PAUL R. PRUCNAL

Personal Information:

Address:	Department of Electrical and Computer Engineering, Princeton University, Princeton, NJ 08544
Telephone:	609-258-5549
Citizenship:	U.S.

Education:

Ph.D.	1979 Columbia University
M.Phil.	1978 Columbia University
M.S.	1976 Columbia University, Electrical Engineering
A.B.	1974 Bowdoin College, *summa cum laude*

Experience:

1990-Current	Princeton University, Professor
1992	Visiting Professor, University of Parma (Sabbatical)
1991	Visiting Professor, RCAST, University of Tokyo (Sabbatical)
1989-1991	New Jersey Advanced Technology Center for Photonics and Optoelectronic Materials, Founding Director
1988-1990	Princeton University, Associate Professor
1984-1988	Columbia University, Associate Professor
1979-1984	Columbia University, Assistant Professor

Consulting:

- Phillips Laboratories (1979-1981)
- Optical Information Systems, Inc (1982)
- GTE Labs (1983-1984)
- AT&T Bell Laboratories (1985-1986)
- IBM (1987-1988)
- Dove Electronics (1987-1989)
- Siemens Corporate Research (1992-1995)
- Center for Computing Sciences (1996-Present)
- Sun Microsystems (1998-2001)
- SAIC (1999-2000)
- Multi Link Technologies, Inc. (1999-2002)
- Alphion, Inc. (2000-Present)
- Ultra Fast Optical Systems (2000-2002)
- Kailight Inc. (2003-2006)
- NEC Laboratories (2004-2011, 2020-present)
- Princeton Optronics (2005-2006)
- Access Optical Networks (2010-2018)
- Bascom Hunter Technologies (2010-present)
- Luminous Computing (2019-present)

Current Research Activities (experimental and theoretical):

Optical networks, photonic switching, optical signal processing, RF photonics, optical interconnects, silicon photonics, neuromorphic photonics.

Honors:

Invited Plenary Speaker

- 9th International Conference on Computer Communications, Tel Aviv, October 1988
- Topical Meeting on Photonic Switching, Salt Lake City, March 1989
- Congreso de Informatica y Telecomunicaciones, Berisso, Argentina, April 1989
- IEEE Communications Society Local Chapter Talks, 1989
- IEEE International Conference on Communications, Atlanta, April 1990
- LEOS Annual Meeting, Boston, November 5, 1990
- IEEE Computer Communications Workshop, October 1992
- IEEE Optical Fiber Communications Conference, February 1993
- OSA Optical Computing Topical Meeting, March 1993
- IEEEOSA Topical Meeting on Photonic Switching, March 1993
- IEEE LEOS Conference, November 1993
- Rank Prize Symposium, April 1994
- Workshop on Massively Parallel Processing using Optical Interconnects, April 1994
- Keynote Address, Viva a Ciencia, Symposium commemorating the 25th Anniversary of Submarine Cables in Portugal, October 1994
- IEEE Optical Fiber Communication Conference, February 1995
- European Fiber Optic Communication & Networking Conference, June 1995
- IEEE LEOS Conference, October 1995
- IEEE LEOS Conference, October 1996
- IEEE Computer Society, May 1996
- ECOC, September 1997
- IEEE LEOS, November 1997
- Sarnoff Symposium, March, 1998
- Rank Prize Symposium, April 1998
- ECOC, September 1998
- XIth Slovak/Czech/Polish Optical Conference on Wave and Quantum Aspects of Contemporary Optics, September 1998
- American Physical Society Annual Meeting, invited tutorial, March 2000
- American Physical Society Annual Meeting, Minneapolis, MN, March 2000
- CLEO/PR-2001, Makahuri Messe, Chiba, Japan, June 2001
- OSA Topical Meeting-Integrated Photonics Research, Vancouver, Canada, July 2002
- WOCC 2002, Newark, NJ, April 2002
- Photonics Prague 2002, Prague, Czech Republic, May 2002
- Europe-U.S.-Japan Symposium on Ultrafast Photonic Technology, Chiba, Japan, July 2003
- ECS'03 Bratislava, Slovakia, September 2003
- IEEE Photonics in Switching Topical Meeting, Versailles France, September, 2003

- “From Smoke Signals to All-Optical Communications,” Given at University of Žilina, Žilina, Slovakia, October 24, 2005
- ”RF Photonics,” DSA, Holmdel, NJ, February 22, 2005
- “Reconfigurable universal transceivers,” U.S. Army Communications Electronics Command, Fort Monmouth, NJ, March 11, 2005
- “All-optical signal processing; “Progress and applications,” Distinguished speaker seminar series, University of Arizona, Tucson, AZ, April 15, 2005
- “Reconfigurable, asynchronous, incoherent optical CDMA networks, “ O-CDMA PI Review, Key West, FL, May 2, 2005
- “All-optical signal processing; Progress and applications,” Center for Communications Research, Princeton, NJ, May 18, 2005
- Plenary Lecture, “All-optical signal processing: Progress and applications,” Ninth Canadian Workshop on Information Theory, McGill University, Montreal, June 6, 2005
- “Flexible access techniques for fiber-to-the-home,” O-CDMA systems Workshop, Key West, FL, May 3-4, 2005
- “Advanced technology for next-generation networks,” NJ Legislative Caucus on Science and Technology: Shaping New Jersey’s Telecommunication Future, Princeton, May 20, 2005
- “All-optical signal processing: Progress and applications,” Center for Computing Sciences, Bowie, MD, June 30, 2005.
- “Advanced optical signal processing techniques for communications and computing,” NEC, Tamagawa Labs, Tokyo, August 24, 2005
- “All-optical signal processing: Challenges and applications,” Tokyo University, August 25, 2005
- “All-optical signal processing: Challenges and applications,” Chinese University of Hong Kong, August 26, 2005
- “All-optical signal processing: Challenges and applications,” Tsinghua University, Beijing, August 31, 2005
- “All-optical signal processing: Challenges and applications,” The Cooper Union, New York City, December 13, 2005
- Keynote Speaker at PRISM/NJCST Summit, May 20, 2005
- “Design of an avionics platform for Lockheed-Martin based on incoherent optical CDMA,” Sarnoff Symposium, Princeton, NJ, March 27-28, 2006
- “How optics has changed data communications,” 15th Czech-Slovak-Polish Optical Conference on Wave and Quantum Aspects of Contemporary Optics. Liberec, Czech Republic, September 11-15, 2006
- “The roll of optics in optical communications,” 15th Czech-Slovak-Polish Optical Conference on Wave and Quantum Aspects of Contemporary Optics. Liberec, Czech Republic, September 11-15, 2006
- “OCDMA-an alternative for optical communications?” Optical Communications, OK 2005, Prague, Czech Republic, September 20-21, 2005
- “Is optical CDMA viable technique for broadband networks?,” Photonics Prague 2005, Prague, Czech Republic, June 8-11, 2005
- “Reconfigurable asynchronous incoherent OCDMA”, PI annual meeting, Chicago, IL August 2006

- Workshop on Optical and Wireless Communications Technologies & *"Princeton testbed for optical and wireless communications"*, PRISM – University-Industry Research Symposium, Princeton University, February 3, 2006
- Seminar of "*Effective Teaching Methods*", McGraw Center, Princeton University, March 15, 2006
- "*All-Optical Signal Processing: Challenges and Applications*", Universita Komenskeho, Bratislava, May 31, 2006
- All-Optical Signal Processing: Technologies for Network Applications, Polytechnic University, New York, NY, November 30, 2006
- All-Optical Signal Processing: Technologies for Network Applications, Globecom Access '06 Business Forum, San Francisco, November 29, 2006
- Concordia University, Montreal, Canada, 5th Workshop on Optimization of Optical Networks, May 8, 2008
- Princeton, NJ Workshop on Modeling and Analysis of Computer and Communication Networks, May 9, 2008
- Santa Fe, NM 2008 Workshop on Interconnections within High Speed Digital Systems. May 18-21, 2008
- Lockheed Martin, Cherry Hill, NJ Seminar presentation and research presentation. July 11, 2008
- St. Thomas, US Virgin Islands ICCCN 2008 August 3, 2008
- Baltimore, MD MIRTHE Summer Workshop, August 5, 2008
- College Park, MD Research seminar at Laboratory for Physical Sciences. October 1, 2008
- "Truly-Asynchronous, Scalable and Survivable Optical CDMA Networks with Heterogeneous QoS," at the 2009 IEEE Lasers and Electro-Optics Society Summer Topical Meeting (LEOS), Newport Beach, CA, USA, July 20-22, 2009
- "Physical layer network security based on optical processing using compact passive devices," OECC 2009, Hong Kong, July 2009.
- Invited panel member, "Quality of Service Performance and Switching Implementation in Optical Networks," at AH-ICI2009, November 2009.
- "Undergraduate Studies and Research in Electrical Engineering at Princeton," at The Lincoln School, Kathmandu, Nepal, November 2009.
- "Physical Layer Security in Data Networks using Optical Signal Processing," 2009 ACP, Shanghai, China, November 2009.
- "*Photonic Neurons for Terahertz Pulse Processing*," 9th International Conference on Optical Communications and Networks (ICOCN 2010), Nanjing, China, October 24-27, 2010.
- "*Ultrafast optical processing and information security*," L3 Communications Telemetry East, Bristol, PA, February 23, 2011.
- "*Ultrafast optical processing and information security*," IEEE World Wide Security and Mobility Conference (WWSMC 2011), Princeton, NJ, July 27, 2011.
- "*Fiber optic networks technology tutorial*," Center for Communication Research, La Jolla, CA, August 9, 2011.

- "*Lightwave neuromorphic signal processing,*" University of Delaware, Newark, DE, October 25, 2011.
- School of Engineering and Applied Science, Leadership Council Speaker, April 5, 2012.
- "*Using technology to protect our information infrastructure*," The Lotus Club, April 27, 2012.
- "*Photonic Neuromorphic Signal Processing and Computing,*" 2012 International Workshop on Information Physics and Computing in Nano-scale Photonics and Materials (IPCN), Orleans, France, September 7, 2012.
- "*Photonic neuromorphic spike processor for ultrafast and low energy cognitive computing*," Bell Labs/Alcatel-Lucent Green ICT Summit, Murray Hill, NJ, USA, January 2013.
- "*Photonic neuromorphic spike processing for ultrafast cognitive computing*," IEEE North Jersey Section Computer Chapter and Signal Processing Chapter, Teaneck, NJ, USA, September 2013.
- "*Integrated photonic spike processing*," Sandia Labs Beyond Moore Device Physics Workshop, Albuquerque, NM, USA, January 2014.
- "*Photonic spike processing*," Neuro-Inspired Computational Elements Workshop, Albuquerque, NM, USA, February 2014.
- "*Lightwave neuromorphic processing*," AFCEA C4I Technology Review Days, Utica, NY, USA, June 2014.
- European Conference Optical Communication (ECOC), Rome, Italy, September, 2018.
- European Conference Optical Communication (ECOC), Brussels, Belgium, December 6, 2020.
- *"Photonics for Neuromorphic Computing,"* 2021 IEEE Photonics Conference (IPC, formerly the IEEE LEOS Annual Meeting), Vancouver, Canada October 19, 2021. Virtual.
- *"Silicon Neuromorphic Photonics*," 26th OptoElectronics and Communications Conference (OECC), Hong Kong, (July, 2021). Virtual.
- *"Photonics for Neuromorphic Computing,"* 24th European Conference on Integrated Optics, Milan, Italy, May 4, 2022.

Professional Societies:

- Fellow of the IEEE (January, 1992)
- Fellow of the OSA (February, 1997)
- Fellow of the National Academy of Inventors (December, 2017)

Academic Societies and Awards:

- Phi Beta Kappa (Alpha of Maine Chapter, 1973)
- Citation for Outstanding Achievement, School of Engineering and Applied Science, Columbia University 1976)
- Eta Kappa Nu (Gamma Lambda Chapter, 1978)
- Sigma Xi (Kappa Chapter, 1979)
- Rudolf Kingslake Medal and Prize, SPIE, for the most noteworthy original paper in Optical Engineering, 1990

- Gold Medal Award from the Faculty of Mathematics, Physics and Informatics at the Comenius University, for leadership in the field of Optics 2006
- Princeton University Graduate Mentoring Award 2006
- E-Council Excellence in Teaching for ELE 203 Fall 2006
- E-Council Excellence in Teaching for ELE 454 Spring 2008
- Walter Curtis Johnson Prize for Teaching Excellence June 2009
- School of Engineering and Applied Science Distinguished Teacher Award, June 1, 2009
- Awards for undergraduate research in my lab:
    - Bryan Bosworth ’09 received the Peter Mark Prize from the EE Department at Class Day, June 2009, for the “best undergraduate research" in the area of electronic materials and devices.
    - John Chang ‘10, J. Rich Steers Award from the New York City Post of the Society of American Military Engineers, December 2009
- Honored by Shirley Tilghman at the event “Celebrate Princeton Invention”
- CNSA selected by the National Security Agency as a “Center of Excellence in Research in Information Assurance.” The award was presented in June at the NSA by Howard Schmidt, Obama’s Cybersecurity Coordinator. This honor has just been highlighted in the news on the Princeton University webpage. http://www.princeton.edu/main/news/archive/S29/01/99S63/index.xml?section=topstories
- Awards for research in my lab:
    - John Chang, Graduate advisee, J. Rich Steers Award, February 5, 2010
    - Bhavin Shastri, PostDoc, IEEE Photonics Society 2011 Fellowship
    - Vinayak Venkataraman ’11, recipient of 2011 John Ogden Bigelow Jr. Prize in Electrical Engineering
    - Mary Catherine Wen ’11, recipient of 2011 Newport Research Undergraduate Award for Excellence in Photonics
- “Princeton named cyber security hub by National Security Agency,” News at Princeton, November 22, 2010 and SEAS website, December 6, 2010
- “Fiber-optic photonic neurons to be developer in collaboration between Princeton University and Lockheed Martin,” Laser Focus World Magazine, July 20, 2011
- “Photonic neuron may compute a billion times faster than brain circuits,” Princeton University website, News at Princeton, July 18, 2011
- “For students, blazing fast lab work,” Princeton Alumni Weekly Magazine, September 14, 2011, Vol. 112, No. 1
- 2012 Honoree, The Lotos Club, New York City
- Lifetime Achievement Award for Excellence in Teaching, awarded by the Princeton Engineering Council 2015
- The President’s Award for Distinguished Teaching 2015
- Featured on November 18, 2016 in the MIT Technology Review, in an article titled “Silicon photonic neural network unveiled.”
  Ref: arxiv.org/abs/1611.02272: Neuromorphic Silicon Photonics
- Awards for research in my lab:

- Lamia Ateshian: 2018 Optical Engineering Award, Princeton
- Alexander Tait: 2017 IEEE Photonics Society Graduate Student Fellowship
- Matthew Chang: 2016 CLEO pitch panel winner
- Alexander Tait: 2016 SEAS award for excellence
- Alexander Tait: 2016 IEEE Summer Topical Meeting Series Best Student Poster Award (first place).
- Mitchell Nahmias: 2015 IEEE Summer Topical Meeting Series Best Student Poster Award (first place).

- National Academy of Inventors (NAI) Fellow, December 2017.

Patents:

	Patent Number	Issue Date	Title
1.	US 4,744,623	05/17/1988	Integrated fiber optic coupler for VHSIC/VLSI interconnects
2.	US 4,791,407	12/13/1988	Alternate mark/space inversion line code
3.	US 4,887,879	12/19/1989	Fiber optic tap
4.	US 5,060,305	10/22/1991	Self clocked, self routed photonic switch
5.	US 5,073,980	12/17/1991	Photonic Switch employing Shared data Transmission Facility
6.	US 5,493,433	02/20/1996	Terahertz Optical Asymmetric Demultiplexer
7.	US 5,825,519	10/20/1998	Optical Mach-Zehnder Time Division Demultiplexer
8.	US 5,828,474	10/27/1998	Optical Apparatus for Transmitting Data of an Electrical Signal
9.	US 5,841,560	11/24/1998	System for Optical Pulse Train Compression and Packet Generation
10.	US 5,917,979	06/29/1999	Asymmetric Optical Loop Mirror Exhibiting Threshold Discrimination for Separation of Input Pulses of Differing Magnitudes
11.	US 6,265,999	07/24/2001	High Speed Serial-to-Parallel Analog-to-Digital Conversation
12.	US 6,433,715 B2	08/13/2002	High-Speed Serial-To-Parallel and Analog-to Digital Conversion
13.	US 6,448,913	09/10/2002	Toad Based Optical Data Format Converter
14.	US 6,535,662	03/18/2003	TOAD Having Enhanced Extinction Ratio of the Switching Window
15.	US 7,035,550	04/25/2006	All Optical 3R Regeneration using the Sagnac and Mach-Zehnder Versions of the Terahertz Optical Asymmetric Interferometer (TOAD)
16.	US 7,068,894	06/27/2006	An All-Optical Wavelength Converter Based on Sagnac Interferometer with an SOA at Asymmetric Position
17.	US 8,315,489	11/20/2012	Optical Sensor Array (AON)
18.	US 8,456,730	06/04/2013	Directly modulated spatial light modulator (AON)
19.	Israel 173226	03/01/2014	All-Optical Wavelength Converter based on Sagnac Interferometer with an SOA at Asymmetric Position

20.	US 8,682,170	03/25/2014	System and Method for Broadband RF Interference Cancellation
21.	US 8,693,810	04/08/2014	Optical Counter-Phase System and Method of RF Intererence Cancellation
22.	US 8,749,874	06/10/2014	Optical Integration System and Method
23.	US 8,917,960 B2	12/23/2014	Optical Switch Using a Michelson Interferometer
24.	US 9,344,125	05/17/2016	Remote Interference Cancelation for Communications Systems (Bascom Hunter)
25.	US 9,444,502	09/13/2016	Interference Cancellation System for Cancelling Interference in the Optical Domain (Bascom Hunter)
26.	US 9,571,205	02/14/2017	Systems Approach to Interference Cancellation
27.	US 9,838,125 B2	12/05/2017	Multibeam Radio Frequency Photonic Beamformer Using a Multi-Signal Slow Light Time Delay Unit
28.	US 10,009,135	06/26/2018	System and Method for Photonic Processing
29.	Filed US 62/664,386	4/30/2018	Design of High Channel Count Two-Pole Photonic Microring Weight Banks
30.	Filed US 62/663,057	4/26/2018	Excitable Laser Processor in a III-V Photonic Integrated Circuit Platform
31.	Filed US 62/647,393	3/23/2018	Photonic Tensor Machine
32.	Filed US 62/669,097	5/9/2018	Photonic Circuit Total Laboratory Automation, Data Management and Virtualization
33.	Filed US 62/667,058	5/4/2018	Method for Linear Analog Photonic Processing Using Mode Filters
34.	Filed US 62/719,516	8/17/2018	Feedback Control for Microring Weight Banks
35.	Filed US 62/690,393	6/27/2018	Optically Accelerated FPGA
36.	Filed US 62/690,425	6/27/2018	Nonlinear Remodulation Unit with Electronic Amplification
37.	Filed US 62/949,912	12/18/2019	Organic Light-Emitting Diode Neuron
38.	US 10,670,860	06/02/2020	Design of High Channel Count Two-Pole Photonic Microring Weight Banks
39.	Filed US 63/045,660	06/29/2020	Integrated Neuromorphic Computing System
40.	Filed US 63/045,720	06/29/2020	Thin Film Neuromorphic Computing System
41.	Filed US 17/125,287	12/17/2020	Light-Emitting Diode Neuron
42.	Filed US 17/360,155	06/28/2021	Integrated Neuromorphic Computing System
43.	Filed US 63/237,223	08/26/2021	Real-time RF fingerprinting using continuous-time recurrent neural network algorithm on FPGA

44.	US 11,187,963	11/30/2021	System and method for programmable nonlinear silicon photonic circuit
45.	US 11,269,179	3/8/2022	Photonic Filter Bank System and Method of Use
46.	Filed US 63/318,968	3/11/2022	Neuromorphic Opto-Electronic System
47.	Filed US 63/318,957	3/11/2022	Reconfigurable Thin-Film Photonic Filter Banks
48.	Filed US 17/896,251	8/26/2022	System and Method for Real-time RF Fingerprinting
49.	Filed US 63/374,655	9/6/2022	In-Plane Convolutional Preprocessor
50.	Filed US 63/374,661	9/6/2022	Multiplane Hardware Neural Network
51.	Filed US 18/050,539	10/28/2022	Reconfigurable Thin-Film Photonic Filter Banks for Neruomorphic Optoelectronic Systems and Methods
52.	Filed 10-2022-0153376	11/16/2022	Reconfigurable Thin-Film Photonic Filter Banks for Neuromorphic Optoelectronic Systems and Methods

Professional Activities:

Associate Editor:

- IEEE Transaction on Communications, Area Editor, 1996 – present
- Proceedings of the IEEE, Review Editor, 1982-1985
- IEEE Circuits and Devices Magazine, 1988-1991
- IEEE Transactions on Communications, 1988-1996
- IEEE Lightwave Communications Magazine, 1989-1991
- Applied Optics, 1989-1994
- IEEE Networks Magazine, Special Issue on “Optical Multi-access Networks,” 3, No. 2, March 1989 (Guest editor)
- Photonics Technology Letters, 1990-1991
- Photonic Network Communications, Kluwer Academic Publishers, Nowell, MA (Prof. Harmen R. van As, Vienna University of Technology, Editor), Editorial Advisory Board, 1996-
- Optical Fiber Technology, (Dr. Emmanuel Desurvire, Alcatel, Editor), Editorial Advisory Board, 1998-
- Journal of Lightwave Technology, Special Issue on "Photonic Packet Switching Technologies, Techniques and Systems", vol. 16, no. 12, December 1998, Guest Editor
- IEEE Journal of Selected Topics in Quantum Electronics, Primary Guest Editor, 2018

Program Committees:

- IEEE/OSA Conference on Optical Fiber Communication, 1988
- IEEE/OSA Topical Meeting on Photonic Switching, 1989
- IEEE/OSA Conference on Lasers and Electro-optics, Subcommittee on Lightwave Communications, 1989
- IEEE/OSA Conference on Lasers and Electro-optics, Subcommittee on Optical Switching, Logic and Storage Systems, 1991
- IEEE/OSA Topical Meeting on Photonic Switching, 1991
- IEEE Princeton Section, Sarnoff Symposium, 1991
- OSA Regional Engineering Workshop, October 1991
- IEEE/OSA Topical Meeting on Optical Computing, 1993
- IEEE/OSA Topical Meeting on Photonics in Switching, 1993
- SPIE Conference on Multigigabit fiber communication systems, 1993
- IEEE (Princeton Section) Sarnoff Symposium, 1994
- IEEE/OSA Topical Meeting on Integrated Photonics Research, 1994
- IEEE Workshop on Massively Parallel Processing using Optical Interconnections, 1994
- ECOC'94, Photonics in Switching Joint Sessions, 1994
- ECOC'94, Florence, Italy, September 1994
- IEEE/OSA Integrated Photonics Research Topical Meeting, 1994
- IEEE/OSA MPPOI, 1995
- IEEE Princeton Central NJ Sarnoff Symposium, 1995
- IEEE/OSA Conference on Lasers and Electro optics, Subcommittee on Optical Switching, Logic and Storage Systems, 1995
- IEEE/OSA Topical Meeting on Photonic Switching, 1995
- IEEE/OSA Conference on Lasers and Electro optics, Subcommittee on Optical Switching, Logic and Storage Systems, 1996
- IEEE/OSA MPPOI, 1996
- IEEE/OSA MPPOI, 1998
- IEEE/OSA Conference on Optical Fiber Communication, 2000
- International Program Committee, IASTED international Conference on Communication, Internet and Information Technology, St. Thomas, USVI November 2006
- Organizer of upcoming PRISM/Complex Materials Center Workshop on “Optical and Wireless Communications”
- Optical Fiber Communications 2009
- 2010 IEEE Optical Fiber Communication and National Fiber Optic Engineers Conference (OFC/NFOEC), San Diego, CA, USA, March 21-25, 2010.
- Summer Topical Meeting on Terabit Optical Ethernet, Hilton Montreal Bonaventure, Montreal, Quebec, Canada, 18-20 July 2011.
- Second Asian Himalayan International Conference on the Internet and Next Generation of Mobile, Wireless and Optical Communication Networks, 2011.

- International Program Committee, International Conference on Communication, Internet, and Information Technology (CIIT 2012).
- Advisory and program committee on Information Physics and Computing in Nanoscale Photonics and Materials Workshop in 2012 Unconventional Computation and Natural Computation Conference
- Technical committee for ICSPCS 2016 (2016 10th International Conference on Signal Processing and Communication Systems - ICSPCS)
- 2019 IEEE Summer Topical, Committee, Fort Lauderdale, Florida, 8-10 July, 2019

Conference or Subcommittee Chair:

- IEEE Summer Topical Meeting on Optical Multiple Access Networks, July 1990, Technical Co-chair
- IEEE/OSA Conference on Lasers and Electrooptics, Technical Subcommittee on Optical Switching, Logic and Storage Systems, 1992
- IEEE/OSA Conference on Lasers and Electrooptics, Technical Subcommittee on Optical Switching, Logic and Storage Systems, 1993
- IEEE Globecomm'93, Session 51 on “Optical communication network systems”
- SPIE Conference on High-Speed Optical Switching, Devices, Networks and Systems, Los Angeles, January 1994
- IEEE/OSA Photonics in Switching Topical Meeting, Sendai, Japan, North American Conference Chair, April 1996
- OSA Photonics in Switching Topical Meeting, Stockholm, Sweden, Conference Program Chair, March 1997
- OSA Photonics in Switching Topical Meeting, Santa Barbara, Conference General Chair, July1999. Organizer and General Chair, “O-CDMA Systems Workshop” Key West, FL May 3-4, 2005
- CLEO/Europe-EQEC, Co-organizer of Joint Symposium, Munich, Germany, 23-27, June 2019
- European Conference Optical Communication (ECOC), Brussels, Belgium, Workshop Organizer and Co-Chair, “Pathway to bringing photonics into high-performance computing: from materials to applications,” December 2020.

Conference Session Presider:

- 1996 Conference on Information Sciences and Systems, Session FP-2 “Optical Networks”
- The 3rd International Conference on Massively Parallel Processing “Using Optical Interconnects, Session III, “WDM in MPP Systems”
- Conference on Information Sciences and Systems, Session on “Optical Communications,” Princeton, March 1988, 1994
- IEEE Workshop on Computer Communications, “Optical Networks and Photonic Switching,” Harriman, September 1988

- IEEE/OSA Topical Meeting on Photonic Switching, Session on “Packet Switching,” Salt Lake City, March 1989
- IEEE Communication Theory Workshop, Session on “Optical communication,” Hawk's Cay, April 1989
- IEEE/OSA Conference on Lasers and Electro-optics, Session on “Optical multi-access techniques for multiuser communication systems,” 1989
- International Workshop on Digital Communications, Session on “Optical multiaccess networks,” Tirrenia, Italy, September 1989
- IEEE/OSA Topical Meeting on Photonic Switching, Session on Logic and Control, Salt Lake City, UT, March 1991
- OSA Annual Meeting, Session on “Integrated and Guided-Wave Optics,” Boston, MA, November 1990
- IEEE Princeton Section Sarnoff Symposium, Session on Optoelectronic Systems Applications, 1991
- LEOS Summer Topic Meeting on Optical Multiple Access Networks, Session on “Packet Switching,” 1992
- Conference on Information Sciences and Systems, Session TA-1 on “Optical Communications,” Princeton, March 1994
- IEEE Workshop on Massively Parallel Processing using Optical Interconnections, Session III, 1994
- Sarnoff Symposium, Session on “Novel optical systems,” April, 1995
- 32nd Annual Conference on Information Sciences and Systems, Session Chair, March, 1998

Boards, Committees, Review Panels:

- Columbia Radiation Laboratory, 1979-1988
- Columbia Bioengineering Institute, 1979-1988
- NSF Review Panel on Optical Communications, March 1987
- 9th International Conference on Computer Communications, Plenary Session, Tel Aviv, (October, 1988)
- Executive Board, NSF Engineering Research Center in Telecommunications, 1985-1988
- NSF Review Panel, ``Research Experiences for Undergraduates Program,” January 9-10, 1989
- Board of Directors, Edwin H. Armstrong Foundation, 1982-
- LEOS Steering Committee, Optical Switching and Processing, 1990-1995
- President's Committee on U.S.-Japan Joint Opto-Electronics Fabrication Project 1981
- NSF Panel on Optical Networks, January 1993
- IEEE LEOS Standing Technical Committee on Optical Communications, 1994
- External Review Panel, Fiber Optic Signal Processing for EWRadar Applications Naval Research Lab 6 Basic Research Program, Washington, DC. December 8, 1995
- IEEE LEOS Standing Technical Committee on ``Optical interconnects and processing systems,”1995-1996

- POEM Executive Committee, 1991-
- Scientific Advisory Board, Epitaxial Lab Inc., Stony Brook, NY; Jie Piao, Pres., 1995-
- Scientific Advisory Board, Institute for Defense Analysis, Center for Computing Sciences, 1996-
- Editorial Board, “Photonic Network Communications Journal, Kluwer Academic Publishers, 1996-
- IEEE MPPOI'96 Panelist, “Intrasystem optical interconnects: performance, cost, functionality.”
- Research Group for Optical Soliton Communications (ROSC, Japan), Foreign member ,1997-
- Executive Council, University League Nursery School 1995-1998 (Treasurer)
- Trustee, University League Nursery School, 1998-
- Board of Directors (President), Glen Homeowners Association, 1995
- Technical Advisory Boards: Alphion, Kailight Photonics, and Access Optical Networks, Inc.
- School of Engineering and Applied Science: Helen Shipley Hunt fund selection committee, 2012
- Princeton University Schmidt Fund Selection Committee, 2011-2012
- Chair of Princeton University Schmidt fund selection committee, 2012-2013
- Princeton University Committee of Seven, 2013
- Princeton University Dean of the Faculty’s Committee on Online Education, 2012-2013
- Princeton University Committee on Undergraduate Admission and Financial Aid, 2013-2016
- Natural Sciences and Engineering Research Council of Canada – Reviewer 2016
- Bascom Hunter Technologies, Board of Directors, 2018-present
- Access Optical Networks, Advisor, 2018-20
- Luminous Computing, Advisor, 2019-20
- Princeton University Writing Program Executive Committee, 2012-present
- Princeton University Committee on Intellectual Property and Technology Licensing, 2011-present
- Princeton University Phi Beta Kappa Committee, 2012-present
- Princeton Univeristy School of Engineering and Applied Sciences Director of the PRISM Center for Network Science and Applications, 2021-present
- Princeton University School of Engineering and Applied Scinces Andlinger Center, Associated Faculty Member 2021-present
- Princeton ECE Faculty representative to IEEE Student Chapter, 2021-present
- Princeton ECE Graduate Committee, 2021-present
- Princeton ECE OPT Faculty Coordinator, 2021-present
- Princeton ECE Sophomore Advisor, 2021

- Princeton ECE Junior Advisor, 2022

Professional Societies:

- IEEE (Student ’75, Member ’78, Senior Member ’90, Fellow ’92)
- Optical Society of America, Fellow 1997; SPIE
- National Academy of Inventors, Fellow, 2017

Vice Chairman:

- Princeton LEOS Chapter, 1990-1991

Papers in conference proceedings based on peer review:

1. Prucnal, P.R. (1980), “A new generalized performance measure for single-threshold optical communication systems,” in Opt. Comm. Sys., Proceeding of the NSF Grantee-User Meeting on Optical Communication Systems, pp. 27-33.
2. Prucnal, P.R. (1981), “Detection and estimation in signal-dependent noise,” in Opt. Comm. Sys., Proceeding of the NSF Grantee-User Meeting on Optical Communication Systems, pp. 103-108.
3. Prucnal, P.R. (1982), “Wideband FSK optical communications experiment,” in Opt. Comm. Sys., Proceeding of the NSF Grantee-User Meeting on Optical Communication Systems, pp. 58-61.
4. Prucnal, P.R. and Fan, T.R. (1983), “Frequency-shift-key modulation for fiber-optic communication,”in Opt. Comm. Sys., Proceeding of the NSF Grantee-User Meeting on Optical Communication Systems, pp. 79-86.
5. Prucnal, P.R., Santoro, M.A. and Lockwood, T. (1985), “Spread spectrum local area network using optical processing,” Proceeding International Tirrenia Workshop on Digital Communic., 5.2.
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401. [Invited] B. J. Shastri, B. A. Marquez, A. N. Tait, T. Ferreira de Lima, H.-T. Peng, C. Huang, and P. R. Prucnal, "Silicon photonic neural networks and applications," in Proc. Photon. North (PN), May 2020, doi: 10.1109/PN50013.2020.9167001.
402. [Invited] B. J. Shastri, B. A. Marquez, M. Filipovich, Z. Guo, E. R. Howard, H. Morison, A. N. Tait, T. Ferreira de Lima, C. Huang, and P. R. Prucnal, "Silicon photonics for AI hardware," in Proc. Adv. Photon. Congress (APC), July 2020, paper IM2A.2.
403. A Jha, C Huang, PR Prucnal, "Reconfigurable all-optical nonlinear activation functions", IEEE Photonics Conference, Sept 2020
404. [Tutorial] P. R. Prucnal, T. Ferreira de Lima, C. Huang, B. A. Marquez, and B. J. Shastri, “Neuromorphic photonics: current status and challenges,” in Proc. European Conf. Opt. Commun. (ECOC), Brussels, Belgium, paper Tu4C-1, Dec. 2020.
405. H.-T. Peng, J. C. Lederman, L. Xu, T. Ferreira de Lima, C. Huang, B. J. Shastri, D. Rosenbluth, and P. R. Prucnal,“A Silicon Photonic Recurrent Neural Network for RF Fingerprinting,” (GOMAC) 2021.
406. B. A. Marquez, Z. Guo, H. D. Morison, S. Shekhar, L. Chrostowski, P. R. Prucnal, and B. J. Shastri, “On-chip online learning and inference for photonic pattern recognition” Proc. Conf. on Lasers and Electro-Optics (CLEO), paper SM1B.5, May 2021.
407. [Invited] B. J. Shastri, C. Huang, A. N. Tait, T. Ferreira de Lima, and P. R. Prucnal, “Photonic neural networks applications,” Proc. Photon. North (PN), June 2021.
408. S. Fujisawa, F. Yaman, H. G. Batshon, M. Tanio, N. Ishii, C. Huang, T. Ferreira de Lima, Y. Inada, P. R. Prucnal, N. Kamiya, and T. Wang, “Nonlinear impairment compensation using neural networks,” in Optical Fiber Communication Conference (OFC) 2021, p. M5F.1., 2021
409. A. Jha, C Huang, and P.R.Prucnal, “Programmable, high-speed all-optical nonlinear activation functions for neuromorphic photonics,” Optical Fiber Communication (OFC) Conference. June, 2021.
410. [Invited] B.J. Shastri, S. Bilodeau, B.A. Marquez, A.N. Tait, T. Ferreira de Lima, C. Huang, L. Chrostowski, S. Shekhar, P.R. Prucnal, “Neuromorphic Photonic Networks,” Optical Fiber Communication Conference (OFC) 2021, Th5A.2, June 2021.
411. C. Huang, T. Ferreira de Lima, S. Fujisawa, A.N. Tait, H.-T. Peng, B.J. Shastri, T. Wang, and P.R. Prucnal, “Neuromorphic photonics for optical communication systems,” in Optical Fiber Communication Conference (OFC) 2021, p. M5B.1, June 2021.
412. [Tutorial] B.J. Shastri, T. Ferreira de Lima, C. Huang, B.A. Marquez, S. Shekhar, L. Chrostowski, and P.R. Prucnal, “Silicon photonics for artificial intelligence and neuromorphic computing,” in Proc. IEEE Photon. Soc. Summer Topical Meeting Series (SUM), paper TuB1.1, July 2021.
413. C. Huang, A. Jha, T. Ferreira de Lima, B.J. Shastri, P.R. Prucnal, “Programmable Optical Nonlinearity for Photonic Neural Networks,” Photonics in Switching and Computing (PSC), paper W1B.2., Sep. 2021

414. [Keynote] B.J. Shastri, C. Huang, A. N. Tait, and P.R. Prucnal, “Photonics for neuromorphic computing and artificial intelligence,” in Proc. OSA Photonics in Switching and Computing Conference (PSC), paper W3B.3, Sep. 2021.
415. C. Huang, T. Ferreira de Lima, A.N. Tait, B.J. Shastri, P.R. Prucnal, “Intelligent Optical Signal Processing for Optical Communications,” Asia Communications and Photonics Conference (ACP), paper T1E, Oct. 2021.
416. [Invited] C. Huang, T. Ferreira de Lima, A.N. Tait, B. Marquez, B.J. Shastri, P.R. Prucnal, “Neuromorphic Photonics for Intelligent Signal Processing,” IEEE Photonic Conference (IPC), paper WD4.1, Oct. 2021.
417. [Postdeadline] W. Zhang, C. Huang, B.J. Shastri, P.R. Prucnal, “Broadband blind source separation by Integrated photonics”, IEEE Photonics Conference (IPC), Oct. 2021.
418. [Invited] T. Ferreira de Lima, C. Huang, B.J. Shastri, P.R. Prucnal, “Real-time Processing with Neuromorphic Silicon Photonics,” IEEE Photonic Conference (IPC), MA3.2., Oct. 2021.
419. [Invited] E.C. Blow, B Shastri, and P.R .Prucnal, “Broadband RF Signal Processing with Neuromorphic Photonics,” SPIE Photonics West, Jan. 2022.
420. [Invited] E. C. Blow, T. Ferreira de Lima, H.-T. Peng, W. Zhang, C. Huang, B. J. Shastri, P. R. Prucnal, “Broadband radio-frequency signal processing with neuromorphic photonics”, Proc. SPIE 12019, AI and Optical Data Sciences III, SPIE OPTO, paper 120190N, Jan 2022.
421. [Invited] B. J. Shastri, C. Huang, A. N. Tait, T. Ferreira de Lima, P. R. Prucnal, “Silicon photonic neural network applications and prospects”, Proc. SPIE 12019, AI and Optical Data Sciences III, SPIE OPTO, paper 120190K, Jan. 2022.
422. A. Jha, C. Huang, H.-T. Peng, W. Zhang, B. J. Shastri, P. R. Prucnal, “High-speed time series prediction and classification on an all-optical neural network”, Proc. Opt. Fiber Commun. (OFC), paper Tu3G.3., Mar. 2022
423. [Invited] C. Huang, T. Ferreira de Lima, S. Bilodeau, W. Zhang, H.-T. Peng, B. J. Shastri, P. R. Prucnal, “Intelligent signal processing by neuromorphic silicon photonics”, Proc. Photon. Electromagn. Res. Symp. (PIERS), April, 2022.
424. [Invited] B. J. Shastri, C. Huang, A. N. Tait, T. Ferreira de Lima, and P. R. Prucnal, “Silicon photonics for neuromorphic computing and artificial intelligence: applications and roadmap”, Proc. Photon. Electromagn. Res. Symp. (PIERS), pp. 18–26. April, 2022.
425. H.-T. Peng, T. Ferreira de Lima, E. C. Blow, S. Bilodeau, A. Jha, C. Huang, B. J. Shastri, P. R. Prucnal, “Time series prediction and classification using silicon photonic neuron with a self-connection”, Proc. Conf. on Lasers and Electro-Optics (CLEO), paper STh4N.4, May 2022.
426. D. Wang, B. Wang, W. Zhang, T. Ferreira de Lima, B. J. Shastri, P. R. Prucnal, C. Huang , “Photonic blind source separation for multimode optical fiber interconnects”, Proc. Conf. on Lasers and Electro-Optics (CLEO), paper SS2B.2, May 2022.
427. [Invited] B. J. Shastri, M. J. Filipovich1, Z. Guo, P. R. Prucnal, S. Shekhar, V. J. Sorger, “In situ training with silicon photonics neural networks”, Proc. Photon. North (PN), May 2022.

428. S. Bilodeau, T. F. de Lima, E. A. Doris, M. Hack and P. R. Prucnal, "Thin film photonic resonator weight stacks," 2022 IEEE Photonics Society Summer Topicals Meeting Series (SUM), pp. 1-2, doi: 10.1109/SUM53465.2022.9858291, July 2022.
429. [Invited] B. J. Shastri, M. J. Filipovich1, Z. Guo, P. R. Prucnal, S. Shekhar, V. J. Sorger, “Silicon photonics neural networks for training and inference”, Proc. Adv. Photon. Congress (APC), paper NeW2D.2, Jul. 2022.
430. [Invited] B. J. Shastri, M. J. Filipovich1, Z. Guo, P. R. Prucnal, S. Shekhar, and V. J. Sorger, “Silicon photonics for training deep neural networks”, Proc. Conf. on Lasers and Electro-Optics (CLEO) Pacific Rim, paper CThA13B-02, Aug. 2022.
431. [Invited] B. J. Shastri, M. J. Filipovich1, Z. Guo, P. R. Prucnal, S. Shekhar, V. J. Sorger, “Silicon photonics for machine learning: training and inference”, Proc. European Conf. Opt. Commun. (ECOC), paper Tu4G.1., Sep. 2022.
432. [Invited] W. Zhang, J. Lederman, T.F. de Lima, E. Blow, B.J. Shastri, P.R. Prucnal, “FPGA-Silicon Photonics Hybrid Processor Solves Broadband Radio Interference in Real-Time”, Frontier in Optics/Laser Science (FiO/LS), paper FW1E.1, Oct. 2022.

Contributions to Conferences, Symposia and Workshops

Optical Society of America, Annual Meeting, Toronto, CANADA (October 1977).
- “Photon counting and energy detection in vision,” given by M.C. Teich.

Society for Neuroscience, Seventh Annual Meeting, Anaheim, CA (November 1977).
- “Photon counting and energy detection: the experiment of Hecht, Shlaer and Pirenne revisited,” given by M.C. Teich.

Association for Research in Vision and Ophthalmology Annual Meeting, Sarasota, FL (May 1978).
- “Quantum requirements at the absolute threshold with non-Poisson visual stimuli,” given by M.C. Teich.

Optical Society of America, Annual Meeting, San Francisco, CA (October 1979).
- “Optimum detection in optical communications with a simple counting processor.”
- “Statistical properties of counting distributions for modulated radiation.”
- “Non-Poisson nature of the effective noise in the visual system near threshold.”

Optical Society of America, Annual Meeting, Rochester, NY (October 1979).
- “Increment threshold law for sources of arbitrary statistics.”
- “Role of quantum fluctuations and the Neyman type-A distribution in human vision,” given by M.C. Teich.

NSF Grantee-User Meeting on Optical Communication Systems, Cincinnati, OH (June 1980).
- “A new generalized performance parameter for single-threshold optical communications.”

Optical Society of America Annual Meeting, Chicago, IL (October 1980).

- “Receiver performance evaluation using photocounting cumulates.”

NSF Grantee-User Meeting on Optical Communication Systems, St. Louis, MO (May 1981).

- “Detection and estimation in signal-dependent noise.”

Optical Society of America Annual Meeting, Orlando, FL (October 1981).

- “Evaluation of fiber-optic error rates using a normalizing transform.”

Joint Services Electronics Program Review Meeting, Columbia University, NY (December 1981).

- “Wideband FSK and FM fiber-optic communication.”

Conference on Lasers and Electrooptics, Phoenix, AZ (April 1982).

- “Wideband FSK fiber-optic communication experiment.”

NSF Grantee-User Meeting on Optical Communication Systems, Berkeley, CA (June 1982).

- “Wideband FSK fiber-optic communication experiment.”

Optical Society of America Annual Meeting, Tucson, AZ (October 1982).

- “Wideband FSK optical fiber communication experiment.”

NSF Grantee-User Meeting on Optical Communications Systems, MIT, Cambridge, MA (May 1983).

- “Frequency-shift-key modulation for fiber-optic communications.”

Optical Society of America Annual Meeting, New Orleans, LA (October 1983).

- “Orthogonal modulation formats for fiber-optic communications.”

Joint Services Electronics Program Review Meeting, Columbia University, NY (October 1984).

- “Ultra high speed circular hollow waveguide modulator.”

Center for Telecommunications Research Opening, Columbia University, NY (December 1984).

- “Telecommunications research at Columbia: Fiber optics.”

NSF Site Visit, Columbia University, NY (January 1985).

- “Ultra high speed optical processing.”

NSF Industry-University Workshop, Columbia University, NY (June 1985).

- “Ultra high speed optical signal processing.”

International Workshop on Digital Communications, Tirrenia, Italy (September 1985).

- “Spread spectrum fiber optic local area network using optical processing.”

Optical Society of America Annual Meeting, Washington, DC (October 1985).

- “Local area network with spread spectrum processing.”
- “Integrated fiber optic coupler for VLSI interconnects.”

DARPA Optical Processing Review, McLean, VA (November 1985).

- “Vertical optical interconnects.”

NASA Review, Greenbelt, MD (November 1985).

- “Transmission codes for optical communications.”

Workshop on Optical Interconnects, MCC, Austin, TX (November 1985).

- “Integrated fiber optic coupler for VHSICVLSI interconnections.”

IBMCTR Workshop on Computer Networks, Arden House, Arden, NY (December 1985).

- “Optical interconnects for VLSI local area networks.”

Society of Photooptical Instrumentation Engineering, Los Angeles, CA (January 1986).

- "Integrated fiber optic coupler for VLSI interconnects."

Optical Society of America, Topical Meeting on Quantum Limited Detection (April 1986).

- "Exact variance stabilizing transforms for image-signal-dependent-noise."

NSF Industry - University Workshop, Columbia University, NY (May 1986).

- "All-optical fiber networks."

International Optical Computing Conference, Jerusalem, Israel (July 1986).

- "VLSI fiber-optic local area network."

SPIE FiberLASE 86, Cambridge, MA (September 1986).

- "VLSI optical interconnection networks."
- "All-optical ultrafast networks."

Fiber-optic communication local area networks 86, Orlando, FL (October 1986).

- "Spread spectrum fiber-optic local area network using optical processing."

International Electronic Packaging Society, San Diego, CA (November 1986).

- "Direct connection of optical fibers to integrated circuits," given by R. Aide.

Optical Processing Annual Review, DARPA, Leesburg, VA (February 1987).

- "VLSI optical micro-area networks."

Topical Meeting on Photonic Switching, Lake Tahoe (March 1987).

- "Self-routing optical switch with optical processing."

International Workshop on High-Speed Optical Processes, University of Michigan, Ann Arbor, MI (May 1987).

- Invited Paper: "A 12.5 Gbps all-optical network demonstration."

95th ASEE Annual Conference, University of Nevada, Reno, NV (June 1987).

- "All-optical integrated circuit micro-area network."

3rd International Conference on Data Communication Systems, Rio de Janeiro, Brazil (June 1987).

- "All-optical integrated circuit micro-area network."

IEEE Communications Techniques Seminar on Metropolitan Area Networks, Princeton, NJ (November 1987).

- Invited Paper: "Self-routing photonic switching technology for metropolitan area networks."

Optical Fiber Communication Conference, New Orleans, LA (January 1988).

- "Low-loss high-impedance integrated fiber-optic tap," given by S. Elby.
- "Self-routing of 12.5 Gbps data through an 8x8 lithium niobate optical crossbar matrix with gigahertz switching speed."

IEEE Communication Theory Workshop, Sedona, AR (April 1988).

- "Ultra-fast all-optical networks."

Conference on Lasers and Electro-optics, Anaheim, CA (April 1988).

- "Optical self-routing of 12.5 Gbps time-division-multiplexed data."

IEEE International Conference on Communications, Philadelphia, PA (June 1988).

- "Ultra fast fiber-optic networks using all-optical processing."

Franco-American Workshop on New Research Directions in Integrated Networks, Sophia Antipolis, France (June 1988).

- Invited Paper: "Self-routing photonic switch with optical processing."

IEEE Workshop on Computer Communications, Harriman, NY (September 1988).

- "Optical self-routing in a self-clocked photonic switch using pulse-interval encoding."

Society of Photooptical Instrumentation Engineers, Boston, MA (September 1988).

- "Fiber-optic interconnect devices for VLSI micro-area networks."

European Conference on Optical Communication, Brighton, England (September 1988).

- "Optical self-routing in a self-clocked photonic switch using pulse-interval encoding," given by P. Perrier.
- "Demonstration of a high-dimensionality local area network photonic switch," given by P. Perrier.

Optical Society of America, Santa Clara, CA (October 1988).

- "Self-synchronizing pulse-interval technique for optical routing control in a photonic switch," given by P. Perrier.
- "Demonstration of a high-dimensionality optical local area network switch," given by P. Perrier.

9th International Conference on Computer Communications, Tel Aviv, Israel (October 1988).

- Invited Plenary Paper: "A new direction in photonic switching."
- Invited Panel Member: "Network architecture for optical communications."

Society of Photooptical Instrumentation Engineers Conference on Medical Imaging, Newport Beach, CA (January 1989).

- "High-density optical storage using optical delay lines," given by G. Maguire.

IEEE OSA Topical Meeting on Photonic Switching, Salt Lake City, UT (March 1989).

- Invited Plenary Paper: "A new direction in photonic switching."
- "Demonstration of a self-clocked optical time-slot interchanger."

Congreso de Informatica y Telecomunicaciones, Berisso, Argentina (April 1989).

- Invited Plenary Paper: "Future trends in fiber-optic networks."

IEEE Communications Theory Workshop, Hawk's Cay (April 1989).

- "A collapsed network photonic switching architecture."

Conference on Lasers and Electro-optics, Baltimore, MD (April 1989).

- "Parameter optimization of GaAsAlGaAs multiple-quantum-well electroabsorption modulators," given by H. Cho.
- "Self-clocked optical time-division switch."

Gordon Research Conference on Holography and Optical Information Processing, Plymouth State College, NH (August 1989).

- Invited Paper, "Optical micro-area networks."

Society of Photooptical Instrumentation Engineers, Boston, MA (September 1989).

- "Optical interconnect switch" given by P. Perrier.

International Workshop on Digital Communications, Tirrenia (September 1989).

- "Optical processing for self-routing photonic switching."

Electrochemical Society, Hollywood, FL (October 1989).

- "Demonstration of a high-dimensionality space-division photonic switch."

Optical Society of America, Orlando, FL (October 1989).

- "Optical self-routing through a tree-structured space-division photonic switch using pulse-interval binary encoding."

IEEE Global Telecommunications Conference, Dallas, TX (November 1989).

- "Synchronous versus asynchronous CDMA for fiber-optic LANs using optical signal processing," given by W. Kwong.

Materials Research Society, Boston, MA (November 1989).

- "An optical interconnect switch."

IEEE International Conference on Communications, Atlanta, GA (April 1990).

- Invited Plenary Paper: "Passive shared-media photonic switching."

Topical Meeting on Optical Multiple Access Networks, Monterey, CA (July 1990).

- "Theory of multichannel CPFSK lightwave network with laser phase noise immunity," given by W. Kwong.
- "Optical clock recovery for high speed optical networks," given by M. Chbat.

Society of Photooptical Instrumentation Engineers, Boston, MA (November 1990).

- "Time-division optical microarea networks."

Optical Society of America, Boston, MA (November 1990).

- "Optical clock recovery circuit using periodic oscillations of a Mach-Zehnder interferometer with delayed feedback," given by M. Chbat.

LEOS, Boston, MA (November 1990).

- "Time-division optical cross connect."

Optical Coherent Transmission in Multipoint Applications, Rome, Italy (January 1991).

- Invited paper: "A continuous phase FSK direct detection lightwave network using subcarrier multiplexing techniques," (conference postponed).

Engineering Foundation Conference on High Speed High Frequency Optoelectronics, Palm Coast, FL (March, 1991).

- "Optical processing for multiaccess networks."

Sarnoff Symposium, Princeton (March 1991).

- "Applications of $Si_{1-x}Ge_x$ strained layer alloys for silicon-based optical interconnects," presented by J.C. Sturm.

Society of Photooptical Instrumentation Engineers, OEAerospace Sensing, Orlando (April 1991).

- "Free-space optical TDM switch."
- "Operating characteristics of a high-speed GaInAs:Fe photoconductive AND gate," given by K. Goel.

IEEE Communication Theory Workshop, Rhodes, Greece (July, 1991).

- "Photonic fast packet switch with optically-processed control."

Optical Society of America, San Jose, CA (November 1991).

- "MQW waveguide modulator for fiber-optic interconnects," given by Y.M. Liu.
- "A simple method to start and maintain self-mode-locking of a Ti: sapphire laser," given by Y.M. Liu.

IEEEOSA Optical Fiber Communications Conference, San Jose, CA (February 1992).

- "Demonstration of a 5 Gbits optical time-division multiple access network," given by R. Boncek.
- "Demonstration of high-contrast ultrafast soliton-trapping AND gate."
- "Programmable ultrafast all-optical CDMA networks," given by W. Kwong.

DOD Fiber Optics '92, McLean, VA (March, 1992).

- “Multiple quantum well modulators and switches for optical interconnect systems,' given by R. Boncek.
- “Gigabit optical time division multiple access network,” given by J. Sokoloff.

Conference on Lasers and Electrooptics, Anaheim, CA (April 1992).

- “Noise measurement of a self-mode-locked Ti: sapphire laser stabilized by a shaker,” (poster) given by Y.M. Liu.
- “Demonstration of a programmable ultrafast all-optical CDMA network”, given by W. Kwong.
- “Cascade of ultrafast soliton trapping and dragging logic gates,” given by M. Islam.

IEEELEOSOSA Integrated Photonics Research Topical Meeting, New Orleans, LA (April 1992).

- “Energy contrast from cascaded soliton logic gates,” given by C. Soccolich.

LEOS Summer Topical Meeting, Santa Barbara, CA (August 1992).

- “Optically processed self-routing, synchronization and contention-resolution for 1D and 2D photonic switching architectures” (post-deadline paper).
- “Ultra fast logic gates in a soliton ring network,” given by M. Islam.
- “A simple 2-stage 2D optoelectronic processor interconnection using smart pixels,” given by S. Forrest.

SPIE International Symposium OEFibers, Boston, MA (September 1992).

- “Optical pulse train modulation using a fiber interferometer,” given by J. Sokoloff.
- “An integratable ultrafast all-optical CDMA multiple access network," by W. Kwong.

IEEE Computer Communications Workshop, Hilton Head, NC (October 1992).

- “Photonic fast packet switching using optically processed control,” (invited paper).

IEEE LEOS Annual Meeting, Boston, MA (November 1992).

- “Demonstration of a phase-noise-cancelled coherent subcarrier fiber-optic communication system,” given by W. Kwong.

NSF Workshop on All-Optical Networks, Washington, DC (January 1993).

- “Architectures and technology for all-optical TDMA networks.”

OFCIOOC '93, San Jose, CA (February 1993).

- “High-speed optical TDMA networks,” (Invited paper), unable to attend: given by J. Sokoloff.
- “Throughput limitations in ultrafast all-optical soliton mesh networks using deflection routing,” given by A. Bononi.
- “Novel packet architecture for ultrafast all-optical networks,” given by F. Forghieri.

OSA Optical Computing Topical Meeting, Palm Springs, CA (March 1993).

- “Smart pixel optical computing architectures,” given by S. Sawchuck (Invited paper).

OSA Photonics in Switching Topical Meeting, Palm Springs, CA (March 1993).

- “Photonic packet switching with optically-processed control” given by D. Blumenthal (invited paper).

- “Terahertz optical asymmetric demultiplexer,” (post-deadline) given by J. Sokoloff.

IEEE Communications Theory Workshop, Hawk's Cay, FL (April 1993).

- “TBA” (Invited paper).

ICC '93, Geneva, Switzerland (May 1993).

- “All-serial coding architecture for ultrafast optical CDMA,” given by W. Kwong.

SPIE Multigigabit Fiber Communications System, San Diego, CA (July 1993).

- “Ultrafast all-optical photonic packet switching,” (Invited paper).
- “Performance of a terahertz optical asymmetric demultiplexer in a 50Gbps optical time-multiplexed system”, given by J. Sokoloff.

LEOS '93, San Jose, CA (November 1993).

- “Photonic fast packet switching” (Invited paper).

IEEE Workshop on LANsMANs, San Diego (October 1993).

- “Photonic packet switching with optically processed control,” (Invited).

27th HICSS Conference, Maui (January 1994).

- “Time-division optical micro-area networks,” (Invited).

OFC'94, San Jose (February 1994).

- “Minimum loss node structures for deflection routing transparent optical networks,” given by A. Bononi.
- “Wavelength conversion of psec optical pulses,” given by P. Ianonne.
- “1.5μ Gbs dispersion-compensated transmission over 333km of conventional fiber using mid-span spectral inversion in an injection-locked semiconductor laser,” given by P. Ianonne (post deadline).

NSF Workshop on Optical Communications and Network Systems, Arlington, VA (March 1994).

- “Education in Optical Communications.” (Invited presentation).

DOD Fiber Optics '94, McLean, VA (March 1994).

- “Optically transparent ATM packet switch node,” given by R. Boncek.

Rank Prize Symposium, Grasmere, England (April 1994).

- “High-speed optical time-division multiple access networks,” (Invited).

Bowdoin Science Symposium, Brunswick, ME (March 1994).

- “Transparent optical networks,” (Invited).

Workshop on Massively Parallel Processing using Optical Interconnects, Cancun, Mexico, (April 1994).

- “Optically-processed self-routing for 1-D and 2-D photonic switching architectures,” (Invited).

Infocomm '94, (1994).

- “New structures of the optical node in multihop transparent optical networks with deflection routing,” given by A. Bononi.

ARPA Networking'94, Santa Fe, NM (September 1994).

- “100 Gbps packet-switched multihop transparent optical networks.”

IEEE Workshop on Computer Communications, Duck Key, Marathon, FL (October 1994).

- “250 Gbps packet-switched transparent optical networks,” (Invited).

Viva A Ci^encia, Cultural Program of the Portuguese Secretariat of State for Industry and Technology, Commemoration of the 25th Anniversary of Submarine Cables, Lisbon, Portugal, (October 1994).

- "Undersea lightwave communication systems," (Keynote address, Invited by the Board of Directors of Companhia Portuguesa Rádio Marconi.)

ARPA Workshop on Solitons for Switched Optical Networks, Weston, MA (December 1994).

- "100 Gbps packet-switched multihop transparent optical networks," (Invited).

OFC'95 Workshop on Ultra-High Bit Rate Networks, San Diego, CA, (February 1995).

- "Ultrafast packet networks," (Invited Keynote Paper).

NCIPT Annual Review, Los Angeles, CA (February 1995).

- "Systems and devices for broadband networks."

OSA Photonics in Switching Topical Meeting, Salt Lake City, UT (March 1995)

- "Ultrafast photonic switching with optically processed control."

IEEE Sarnoff Symposium, Princeton, NJ (April 1995).

- "Ultrafast All-Optical Wavelength and Polarization Independent Demultiplexer," (Invited Paper), given by K. Kang.

Conference on Lasers and Electrooptics, Baltimore, MD (May 1995).

- "Demonstration of ultrafast, all-optical, low control energy, single wavelength, polarization independent, cascadable, and integratable switch," post-deadline paper given by K. Kang.

European FOC & Networking, Brighton, England (June 1995).

- "Transparent optical networks with time division multiplexing," (Invited Paper).

Int. Symposium on Computer Architecture, Santa Margherita Ligure, (June 1995).

- "Are crossbars really dead?"

ARPA 1995 CSTO Program Review, Ft. Lauderdale, FL (June 1995).

- "100 Gbps packet switched multihop transparent optical networks."

ARPA 1995 MTO Program Review, Big Sky, MT (July 1995).

- "100 Gbps packet switched multihop transparent optical networks."

IEEE LEOS, San Francisco, CA (October 1995).

- "TDM optical networks," (Invited paper).

Experimental mechanics and applied optics, Kovoce, Slovakia (October 1995)

- "Undersea lightwave communications," Keynote address.

AFOSRBMDO Focused Research Initiative kickoff, College Park, MD (December 1995).

- "Terabit networks and devices for data fusion."

HICSS '96 Maui, HI (January 1996).

- "Time division optical networks."

NCIPT Annual Meeting, Los Angeles, CA (February 1996).

- "Packaging issues for broadband optical networks."

ARPA Networking PI Meeting, Charleston, SC (February 1996).

- "Architectural and performance issues in transparent optical networks," given by H. Kobayashi.

IEEE Santa Fe Workshop on Interconnections in High Speed Digital Systems, Santa Fe, NM (May 1996).

- “100Gbps packet-switched multihop transparent optical networks,” (Invited paper).

IEEE LEOS Annual Meeting, Boston, MA (November 1996).

- “Packaging issues in optical TDM networks,” (Invited paper).
- “Optical packet compressor operating at 100 Gbs,”
- “Ultrafast all-optically controlled 2x2 crossbar switch.”

DARPA 1996 ETO Program Review, Orlando, FL (October 1996)

- “100 Gbps packet switched multihop transparent optical networks”

IEEE Massively Parallel Processing using Optical Interconnects, Maui, HI (October 1996)

- “High throughput optical algorithms for the FFT and sorting via data packing”

OSAIEEE Photonics in Switching, Stockholm, Sweden (April 1997).

- “TDM 100 Gbps packet switching in an optical ShuffleNet”
- “Demonstration of ultrafast all-optical packet routing”

European Conference on Optical Communications, Edinburgh, Scotland, (September, 1997)

- “Towards Terabit/sec TDM Photonic Systems” (invited paper)

Photonic A/D Converter Technology Workshop, Arlington, VA (October, 1997)

- “Real time ultrafast optical sampling using the TOAD”

IEEE LEOS Annual Meeting, San Francisco, CA (November, 1997)

- “Transparent optical networks with time division multiplexing” (invited paper)

DARPA /ETO, PI Meeting, Reston, VA (February, 1998)

- "100 Gb/s packet-switched multihop optical networks"
- "Demonstration of a 100 Gbps scalable optical multiprocessing system using OTDM"

Sarnoff Symposium, Princeton, NJ (March, 1998)

- “Ultrafast optical networks,” (invited).

DARPA/ITO PI Meeting, Tucson, AZ (March, 1998)

- "Demonstration of a 100 Gbps Scalable Optical Multiprocessing System Using OTDM"

Rank Pize Symposium on Ultrafast Photonic Processing, Grasmere, England (April, 1998)

- "Ultrafast Photonic Processing in Networks," (invited paper)

ICC, Atlanta, GA, (April, 1998)

- "Performance and fault-tolerance of ultrafast optical shuffle networks with optimal node structure"

Conference on Lasers and Electrooptics, San Francisco, CA (May 1998)

- "Experimental and Theoretical Evaluation of an Ultrafast Multihop Packet Switched Optical TDM Network Testbed”
- "Influence of Crosstalk on the Scalability of Large OTDM Interconnects Using a Novel Fast Time-Slot Tuner",
- "Single-shot Optical Sampling Oscilloscope for Ultrafast Optical Waveforms"
- "A Widely Tunable Laser Based on Semiconductor Optical Amplifier in a Highly Birefringent Fiber Ring Cavity"

XIth Slovak-Czech-Polish Optical Conference on Wave and Quantum Aspects of Contemporary Optics, Stara Lesna, Slovakia (September, 1998)

- “Novel all-optical devices for terabit optical networks” (invited paper)
- "High Speed Optical Networks" (invited paper)

European Conference on Optical Communications, Madrid, Spain (September, 1998)

- "Photonic signal processing in high speed optical TDM networks," (invited paper)

IEEE/LEOS Topical Meeting on Microwave Photonics, Princeton, NJ (October 1998)

- "Generation, Routing, and Detection of 100 GSa/s Arbitrary Analog Optical Waveform Packets Using Analog Optical TDM”

DARPA Next Generation Internet Conference, Arlington, VA (October, 1998)

- "Demonstration of a 100 Gbps Scalable Optical Multiprocessing System Using OTDM"

LEOS Annual Meeting, Orlando, FL (December 1998)

- "Saturation Effects in a Terahertz Optical Asymmetric Demultiplexer,"
- "A Simple Method to Characterize Dynamic Parameters of Semiconductor Waveguide Amplifier,"
- “Demonstration of 100 GSa/s Analog Photonic Packet Service Using Analog Optical TDM,”

!0th Annual Workshop on Interconnections Within High Speed Digital Systems, Santa Fe, NM (May 1999)

- “Latency & Scaling Issues in High-speed Optical TDM Networks” (Invited Paper)

Optical Fiber Communications Meeting, Baltimore, MD (March 2000)

- "Ultrafast Optical Signal Processing"

American Physical Society Annual Meeting, Minneapolis, MN (March 2000)

- "The Physics of Optical Switching Technology", invited tutorial

CLEO/PR-2001, Makahuri Messe, Chiba, Japan (June 2001)

- "TOAD an All-Optical Switch for Ultrashort Pulse Signal Processing and Networks"

CISS Conference, Princeton, NJ, USA. (March 2002)

- “A fast optical switch based on two cascaded Terahertz Optical Asymmetric Demultiplexers (TOAD)”
- “Performance-improved all-optical RZ to NRZ format conversion for hybrid optical networking interface”

LEOS Summer Topical Meeting Chateau Mont Tremblant, QC Canada (July 2002)

- “Systems Perspective on Optical Processing/Packet Networks
- “173 picosecond wavelength switching of four WDM channels using an OTDM channel selector”

OSA Topical Meeting-Integrated Photonics Research, Vancouver, Canada July 2002

- "Wavelength Converters using SOAs: Simulations and Experiments" Invited Talk

IEEE Laders and Electro-Optics Society, Glasgow Scotland (November 2002)

- "All-optical data format conversion between RZ and NRZ based on wavelength converter"
- “Monolithically integrated Sagnac interferometer for all-optical wavelength conversion”

WOCC 2002, Newark, NJ (April 2002)

- "New Generation of All-Optical Devices for Optical Networks"

Photonics Prague 2002, Prague, Czech Republic, (May 2002)

- "New Generation of All-Optical Devices for Future Communication Networks"

CLEO 2003, Baltimore, MD (June 2003)

- "Suppression of beating noise of narrow linewidth Erbium doped fiber ring laser using SOA"
- "Highly scalable serial-parallel optical delay line"
- "Wavelength tunable semiconductor fiber ring laser"

Europe-U.S.-Japan Symposium on Ultrafast Photonic Technology, Chiba, Japan, (July 2003)

- "An Optical Platform for Ultra-fast Signal Processing and Networks" **Invited**

Workshop on University-Industry Collaboration, Princeton, NJ, (September 17, 2003)

- "NJ Center for Ultra-Fast Broadband Communication Networks" **Invited**

4th Electronic Circuits and Systems Conference, Bratislava, Slovakia (September 2003)

- "Fiber Ring Laser with Computer Controlled Wavelength Tunability"

Photonics in Switching 2003. Versailles, Paris, France (September 2003)

- "All-optical wavelength conversion using SOA at nearly symmetric position in a fiber-based Sagnac interferometric loop"

LEOS Tucson, AZ, (October 2003)

- **"**Scalable OTDM Transmitter with full Multicast Capability"
- "A Scalable Wavelength-hopping, Time-spreading Optical-CDMA system"

Nonlinear Guided Waves and Their Applications. Optical Society of America, 2004

- "Noise-immune universal computation using Manakov soliton collision cycles."

ThP4, Avionics, Fiber-Optics and Photonics Workshop, St. Louis, MO, April 2004

- "Incoherent 2D Optical Code Division Multiple Access"

IEEE Sarnoff Symposium on Advances in Wired and Wireless Communications, Princeton, NJ, April 26-27, 2004

- "Pulse width and wavelength tunable injection modelocking lasers employing TOAD technologies"
- "Fully automated narrow-linewidth wavelength tunable semiconductor fiber ring laser with fast wavelength selection"

CLEO 2004, San Francisco, CA, May 2004

- "Wavelength aware receiver for enhanced 2D OCDMA system performance"
- "Noise reduction in fiber ring lasers by use of a semiconductor optical amplifier"
- "Novel all-optical NRZ wavelength conversion employing SOA-based Sagnac interferometer"
- "Scalability of Frequency-Hopping Time Spreading OCDMA code matrix"

IASTED WOC (OCSN), Banff, Canada, July 2004

- "Demonstration of 4-node 253Gchip/s fast frequency-hopping time-spreading optical CDMA with differentiated service provisioning"

14th Czech-Slovak-Polish Optical Conference on Wave and Quantum Aspects of Contemporary Optics, Nitra, Slovakia, Sept. 13-17, 2004.

- “New Approach to High Speed Optical Code Division Multiple Access Networks with Multidimensional Codes and Use of Novel All-Optical Technology,”

Optics East, Philadelphia, PA, October 25-28, 2004

- “Ultrafast Technologies for Photonic Networks”

LEOS 2004, Puerto Rico, November 2004

- “Experimental Demonstration and Scalability Analysis of a 4-Node 102Gchip/s Fast Frequency-Hopping Time-Spreading Optical CDMA Network”
- “Multiple access interference (MAI) noise reduction in a 2D optical CDMA system using ultrafast optical thresholding”
- “Optical frequency-shift-keying (FSK) encoded pulses for high-capacity label switching applications”
- "Integrated Holographic Encoder/Decoder for 2D Optical CDMA"
- “All-Optical OCDMA Code Drop Unit for Transparent Ring Networks”
- “Vacuum-induced fluctuations of Manakov solitons based on a linearization approximation.”

Globecom 2005 Conference

- Increasing the Spectral Efficiency of Asynchronous O-CDMA: Performance Analysis

OFC 2005

- Compensation of chromatic dispersion by chirp control in all-optical regenerator based on asymmetric Sagnac loop

11th International Symposium on High-Performance Computer Architecture, 2005. HPCA-11, February 12-16, 2005

- Exploring the design space of power-aware opto-electronic networked systems

5th Int’l Conference Photonics, Devices and Systems (Photonics Prague 2005), Prague, Czech Republic, June 8-11, 2005

- Is optical CDMA a viable technique for broadband networks?

2005 LEOS Summer Topical Meetings, July 25-27, 2005

- A rapidly reconfigurable multicast capable photonic switched interconnect - design and operating principles
- Demonstration of an all-optical interface between wavelength-hopping time-spreading optical CDMA and WDM networks
- Experimental demonstration of a 2D incoherent transparent OCDMA path router

5th Electronic Circuits and Systems Conference (ECS’05), Bratislava, Slovakia, September 8-9, 2005

- Design and demonstration of a novel incoherent optical CDMA system

IEEE MILCOM 2005, Atlantic City, NJ, Sept. 17-20, 2005

- Design and demonstration of a novel incoherent optical CDMA system

OK 2005, Prague, Czech Republic, September 20-21, 2005

- OCDMA-an alternative for optical communications

IEEE Conference Avionics Fiber-Optics and Photonics, 2005, September 20-22, 2005

- Integrated holographic encoder/decoder for avionic optical CDMA platforms
- Performance enhancement of optical CDMA systems using ultrafast all-optical sampling

LEOS 2005, Sydney, Australia, October 23-27, 2005

- Novel M-ary Architecture for Optical CDMA using Pulse Position Modulation
- Quantum phase noise reduction in soliton collisions
- Simultaneous All-Optical 3R Regeneration of Multiple WDM Channels

Workshop on Optical and Wireless Communications Technologies, Princeton University, Princeton, NJ, February 3, 2006

- "Princeton testbed for optical and wireless communications", PRISM – University-Industry Research Symposium

Seminar, McGraw Center, Princeton University, Princeton, NJ, March 15, 2006

- "Effective Teaching Methods"

Sarnoff Symposium, Princeton, NJ, March 27-28, 2006

- "Design of an avionics platform for Lockheed-Martin based on incoherent optical CDMA,"

Universita Komenskeho, Bratislava, May 31, 2006

- "All-Optical Signal Processing: Challenges and Applications"

PI annual meeting, Chicago,IL, August 2006

- "Reconfigurable asynchronous incoherent OCDMA"

15th Czech-Slovak-Polish Optical Conference on Wave and Quantum Aspects of Contemporary Optics, Liberec, Czech Republic, September 11-15, 2006

- "How optics has changed data communications"
- "The roll of optics in optical communications"

Globecom Access '06 Business Forum, San Francisco, November 29, 2006

- All-Optical Signal Processing: Technologies for network Applications

Polytechnic University, New York, NY, November 30, 2006

- All-Optical Signal Processing: Technologies for network Applications

2007 Optical Fiber Communication and National Fiber Optic Engineers Conference (OFC/NFOEC), Anaheim, CA, USA, March 25-29, 2007

- "Integration of dual-code optical CDMA encoder and decoder by holographic bragg reflectors"
- "Optical approach to avionic platforms based on OCDMA"
- "Towards a cryptaanalysis of spectral-phase encoded optical CDMA with phase-scrambling"

US Army Command Laboratory, Ft. Monmouth, April 12, 2007

- "Optical Analog to Digital Conversion"

Webcast: April 13, 2007

- Advances in Metropolitan Optical Networking and Wireless/Optical Integration I

2007 Nonlinear Optics and Applications II, Prague, Czech Republic

- "Novel optical CDMA platform for avionics applications"

2007 IEEE Sarnoff Symposium, Princeton, NJ, USA, April 30 - May 2, 2007

- "Timing jitter analysis of a multi-wavelength all-optical regenerator"

2007 Conference on Lasers and Electro-Optics (CLEO), Baltimore, MD, May 6-11, 2007

- "Improving transmission privacy using optical layer XOR"
- "Security analysis of stealth transmission over a public fiber-optical network"

Boston University, Seminar, May 16, 2007

- “All-optical Signal Processing Technologies for Network Applications”

Webcast: May 18, 2007

- Advances in Metropolitan Optical Networking and Wireless/Optical Integration II

18th Annual Workshop Interconnections within High-Speed Digital Systems, Santa Fe, New Mexico, May 20-23, 2007

- Poster "Interferometric noise characterization in OCDMA networks with FBG encoders/decoders and 2-D time-spreading wavelength-hopping codes"

International Symposium on Next-Generation Lightwave Communications, Hong Kong, June 11-13, 2007

- "Ultrafast Optical Technologies for Optical CDMA and Network Security" [Invited]

9th International Conference on Transparent Optical Networks (ICTON 2007), Rome, Italy, July 1-5, 2007

- "Interferometric noise characterisation of a 2-D time spreading wavelength hopping OCDMA networks using FBG encoding/decoding"

Research seminar, Holmdel, NJ, July 12, 2007

- “Ultrafast Optical Technologies for Optical CDMA and Network Security”
- Technical meetings

2007 International Conference on Photonics in Switching (PS), San Francisco, CA, USA, August 19-22, 2007

- "Increasing optical security with OCDMA using optical XOR"

3rd International Symposium on Ultrafast Photonic Technologies (ISUPT 2007), Boston, MA, August 20-21, 2007

- "Ultrafast Optical Technologies for Optical CDMA and Network Security"
- Research and development discussion with professors from Boston University.

33rd European Conference on Optical Communication (ECOC), Berlin, Germany, September 16-20, 2007

- Achieving physical layer security / privacy with self-wrapped OCDM transmission"

2007 IEEE Avionics Fiber Optics and Photonics Conference (AVFOP), Victoria, BC, Canada, October 2-5, 2007

- "Novel secure platform for avionic applications based on optical CDMA"

20th IEEE Lasers and Electro-Optics Society (LEOS 2007), Lake Buena Vista, FL, USA, October 21-25, 2007

- "Experimental evaluation of near-far effect in optically-thresholded OCDMA network transporting gigabit ethernet traffic"
- "Stealth transmission over a WDM network with detection based on an all-optical thresholder"

2007 Military Communications Conference (MILCOM), Orlando, FL, USA, October 29-31, 2007

- "Achieving physical layer security / privacy with self-wrapped OCDM transmission"

2008 Optical Fiber Communication and National Fiber Optic Engineers Conference (OFC/NFOEC), San Diego, CA, USA, February 24-28, 2008

- Virtual I/Q multiplexing in optical code division for secure local area OFDM transport"

42nd Annual Conference on Information Sciences and Systems (CISS 2008) Princeton, NJ, USA, March 19-21, 2008

- Demonstration of 2-D wavelength-hopping time-spreading incoherent optical CDMA network by pulse carving of CW laser source"

2008 IEEE Sarnoff Symposium, Princeton, NJ, USA, April 28-30, 2008

- Miniaturization of 2-D wavelength-hopping time-spreading incoherent optical CDMA network by pulse carving of CW laser source"

2008 Conference on Lasers and Electro-Optics and Quantum Electronics and Laser Science Conference (CLEO/QELS), San Jose, CA, USA, May 4-9, 2008

- Steganographic fiber-optic transmission using coherent spectral-phase-encoded optical CDMA"

5th Workshop on Optimization of Optical Networks (OON 2008), Montréal, Canada, May 7-8, 2008

- "Data Availability and Confidentially in OCDMA Networks"

Workshop on Modeling And Analysis Of Computer And Communication Systems, Princeton, NJ, May 9, 2008

- "Securing the optical-wireless interface in access networks"

19th Annual Workshop on Interconnections within High Speed Digital Systems (HSD 2008), Santa Fe, New Mexico, May 18-21, 2008

- "All-Optical Processing for Optical CDMA and Network Security" [Invited]
- Poster "Self-Clocked All-Optical Add/Drop Multiplexer for Asynchronous Optical CDMA Networks"
- Poster "Incoherent Method of Optical Interference Cancellation for Radio-Frequency Communications"

Lockheed Martin, Cherry Hill, NJ, July 11, 2008

- Seminar and research presentation

17th International Conference on Computer Communications and Networks (ICCCN 2008), St. Thomas, USA Virgin Islands, August 3-7, 2008

- "Using optical signal processing to provide information security in data networks"

2008 International Conference on Photonics in Switching (PS), Sapporo, Hokkaido, Japan, August 4-7, 2008

- "Securing data networks using optical signal processing"

MIRTHE Summer Workshop, Baltimore, MD August 5, 2008

- Workshop

2008 Photonics, Devices, and Systems IV, Prague, Czech Republic, August 27-29, 2008

- "Design and demonstration of OCDMA system with superior scalability"

Laboratory for Physical Sciences, College Park, MD, October 1, 2008

- Research seminar

21st IEEE Lasers and Electro-Optics Society (LEOS 2008), Newport Beach, CA, USA, November 9-13, 2008

- "Low-latency nonlinear fiber-based approach for data encryption and anti-jamming in optical network"

2008 IEEE Photonics Global at Singapore (IPGC), Singapore, December 8-11, 2008

- "Improving performance of FBG-based OCDMA system employing all-optical signal processing"
- "Providing network security with optical signal processing"

2009 Optical Fiber Communication and National Fiber Optic Engineers Conference (OFC/NFOEC), San Diego, CA, USA, March 22-26, 2009

- “All-optical encryption for optical network with interleaved waveband switching modulation"
- "Multiple access interference and interferometric noise suppression using dispersion imbalanced loop mirror in optical CDMA networks"
- "Optical steganography using chirped fiber bragg grating"

2009 Conference on Lasers and Electro-Optics and Quantum Electronics and Laser Science Conference (CLEO/QELS), Baltimore, MD, USA, June 2-4, 2009

- "Optical auto-correlation peak discriminator for optical CDMA signal detection"

16th International Conference on Digital Signal Processing (DSP), Santorini, Greece, July 5-7, 2009

- "Optical steganography for data hiding in optical networks"

14th OptoElectronics and Communications Conference (OECC 2009), Hong Kong, China, July 13-17, 2009

- "Physical layer network security based on optical processing using compact passive devices" [Invited]

2009 IEEE Lasers and Electro-Optics Society Summer Topical Meeting (LEOS), Newport Beach, CA, USA, July 20-22, 2009

- "Asynchronous detection with clock and data recovery in optical CDMA networks using a dispersion-imbalanced loop mirror"
- "Secure sensor data transmission channel overlay on passive optical networks"
- "Truly-asynchronous, scalable and survivable optical CDMA networks with heterogeneous QoS" [Invited]

2009 Asia Communications and Photonics Conference and Exhibition (ACP), Shanghai, China, November 2-6, 2009

- "Physical layer security in data networks using optical signal processing" [Invited]

2010 Optoelectronic Interconnects and Component Integration IX, San Francisco, CA, USA, January 25-27, 2010

- "Electro optic cosite interference mitigation"

2010 Optical Fiber Communication and National Fiber Optic Engineers Conference (OFC/NFOEC), San Diego, CA, USA, March 21-25, 2010

- "All-optical XOR gate with feedback using highly Ge-doped nonlinear fiber"
- "Asynchronous and packetized transmission in optical CDMA distributed sensor network"

- "Four-wave mixing in highly Ge-doped nonlinear fiber"
- "Improving optical steganography transmission privacy by imposing phase masks on stealth signals"

2010 Conference on Lasers and Electro-Optics and Quantum Electronics and Laser Science Conference (CLEO/QELS), San Jose, CA, USA, May 16-21, 2010

- "Secure Optical Transmission in Single-User Channel Using Encrypted Wireless CDMA Codes"

2010 IEEE Photonics Society Summer Topical Meeting, Playa del Carmen, Mexico July 19-21, 2010

- "Heterogeneous optical CDMA with near-far mitigation"

2010 IEEE Avionics Fiber Optics and Photonics Conference (AVFOP), September 21-23, 2010

- "A Photonic Neuromorphic Computational Primitive for Complex High Bandwidth Signal Processing"

9th International Conference on Optical Communications and Networks (ICOCN 2010), Nanjing, China, October 24-27, 2010

- "Photonic Neurons for Terahertz Pulse Processing" [Invited]

23rd Annual Meeting of the IEEE Photonics Society, Denver, CO, November 7-11, 2010

- "Optical Steganography over a Public DPSK Channel"

2011 Optical Fiber Communication and National Fiber Optic Engineers Conference (OFC/NFOEC), Los Angeles, CA, March 6-10, 2011

- "Polarization Insensitive Cross-Phase Modulation in 10.5-M Highly Ge-Doped Nonlinear Fiber"
- "Performance Investigation of Polarization-Multiplexed 16-QAM Using All-Optical OFDM Transmission and Digital Coherent Detection"

2011 Progress in Electromagnetics Research Symposium, Marrakesh, Morocco, March 20-23, 2011

- "Lightwave Neuromorphic Based Terahertz Pulse Processor"

2011 Conference on Lasers and Electro-Optics (CLEO), Baltimore, MD, May 1-6, 2011

- "Experimental Characterization of Simultaneous Gain Pumping and Depletion in a Semiconductor Optical Amplifier"

22nd Annual Workshop on Interconnections within High Speed Digital Systems, Santa Fe, NM, May 8-11, 2011

- "Analysis of Hybrid Spike Coding for High-Speed Networking"
- "Constructing Terahertz Spike Processors -- Improving the Photonic Neuron"
- "High Performance All-Optical Thresholding for High-Speed Interconnects".
- "Intelligent Sensor Interconnection Networks Performing Signal Classification"

2011 International Conference on Information Photonics, Ottawa, Canada, May 18-20, 2011

- "Lightwave Neuromorphic Signal Processing"

2011 International Conference on Business and Information (BAI), Bangkok, Thailand, July 4-6, 2011

- "Experimental Demonstration of Survivable Optical CDMA Ring Networks"

2011 IEEE Photonics Society Summer Topical Meeting Series, Montreal, Canada, July 18-20, 2011

- "Experimental Demonstration of Bandwidth Provisioning in a Heterogeneous Optical CDMA System Transporting Gigabit Ethernet Traffic"

SPIE Optics and Photonics for Information Processing V Conference, San Diego, California, USA, August 24, 2011

- "Optical Hybrid Analog-Digital Signal Processing Based on Spike Processing in Neurons"

2011 Eastern Analytical Symposium and Exposition in Somerset, NJ, November 14-17, 2011

- “Co-Site RF Interference Cancellation for Power Savings in a Wireless Sensor Network”

Optical Fiber Communication Conference and Exposition and the National Fiber Optic Engineers Conference (OFC/NFOEC), paper OTh3H.1, Los Angeles, CA, USA, March 2012

- “Asynchronous Spiking Neuron Based on Four-Wave Mixing and Cross Absorption Modulation”

SPIE Defense, Security, and Sensing 2012, paper 8397-4, Baltimore, MD, April 2012

- “Co-Site Interference Mitigation using Optical Signal Processing”

2012 International Conference on Optical MEMS and Nanophotonics (OMN), August 6-9, 2012

- "A Dual Resonator Enhanced Asymmetric Mach-Zehnder: Ultrafast Passive Thresholder for Silicon-on-Insulator"

2012 International Workshop on Information Physics and Computing in Nano-scale Photonics and Materials (IPCN), Orleans, France, September 7, 2012

- "Photonic Neuromorphic Signal Processing and Computing"

2012 IEEE Photonics Conference (IPC), Burlingame, CA, September 23-27, 2012

- "A 20-Gsample/S (10 Ghz × 2 Clocks) Burst-Mode CDR Based on Injection-Locking and Space Sampling for Access Networks"

Bell Labs/Alcatel-Lucent Green ICT Summit, Murray Hill, NJ, USA, Jan. 2013

- “Photonic neuromorphic spike processor for ultrafast and low energy cognitive computing”

2013 Optical Fiber Communication and National Fiber Optic Engineers Conference (OFC/NFOEC), Anaheim, CA, March 17-21, 2013

- "112-Gb/S Dp-Qpsk Transmission over 7,860-Km Dmf Using Phase Conjugated Copy and Digital Phase-Sensitive Boosting with Enhanced Noise and Nonlinearity Tolerance"
- "A Timing Jitter Insensitive Logic Gate Using Tunable Gain Dynamics in an SOA and Optical Thresholding"

2013 IEEE Optical Interconnects Conference, Santa Fe, NM, May 5-8, 2013

- "Intelligent Thz Photonic Processor for Interconnection Networks Based on Spike Timing Dependent Plasticity"

2013 Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, June 9-14, 2013

- “Room Temperature and High Responsivity Short Wavelength Ii-Vi Quantum

Well Infrared Photodetector”

- “Two dimensional encrypted optical steganography based on amplified spontaneous emission noise”
- “Amplitude-invariant fast q12 light in a semiconductor optical amplifier for microwave photonics”
- “Coupled waveguides for optical multiplexing in high-performance interconnects”
- "Two Dimensional Encrypted Optical Steganography Based on Amplified Spontaneous Emission Noise”

13th International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD), Vancouver, Canada, August 19-22, 2013

- "Exploring Excitability in Graphene for Spike Processing Networks"

IEEE North Jersey Section Computer Chapter and Signal Processing Chapter, Teaneck, NJ, USA, September 2013

- “Photonic neuromorphic spike processing for ultrafast cognitive computing”

2013 IEEE Photonics Conference (IPC), Seattle, WA, USA, September 2013

- “Phase mask encrypted optical steganography based on amplified spontaneous emission noise”
- “An evanescent hybrid silicon laser neuron”
- “Graphene excitable laser for photonic spike processing”

Sandia Labs Beyond Moore Device Physics Workshop, Albuquerque, NM, USA, January 2014

- “Integrated photonic spike processing”

Professor Dinner Series at the Colonial Club, February 2014

- “Using Technology to Protect our Information Infrastructure,” invited talk.

Neuro-Inspired Computational Elements Workshop, Albuquerque, NM, USA, February 2014

- “Photonic spike processing”

2014 Wireless Optical Communications Conference (WOCC), Newark, NJ, USA, May 2014

- “An integrated optical interference cancellation system”

2014 IEEE Optical Interconnects Conference, Coronado Bay, CA, USA, May 2014

- “O-BAR: A scalable, optical neuromorphic communication protocol”
- “Broadcast-and-weight interconnects for integrated distributed processing systems”

2014 Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, USA, June 2014

- “Coincidence detection with graphene excitable laser”
- “Optical encryption based on cancellation of analog noise”

AFCEA C4I Technology Review Days, Utica, NY, USA, June 2014

- “Lightwave neuromorphic processing”

2014 IEEE/ACM Int. Symposium on Nanoscale Architectures (NANOARCH 2014), Paris, France, July 2014

- “Applications of wavelength-fan-in for high-performance distributed processing systems”

2014 IEEE Summer Topicals Meeting Series, Montreal, QC, Canada, July 2014

- “Bistable spiking circuit with 67rapheme excitable laser for cascadable photonic logic”

2014 Symposium on Nonlinear Theory and its Applications (NOLTA), Luzern, Switzerland, September 2014

- “Recent progress towards a fully-integrated hybrid silicon laser neuron platform”

2014 IEEE Photonics Conference (IPC), San Diego, CA, USA, October 2014

- “Spatiotemporal pattern recognition with cascadable graphene excitable lasers”
- “Resonant excitable switching with graphene”
- “Microwave photonic self-interference cancellation system using a slow and fast light delay line”

2015 IEEE Environment and Electrical Engineering Conference (EEEIC), Rome, Italy, June 2015

- “Optical self-interference cancellation system for improved spectrum sensing in cognitive radios”

2015 IEEE Photonics Society Summer Topical Meeting Series, Nassau, Bahamas, July 2015

- “A photonic integrated circuit for full duplex spectrum monitoring in cognitive radio”
- “A receiver-less link for excitable laser neurons: design and simulation”
- “Proposal for CMOS- compatible optoelectronic integrated circuit for online wideband PCA”
- “Balanced WDM weight banks for analog optical processing and networking in silico,” invited paper

2015 IEEE Photonics Conference (IPC), Reston, VA, October 2015.

- “Continuous control of microring weight banks”
- “Compact optical steganography based on amplified spontaneous emission noise”

2016 IEEE Optical Interconnects Conference (OI), San Diego, CA, USA, May 2016

- “Coherent interactions in microring weight banks and impact on channel density”
- “Silicon photonic weight bank control of integrated analog network dynamics”
- “Multi-channel microring weight bank control for reconfigurable analog photonic networks”

2016 Conference on Lasers and Electro- Optics (CLEO), San Jose, CA, USA, June 2016

- “Long range secure key distribution over multiple amplified fiber spans based on environmental instabilities”
- “Demonstration of an O/E/O receiverless link in an integrated multi-channel laser neuron”

2016 IEEE Photonics Society Summer Topicals Meeting Series (SUM), Newport Beach, CA, USA, July 2016

- “Demonstration of a silicon photonic neural network”
- “Brain-inspired photonic hardware platforms”
- “Physical modeling of photonic neural networks”

2016 Advanced Photonics Congress (APC), Vancouver, BC, Canada, July 2016

- “Passively synchronized Q-switched and simultaneous mode-locked dual-band Tm3+:ZBLAN fiber laser at 1.48- and 1.85-μm using common graphene saturable absorber”
- “Emerging photonic hardware platforms”

2016 International Topical Meeting on Microwave Photonics (MWP), Long Beach, CA, USA, October 2016

- “Microwave photonic interference canceller: noise reduction via balanced architecture”

2016 IEEE Photonics Conference (IPC), Waikoloa, Hawaii, USA, October 2016

- “A microwave photonic canceller for improved interference rejection in full duplex radio”
- “Optical steganography communication using signal-carrying noise dispersion”
- “Spike coded bit sequence generation using photonic excitable laser”

2017 Optical Fiber Communications Conference and Exhibition (OFC), Los Angeles, CA, March 2017

- "Microwave photonic chaos based device fingerprinting"

2017 Advanced Photonics Congress (APC), New Orleans, LA, USA, July 2017

- [Invited] “Emergence of neuromorphic photonics”

2017 Optical Interconnects Conference (OI), Santa Fe, NM, USA, June 2017

- “Application regime and distortion metric for multivariate RF photonics”

2017 Conference on Lasers and Electro- Optics (CLEO), San Jose, CA, USA, May 2017

- “Simultaneous excitatory and inhibitory dynamics in a graphene excitable laser”
- “Silicon microring weight banks for multivariate RF photonics”

2017 IEEE Photonics Conference (IPC), Lake Buena Vista, FL, USA, October 2017

- “Microring weight bank designs with improved channel density and tolerance”
- “Reconfigurable analog photonic networks,”

2018 Conference Inf. Sci. Syst. (CISS), Princeton, NJ, USA, Mar. 2018

- “Blind Source Separation in the Physical Layer”

2018 Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, USA, May 2018

- “Attojoule Modulators for Photonic Neuromorphic Computing”
- “Microring Weight Banks for Neuromorphic Silicon Photonics”

2018 OSA Advanced Photonics, Zurich, Switzerland, July 2018

- “Electrooptic Nonlinear Activation Functions for Vector Matrix Multiplications in Optical Neural Networks”

2018 SPIE Optics and Photonics Congress, San Diego, CA, USA, Aug. 2018

- “Integrated Neuromorphic Photonics”

2018 Active Photonic Platforms, San Diego, CA, USA, Sep. 2018

- “Attojoule modulators for photonic neuromorphic algorithms”

2018 European Conf. Opt. Commun. (ECOC), Rome, Italy, Sept. 2018.

- “Photonics for Neuromorphic Computing”

2018 IEEE Photonics Conference (IPC), Arlington, VA, USA, Sept.-Oct. 2018

- “A TeraMAC Neuromorphic Photonic Processor”
- “Integrated Balanced Microwave Photonic Canceller”
- “Temporal Dynamics of An Integrated Photonic Neuron”

2019 OFC, San Diego, CA, USA, March 2019

- “Giant enhancement in signal contrast using integrated all-optical nonlinear thresholder”

2019 SPIE OPTO, San Francisco, CA, USA, Mar. 2019

- “Advances in photonic neuromorphic computing”

2019 CLEO, San Jose, CA, USA, May 2019

- “Autaptic circuits of integrated laser neurons”
- “Enhancing SOI waveguide nonlinearities via microring resonators”
- “Multiwavelength neuromorphic silicon photonics”

2019 EIPBPN, Minneapolis, IN, USA, May 2019

- “Neuromorphic Computing Hardware with Silicon Photonics”

2019 PIERS, Rome, Italy, June 2019

- “Progress on Neuromorphic Silicon Photonics”

2019 CLEO/Europe, Munich, Germany, June 2019

- “Multiwavelength neuromorphic silicon photonics”

2019 IEEE SUM, Fort Lauderdale, FL, USA, July 2019

- “Advances in neuromorphic silicon photonics”
- “Neuromorphic silicon photonics on foundry and cryogenic platforms”
- “Neuromorphic photonic processor applications”

2020 International Society for Optics and Photonics, 2020

- “Electro-optic perceptron towards 10ˆ 18 mac/j-efficient photonic neural networks”
- “Advances in neuromorphic photonics”

2020 OFC, San Diego, CA, USA, March 2020

- “Real-time operation of silicon photonic neurons”
- “Demonstration of multi-channel feedback control for on-chip microring weight banks”
- “Demonstration of photonic neural network for fiber nonlinearity compensation in long-haul transmission systems”

2020 SPIE OPTO, San Francisco, CA, USA, Mar. 2020

- “Electro-optic perceptron towards 1018 MAC/J-efficient photonic neural networks”
- “Advances in neuromorphic photonics”

2020 Proc. Photon. North PN, May 2020

- “Silicon photonic neural networks and applications”

2020 CLEO, San Jose, CA, USA, May 2020

- “Programmable fast all-optical thresholderSilicon photonic weights for microwave photonic canceller”

2020 APC, China, May 2020

- “Silicon photonics for AI hardware”

2020 IPC IEE Photonics Conference, Virtual, September 2020

- “Reconfigurable all-optical nonlinear activation functions”

2021 First Workshop on Neuromorphic photonics, Thessanoliki, Greece, Dec. 2021

- “Prospects and applications of photonic neural networks”

2021 Conversations in Photonics Series, Oxford University, Virtual, Oct. 2021
2021 Emerging Topics in Artificial Intelligence, conference within the SPIE Optics and Photonics Congress, Virtual, Aug. 2021
2021 OSA Advanced Photonics Congress, Virtual, Aug. 2021

- “Neuromorphic and Computational Photonics”

2021 Winter School on Optoelectronics and Photonics: Neuromorphic Photonics, Virtual, June 2021

- “Spiking Photonic Neural Networks”

2021 Workshop on Neuromorphic Computing, OFC ’21, Virtual, June 2021

- “Neuromorphic silicon photonics”

2021 IEEE Conference on Lasers and Electrooptics (CLEO), Virtual, May 2021

- “Neuromorphic Silicon Photonics and Applications”

2021 SPIE Photonics West 2021, Virtual, Jan. 2021

- "Spiking neural networks and RF-intelligent Information Processing”

2022 IEEE Optical Fiber Communications Conference, San Jose, CA, March 2022

- “Neuromorphic Photonics”

2022 IEEE VLSI Symposium, Honolulu, HI, June 2022

- “Photonics for Neuromorphic Computing”

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PAUL R. PRUCNAL, Ph.D.

LITIGATION RELATED EXPERIENCE

Has been deposed and has testified at jury trials. All reports on patent disputes have included both infringement and validity.

Disclosed as a testifying expert in the following closed matters:

Case: **Ericsson** v. Apple
Investigation No. 337-TA-**1300** (U.S. International Trade Commission)
Matter: Certain mobile phones, tablet computers, smart watches,…
Responsibilities: Research, reports, deposition
Date closed: 2022
Attorney/Firm: Steve Anzalone of Fischer Broyles and JC Masullo of Winston Strawn for the plaintiff

Case: WSOU Investments LLC v. **Juniper Networks, Inc.**,
Civil Action Nos. 20-cv-00812, 20-cv-00813, 20-cv-00814, 20-cv-00815, 20-cv-00816, 20-cv-00902, 20-cv-00812903
Matter: Patent ligitation concerning optical add/drop multiplexers
Responsibilities: Research, declaration
Date closed: Last work performed in September 2021.
Attorney/Firm: Margaret Shyr of Quinn Emanuel for the defendant.

Case: Huawei Technologies Co. Ltd. v **Verizon Communications, Inc.,** et. al
Civil Action No. 2:20-cv-00030 (E.D. Texas)
Matter: Patent litigation regarding synchronization in optical transport networks
Responsibilities: Research, reports, deposition, trial testimony
Date closed: 2021
Attorney/Firm: Brian Mack of Quinn Emanuel for the defendant

Case: Oyster Optics LLC v. **Infinera Corporation**
Civil Action No. 2:19-cv-257 (E.D. Texas)
Matter: Patent litigation regarding data modulation in optical communications
Responsibilities: Research, reports, deposition, trial preparation
Date closed: 2021
Attorney/Firm: Joseph V. Colaianni of Fish and Richardson for the defendant

Case: Chanbond LLC v. Atlantic Broadband Group, LLC, Bright House Networks, LLC, Cable One Inc., Cablevision Systems Corp., Cequel Communications, LLC, Charter Communications, Inc., Comcast Corp., **Cox Communications, Inc**., Mediacom Communications Corp., RCN Telecom Services, LLC, Time Warner Cable Inc., WaveDivision Holdings, LLC, and WideOpen West Finance, LLC.
Civil Action No. 1:15-cv-00849-RGA (D. Del.)
Matter: Patent litigation regarding data over cable systems
Responsibilities: Research, reports, deposition, trial testimony
Date closed: 2021

Attorney/Firm: Krishnan Padmanabhan of Winston and Strawn for the defendant

Case: **Cisco Systems, Inc**. v. Capella Photonics, Inc.
Civil Action No. 3-20-cv-01858 (NDCA)
Matter: IPR on optical reconfigurable optical add/drop multiplexing technology
Responsibilities: Declaration, deposition
Date closed: 2021
Attorney/Firm: Krishnan Padmanabhan of Winston and Strawn, and Gregory Huh of Haynes Boone for the plaintiff

Case: **Corning Optical Communications LLC** v. AFL Telecommunications LLC; FS.com Inc.; Leviton Manufacturing Co., Inc.; Panduit Corporation; The Siemon Company; and the LAN Wirewerks Research Laboratories Inc. d/b/a Wirewerks
Investigation No. 337-TA-1194 (U.S. International Trade Commission)
Matter: Certain high-density fiber optic equipment and components
Responsibilities: Research, reports, deposition, trial testimony
Date closed: 2020
Attorney/Firm: Evan Leo of Kellogg Hansen for the plaintiff

Case: **Viavi Solutions Inc.**
Civil Action No.
Matter: Optical filters
Responsibilities: Research
Date closed: 2020
Attorney/Firm: Charles Monterio of Venable LLC for the plaintiff

Case: Fiber LLC v. **Alcatel-Lucent USA Inc.**
Civil Action No. 1:13-cv-00840-PAB-KLM Colorado
Matter: Patent dispute regarding fiber optic technology
Responsibilities: Research
Date closed: 2019
Attorney/Firm: Laura Huffman of King & Spalding for the defendant

Case: ViaSat, inc. v. **Acacia Communications, Inc**.
Civil Action No. 16-cv-00463-BEN-JMA
Matter: Trade secret misappropriation claim
Responsibilities: Research, reports, deposition, trial testimony
Date closed: 2019
Attorney/Firm: Thomas Franklin of Wolf Greenfield for the defendant

Case: Huawei Technologies, Co. Ltd et al v. **Samsung Electronics Co**, Ltd. et al,
Civil Action No. Case No. 3:16-cv-02787 (N.D.Cal)
Matter: Patent litigation regarding cellular communications

Responsibilities:	Research, reports, deposition
Date closed:	2019
Attorney/Firm:	Iman Lordgooei and Deepa Acharya of Quinn Emanuel Urquhart & Sullivan for the defendant

Case:	Lambda Optical v. **Alcatel-Lucent**
Civil Action No.	10-487 (LPS) (District of Delaware)
Matter:	Patent dispute regarding telecommunications switching equipment
Responsibilities:	Research, reports, depositions
Date closed:	2019
Attorney/Firm:	Bill McCabe of Ropes & Gray, and Joseph Milowic III of Quinn Emanuel Urquhart & Sullivan for the defendant

Case:	Core Optical Technologies, LLC v. **Infinera Corp**.
Civil Action No.	Case No. 8:17-cv-00548-AG-JPR
Matter:	Optical telecommunications systems
Responsibilities:	Declaration
Date closed:	2019
Attorney/Firm:	Ray Zado of Quinn Emanual for the defendant

Case:	Core Optical Technolgies v. **Fujitsu Network Communications**
Civil Action No.	8:16-cv-00437 (C.D. California) and related PTAB proceedings
Matter:	Petition for Inter Partes Review of patents concerning optical telecommunications systems
Responsibilities:	Research, two declarations
Date closed:	2018
Attorney/Firm:	Alex Middleton of Ropes & Gray and Ryan Malloy of Morrison & Foerster LLP, co-counsel for the petitioner, Fujitsu

Case:	**Alacritec**, Inc. v. CenturyLink, Inc., Dell Inc., EMC Corp., Wiwynn International Corp., Wiwynn Corp., Wistron Corp., CenturyLink, Inc., Intel Corp., Emulex Corp[., QLogix Corp., Broadcomm Corp., Mellanox Technologies, Chelsio Communications, Red hat, inc., Canonical Ltd., and Novell/Micro Focus
Civil Action No.	2:16-cv-00693-JRG
Matter:	Litigation on computer network systems, protocols and technology
Responsibilities:	Research, declarations
Date closed:	2018
Attorney/Firm:	Brian Mack of of Quinn Emanuel Urquhart & Sullivan for the plaintiff

Case:	Neptune Subsea IP Ltd.
Civil Action No.	Inv. No. 337-TA
Matter:	Litigation on optical amplifiers for undersea communications
Responsibilities:	Declaration
Date closed:	2018

Attorney/Firm:	Christina Ondrick and Blair Jacobs of Paul Hastings.
Case:	**Lowe's Companies, Inc.**
Matter:	Petition for Inter Partes Review of patents concerning U.S. Patent No. 7,915,631
Responsibilities:	Research, declaration
Date closed:	2017
Attorney/Firm:	B. Todd Patterson of Patterson and Sheridan for the petitioner
Case:	**Vizio, Inc**. v. Nichia Corporation
Matter:	Petition for Inter Partes Review of patents concerning white light emitting diodes
Responsibilities:	Research, declaration
Date closed:	2017
Attorney/Firm:	Gabrielle Higgins of Ropes and Gray, and David Tennant of White and Case for the petitioner, Vizio.
Case:	**Mobile Telcommunications Technolgies** v. Google Inc.
Civil Action No.	2:16-cv-00002-JRG-RSP (Eastern D. of Texas, Marshall Div.)
Matter:	Patent dispute regarding mobile communications
Responsibilities:	Expert report
Date closed:	2017
Attorney/Firm:	Nicholas Wyss of Reed Scardino for the plaintiff
Case:	**Hologram USA** v. Pulse Entertainment Corp.
Civil Action No.	2:14-cv-00772-GMN-NJK (D. Nevada)
Matter:	Patent ligitation concerning optical display technology
Responsibilities:	Declarations, expert report
Date closed:	2016
Attorney/Firm:	May Chan of Baker Marquart for the plaintiff
Case:	**Mobile Telcommunications Technolgies** v. HTC/ZTE
Civil Action No.	2:13-cv-00948-JRG-RSP (Eastern D. of Texas, Marshall Div.) and 2:13-cv-00946-JRG-RSP (Eastern D. of Texas, Marshall Div.)
Matter:	Patent dispute regarding mobile communications
Responsibilities:	Research, reports, deposition and trial testimony
Date closed:	2016
Attorney/Firm:	Dustin Taylor of Reed Scardino for the plaintiff
Case:	**Covidien and Metronic PLC** v. Masimo Corporation
Inter Partes Review	IPR2016-00056
Matter:	Petition for Inter Partes Review of patents concerning medical signal processing electronics
Responsibilities:	Research, declaration, deposition
Date closed:	2016
Attorney/Firm:	Jason Stach of Finnegan Henderson for the plaintiffs

Case:	**Mobile Telcommunications Technolgies** v. Samsung
Civil Action No.	2:15-cv-00183-JRG-RSP (Eastern D. of Texas, Marshall Div.)
Matter:	Patent dispute regarding mobile communications
Responsibilities:	Research, reports, deposition
Date closed:	2016
Attorney/Firm:	Dustin Taylor of Reed Scardino for the plaintiff

Case:	**Mobile Telcommunications Technolgies** v. LG Electronics
Civil Action No.	2:13-cv-947-JRG-RSP (Eastern D. of Texas, Marshall Div.)
Matter:	Patent dispute regarding mobile communications
Responsibilities:	Research, reports, deposition
Date closed:	2015
Attorney/Firm:	Dustin Taylor of Reed Scardino for the plaintiff

Case:	**One-Blue, Philips, Sony, Panasonic and Pioneer** v. Imation
Civil Action No.	13-917-LPS (D. Del.)
Matter:	Blu-ray disc technology
Responsibilities:	Research and report
Date closed:	2016
Attorney/Firm:	Frank DeCosta of Finnegan for the plaintiffs

Case:	**Hologram USA** v. VNTANA 3D, LLC
Civil Action No.	14-cv-09489-BRO-AGR (Central D Calif.)
Matter:	Patent ligitation concerning optical display technology
Responsibilities:	Research and report
Date closed:	2016
Attorney/Firm:	May Chan of Baker Marquart for the plaintiffs

Case:	Cirque de Soleil v. **Hologram USA**
Inter Partes Review	IPR2015-00962
Matter:	Patent ligitation concerning optical display technology
Responsibilities:	Research
Date closed:	2015
Attorney/Firm:	May Chan of Baker Marquart for the defendants

Case:	**Hologram** USA v. Cirque de Soleil
Civil Action No.	2:14-cv-00916 (D. Nevada)
Matter:	Patent ligitation concerning optical display technology
Responsibilities:	Research, declaration
Date closed:	2015
Attorney/Firm:	May Chan of Baker Marquart for the plaintiffs

Case:	Sprint v. **Comcast**
Civil Action No.	1:12-cv-1013-RGA (CJB) (D. Delaware)
Matter:	Patent dispute regarding telecommunication networks

Responsibilities:	Research, reports, deposition and trial testimony
Date closed:	2015
Attorney/Firm:	David Lisson of Davis, Polk and Wardwell for the defendant
Case:	**Linex Technologies, Inc.** v. Hewlett-Packard Co., Apple Computer Inc., Aruba Networks, Inc., Meru Networks, and Ruckus Wireless
Civil Action No.	4:13-cv-00159-CW (Northern District of California)
Matter:	Patent dispute regarding wireless technology
Responsibilities	Research, reports, deposition
Date closed:	2014
Attorney/Firm:	Vince Kovalick of Finnegan Henderson for the plaintiff
Cases:	In re Certain Wireless Devices with 3G and/or 4G Capabilities and Components Thereof, Investigation No. 337-TA-868 (Int'l Trade Comm'n); ***InterDigital Commc'ns, Inc****. v. Huawei Techs. Co.*, Case No. 1:13cv00008 (D. Del. 2013) *InterDigital Commc'ns, Inc. v. ZTE Corp., Case No. 1:13cv00009 (D. Del. 2013)* *InterDigital Commc'ns, Inc. v. Nokia Corp., Case No. 1:13cv00010 (D. Del. 2013)* *InterDigital Commc'ns, Inc. v. Samsung Elecs. Co.*, Case No. 1:13cv00011 (D. Del. 2013)
Matter:	Patent dispute regarding wireless technology
Responsibilities:	Claim construction, reports, deposition
Date closed:	2014
Attorney/Firm:	Adam Greenfield of Latham & Watkins LLP for Complainant/Plaintiff InterDigital
Case:	**ParkerVision** v. Qualcomm
Civil Action No.	3:11-cv-719-J-37TEM (Middle District of FL, Jacksonville Div.)
Matter:	Patent dispute regarding wireless technology
Responsibilities:	Research, reports, deposition and trial testimony
Date closed:	2013
Attorney/Firm:	Josh Budwin of McKool Smith for the plaintiff
Case:	**Philips** v. Cinram
Civil Action No.	08-00515 (CLB) (S.D. New York)
Matter:	Patent dispute regarding compact disc technology
Responsibilities:	Research, reports, deposition, Markman and trial testimony
Date closed:	2013
Attorney/Firm:	Vince Kovalick of Finnegan Henderson for the plaintiff
Case:	**InterDigital Communications** v. Huawei Technologies
Case No.	1:11cv654-UNA (D. Del. 2011), ITC Inv. No. 337-TA-800
Matter:	Patent dispute regarding CDMA and wireless technology

Responsibilities:	Research, reports, deposition and trial testimony
Date closed:	2013
Attorney/Firm:	Adam Greenfield of Latham & Watkins for the plaintiff

Case:	**Red River** v. Verizon
Civil Action No.	3:11-CV-01010-L (N.D. Texas, Dallas Division)
Matter:	Patent dispute regarding fiber optic networks
Responsibilities:	Research
Date closed:	2012
Attorney/Firm:	Chris Bovenkamp of McKool Smith for the plaintiff

Case:	**Telcordia** v. Cisco Systems and Telcordia v. Lucent,
Civil Action Nos.	04-876 GMS and 04-875 GMS (District of Delaware)
Matter:	Patent dispute regarding fiber optic networks
Responsibilities:	Research, reports, deposition and trial testimony
Date closed:	2007
Attorney/Firm:	Vince Kovalick of Finnegan Henderson for plaintiff

Case:	**Broadwing** v. Great Northern Insurance Co.
Civil Action No.	WDQ-04-CV-03163 (D. Del., Northern Division)
Matter:	Insurance claim on optical transmission equipment
Responsibilities:	Research, report and deposition
Date closed:	2006
Attorney/Firm:	Paul Lucey of Dickstein Shapiro for the plaintiff

Case:	Ciena v. **Nortel**
Civil Action No.	2:05-CV-14-LED (E.D. Texas, Marshall Division)
Matter:	Patent dispute regarding fiber optic networks
Responsibilities:	Research, reports and deposition
Date closed:	2006
Attorney/Firm:	Josh Budwin of McKool Smith for defendant

Case:	Dixon v. **Circuit City and Targus**
Civil Action No.	1:03cv173 (E.D. Va., Alexandria Div.)
Matter:	Patent dispute regarding power adapters
Responsibilities:	Research and reports
Date closed:	2003
Attorney/Firm:	Roger Wise of Pillsbury Winthrop for defendants

Case:	**Commarco** v. Mobility
Civil Action No.	CIV-03-0202 (PHX) (MHM) (D. Ariz.)
Matter:	Patent dispute regarding power adapters
Responsibilities:	Research and reports
Date closed:	2003
Attorney/Firm:	David Jakopin of Pillsbury Winthrop for plaintiff

Case:	Ciena v. **Corvis**
Civil Action No.	00-662 (D. Del.)
Matter:	Patent dispute regarding fiber optic networks
Responsibilities:	Research, reports, deposition and trial testimony
Date closed:	2003
Attorney/Firm:	Blair Jacobs of Pillsbury Winthrop for defendant

Case:	**Nortel** v. ONI
Civil Action No.	C00-0864MMC (N.D. Calif., San Francisco Div.)
Matter:	Patent and trade secret dispute regarding fiber optic networks
Responsibilities:	Research, reports and deposition
Date closed:	2003
Attorney/Firm:	Pedro Saurez of Finnegan Henderson Mark Lyon of Gibson Dunn, both for the plaintiff

Case:	**Fujitsu** v. Matera
Civil Action No.	00-7173 (Dallas County 193rd D.)
Matter:	Theft of trade secret dispute regarding fiber optic networks
Responsibilities:	Research and report
Date closed:	2001
Attorney/Firm:	Steve Shortgen of Baker Botts for plaintiff

Case:	**Alcatel** v. Chiaro
Civil Action No.	599-CV-7240 (E.D. Tex.)
Matter:	Theft of trade secret dispute regarding fiber optic networks
Responsibilities:	Research, report and deposition
Date closed:	2001
Attorney/Firm:	Douglas Wyatt of Baker Botts for the plaintiff

Case:	**Pirelli** v. Sipowicz
Civil Action No.	98-C-7240 (N.D. Ill.)
Matter:	Theft of trade secret dispute regarding fiber optic networks
Responsibilities:	Research, report and deposition
Date closed:	2000
Attorney/Firm:	Glen Kanwit of Hopkins and Sutter for the plaintiff

Case:	**Pirelli** v. Ciena
Civil Action No.	96-625-MMS (District of Delaware)
Matter:	Patent dispute regarding fiber optic communications
Responsibilities:	Research and reports
Date closed:	1998
Attorney/Firm:	Ken Johnson of Weil Gotshal for the plaintiff