

Marco Pizzocaro

Curriculum Vitæ

Dati Anagrafici

Nome Marco
Cognome Pizzocaro

Educazione

- 2010 - 2012 **Dottorato di Ricerca in Metrologia, scienza e tecnica delle misure,**
Politecnico di Torino, Italia.
- 2004 - 2009 **“Diploma di Licenza” in Fisica,**
Scuola Normale Superiore, Pisa, Italia, 70/70 con lode.
- 2007 - 2009 **Laurea Specialistica in Scienze Fisiche,**
Università di Pisa, Italia, 110/110 con lode.
- 2004 - 2007 **Laurea in Fisica,**
Università di Pisa, Italia, 110/110 con lode.

Esperienza

Esperienza professionale

- Dicembre 2016 - oggi **Ricercatore presso ente di ricerca,**
INRIM, Torino, Italia, Divisione Metrologia quantistica e nanotecnologie.
- Marzo 2014 - **Ricercatore presso ente di ricerca a tempo determinato,**
Dicembre 2016 *INRIM, Torino, Italia, Divisione Metrologia Fisica.*
- Gennaio 2013 - **Assegnista di Ricerca,**
Dicembre 2013 *Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino, Italia.*
- Maggio 2011 - **Ricercatore ospite,**
Ottobre 2011 *Gruppo di misura di frequenze ottiche, NIST, Boulder, Colorado, USA.*
- Gennaio 2010 - **Borsista (studente di dottorato),**
Dicembre 2012 *INRIM, Torino, Italia, Divisione Metrologia Fisica.*

Conoscenza delle Lingue

Italiano Nativa
Inglese Scritta: ottima; Parlata: ottima.

Elenco dei prodotti scientifici

Pubblicazioni su riviste ISI

- [1] M. Pizzocaro, M. Sekido, K. Takefuji, H. Ujihara, H. Hachisu, N. Nemitz, M. Tsutsumi, T. Kondo, E. Kawai, R. Ichikawa, K. Namba, Y. Okamoto, R. Takahashi, J. Komuro, C. Clivati, F. Bregolin, P. Barbieri, A. Mura, E. Cantoni, G. Cerretto, F. Levi, G. Maccaferri, M. Roma, C. Bortolotti, M. Negusini, R. Ricci, G. Zacchiroli, J. Roda, J. Leute, G. Petit, F. Perini, D. Calonico, and T. Ido, "Intercontinental comparison of optical atomic clocks through very long baseline interferometry," *Nature Physics* **17**, 223 (2021)
- [2] G. Mana and M. Pizzocaro, "The least informative distribution and correlation coefficient of measurement results," *Metrologia* **58**, 015012 (2021)
- [3] M. Sekido, K. Takefuji, H. Ujihara, T. Kondo, M. Tsutsumi, E. Kawai, H. Hachisu, N. Nemitz, M. Pizzocaro, C. Clivati, F. Perini, M. Negusini, G. Maccaferri, R. Ricci, M. Roma, C. Bortolotti, K. Namba, J. Komuro, R. Ichikawa, T. Suzuyama, K.-i. Watabe, J. Leute, G. Petit, D. Calonico, and T. Ido, "A broadband VLBI system using transportable stations for geodesy and metrology: an alternative approach to the VGOS concept," *Journal of Geodesy* **95**, 41 (2021)
- [4] C. Clivati, P. Savio, S. Abrate, V. Curri, R. Gaudino, M. Pizzocaro, and D. Calonico, "Robust optical frequency dissemination with a dual-polarization coherent receiver," *Opt. Express* **28**, 8494 (2020)
- [5] M. Pizzocaro, F. Bregolin, P. Barbieri, B. Rauf, F. Levi, and D. Calonico, "Absolute frequency measurement of the $^1S_0 - ^3P_0$ transition of ^{171}Yb with a link to international atomic time," *Metrologia* **57**, 035007 (2020)
- [6] P. Barbieri, C. Clivati, M. Pizzocaro, F. Levi, and D. Calonico, "Spectral purity transfer with 5×10^{-17} instability at 1 s using a multibranch er: fiber frequency comb," *Metrologia* **56**, 045008 (2019)
- [7] J. Grotti, S. Koller, S. Vogt, S. Häfner, U. Sterr, C. Lisdat, H. Denker, C. Voigt, L. Timmen, A. Rolland, F. N. Baynes, H. S. Margolis, M. Zampaolo, P. Thoumany, M. Pizzocaro, B. Rauf, F. Bregolin, A. Tampellini, P. Barbieri, M. Zucco, G. A. Costanzo, C. Clivati, F. Levi, and D. Calonico, "Geodesy and metrology with a transportable optical clock," *Nature Physics* **14**, 437 (2018)
- [8] B. Rauf, M. C. V. López, P. Thoumany, M. Pizzocaro, and D. Calonico, "Phase noise cancellation in polarisation-maintaining fibre links," *Review of Scientific Instruments* **89**, 033103 (2018)
- [9] G. Milani, B. Rauf, P. Barbieri, F. Bregolin, M. Pizzocaro, P. Thoumany, F. Levi, and D. Calonico, "Multiple wavelength stabilization on a single optical cavity using the offset sideband locking technique," *Optics Letters* **42**, 1970 (2017)
- [10] M. Pizzocaro, P. Thoumany, B. Rauf, F. Bregolin, G. Milani, C. Clivati, G. A. Costanzo, F. Levi, and D. Calonico, "Absolute frequency measurement of the $^1S_0 - ^3P_0$ transition of ^{171}Yb ," *Metrologia* **54**, 102 (2017)
- [11] G. Cappellini, P. Lombardi, M. Mancini, G. Pagano, M. Pizzocaro, L. Fallani, and J. Catani, "A compact ultranarrow high-power laser system for experiments with 578nm ytterbium clock transition," *Rev. Sci. Inst.* **86**, 073111 (2015)
- [12] G. Cappellini, M. Mancini, G. Pagano, P. Lombardi, L. Livi, M. Siciliani de Cumis, P. Cancio, M. Pizzocaro, D. Calonico, F. Levi, C. Sias, J. Catani, M. Inguscio, and

- L. Fallani, "Direct observation of coherent interorbital spin-exchange dynamics," *Physical Review Letters* **113**, 120402 (2014)
- [13] M. Pizzocaro, D. Calonico, P. C. Pastor, J. Catani, G. A. Costanzo, F. Levi, and L. Lorini, "Efficient frequency doubling at 399 nm," *Appl. Opt.* **53**, 3388 (2014)
- [14] C. Clivati, D. Calonico, G. A. Costanzo, A. Mura, M. Pizzocaro, and F. Levi, "Large-area fiber-optic gyroscope on a multiplexed fiber network," *Optics Letters* **38**, 1092 (2013)
- [15] N. Hinkley, J. A. Sherman, N. B. Phillips, M. Schioppo, N. D. Lemke, K. Beloy, M. Pizzocaro, C. W. Oates, and A. D. Ludlow, "An atomic clock with 10^{-18} instability," *Science* **341**, 1215 (2013)
- [16] M. Pizzocaro, D. Calonico, C. Calosso, C. Clivati, G. A. Costanzo, F. Levi, and A. Mura, "Active disturbance rejection control of temperature for ultrastable optical cavities," *IEEE Trans. Ultrason., Ferroelect., Freq. Cont.* **60**, 273 (2013)
- [17] M. Pizzocaro, G. A. Costanzo, A. Godone, F. Levi, A. Mura, M. Zoppi, and D. Calonico, "Realization of an ultrastable 578-nm laser for an Yb lattice clock," *IEEE Trans. Ultrason., Ferroelect., Freq. Cont.* **59**, 426 (2012)
- [18] J. A. Sherman, N. D. Lemke, N. Hinkley, M. Pizzocaro, R. W. Fox, A. D. Ludlow, and C. W. Oates, "High-accuracy measurement of atomic polarizability in an optical lattice clock," *Physical Review Letters* **108**, 153002 (2012)
- [19] J. Belfi, N. Beverini, F. Bosi, G. Carelli, A. Di Virgilio, E. Maccioni, and M. Pizzocaro, "Rotational sensitivity of the G-Pisa gyrolaser," *IEEE Trans. Ultrason., Ferroelect., Freq. Cont.* **57**, 618 (2010)
- [20] J. Belfi, N. Beverini, F. Bosi, G. Carelli, A. Di Virgilio, E. Maccioni, M. Pizzocaro, F. Sorrentino, and F. Stefani, "Active control and sensitivity of the 'G-Pisa' gyrolaser," *Nuovo Cimento B* **125**, 557 (2010)
- [21] A. Di Virgilio, M. Allegrini, J. Belfi, N. Beverini, F. Bosi, G. Carelli, E. Maccioni, M. Pizzocaro, A. Porzio, U. K. Schreiber, S. Solimeno, and F. Sorrentino, "Performances of 'G-Pisa': a middle size gyrolaser," *Class. Quant. Grav.* **27**, 084033 (2010)
- Pubblicazioni su Lavori di Conferenza**
- [22] E. Bertacco, D. Calonico, E. Cantoni, G. Cerretto, R. Costa, F. Fiasca, V. Formichella, F. Levi, A. Mura, A. Perucca, M. Pizzocaro, F. Pollastri, M. Sellone, I. Sesia, G. Signorile, P. Terzi, T. T. Thai, G. Costanzo, and G. Rovera, "Latest improvements at INRIM time laboratory," in "Proceedings of the 51st Annual Precise Time and Time Interval Systems and Applications Meeting," (2020)
- [23] T. Ido, H. Hachisu, N. Nemitz, K. Takefuji, H. Ujihara, E. Kawai, H. Ishijima, M. Tsusumi, R. Ichikawa, M. Sekido, M. Pizzocaro, F. Bregolin, P. Barbieri, F. Levi, A. Mura, C. Clivati, G. Cerretto, D. Calonico, F. Perini, G. Maccaferri, M. Roma, C. Bortolotti, M. Negusini, and R. Ricci, "Intercontinental comparison of lattice clocks using a broadband vlbi technique," in "2019 Joint Conference of the IEEE International Frequency Control Symposium and European Frequency and Time Forum (EFTF/IFC)," pp. 1–2 (2019)
- [24] H. S. Margolis, H. Denker, C. Voigt, L. Timmen, J. Grotti, S. Koller, S. Vogt, S. Häfner, U. Sterr, C. Lisdat, A. Rolland, F. N. Baynes, M. Zampaolo, P. Thoumany, M. Pizzocaro, B. Rauf, F. Bregolin, A. Tampellini, P. Barbieri, M. Zucco, G. A.

- Costanzo, C. Clivati, F. Levi, and D. Calonico, "Optical atomic clocks: From international timekeeping to gravity potential measurement," in "Conference on Lasers and Electro-Optics," p. SM1F.3, Optical Society of America (2019)
- [25] F. Bregolin, G. Milani, *M. Pizzocaro*, B. Rauf, P. Thoumany, F. Levi, and D. Calonico, "Optical lattice clocks towards the redefinition of the second," in "Journal of Physics: Conference Series," vol. 841, p. 012015, IOP Publishing (2017)
- [26] G. Milani, B. Rauf, P. Barbieri, F. Bregolin, *M. Pizzocaro*, P. Thoumany, F. Levi, and D. Calonico, "Multiple lasers stabilization on a single three color optical cavity," in "2017 Joint Conference of the European Frequency and Time Forum and IEEE International Frequency Control Symposium (EFTF/IFCS)," pp. 446–447 (2017)
- [27] *M. Pizzocaro*, P. Thoumany, F. Bregolin, G. Milani, B. Rauf, M. d. C. Vélez López, C. Clivati, G. A. Costanzo, F. Levi, and D. Calonico, "Absolute frequency measurement of the 171yb optical lattice clock at inrim," in "2017 Joint Conference of the European Frequency and Time Forum and IEEE International Frequency Control Symposium (EFTF/IFCS)," pp. 813–814 (2017)
- [28] A. Tampellini, C. Clivati, *M. Pizzocaro*, D. Calonico, S. Straullu, V. Curri, and R. Gaudino, "Introducing dsp-based coherent receivers for wide-area reference frequency distribution in metrology applications," in "2017 European Conference on Optical Communication (ECOC)," pp. 1–3 (2017)
- [29] B. Rauf, *M. Pizzocaro*, P. Thoumany, G. Milani, F. Bregolin, M. Gozzelino, D. Calonico, G. A. Costanzo, C. Clivati, and F. Levi, "Metrological characterization of INRIM's Yb lattice clock," in "2016 European Frequency and Time Forum (EFTF)," pp. 1–4 (2016)
- [30] *M. Pizzocaro*, F. Bregolin, G. Milani, B. Rauf, P. Thoumany, G. Costanzo, F. Levi, and D. Calonico, "Ytterbium optical lattice clock at INRIM," in "Frequency Control Symposium the European Frequency and Time Forum (FCS), 2015 Joint Conference of the IEEE International," pp. 300–303 (2015)
- [31] C. Clivati, G. Costanzo, *M. Pizzocaro*, D. Calonico, A. Mura, F. Levi, M. Olivieri, and G. Spada, "A fiber optic gyroscope on multiplexed telecommunication network with a large enclosed area," in "European Frequency and Time Forum International Frequency Control Symposium (EFTF/IFC), 2013 Joint," pp. 1021–1024 (2013)
- [32] H. Margolis, R. Godun, P. Gill, L. Johnson, S. Shemar, P. Whibberley, D. Calonico, F. Levi, L. Lorini, *M. Pizzocaro*, P. Delva, S. Bize, J. Achkar, H. Denker, L. Timmen, C. Voigt, S. Falke, D. Piester, C. Lisdat, U. Sterr, S. Vogt, S. Weyers, J. Gersl, T. Lindvall, and M. Merimaa, "International timescales with optical clocks (ITOC)," in "European Frequency and Time Forum International Frequency Control Symposium (EFTF/IFC), 2013 Joint," pp. 908–911 (2013)
- [33] *M. Pizzocaro*, F. Bregolin, D. Calonico, G. Costanzo, F. Levi, and L. Lorini, "Improved set-up for the ytterbium optical clock at INRIM," in "European Frequency and Time Forum International Frequency Control Symposium (EFTF/IFC), 2013 Joint," pp. 379–382 (2013)
- [34] *M. Pizzocaro*, D. Calonico, C. Calosso, C. Clivati, G. A. Costanzo, F. Levi, and A. Mura, "Active disturbance rejection control: Application to the temperature stabilization of ultra-stable cavities," in "Proceedings of the 26th European Frequency and Time forum," pp. 169–173 (2012)

- [35] *M. Pizzocaro*, G. Costanzo, M. Zoppi, D. Calonico, F. Levi, A. Mura, and A. Godone, "Generation of an ultrastable 578 nm laser for Yb lattice clock," in "Frequency Control and the European Frequency and Time Forum (FCS), 2011 Joint Conference of the IEEE International," pp. 1–4 (2011)
- [36] M. Zoppi, G. Costanzo, *M. Pizzocaro*, D. Calonico, F. Levi, L. Lorini, E. Bertacco, and A. Godone, "Measurement of radiative decay and cold collision trap losses in laser-cooled ytterbium," in "Frequency Control and the European Frequency and Time Forum (FCS), 2011 Joint Conference of the IEEE International," pp. 1–4 (2011)
- [37] D. Calonico, F. Levi, L. Lorini, G. Costanzo, M. Zoppi, *M. Pizzocaro*, A. Mura, E. K. Bertacco, and A. Godone, "Yb optical lattice clock at INRIM," in "Proceedings of the 24th European Frequency and Time forum," P2.27 (2010)
- [38] J. Belfi, N. Beverini, F. Bosi, G. Carelli, A. Di Virgilio, R. Graham, E. Maccioni, *M. Pizzocaro*, A. Porzio, U. K. Schreiber, S. Solimeno, F. Sorrentino, and A. Velikoseltsev, "G-pisa gyrolaser," in "Frequency Control Symposium, 2009 Joint with the 22nd European Frequency and Time forum. IEEE International," pp. 738–741 (2009)

Rapporti tecnici

- [39] M. Abdel-Hafiz, P. Ablewski, A. Al-Masoudi, H. A. Martínez, P. Balling, G. Barwood, E. Benkler, M. Bober, M. Borkowski, W. Bowden, R. Ciuryło, H. Cybulski, A. Didier, M. Doležal, S. Dörscher, S. Falke, R. M. Godun, R. Hamid, I. R. Hill, R. Hobson, N. Huntemann, Y. Le Coq, R. Le Targat, T. Legero, T. Lindvall, C. Lisdat, J. Lodewyck, H. S. Margolis, T. E. Mehlstäubler, E. Peik, L. Pelzer, *M. Pizzocaro*, B. Rauf, A. Rolland, N. Scharnhorst, M. Schioppo, P. O. Schmidt, R. Schwarz, Ç. Şenel, N. Spethmann, U. Sterr, C. Tamm, J. W. Thomsen, A. Vianello, and M. Zawada, "Guidelines for developing optical clocks with 10^{-18} fractional frequency uncertainty," *arXiv:1906.11495* (2019)
- [40] M. Allegrini, J. Belfi, N. Beverini, F. Bosi, G. Carelli, A. Di Virgilio, E. Maccioni, *M. Pizzocaro*, A. Porzio, U. K. Schreiber, S. Solimeno, and F. Sorrentino, "G-Pisa gyrolaser after 1 year of operation and considerations about its use to improve the Virgo IP control," Virgo note VIR-021A-09 (2009)