

# Daniele Modotto

## PERSONAL DETAILS

**Date of birth:** April 23<sup>rd</sup>, 1971

**Place of birth:** Udine (Italy)

**Nationality:** Italian citizen

**E-mail:** daniele.modotto@unibs.it

### **Present position:**

Full Professor of Electromagnetic Fields (Professore Ordinario, settore scientifico disciplinare ING-INF/02 Campi Elettromagnetici)

### **Work address:**

Dipartimento di Ingegneria dell'Informazione

Università degli Studi di Brescia

via Branze, 38 - 25123 Brescia, Italy

## EDUCATION

**1997-2000:** Doctor of Philosophy (PhD) degree in Electronics and Telecommunications Engineering, Università degli Studi di Padova, Padova, Italy.

Thesis: “Fenomeni non lineari in strutture periodiche in regime di quasi accordo di fase” (Nonlinear phenomena in periodic structures under the quasi-phase matching condition);

tutor: Prof. G.F. Nalesso.

**1991-1996:** Laurea degree in Electronic Engineering (110/110 summa cum laude), Università degli Studi di Padova, Padova, Italy.

Thesis: “L'interferometro di Mach-Zehnder non lineare: analisi, simulazione ed ottimizzazione” (The nonlinear Mach-Zehnder interferometer: analysis, numerical modelling and optimization);

tutor: Prof. C.G. Someda.

**1985-1990:** Maturità Scientifica (High School Diploma), grade: 60/60.

### **Languages**

Italian: native.

English: fluent

## EMPLOYMENT

- **December 2018 - present:** Full Professor (Professore Ordinario), Dipartimento di Ingegneria dell'Informazione, Università degli Studi di Brescia, Brescia, Italy.
- **November 2014 - November 2018:** Associate Professor (Professore Associato), Dipartimento di Ingegneria dell'Informazione, Università degli Studi di Brescia, Brescia, Italy.
- **November 2002 - October 2014:** Assistant Professor (Ricercatore), Dipartimento di Ingegneria dell'Informazione, Università degli Studi di Brescia, Brescia, Italy.
- **November 2001 - October 2002:** Research Assistant (Assegnista di ricerca), Dipartimento di Elettronica per l'Automazione, Università degli Studi di Brescia, Brescia, Italy.
- **September 2001 - October 2001:** scholarship from the Istituto Nazionale per la Fisica della Materia (National Institute for the Physics of Matter).
- **May 2000 - August 2001:** Research Assistant, Department of Electronics and Electrical Engineering, University of Glasgow, Glasgow, UK.
- **1999 - 2000:** scholarship from the Istituto Nazionale per la Fisica della Materia (National Institute for the Physics of Matter).

## TEACHING ACTIVITY

- 2014/2015 - present: teacher of the course “Remote Sensing Data Acquisition”, 3 credits, Master degree in Communication Technologies and Multimedia (Master degree taught in English).
- 2012/2013 - present: teacher of the course “Antennas and Wireless Systems Laboratory”, 9 credits, Master degree in Communication Technologies and Multimedia (Master degree taught in English).
- 2011/2012: teacher of the course “Antenne e Laboratorio di Telecomunicazioni” (Antennas and Telecommunications Laboratory), 9 credits, Laurea Magistrale in Ingegneria delle Telecomunicazioni (Master degree in Telecommunications Engineering).
- 2010/2011: teacher of the course “Microonde” (Microwave Engineering), 6 credits, Laurea Magistrale in Ingegneria delle Telecomunicazioni (Master degree in Telecommunications Engineering).
- 2004/2005 - 2009/2010: teacher of the course “Campi Elettromagnetici B” (Electromagnetic Fields B), 5 credits, Laurea Specialistica in Ingegneria delle Telecomunicazioni (Master degree in Telecommunications Engineering).
- 2003/2004 - 2010/2011: teacher of the course “Laboratorio Specialistico Campi/TLC” (Advanced Electromagnetic Fields and Telecommunications Laboratory), 5 credits, Laurea Specialistica in Ingegneria delle Telecomunicazioni (Master degree in Telecommunications Engineering).
- 2002/2003 - 2009/2010: teaching assistant for the course “Laboratorio Campi/TLC” (Electromagnetic Fields and Telecommunications Laboratory), 5 credits, Laurea in Ingegneria dell'Informazione (Bachelor degree in Information Engineering).

- 2011/2012 - present: laboratory assistant for the course “Microwave Engineering”, 6 credits, Master degree in Communication Technologies and Multimedia (Master degree taught in English).
- 2012/2013 - present: laboratory assistant for the course “Optical Communication Systems”, 9 credits, Master degree in Communication Technologies and Multimedia (Master degree taught in English).

Since 2002 he has tutored more than 30 “Laurea” (Bachelor degree) and “Laurea Specialistica” (Master degree) theses.

Since 2004/2005 he serves as tutor (adviser of studies) for undergraduate and master students of Telecommunications Engineering (now Communication Technologies and Multimedia).

Since 2004/2005 he sits in the Board of Professors of the PhD programme in “Ingegneria dell’Informazione”.

Since 2014/2015 he is a member of the Students-Professors Joint Committee (Commissione Paritetica Docenti-Studenti) of the Dipartimento di Ingegneria dell’Informazione.

Since May 2017 he is the Chairman of the Students-Professors Joint Committee.

## **RESEARCH FUNDING**

Funding scheme: Galileo programme (funded by the Università Italo-Francese / Université Franco Italienne).

He was the principal investigator of the Brescia Unit for the project “Supercontinuum sources in fiber ring cavities”; the principal investigator of the French Unit was Dr. B. Kibler (Université de Bourgogne, Dijon).

Year: 2014.

Funding scheme: British-Italian partnership programme (funded by CRUI and British Council).

He was the principal investigator of the Brescia Unit for the project “Modelling of carbon nanotube based nonlinear saturable absorbers for all-optical processing applications”; the principal investigator of the British Unit was Dr. S.A. Boscolo (School of Engineering and Applied Science of Aston University, Birmingham).

Year: 2010.

Funding scheme: PRIN 2005 (Project of Relevant National Interest of the Italian Ministry of Education, University and Research, MIUR).

Local principal investigator for the project “Photonic band gap nanosensors”; the other universities involved in the project were: Politecnico di Bari (national principal investigator: Prof. A. D’Orazio) and Università degli Studi di Lecce (local principal investigator: Prof. M. De Vittorio).

Years: 2006-2007.

He was staff member of the following research projects:

2017-present: “Spatiotemporal multimode complex optical systems (STEMS)”, European Research Council Advanced Grant (funded by the European Union); principal investigator: Prof. S. Wabnitz.

2012-2014: “Mid-wave infrared supercontinuum from silicon waveguides”, funded by Fondazione Cariplo; local principal investigator: Prof. S. Wabnitz.

2009-2011: “Study of nonlinearities in periodically poled silicon waveguides for new mid-infrared laser sources”, funded by Fondazione Cariplo; local principal investigator: Prof. S. Wabnitz.

2009: “Sistemi e dispositivi ottici non lineari”, Azione Integrata Italia-Spagna funded by MIUR; local principal investigator: Prof. S. Wabnitz.

2007-2008: “Design of a single-chip Ultra Wide Band portable radar”, PRIN 2006, funded by MIUR; local principal investigator: Prof. Z.M. Kovács-Vajna.

2003-2005: “Modeling and numerical methods of photonic devices for high capacity optical networks”, FIRB 2001, funded by MIUR; local principal investigator: Prof. C. De Angelis.

2000-2002: “Ultrafast all-optical signal processing in engineered quadratic nonlinear waveguides (ROSA)”, FP5-IST: Information Society Technologies Programme, funded by the European Union; local principal investigator: Prof. C. De Angelis.

1999-2001: “Optical frequency conversion in semiconductor heterostructures II (OFCORSE II)”, FP4-IST: Information Society Technologies Programme funded by the European Union; local (University of Glasgow) principal investigator: Prof. J.S. Aitchison.

## RESEARCH ACTIVITIES

His current research interests include the design and experimental characterization of devices working in different bands of the electromagnetic spectrum: from innovative planar antennas for WLAN to semiconductor waveguides for nonlinear conversion in the near and mid-infrared wavelength ranges. His scientific contributions cover 8 topics:

1) **Nonlinear optics in crystals**: second harmonic generation and wavelength conversion in ferroelectric crystals with particular attention to the temporal dynamics of sub-nanosecond pulses; generation of spatial quadratic solitons and study of their interactions and collisions.

2) **Integrated and nonlinear optics in semiconductors**: design of waveguides (and waveguide based components) in III-V semiconductors (aluminium gallium arsenide, AlGaAs) and in silicon (based on the Silicon-On-Insulator, SOI, technology); cubic and quadratic nonlinear effects in AlGaAs and SOI waveguides. Design of ring resonators for the generation of frequency combs in the near infrared. Development of bidirectional beam propagation methods to simulate the propagation in deep etch gratings and in periodic structures (and accounting for the presence of second and third order nonlinear effects).

- 3) **Photonic crystal waveguides**: analysis of the modes of planar waveguides based on the presence of a propagation bandgap; study of the coupling among the modes and of the role of the defects in the periodic lattice; guided resonances and design of mechanical deformation sensors based on the guided resonances of planar integrated micro-membranes.
- 4) **Plasmonics**: design of plasmonic waveguides (composed of metals and dielectrics) for the visible and near infrared spectral regions; enhancement of the nonlinear effects by tuning the dispersion of the plasmonic waveguides. Optical antennas: equivalent circuit and optimization of the field enhancement in the near field.
- 5) **Nonlinear effects in microstructure optical fibers**: numerical and experimental study of wavelength conversion and spectral broadening (supercontinuum generation) in microstructure optical fibers. Observation of four-wave mixing spectral peaks due to the nonlinear interaction among different modes.
- 6) **Nonlinear effects in multimode fibers**: study of spectral broadening and beam cleaning in commercial multimode fibers (both step-index and GRIN). Analysis of spectral broadening and beam cleaning in microstructure multimode fibers and study of the influence of the Raman effect. Optical poling of GRIN fibers and characterization of the generated second harmonic.
- 7) **Optical characterization of surfaces**: design and testing of a confocal microscopy setup to measure the position of a reflecting surface and evaluating the surface roughness; the light source is based on supercontinuum generation in an optical fiber and its spectrum is flat and bright in the 500-900 nm spectral range: this source allows for better performance than a standard halogen lamp.
- 8) **Planar antennas**: design and test of planar antennas for WLAN systems and pulsed radars (including UWB) working in the 500-1600 MHz band and in the 6-9 GHz band. Fabrication and testing of antennas on flexible substrates (like Kapton) or on low-cost rigid plastics.

The most important and original results are:

- Development of a Bidirectional Beam Propagation Method to simulate the propagation of beams and pulses in media and waveguides exhibiting strong variations of the refractive index. Both quadratic and cubic nonlinear effects are included in the mathematical model.
- Numerical and experimental study of cubic and quadratic effects in AlGaAs nanowires (i.e. ridge waveguides whose width is smaller than 1  $\mu\text{m}$ ) in the near and mid-infrared wavelength range.
- Numerical and experimental analysis of supercontinuum generation in multicore microstructure fibers where dispersion can be chosen during the design process by varying the core dimensions and the level of doping.
- Theoretical and experimental analysis of dispersive wave generation in a dual concentric core microstructure fiber. After a propagation of a few meters, the dispersive wave carries almost half of the power of the optical pulses injected into the fiber.
- First experimental evidence of second harmonic generation in silicon waveguides strained by a silicon nitride overlayer. The mechanical deformation of the silicon layer, due to the stress introduced by the silicon nitride overlayer, gives rise to a sizable quadratic nonlinear coefficient. This discovery paves the way for a whole new class of devices for wavelength conversion in the near and mid-infrared.
- First experimental observation of optical poling in a multimode GRIN fiber. The nonlinear quadratic coefficient saturates after a writing time of 3-4 hours and the written nonlinearity is permanent and fulfills the quasi-phase matching condition.

He played a propulsive role in the establishment of the Electromagnetic Fields and Photonics Laboratory. He designs the experiments, contributes to the experimental work and oversees the Laboratory activities; since March 2012, he is the Manager of the Laboratory.

He has published more than 60 papers on peer-review journals and more than 90 contributions on conference proceedings.

He regularly reviews manuscripts for the following publishers: Optical Society of America (Optics Letters, Journal of the Optical Society of America A, Journal of the Optical Society of America B, Optics Express, Optica, Applied Optics), Institute of Electrical and Electronics Engineers (IEEE Antennas and Wireless Propagation Letters, Photonics Journal, IEEE Photonics Technology Letters, IEEE Journal of Quantum Electronics, IEEE Transactions on Vehicular Technologies), Elsevier (Optical Fiber Technology, Optics and Laser Technology) and EMW Publishing (Progress in Electromagnetics Research C, Progress in Electromagnetics Research Letters).

He is a reviewer of the projects submitted to the calls for proposals of the Italian Ministry of Education, University and Research (MIUR)

## JOURNAL ARTICLES

- J1. K. Krupa, V. Couderc, A. Tonello, D. Modotto, A. Barthélémy, G. Millot, S. Wabnitz, "Refractive index profile tailoring of multimode optical fibers for the spatial and spectral shaping of parametric sidebands," *Journal of the Optical Society of America B*, vol. 36, no. 4, pp. 1117-1126, 2019.
- J2. J. Qin, F. Huang, X. Li, L. Deng, T. Kang, A. Markov, F. Yue, Y. Chen, X. Wen, S. Liu, Q. Xiong, S. Semin, T. Rasing, D. Modotto, R. Morandotti, J. Xu, H. Duan, L. Bi, "Enhanced second harmonic generation from ferroelectric HfO<sub>2</sub>-based hybrid metasurfaces," *ACS Nano*, vol. 13, no. 2, pp. 1213-1222, 2019.
- J3. K. Krupa, G. Garmendia Castañeda, A. Tonello, A. Niang, D.S. Kharenko, M. Fabert, V. Couderc, G. Millot, U. Minoni, D. Modotto, S. Wabnitz, "Nonlinear polarization dynamics of Kerr beam self-cleaning in a graded-index multimode optical fiber," *Optics Letters*, vol. 44, no. 1, pp. 171-174, 2019.
- J4. K. Krupa, A. Tonello, V. Couderc, A. Barthélémy, G. Millot, D. Modotto, S. Wabnitz, "Spatiotemporal light-beam compression from nonlinear mode coupling," *Physical Review A*, vol. 97, no. 4, 043836, 2018.
- J5. A. Markov, A. Mazhorova, H. Breitenborn, A. Bruhacs, M. Clerici, D. Modotto, O. Jedrkiewicz, P. Di Trapani, A. Major, F. Vidal, R. Morandotti, "Broadband and efficient adiabatic three-wave-mixing in a temperature-controlled bulk crystal," *Optics Express*, vol. 26, no. 4, pp. 4448-4458, 2018.
- J6. R. Dupiol, K. Krupa, A. Tonello, M. Fabert, D. Modotto, S. Wabnitz, G. Millot, V. Couderc, "Interplay of Kerr and Raman beam cleaning with a multimode microstructure fiber," *Optics Letters*, vol. 43, no. 3, pp. 587-590, 2018.

- J7. A. Bendahmane, K. Krupa, A. Tonello, D. Modotto, T. Sylvestre, V. Couderc, S. Wabnitz, G. Millot, “Seeded intermodal four-wave mixing in a highly multimode fiber,” *Journal of the Optical Society of America B*, vol. 35, no. 2, pp. 295-301, 2018.
- J8. M. Farran, S. Boscolo, A. Locatelli, A.D. Capobianco, M. Midrio, V. Ferrari, D. Modotto, “High-gain printed monopole arrays with low-complexity corporate-feed network,” *IET Microwaves, Antennas and Propagation*, vol. 11, no. 11, pp. 1616-1621, 2017.
- J9. D. Ceoldo, K. Krupa, A. Tonello, V. Couderc, D. Modotto, U. Minoni, G. Millot, S. Wabnitz, “Second harmonic generation in multimode graded-index fibers: spatial beam cleaning and multiple harmonic sideband generation,” *Optics Letters*, vol. 42, no. 5, pp. 971-974, 2017.
- J10. D. Ceoldo, A. Bendahmane, J. Fatome, G. Millot, T. Hansson, D. Modotto, S. Wabnitz, B. Kibler, “Multiple four-wave mixing and Kerr combs in a bichromatically pumped nonlinear fiber ring cavity,” *Optics Letters*, vol. 41, no. 23, pp. 5462-5465, 2016.
- J11. J.M. Chávez Boggio, A. Ortega Moñux, D. Modotto, T. Fremberg, D. Bodenmüller, D. Giannone, M.M. Roth, T. Hansson, S. Wabnitz, E. Silvestre, L. Zimmermann, “Dispersion-optimized multicladding silicon nitride waveguides for nonlinear frequency generation from ultraviolet to mid-infrared,” *Journal of the Optical Society of America B*, vol. 33, no. 11, pp. 2402-2413, 2016.
- J12. M. Farran, S. Boscolo, A. Locatelli, A.D. Capobianco, M. Midrio, V. Ferrari, D. Modotto, “Compact quasi-Yagi antenna with folded dipole fed by tapered integrated balun,” *Electronics Letters*, vol. 52, no. 10, pp. 789-790, 2016.
- J13. M. Farran, D. Modotto, S. Boscolo, A. Locatelli, A.D. Capobianco, M. Midrio, V. Ferrari, “Compact printed parasitic arrays for WLAN applications,” *IEEE Antennas and Wireless Propagation Letters*, vol. 15, pp. 918-921, 2016.
- J14. D. Modotto, M. Andreana, K. Krupa, G. Manili, U. Minoni, A. Tonello, V. Couderc, A. Barthélémy, A. Labruyère, B.M. Shalaby, P. Leproux, S. Wabnitz, A.B. Aceves, “Efficiency of dispersive wave generation in dual concentric core microstructured fiber,” *Journal of the Optical Society of America B*, vol. 32, no. 8, pp. 1676-1685, 2015.
- J15. A. Tonello, D. Modotto, K. Krupa, A. Labruyère, B.M. Shalaby, V. Couderc, A. Barthélémy, U. Minoni, S. Wabnitz, A.B. Aceves, “Dispersive wave emission in dual concentric core fiber: the role of soliton-soliton collisions,” *IEEE Photonics Technology Letters*, vol. 27, no. 11, pp. 1145-1148, 2015.
- J16. T. Hansson, D. Modotto, S. Wabnitz, “Mid-infrared soliton and Raman frequency comb generation in silicon microrings,” *Optics Letters*, vol. 39, no. 23, pp. 6747-6750, 2014.
- J17. A. Locatelli, D. Modotto, C. De Angelis, S. Boscolo, M. Midrio, A.D. Capobianco, “Design of fully printed omnidirectional CRLH loop antennas for WLAN technology,” *Microwave and Optical Technology Letters*, vol. 56, no. 6, pp. 1405-1408, 2014.
- J18. T. Hansson, D. Modotto, S. Wabnitz, “Analytical approach to the design of microring resonators for nonlinear four-wave mixing applications,” *Journal of the Optical Society of America B*, vol. 31, no. 5, pp. 1109-1117, 2014.
- J19. T. Hansson, D. Modotto, S. Wabnitz, “On the numerical simulation of Kerr frequency combs using coupled mode equations,” *Optics Communications*, vol. 312, pp. 134-136, 2014.
- J20. T. Hansson, D. Modotto, S. Wabnitz, “Dynamics of the modulational instability in microresonator frequency combs,” *Physical Review A*, vol. 88, 023819, 2013.
- J21. A. Cacciatori, D. Modotto, S. Boscolo, M. Midrio, A. Locatelli, C. De Angelis, Z.M. Kovács-Vajna, “Broadband printed directional bow-tie antenna for the 500-1600-MHz band,” *Microwave and Optical Technology Letters*, vol. 55, no. 10, pp. 2329-2333, 2013.

- J22. U. Minoni, G. Manili, S. Bettoni, E. Varrenti, D. Modotto, C. De Angelis, “Chromatic confocal setup for displacement measurement using a supercontinuum light source,” *Optics and Laser Technology*, vol. 49, pp. 91-94, 2013.
- J23. S. Wabnitz, A. Picozzi, A. Tonello, D. Modotto, G. Millot, “Control of signal coherence in parametric frequency mixing with incoherent pumps: narrowband mid-infrared light generation by downconversion of broadband amplified spontaneous emission source at 1550 nm,” *Journal of the Optical Society of America B*, vol. 29, no. 11, pp. 3128-3135, 2012.
- J24. G. Manili, A. Tonello, D. Modotto, M. Andreana, V. Couderc, U. Minoni, S. Wabnitz, “Gigantic dispersive wave emission from dual concentric core microstructured fiber,” *Optics Letters*, vol. 37, no. 19, pp. 4101-4103, 2012.
- J25. F. Baronio, M. Conforti, C. De Angelis, D. Modotto, S. Wabnitz, M. Andreana, A. Tonello, P. Leproux, V. Couderc, “Second and third order susceptibilities mixing for supercontinuum generation and shaping,” *Optical Fiber Technology*, vol. 18, no. 5, pp. 283-289, 2012.
- J26. F.M. Pigozzo, D. Modotto, S. Wabnitz, “Second harmonic generation by modal phase matching involving optical and plasmonic modes,” *Optics Letters*, vol. 37, no. 12, pp. 2244-2246, 2012.
- J27. M. Cazzanelli, F. Bianco, M. Ghulinyan, G. Pucker, D. Modotto, S. Wabnitz, F.M. Pigozzo, S. Ossicini, E. Degoli, E. Luppi, V. Vényard, L. Pavesi, “Second-order nonlinear silicon photonics,” *SPIE Newsroom*, doi: 10.1117/2.1201203.004138, 2012.
- J28. K. Krupa, M. Bettanzana, A. Tonello, D. Modotto, G. Manili, V. Couderc, P. Di Bin, S. Wabnitz, A. Barthélémy, “Four-wave mixing in nonlinear fiber with two intracavity frequency-shifted laser pumps,” *IEEE Photonics Technology Letters*, vol. 24, no. 4, pp. 258-260, 2012.
- J29. M. Cazzanelli, F. Bianco, E. Borga, G. Pucker, M. Ghulinyan, E. Degoli, E. Luppi, V. Vényard, S. Ossicini, D. Modotto, S. Wabnitz, R. Pierobon, L. Pavesi, “Second harmonic generation in silicon waveguides strained by silicon nitride,” *Nature Materials*, vol. 11, no. 2, pp. 148-154, 2012.
- J30. D. Modotto, G. Manili, U. Minoni, S. Wabnitz, C. De Angelis, G. Town, A. Tonello, V. Couderc, “Ge-doped microstructured multicore fiber for customizable supercontinuum generation,” *IEEE Photonics Journal*, vol. 3, no. 6, pp. 1149-1156, 2011.
- J31. T. Stomeo, M. Grande, G. Rainò, A. Passaseo, A. D’Orazio, V. Marrocco, R. Cingolani, A. Locatelli, D. Modotto, C. De Angelis, M. De Vittorio, “Optical filter based on a coupled bilayer photonic crystal,” *Microelectronic Engineering*, vol. 88, no. 8, pp. 2771-2774, 2011.
- J32. D. Duchesne, K.A. Rutkowska, M. Volatier, F. Légaré, S. Delprat, M. Chaker, D. Modotto, A. Locatelli, C. De Angelis, M. Sorel, D.N. Christodoulides, G. Salamo, R. Arès, V. Aimez, R. Morandotti, “Second harmonic generation in AlGaAs photonic wires using low power continuous wave light,” *Optics Express*, vol. 19, no. 13, pp. 12408-12417, 2011.
- J33. G. Manili, D. Modotto, U. Minoni, S. Wabnitz, C. De Angelis, G. Town, A. Tonello, V. Couderc, “Modal four-wave mixing supported generation of supercontinuum light from the infrared to the visible region in a birefringent multi-core microstructured optical fiber”, *Optical Fiber Technology*, vol. 17, no. 3, pp. 160-167, 2011.
- J34. M. Midrio, M. Romagnoli, S. Boscolo, C. De Angelis, A. Locatelli, D. Modotto, A.D. Capobianco, “Flared monopole antennas for 10- $\mu$ m radiation,” *IEEE Journal of Quantum Electronics*, vol. 47, no. 1, pp. 84-91, 2011.



- J35. A. Locatelli, D. Modotto, F.M. Pigozzo, S. Boscolo, C. De Angelis, A.D. Capobianco, M. Midrio, "A planar, differential, and directive Ultra-Wideband antenna," *IEEE Transactions on Antennas and Propagation*, vol. 58, no. 7, pp. 2439-2442, 2010.
- J36. C. De Angelis, A. Locatelli, D. Modotto, S. Boscolo, M. Midrio, A.D. Capobianco, "Frequency addressing of nano-objects by electrical tuning of optical antennas," *Journal of the Optical Society of America B*, vol. 27 no. 5, pp. 997-1001, 2010.
- J37. T. Stomeo, M. Grande, G. Rainò, A. Passaseo, A. D'Orazio, R. Cingolani, A. Locatelli, D. Modotto, C. De Angelis, M. De Vittorio, "Optical filter based on two coupled PhC GaAs-membranes," *Optics Letters*, vol. 35, no. 3, p. 411-413, 2010.
- J38. A. Locatelli, D. Modotto, F.M. Pigozzo, S. Boscolo, E. Autizi, C. De Angelis, A.D. Capobianco, M. Midrio, "Increasing directionality of planar Ultra Wide Band antennas," *Microwave and Optical Technology Letters*, vol. 52, no. 1, p. 78-82, 2010.
- J39. A. Locatelli, C. De Angelis, D. Modotto, S. Boscolo, F. Sacchetto, M. Midrio, A.D. Capobianco, F.M. Pigozzo, C.G. Someda, "Modeling of enhanced field confinement and scattering by optical wire antennas," *Optics Express*, vol. 7, no. 19, p. 16792-16800, 2009.
- J40. D. Modotto, M. Conforti, A. Locatelli, C. De Angelis, "Imaging properties of multimode photonic crystal waveguides and waveguide arrays," *Journal of Lightwave Technology*, vol. 25, no. 1, pp. 402-409, 2007.
- J41. F. Pozzi, M. Sorel, G.A. Siviloglou, S. Suntsov, R. El-Ganainy, R. Iwanow, G.I. Stegeman, D.N. Christodoulides, D. Modotto, A. Locatelli, C. De Angelis, R. Morandotti, "Enhanced third-order nonlinear effects in ultra-compact AlGaAs nanowires," *Optics and Photonics News, Optics in 2006*, pp. 36, 2006.
- J42. G.A. Siviloglou, S. Suntsov, R. El-Ganainy, R. Iwanow, G.I. Stegeman, D.N. Christodoulides, R. Morandotti, D. Modotto, A. Locatelli, C. De Angelis, F. Pozzi, C.R. Stanley, M. Sorel, "Enhanced third-order nonlinear effects in optical AlGaAs nanowires," *Optics Express*, vol. 14, no. 20, pp. 9377-9384, 2006.
- J43. A. Locatelli, M. Conforti, D. Modotto, C. De Angelis, "Discrete negative refraction in photonic crystal waveguide arrays," *Optics Letters*, vol. 31, no. 9, pp. 1343-1345, 2006.
- J44. T.C. Kleckner, D. Modotto, A. Locatelli, J.P. Mondia, S. Linden, R. Morandotti, C. De Angelis, C.R. Stanley, H.M. van Driel, J.S. Aitchison, "Design, fabrication, and characterization of deep-etched waveguide gratings," *Journal of Lightwave Technology*, vol. 23, no. 11, pp. 3832-3842, 2005.
- J45. A. Locatelli, M. Conforti, D. Modotto, C. De Angelis, "Diffraction engineering in arrays of photonic crystal waveguides," *Optics Letters*, vol. 30, no. 21, pp. 2894-2896, 2005.
- J46. D. Modotto, J.P. Mondia, S. Linden, H.W. Tan, R. Morandotti, T.C. Kleckner, A. Locatelli, C. De Angelis, H.M. van Driel, C.R. Stanley, J.S. Aitchison, "Asymmetric spectrum evolution of high power short pulses in AlGaAs waveguides," *Optics Communications*, vol. 249, no. 1-3, pp. 201-208, 2005.
- J47. R. Morandotti, H.S. Eisenberg, D. Mandelik, Y. Silberberg, D. Modotto, M. Sorel, C.R. Stanley, J.S. Aitchison, "Optics in non homogeneous waveguide arrays," *Opto-Electronics Review*, vol. 13, no. 2, pp. 103-106, 2005.
- J48. D. Modotto, C. De Angelis, M.A. Magaña-Cervantes, R.M. De La Rue, R. Morandotti, S. Linden, H.M. van Driel, J.S. Aitchison, "From linear to cubic nonlinear imaging effects in multimode waveguides," *Journal of the Optical Society of America B*, vol. 22, no. 4, pp. 870-877, 2005.
- J49. A. Locatelli, D. Modotto, C. De Angelis, F.M. Pigozzo, A.D. Capobianco, "Time domain bidirectional beam propagation method for second harmonic generation in multilayers," *Optical and Quantum Electronics*, vol. 37, no. 1-3, pp. 121-131, 2005.
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