

Curriculum Vitae



Personal information

First name / Surname	Michele Marrocco	
Address (work)	ENEA – SP 081 via Anguillarese 301 00123 S. Maria di Galeria (Rome) Italy	
Telephone(s)	+39 06 3048 3345	Mobile: +39 338 8731070
Fax	+39 06 3048 4811	
E-mail	michele.marrocco@enea.it	
Nationality	Italian	
Date of birth	10 Jan 1965	
Gender	Male	

Education

1995-1999	Post-doc
Institution	Max-Planck Institute for Quantum Optics (Garching)
Supervisor	Prof. H. Walther (Director)
1991-1994	Ph.D. in Physics
Institution	University of Rome "Sapienza"
Supervisor	Prof. F. De Martini
1990	Degree in Physics
Institution	University of Rome "Sapienza"
Supervisor	Prof. F. De Martini

Main work experience

2001-now	Researcher
Activity	Laser spectroscopy, Molecular physics
Employer	ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development)
2010-now	Consultant
Activity	Laser expert of diagnostic and therapeutic applications
Employer	Hospital in Bassano del Grappa (Vicenza, Italy)
2009-now	Lecturer
Activity	(Principal subject) Thermodynamics
Employer	Dept. of Physics, University of Rome "Sapienza" (Prof. N. Saini)
1999-2000	Consultant
Activity	Laser expert
Employer	Quanta System Srl (Milan, Italy)

Language skills, scientific competences and personal interests

Mother tongue	Italian
Other Languages	English (Cambridge Certificates: FCE, CAE) German (Goethe-Zertifikat B1: Zertifikat Deutsch) French (Personal studies) Portuguese (Personal studies) Greek (Personal studies) Swedish (Personal studies)
General expertise	Quantum Optics, Non-linear Optics, Laser spectroscopy, Optical microscopy, Laser physics, Thermodynamics
Specialized expertise	Cavity Quantum Electrodynamics, Laser Induced Fluorescence, Fluorescence Correlation Spectroscopy, Spontaneous and Stimulated Raman scattering, Coherent anti-Stokes Raman scattering, Polarization spectroscopy
Other scientific activities	Reviewer for APS, OSA, Elsevier, Wiley Participants in numerous national and international conferences and workshops Member of the steering committee of ECONOS (European Conference On Nonlinear Optical Spectroscopy) Visiting scientist (contact: Prof. P.-E. Bengtsson, University of Lund, Sweden) Visiting scientist (contact: Prof. P. Mataloni, University of Rome, Italy)
Personal interests	Long-distance running (member of the sport team A.S.D. ENEA) Long-distance swimming (member of the Italian Swimming Federation) Cooking (Master in Pastry and Ice-creams, Institute "A tavola con lo chef")

List of publications in peer-reviewed journals

Dr. Michele Marrocco

ENEA Casaccia – Labs of molecular spectroscopy and laser diagnostics
michele.marrocco@enea.it

- 1) "Transverse Quantum Correlation in the Active Microscopic Cavity"
F. De Martini, M. Marrocco and D. Murra
Physical Review Letters, Vol. 65, n. 15 (1990), pp. 1853-1856
- 2) "Spontaneous Emission in the Optical Microscopic Cavity"
F. De Martini, M. Marrocco, P. Mataloni, L. Crescentini and R. Loudon
Physical Review A, Vol. 43, n. 5 (1991), pp. 2480-2497
- 3) "Spontaneous and Stimulated Emission in the Thresholdless Microlaser"
F. De Martini, M. Marrocco, P. Mataloni and D. Murra
Journal of Optical Society of America B (JOSA B), Vol. 10, n. 2 (1993), pp. 360-380
- 4) "Microcavity Transverse Coherence Length and Microlaser Threshold"
A. Aiello, F. De Martini, M. Marrocco and P. Mataloni
Optics Letters, Vol. 20, n. 13 (1995), pp. 1492-1494
- 5) "Molecular Raman Effect in the Optical Microcavity: QED Vacuum Confinement of an Inelastic Quantum Scattering process"
F. De Martini, M. Marrocco, C. Pastina, and F. Viti
Physical Review A, Vol. 53, n. 1 (1996), pp. 471-480
- 6) "Single-Mode Generation of Quantum Photon States by Excited Single Molecules in a Microcavity Trap"
F. De Martini, G. Di Giuseppe, and M. Marrocco
Physical Review Letters, Vol. 76, n. 6 (1996), pp. 900-903
- 7) "Molecular Raman Effect in an Optical Microcavity: a Classical Approach"
M. Marrocco
Physical Review A, Vol. 54, n. 4 (1996), pp. 3626-3633
- 8) "Characterisation of Stray Electric Fields in Niobium Cavities Using Ultra-High Resolution Spectroscopy"
M. Weidinger, M. Marrocco, R. T. Sang, and H. Walther
Optics Communications, Vol. 141, n. 5/6 (1997), pp. 273-278
- 9) "Quantum-electrodynamic Shifts in Rydberg Atoms between Parallel Metal Plates"
M. Marrocco, M. Weidinger, R. T. Sang, and H. Walther
Physical Review Letters, Vol 81, n. 26, pp. 5784-5787 (1998)
- 10) "Negligibility of temporal laser wing effects in saturated LIF diagnostics"
M. Magaldi, M. Marrocco
Applied Physics B 76, 699-705 (2003)
- 11) "An alternative approach to temporal laser-wing effects in saturated laser-induced fluorescence"
M. Marrocco
Applied Physics B 77, 65-70 (2003)
- 12) "Spatial laser-wing suppression in saturated laser-induced fluorescence without spatial selection"
M. Marrocco
Optics Letters 28, 2016-2018 (2003)

- 13) "Fluorescence Correlation Spectroscopy: incorporation of probe volume effects into the three-dimensional gaussian approximation"
M. Marrocco
Applied Optics 43, 5251-5262 (2004)
- 14) "Geometric determination of saturation in fluorescence spectroscopy"
M. Marrocco
Applied Optics 44, 2879-2886 (2005)
- 15) "Spatial transform for spectroscopic signals generated by Gaussian laser beams"
M. Marrocco
Physical Review A 72, 023814 (2005)
- 16) "A quantitative approach to evaluate the problem of coherence of spectral components of the third-order susceptibility generating Coherent Anti-Stokes Raman signals"
M. Marrocco
Journal of Raman Spectroscopy 38, 452-459 (2007)
- 17) "Spectral synthesis of Coherent Anti-Stokes Raman spectra with broadband Stokes lasers of arbitrary lineshapes"
M. Marrocco
Journal of Raman Spectroscopy 38, 1064-1072 (2007)
- 18) "General criterion to discern between coherent and incoherent synthesis of broadband coherent anti-Stokes Raman spectra"
M. Marrocco
Journal of Raman Spectroscopy 38, 1338-1344 (2007)
- 19) "Coherent anti-Stokes Raman scattering microscopy in presence of electromagnetic confinement"
M. Marrocco
Laser Physics 17, 935-941 (2007)
- 20) "Reliability of Herman-Wallis factors for Raman spectroscopy of Q-branch molecular transitions"
M. Marrocco
Chemical Physics Letters 442, 224-227 (2007)
- 21) "Fluorescence correlation spectroscopy of diffusion probed with Gaussian-Lorentzian spatial distribution"
M. Marrocco
Chemical Physics Letters 449, 227-230 (2007)
- 22) "Saturation of two-photon excitation provides insight into the effects of a quantum dot blinking suppressant: A fluorescence correlation spectroscopy study"
R. Heuff, D. Cramb, M. Marrocco
Journal of Physical Chemistry C 111, 18942-18949 (2007)
- 23) "Fluorescence correlation spectroscopy for diffusion of mobile quantum dots in dilute solutions"
R. Heuff, D. Cramb, M. Marrocco
Chemical Physics Letters 454, 257-261 (2008)
- 24) "Two-photon excitation fluorescence correlation spectroscopy of diffusion for Gaussian-Lorentzian volumes"
M. Marrocco
Journal of Physical Chemistry A 112, 3831-3836 (2008)
- 25) "Coherent anti-Stokes Raman scattering microscopy of samples probed with Gaussian volumes"

- M. Marrocco*
Journal of Physical Chemistry A 112, 13458-13462 (2008)
- 26) "Herman-Wallis factor to improve thermometric accuracy of vibrational coherent anti-Stokes Raman spectra of H₂"
M. Marrocco
Proceedings of the Combustion Institute 32, 863-870 (2009)
- 27) "Comparative analysis of Herman-Wallis factors for uses in coherent anti-Stokes Raman spectra of light molecules"
M. Marrocco
Journal of Raman Spectroscopy 40, 741-747 (2009).
- 28) "Coherent anti-Stokes Raman scattering microscopy within a microcavity with parallel mirrors"
M. Marrocco, E. Nichelatti
Journal of Raman Spectroscopy 40, 732-740 (2009).
- 29) "Counter-gradient transport in the combustion of a premixed CH₄/air annular jet by combined PIV/OH-LIF"
G. Troiani, M. Marrocco, S. Giammartini, C. M. Casciola
Combustion and Flame 156, 608-620 (2009).
- 30) "High-resolution microscopy with transition from continuous to discrete diffraction"
M. Marrocco
Optics Communications 282, 3869-3872 (2009).
- 31) "Discrete diffraction for analytical approach to tightly focused electric fields with radial polarization"
M. Marrocco
Optics Communications 282, 3862-3868 (2009).
- 32) "Cooperative optical effects in volumes embedded in layered media"
E. Nicelatti, M. Marrocco and R. M. Montereali
Journal of Raman Spectroscopy 41, 859-865 (2010)
- 33) "CARS thermometry revisited in light of the intramolecular perturbation"
M. Marrocco
Journal of Raman Spectroscopy 41, 870-874 (2010)
- 34) "Vectorial descriptions of nonlinear Raman microscopy"
M. Marrocco
Journal of Raman Spectroscopy 41, 882-889 (2010)
- 35) "CARS spectroscopy"
M. Marrocco
Handbook of Combustion, Eds: M. Lackner, F. Winter, A. K. Agarwal, Wiley (2010), Vol. 2, Chapter B5.
- 36) "Laser measurements"
M. Marrocco, G. Troiani
Industrial Combustion Testing, Ed: C. Baukal (2010), Taylor & Francis Chapter 12.
- 37) "Methods for Vectorial Analysis and Imaging in High-Resolution Laser Microscopy"
M. Marrocco
Advances in Imaging and Electron Physics, Ed: P. H. Hawkes (2011), Academic Press, San Diego, Vol. 165, pp. 131-173.
- 38) "Herman-Wallis correction in vibrational CARS of oxygen"

M. Marrocco

Journal of Raman Spectroscopy 42, 1836-1842 (2011).

39) "On the sensitivity of rotational CARS N₂ thermometry to the Herman-Wallis factor"

A. Bohlin, P.-E. Bengtsson, M. Marrocco

Journal of Raman Spectroscopy 42, 1843-1847 (2011).

40) "Iodine compounds speciation in HI-I₂ aqueous solutions by Raman spectroscopy"

A. Spadoni, M. Falconieri, M. Lanchi, R. Liberatore, M. Marrocco, G. S. Sau, P. Tarquini

International Journal of Hydrogen Energy 37, 1326-1334 (2012).

41) "Herman-Wallis corrections in dual-pump CARS intensities for combustion temperature and species"

M. Marrocco, G. Magnotti, A. D. Cutler

Journal of Raman Spectroscopy 43, 595-598 (2012).

42) "On the sensitivity of rotational O₂ CARS thermometry to the Herman-Wallis factor"

A. Bohlin, E. Nordström, P.-E. Bengtsson, M. Marrocco

Journal of Raman Spectroscopy, 43, 599-603 (2012).

43) "Vibration-rotation interaction in time-resolved coherent anti-Stokes Raman scattering for gas-phase thermometry"

M. Marrocco

Journal of Raman Spectroscopy 43, 621-626 (2012).

44) "Effect of vibration-rotation coupling on simultaneous extraction of temperature and species concentration from vibrational CARS spectra of hot gases"

M. Marrocco

Journal of Raman Spectroscopy, DOI 10.1002/jrs.4357 (in press)

45) "Coherent anti-Stokes Raman diagnostics in combustion science"

M. Marrocco

Progress in Energy and Combustion Science (2014), in preparation after invitation.