmer (Co-Principal Investigator)

Ioannis Roudas (Co-Principal Investigator)

Title: "GOALI: Nanostructure-enabled QPM Counter-Propagating Optical Parametric Oscillator"

Sponsor: National Science Foundation (NSF)

Award #1710128

Duration: August 1, 2017 - July 31, 2020

Award Amount: \$390,000

Current MSU Funding: \$390,000

Internal

- Participants:

Ioannis Roudas (Principal Investigator with MSU)

Title: "Telecommunications systems laboratory"

Program: Equipment Fee Allocation Committee (EFAC)

Sponsor: Montana State University

Duration: 7/19-6/20

Award amount: \$22,270.

Research grants at the University of Patras, Greece

External

- I. Roudas (PI), “Next generation all-optical optical multiwavelength networks,” General Secretariat of Research and Technology, Greece. Duration: 11/05-12/10, Award amount: €135,000.
- I. Roudas (PI), “Novel phase-shift keying modulation formats for mitigation of transmission impairments in optical communications systems and networks,” General Secretariat of Research and Technology, Greece. Duration: 1/07-6/08, Award amount: €65,000.
- I. Roudas (co-PI), “Design of novel almost-all-optical burst and packet switching node architectures,” Department of Education, Greece. Duration: 1/05-12/06, Award amount: €55,000.

Internal

- I. Roudas (PI), “Adaptive polarization mode dispersion compensation in optical communications systems and networks networks,” Fundamental Research Program C. Caratheodory, University of Patras, Greece. Duration: 1/08-12/10, Award amount: €24,000.

Service

Professional Societies

- Associate Editor, *IEEE Photonics Journal*, 2013-2019.
- TPC Chair, Optical Networks and Systems Subcommittee, *IEEE Photonics Conference*, 2017-2019.
- TPC Member, Optical Communications Subcommittee, *IEEE Photonics Conference*, 2009-2012.
- TPC Member, Coherent Optical Communication Subcommittee, *SPIE Photonics West*, 2010.
- TPC member, Optical and Broadband Communication Subcommittee, *International Conference on Communications, Circuits and Systems (ICCCAS)*, 2007.
- Reviewer for *IEEE/OSA Journal of Lightwave Technology*, *IEEE Photonics Technology Letters*, *IEEE Journal of Quantum Electronics*, *Optics Express*, *Journal of Modern Optics*, and *Optics Communications*.

Grant Panels

- Reviewer, EU HORIZON 2020 FET-OPEN (June 2018)
- Reviewer, ABET, University of Nicosia, Cyprus (May 2018)
- Reviewer, National Science Foundation (February 2018)
- Reviewer, Montana NASA EPSCoR Research Initiation (December 2016)

University Committees

- MSU Norm Asbjornson College of Engineering Strategic Planning Committee (Summer 2019)
- MSU ECE Strategic Planning Committee (AY 2018-2019)
- MSU ECE Promotion and Tenure Committee (AY 2018-2019)
- MSU ECE Diversity and Inclusion Committee (AY 2018-2019)
- MSU ECE Graduate Committee (AY 2016-2018)

Memberships

- Member, IEEE Photonics Society
- Treasurer, IEEE Central Montana Section