

# Gerardo A. Castañón

## *Office Address*

Centro de Electronica y Telecomunicaciones  
ITESM Campus Monterrey  
Edificio CETEC, 7o Piso, Torre Sur  
Ave. Eugenio Garza Sada # 2501 Sur  
Col. Tecnologico Monterrey, N.L. 64849, Mexico  
Tel.(52)(81) 8158-2293  
Fax (52)(81) 8359-7211  
E-mail: gerardo.castanon@itesm.mx

## *Home Address*

Pedregal del Peñasco 6836  
Col. Pedregal de la Silla  
Monterrey, Nuevo Leon  
CP. 66470  
Tel. (52)(81) 1133-5295

## EDUCATION

- **Ph.D. in Electrical Engineering**, State University of New York (SUNY) at Buffalo, Buffalo New York, Major: Telecommunications. Degree received on February 1998.
- **M.Sc. in Electrical Engineering**, SUNY at Buffalo, Buffalo New York, September 1995.
- **M.Sc. in Electronics Engineering**, Monterrey Institute of Technology and Higher Education (ITESM), Monterrey Mexico, June 1990.
- **M.Sc. in Physics**, Scientific Research Center and higher Education (CICESE), Ensenada Mexico, Major: Optics, December 1989.
- **B.Sc. in Physics Engineering**, ITESM, Monterrey Mexico, September 1987.

## EMPLOYMENT HISTORY

- **Assistant Professor in Center of Electronics and Telecommunications**, September 2002 - present, Monterrey Institute of Technology and Higher Education (ITESM), Monterrey Mexico.
- **Senior Product Planner (photonics)**, April 2002-August 2002. Product Planning Department, Fujitsu Network Communications, Inc., Richardson, TX. USA.
- **Senior Researcher**, December 2000-March 2002. Photonics Networking Laboratory, Fujitsu Network Communications, Inc., Richardson, TX. USA.
- **Research Scientist**, January 1998-November 2000. Alcatel Network Systems, Inc., Alcatel Corporate Research Center, Richardson, TX. USA.
- **Assistant Professor in Physics Department**, June 1990- January 1992, Monterrey Institute of Technology and Higher Education (ITESM), Monterrey Mexico.
- **Instructor Professor in Physics Department**, Aug. 1989-1990, ITESM, Monterrey Mexico.
- **Teaching Assistant**, Dept. of Electrical and Computer Engineering, SUNY at Buffalo, January 1997 - December 1997. Conducted recitations and graded papers in Signals & Systems, and Electronic Circuit courses.

## AWARDS AND HONORS

- National Research Scientist Level 1 in Mexico.
- FULBRIGHT-CONACYT Scholarship (September 1992-July 1997)
- Teaching Assistantship (January 1997 - December 1997), SUNY at Buffalo (from the ECE Department)
- Scholarship from Monterrey Institute of Technology and Higher Education (January 1992-August 1992)
- Alumni Research Competition Award 1990, from ITESM.
- CONACYT Scholarship (September 1987-July 1989)
- Acts as a reviewer for the following journals: 1) IEE Electronics Letters, 2) IEEE/OSA Journal of Lightwave Technology, 3) IEEE/ACM Transactions on Networking, 4) IEE Proceedings-Communications, 5) IEEE Transactions on Communications, 6) Computer Networks and ISDN Systems
- Member of the IEEE Computer/Communications Society, Laser & Electro-optics Society and Optical Society of America
- My biography is included in the book **Marquis Who's Who in America**, November 2002, Edition 57.

## EXPERIENCE AND SKILLS

- Analysis experience in 40 Gb/s and ultra high bit-rate lightwave systems. Understanding of modulation formats, dispersion compensation schemes and enabling technologies for next generation transmission systems.
- Experience in Teletraffic/Transmission performance of high-speed optical cross-connected networks, packet

switching networks, IP over WDM, SONET, ATM, optical amplifiers, wavelength conversion, access and routing schemes, queueing theory. Familiar with aspects of optics (physical, holography, Fourier optics, speckle, interferometry) and optical devices (optical fiber, optical amplifiers, lasers, demultiplexers, multiplexers, filters, receivers, transmitters).

- Participation on the design of Tera-bit Internet Protocol Optical Routers. Experience on developing analytical models and simulators for WDM all-optical packet switched meshed networks.
- Ten years experience in teaching (lectures, classes, and lab on physical optics, laser physics, general physics, electronic circuits).
- **Computer Experience-** operating systems: UNIX, MS-DOS, Windows, Linux, Macintosh; Programming languages: C, Fortran, Pascal, Basic, Java; Software: Photonics Transmission Design Suit (Virtual Photonics), Matlab, Maple, Mathematica, Excel, MS Office, Latex.
- Optical Systems Design. Design and construction of an electronic speckle pattern interferometer.

## PATENTS

1. **Gerardo A. Castan,** "Preferred WDM packet switched router architecture and method for generating the same", USA Patent US6,810,211, B1. October 2004.
2. **G. Castañón,** "A Routing Algorithm for Packet Switching All-Optical Networks" Patent filed, July 1999.
3. **G. Castañón,** "Highly Scalable Multidimensional Dynamic Optical-Hub Architecture", Patent filed June 2002.

## GRANTS

1. "Enabling Future Technologies for Transparent Optical Networks", Research grant 2003 (CONACYT) (\$ 40,000.00 USD per year).
2. "3D Video Transmission in High Speed Networks", Research grant 2003 (ITESM) (\$ 150,000.00 USD per year).

## RECENT PUBLICATIONS:

### Journal Publications:

1. Choo Peng Tan, **Gerardo Castañón,** Su Fong Chien, Ah Heng You, and Andy L.Y. Low, Buffering Management Schemes for Optical Variable Length Packets Under Limited Packet Sorting, , *submitted for publication to Journal of Photonic Network Communications*
2. Hee S. Liew, Su Fong Chien, **Gerardo Castañón,** Ali M. Abdelrahman, Fair Scheduling with Simple Rate Based Buffer Partitioning, *Submitted to journal of high speed networks.*
3. Choon Fang Teo, Yun Cie Foo, Su Fong Chien, Andy L.Y. Low, A.H. You and **Gerardo Castañón,** Wavelength Converters Placement in All Optical Networks Using Particle Swarm Optimization, *Journal of Photonic Network Communications*, Vol. 10, No.1, pp.23-37, July 2005.
4. **Gerardo Castañón,** Chong Gee Koa, Alberto Bononi, Su Fong Chien and Andy Lock Yen Low, Analysis of Shufflenets with limited number of wavelength converters employing deflection routing, *OSA Journal of Optical Networking*, Vol. 4, No. 1, pp.28-37, January 2005.
5. **G. Castañón,** "Design-Dimensioning Model for Transparent WDM Packet Switched Irregular Networks", *IEEE Journal of Lightwave Technol.* Vol. 20, pp. 1-9, January 2002.
6. **G. Castañón,** L. Tancevski and L. Tamil, "Optical Packet Switching with Multiple Path Routing" *Journal of Computer Networks and ISDN Systems, Special Issue on Optical Networks for New Generation Internet and Data Communication Systems*, Vol. 32, pp. 653-662, 15 May 2000.
7. L. Tancevski, S. Yegnanarayanan, **G. Castañón,** L. Tamil, F. Masetti, T. McDermond "Optical Routing of Asynchronous, Variable Length Packets", *IEEE Journal of Select Areas on Comm., Special Issue on Protocols and Architectures for Next Generation Optical WDM Networks*, Vol. 18, pp. 2084-2093, October 2000.
8. **G. Castañón,** L. Tancevski and L. Tamil, "Deflection Routing in All-Optical Packet Switched Irregular Networks" *OSA Trends in Optics & Photonic Series (TOPS)*, Vol. 30 on Photonics in Switching, 2000.
9. L. Tancevski, **G. Castañón,** L. Tamil, "Granularity Based Perspective Analysis of Optical IP Packet", *OSA Trends in Optics & Photonic Series (TOPS)*, Vol. 30 on Photonics in Switching, 2000.

10. L. Tamil, T. McDermott, F. Masetti, **G. Castañón**, A. Ge, L. Tancevski, "Optical IP Routers: Design and Performance Issues under Self-Similar Traffic", *Journal of High Speed Networks*, Vol. 8, pp. 59-67, 1999.
11. A. Bononi, **G. A. Castañón**, and O. K. Tonguz, "Analysis of Hot-Potato Optical Networks with Wavelength Conversion", *IEEE J. Lightwave Technol.*, vol. 17, pp. 525-534, April, 1999.
12. **G. A. Castañón**, O. K. Tonguz, and A. Bononi, "BER Performance of Multiwavelength Optical Cross-connect Networks with Deflection Routing", *IEE Proceedings-Communications*, vol. 144, no. 2, pp. 114-120, April 1997.
13. **G. A. Castañón**, O. K. Tonguz, and A. Bononi, "On the Benefits of Wavelength Translation in Datagram All-optical Networks", *IEE Electronics Letters*, vol. 33, No. 18, pp. 1567-1568, 28th August 1997.

### Conference Publications:

1. **Gerardo Castañón**, An Optical Cross Connect Architecture Based on Planar Lightwave Circuits Switches, *Proceedings IEEE Workshop on High Performance Switching and Routing*, May, 2005.
2. **Gerardo Castañón**, Chong Gee Koa, Su Fong Chien, Andy Lock Yen Low and Alberto Bononi, Performance Analyses of Regular Networks with limited number of wavelength converters by employing deflection Routing, *Proceedings IEEE Workshop on High Performance Switching and Routing*, May 2005.
3. **Gerardo Castañón**, Performance requirements for all-optical networks, *Proceedings SPIE, Conference on Optical transmission systems and equipment for WDM networking III*, Vol. 5596-18, pp. 127-134, October 2004.
4. L. Marciano and **Gerardo Castañón**, Routing strategy based on traffic correlation parameters, *Proceedings SPIE, Conference on Performance, Quality of Service, and Control of Next-Generation Communications Networks*, Vol5598-38, pp. 293-304, October 2004
5. **G. Castañón**, and T. Hoshida "Impact of Filter Dispersion Slope in NRZ, CS-RZ, IMDPSK and RZ formats on Ultra High Bit-Rate Systems", in *Proceedings of European Conference on Optical Communications ECOC'2002*, Copenhagen Denmark, September 8-12, 2002.
6. L. Steinhorst and **G. Castañón** "Mixed Fiber Networks and DWDM Transmission Systems", *Accepted for presentation in National Fiber Optics Engineering Conference NFOEC'02*, Dallas TX September 15-19, 2002.
7. **G. Castañón**, and T. Hoshida "Performance Limitation of High Bit-Rate Dense WDM Systems Due to Filter Dispersion Slope", in *Proceedings of OptoElectronics and Communications Conference (OECC'2002)*, paper:10B2-2, Vol. 1, pp:116-117, Yokohama Japan, July 8-12, 2002.
8. Ashwin Gumaste, Susumu Kinoshita, Koji Takeguchi and **Gerardo Castañón**, "Bifurcated Traffic and Channel Assignment (BITCA) to Interconnected Metro Rings" in *Proceedings of Optical Fiber Communications Conference (OFC'2002)*, paper TuG5, Vol. 1. pp:39-41, March 2002.
9. O. Vassilieva, T. Hoshida, S. Choudhary, **G. Castañón**, H. Kuwahara, T. Terahara, and H. Onaka "Numerical comparison of NRZ, CS-RZ, and IM-DPSK formats in 43Gbit/s WDM transmission", in *Proceedings of the 14th annual meeting of IEEE Lasers & electro-optics society (LEOS'2001)*, paper:ThC2, 11-15 November 2001.
10. **G. Castañón**, O. Vassilieva, S. Choudhary, and T. Hoshida, "Requirement of filter characteristics for 40 Gbit/s-based DWDM systems", in *Proceedings of European Conference on Optical Communications ECOC'2001*, Vol.1, pp.60-61, Amsterdam, Netherlands , 30 September - 5 October 2001.
11. L. Tancevski, A. Ge, **G. Castañón**, "Optical Packet Switch with Partially Shared Buffers: Design Principles", in *Proceedings of Optical Fiber Communications Conference (OFC'2001)*, paper:Tuk3, March 2001.
12. H. Kim, L. Tancevski, A. Ge, **G. Castañón**, "FWM noise reduction in Bursty Metro Transmission", in *Proceedings of Optical Fiber Communications Conference (OFC'2001)*, paper:WN1, March 2001.
13. **G. Castañón**, "Design Model for Transparent WDM Packet Switched Irregular Networks", in *Proceedings of European Conference on Optical Communications ECOC'2000*, Vol.2, pp. 27-28, Munich, Germany, September 2000.
14. A. Ge, L. Tancevski, **G. Castañón**, L. Tamil, "WDM Fiber Delay Line Buffer Control for Optical Packet Switching," in *Proceedings, SPIE OptiComm 2000*.
15. **G. Castañón**, "Sharp Approximated Model for WDM All-Optical Packet Switched Irregular Networks", in *Proceedings of IEEE Global Telecommunications Conference, GLOBECOM'2000*, Vol. 1, pp. 695-700, San Francisco, 27 November- 1 December, 2000.

16. **G. Castañón**, L. Tancevski, S. Yegnanarayanan, and L. Tamil, "Asymmetric WDM All-Optical Packet Switched Routers". in *Proceedings of Optical Fiber Communications Conference (OFC'2000)*, paper:WD4, pp. 53-55, March 2000.
17. S. Yegnanarayanan, L. Tancevski, **G. Castañón** and L. Tamil, "Low-Jitter Asynchronous Optical Packet Regenerator using Wavelength Sampling Technique". in *Proceedings of Optical Fiber Communications Conference (OFC'2000)*, paper:WM48, pp. 353-355, March 2000.
18. **G. Castañón** , L. Tancevski and L. Tamil, "Routing Strategies for the Optimization of Components in All-Optical Packet Switched Networks" in *Proceedings of European Conference on Optical Communications ECOC'99*, Paper: P4.1, September 26-30, 1999.
19. **G. Castañón** , L. Tancevski and L. Tamil, "Routing Strategies for All-Optical Packet Switched Irregular Networks" in *Proceedings of OSA Photonics in Switching'99* , pp. 49-51, July, 1999.
20. **G. Castañón** , L. Tancevski and L. Tamil, "Routing in All-Optical Packet Switched Irregular Mesh Networks", in *Proceedings of IEEE Global Telecommunications Conference, GLOBECOM'99*, Vol. 2, pp. 1017-1022, Rio de Janeiro, Brazil, December 1999.
21. L. Tancevski, **G. Castañón**, L. Tamil, "Optical IP Packet Transport: A Granularity Perspective" in *Proceedings of OSA Photonics in Switching'99*, pp. 61-63, Santa Barbara CA, July 1999.
22. L. Tancevski, **G. Castañón**, L. Tamil, "Performance of an Optical IP Router using Non-Degenerated Buffers", in *Proceedings of IEEE Global Telecommunications Conference, GLOBECOM'99*, Vol. 2, pp. 1454-1459, Rio de Janeiro, Brazil, December 1999.
23. **G. Castañón** , A. Ge, L. Tancevski and L. Tamil, "Optical Packet Switching with Multiple Path Routing" Optical Network in *Proceedings of Design and Modeling (ONDM'99) Conference*, Paris France, Vol. 1, pp. 136-143, February 1999.
24. L. Tancevski, A. Ge, **G. Castañón**, L. Tamil, "A new Scheduling algorithm for Asynchronous Variable Length IP Traffic", in *Proceedings of Optical Fiber Communication (OFC'99) Conference*, February 1999,
25. L. Tamil, T. McDermott, F. Masetti, **G. Castañón**, A. Ge, L. Tancevski, "Analysis of All-Optical IP Routers", SPIE'98 Symposium on Voice, Video and Data Communications, November 1-6, 1998.
26. **G. A. Castañón**, "Performance Evaluation of Optical Cross-connected Networks", *Ph. D. Dissertation, State University of New York at Buffalo*, December 1997.
27. A. Bononi, **G. A. Castañón**, and O. K. Tonguz, " Analysis of Hot-Potato Optical Networks with Wavelength Converters", *IEEE International Conference on Communications (ICC'98)*, accepted for presentation, Session S15.3, Atlanta, Georgia, 7-11 June, 1998.
28. **G. A. Castañón**, O. K. Tonguz, and A. Bononi, "Combined Teletraffic/Transmission Performance of Multi-wavelength Optical Cross-Connected Networks using Hybrid-Store-and-Forward", *Proceedings of IEEE Global Telecommunications Conference, GLOBECOM'97*, Session S24.2, vol. 2, pp. 856-862, Phoenix, 3-8 November 1997.
29. **G. A. Castañón**, O. K. Tonguz, and A. Bononi, " Teletraffic/Transmission Performance of Multi-hop Networks using Hybrid-Store-and-Forward", *6th International Conference on Computer Communications and Networks, (ICCCN'97)*, vol. 1, pp. 138-143, Las Vegas, 22-25 September 1997.
30. **G. A. Castañón**, O. K. Tonguz, and A. Bononi, "Performance of Wavelength Translation in All-Optical Cross-connected Networks", *Proceedings of IEEE/LEOS Summer Meeting*, vol 1, TuC3, pp. 34-35, Montreal, Canada, August 1997.
31. **G. A. Castañón**, O. K. Tonguz, and A. Bononi, "Transmission Performance of Transparent Multi-wavelength Optical Cross-connected Networks", *Proceedings of the Second IEEE Symposium on Computers and Communications (ISCC'97)*, vol. 1, pp. 323-329, Alexandria, Egypt, 1-3 July 1997.
32. **G. A. Castañón**, O. K. Tonguz, and A. Bononi, "Teletraffic Performance of Multi-wavelength Optical Cross-connected Networks using Wavelength Translation", *Proceedings of the 5th International Conference on Telecommunication Systems*, vol. 1, pp. 205-209, Tennessee, 20-23 March 1997.
33. **G. A. Castañón**, O. K. Tonguz, and A. Bononi, "Impact of Crosstalk on the Performance of Multiwavelength Optical Cross-connected Networks using Deflection Routing", *Proceedings of the IEEE Lasers and Electro-Optics Society 1996 Annual Meeting (LEOS'96)*, vol. 2, pp. 318-319, Boston, November 1996.
34. **G. A. Castañón**, "Analysis of object movements using an Electronic Speckle Pattern Interferometer", *XX Congreso de Investigacion y Extension del Sistema ITESM*, Monterrey 1990.

35. **G. A. Castañón**, R. Villagomez, "Design of an Electronic Speckle Pattern Interferometer", *Proceedings of the XI Congreso de la Academia Nacional de Ingenieria*, Mexico, 1989.

## REFERENCES

Prof. Alberto Bononi  
Dipartimento di Ingegneria  
dell'Informazione  
Universita di Parma  
I-43100 Parma ITALY  
Internet:alberto@com.tlc.unipr.it

Prof. Ozan K. Tonguz  
Dep. of Electrical & Computer Eng.  
Hamerschlag Hall, B203  
Carnegie Mellon University  
Pittsburg, PA 15213-3890  
Tel: (412) 268-5991  
Internet:tonguz@ece.cmu.edu

Prof. Franco Callegati  
DEIS Universita' di Bologna  
Viale Risorgimento 2  
40136 Bologna ITALY  
Tel:+39 51 2093089  
Internet:fcallegati@deis.unibo.it

G Castanon, L Tancevski, L Tamil. Seamless Interconnection for Universal Services. Global Telecommunications '99, 1999. A Ge, L Tancevski, G Castanon, LS Tamil. OptiComm 2000: Optical Networking and Communications 4233, 247-256, 2000. 28. Gerardo Castañón, is the head of the optical communications research group. Full professor, member of the national research system in Mexico. Member of the Academy of Science in Mexico.