

## PERSONAL INFORMATION

**Enrico Forestieri**

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## ACADEMIC CAREER

- 2005–Present **Professor**  
SSD ING-INF/03, Scuola Superiore Sant'Anna, Pisa
- 2001–2005 **Associate Professor**  
SSD ING-INF/03, Scuola Superiore Sant'Anna, Pisa
- 1991–2001 **Ricercatore Universitario**  
RD I23, Università degli Studi di Parma
- 1989–1991 **Contract Professor**  
Facoltà di Ingegneria, Università degli Studi Parma

## PROFESSIONAL EXPERIENCE

- 2001–Present **Coordinator**  
Optical Communication Theory and Techniques Area, Institute of Communication, Information and Perception Technologies (TeCIP), Scuola Superiore Sant'Anna
- 2001–Present **Scientific Coordinator/Task Leader**  
Several research projects between Ericsson (formerly Marconi Communications) and Scuola Superiore Sant'Anna or the National Interuniversity Consortium for Telecommunications (CNIT)
- 2018–2019 5G transport over DWDM metro or broadcast-&-select WDM PON
- 2017 High Speed Optical Transmission for 5G Radio Access
- 2016 Low-cost optical short-reach interconnects for 5G radio
- 2015 Optical Short Reach Interconnect: Modulation Formats Analysis
- 2013–2014 Solutions for nonlinear compensation
- 2013–2014 Performance analysis and characterization of modulation formats for 400 Gb/s and 1 Tb/s
- 2012 Turbo Equalization for High Speed Coherent Systems
- 2011 400G System modeling and DSP
- 2010 Polarization multiplexed coherent multilevel system 100G and beyond: Digital signal processing algorithms for compensation of non linear effects
- 2010 Beyond 100G Transport
- 2009 100 GbE Transport
- 2008–2009 100G PM-D(Q)PSK Receiver Optical Front-End with Coherent Detection and Off-Line Electronic Post-Processing
- 2008–2009 100Gb Technologies Investigations
- 2007–2008 100GbE Transport Technologies Investigations - Study of advanced modulation formats and signal processing techniques for long-haul distance

- 2006–2007 40 Gbit/s DQPSK Transmission on DWDM Multi-Span Systems  
2004–2005 40 Gbit/s Transmission on DWDM Systems  
2001–2003 PMD Compensator Project
- 2017-2019 **Task Leader**  
Project POR FESR 2014-2020 “Fotonica Integrata Per Interconnessioni Luminose Intra-chip, Intra-board e Intra-System (FIPILI3)”
- 2015 **General Chairman**  
Tyrrhenian International Workshop on Digital Communications
- 2014–2016 **Director**  
Photonic Networks National Laboratory  
National Interuniversity Consortium for Telecommunications (CNIT)
- 2011-2013 **Task Leader**  
Project PAR FAS 2007-2013 “Architetture di Reti e Nodi Ottici per la Trasmissione ad alta capacità e il Trasporto accesso-metro-core basati su Tecnologie fotoniche integrate (ARNO-T3)”
- 2006–2011 **Associate Editor**  
IEEE Journal of Lightwave Technology
- 2005–2007 **Scientific coordinator**  
PRIN project STORiCo (Sistemi di Trasmissione Ottici a Rivelazione Coerente)
- 2004 **General Chairman**  
International Workshop on Digital Communications
- 2001-2003 **Task Leader**  
PRIN project “Stabilizzazione e compressione di sorgenti quasi-solitoniche, moltiplicazione, propagazione, rigenerazione e demoltiplicazione di segnali OTDM per sistemi ad elevatissimo bit-rate”
- 1999-2001 **Task Leader**  
PRIN project “Tecniche trasmissive e di demultiplexing per TDM ottico ed effetti delle caratteristiche della fibra sulle prestazioni”
- 1997-1999 **Involved in research activities between CSELT and University of Parma**
- 1996-1998 **Task Leader**  
European project DAWRON (Design of Advanced Wavelength Routed Optical Networks)

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**PERSONAL SKILLS**

Mother tongue Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C2	C1	C1	C2
French	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user  
[Common European Framework of Reference for Languages](#)

## ACKNOWLEDGMENTS

Best Paper Award

### IEEE International Conference on Communications (ICC) Optical Networks and Systems Symposium

Granted by IEEE Communications Society - USA

G. Colavolpe, T. Foggi, E. Forestieri, G. Prati, "Optimal electrical processing in multilevel optical systems insensitive to GVD and PMD", In: 2008 IEEE International Conference on Communications. p. 5385-5389, Beijing, China, 19-23 May 2008, doi: 10.1109/ICC.2008.1009

Top Scored Paper Award

### International Conf. on Optical Network Design and Modeling (ONDM)

Granted by International Federation for Information Processing (IFIP) - AUT. Award assigned to the paper that received the highest score from the technical committee of an IFIP conference. M. Secondini, S. Rommel, F. Fresi, E. Forestieri, G. Meloni, L. Potì, "Coherent 100G non-linear compensation with single-step digital backpropagation.", In: 2015 International Conference on Optical Network Design and Modeling (ONDM), p. 63-67, Pisa, 11-14 May 2015, doi: 10.1109/ONDM.2015.7127275

## INTERNATIONAL PATENTS

PCT/EP2016/069085	Encoding for optical transmission (CAPS-3)
PCT/EP2016/061827	Line coding for optical transmission (tribinary)
PCT/EP2015/070494	Method of transmitting communications traffic, transmitter and communications transmission system
PCT/EP2014/059646	Non-linear propagation impairment equalisation
PCT/EP2012/064596	Receiver for optical transmission system
PCT/EP2010/062866	Phase noise compensation in coherent optical communications systems
PCT/EP2009/052071	Equalizer for an optical transmission system
PCT/IB2006/004207	Adaptable signal processor for optical transmitters able to compensate for a wide range of fibre chromatic dispersion
PCT/EP2006/069168	Maximum likelihood sequence estimation in optical fibre commun. systems
PCT/EP2005/051061	System, method and apparatus for polarization mode dispersion compensation and demultiplexing polarization multiplexed signals
PCT/IB02/05446	Method based on the Stokes parameters for the adaptive adjustment of optical PMD compensators
PCT/IB02/05661	Method based on the mean square error for the adaptive adjustment of optical PMD compensators
PCT/IB01/02795	Line coding scheme for digital communications, transmission method and apparatus

## SELECTED JOURNAL ARTICLES

- [1] M. Secondini, E. Agrell, E. Forestieri, and D. Marsella, "Nonlinearity Mitigation in WDM Systems: Models, Strategies and Achievable Rates," *J. Lightwave Technol.*, vol. 37, no. 10, pp. 2270-2283, May 15, 2019
- [2] S. Civelli, E. Forestieri, and M. Secondini, "Decision-Feedback Detection Strategy for Nonlinear Frequency-Division Multiplexing," *Opt. Exp.*, vol. 26, no. 9, pp. 12057-12071, 2018.
- [3] M. Morsy-Osman, F. Fresi, E. Forestieri, M. Secondini, L. Potì, F. Cavaliere, S. Lessard, and D. Plant, "50 Gb/s Short-Reach Interconnects with DSP-Free Direct-Detection Enabled by CAPS Codes," *Opt. Exp.*, vol. 26, no. 14, pp. 17916-17926, 2018.
- [4] M. Secondini and E. Forestieri, "Scope and limitations of the nonlinear Shannon limit," *J. Lightwave Technol.*, vol. 35, no. 4, pp. 893-902, Feb. 2017.

- [5] F. Fresi, M. Imran, A. Malacarne, G. Meloni, V. Sorianello, E. Forestieri, L. Potì, "Advances in Optical Technologies and Techniques for High Capacity Communications," *J. Optical Communications and Networking*, vol. 9, no. 4, pp. C54-C64, Apr. 2017.
- [6] E. Forestieri, M. Secondini, F. Fresi, G. Meloni, L. Potì, F. Cavaliere, "Extending the Reach of Short-Reach Optical Interconnects with DSP-Free Direct-Detection," *J. Lightwave Technol.*, vol. 35, no. 15, pp. 3174-3181, Aug. 2017.
- [7] S. Civelli, E. Forestieri, M. Secondini, "Why Noise and Dispersion may Seriously Hamper Non-linear Frequency-Division Multiplexing," *IEEE Photon. Technol. Lett.*, vol. 29, no. 16, pp. 1332-1335, 2017.
- [8] M. Secondini, T. Foggi, F. Fresi, G. Meloni, F. Cavaliere, G. Colavolpe, E. Forestieri, L. Potì, R. Sabella, and G. Prati "Optical time-frequency packing: Principles, design, implementation, and experimental demonstration," *J. Lightwave Technol.*, vol. 33, no. 17, pp. 3558-3570, Sept. 2015.
- [9] M. Secondini, S. Rommel, G. Meloni, F. Fresi, E. Forestieri, and L. Potì, "Single-step digital backpropagation for nonlinearity mitigation," *Photonic Network Communications*, pp. 63-67, Dec. 2015.
- [10] D. Marsella, M. Secondini, and E. Forestieri, "Maximum likelihood sequence detection for mitigating nonlinear effects," *J. Lightwave Technol.*, vol. 32, no. 5, pp. 908-916, Mar. 2014.
- [11] M. Secondini and E. Forestieri, "On XPM mitigation in WDM fiber-optic systems," *IEEE Photon. Technol. Lett.*, vol. 26, no. 22, pp. 2252-2255, Nov. 2014.
- [12] M. Secondini, E. Forestieri, and G. Prati, "Achievable information rate in nonlinear WDM fiber-optic systems with arbitrary modulation formats and dispersion maps," *J. Lightwave Technol.*, vol. 31, no. 23, pp. 3839-3852, Dec. 2013.
- [13] M. Secondini and E. Forestieri, "Analytical fiber-optic channel model in the presence of cross-phase modulation," *IEEE Photon. Technol. Lett.*, vol. 24, no. 22, pp. 2016-2019, Nov. 2012.
- [14] L. Gerardi, M. Secondini, and E. Forestieri, "Performance evaluation of WDM systems through multicanonical Monte-Carlo simulations," *J. Lightwave Technol.*, vol. 29, no. 6, pp. 871-879, 2011.
- [15] G. Colavolpe, T. Foggi, E. Forestieri, and M. Secondini, "Impact of Phase Noise and Compensation Techniques in Coherent Optical Systems," *J. Lightwave Technol.*, vol. 29, pp. 2790-2800, Sept. 2011.
- [16] A. Barbieri, G. Colavolpe, T. Foggi, E. Forestieri, and G. Prati, "OFDM vs. single-carrier transmission for 100 Gbps optical communication," *J. Lightwave Technol.*, vol. 28, no. 17, pp. 2537-2551, 2010.
- [17] E. Forestieri and M. Secondini, "On the error probability evaluation in lightwave systems with optical amplification," *J. Lightwave Technol.*, vol. 27, no. 6, pp. 706-717, Mar. 15, 2009.
- [18] G. Colavolpe, T. Foggi, E. Forestieri, and G. Prati, "Robust multilevel coherent optical systems with linear processing at the receiver," *J. Lightwave Technol.*, vol. 27, no. 13, pp. 2357-2369, July 1, 2009.
- [19] M. Secondini, M. Frezzini, and E. Forestieri, "Analytical performance evaluation of optical DQPSK systems with post-detection filtering," *IEEE Photon. Technol. Lett.*, vol. 21, no. 13, pp. 908-910, July 1, 2009.
- [20] M. Secondini, E. Forestieri, and C. R. Menyuk, "A combined regular-logarithmic perturbation method for signal-noise interaction in amplified optical systems," *J. Lightwave Technol.*, vol. 27, no. 16, pp. 3358-3369, Aug. 15, 2009.