

Vittorio Pizzella - Curriculum Vitae

Career/Education

- 2005-present University “G d’Annunzio” of Chieti-Pescara, Full Professor of Physics – SSD FIS/07, SC 02/D1
- 1999-2005 University “G d’Annunzio” of Chieti-Pescara, Associate Professor of Physics
- 1988-1999 Researcher at the Institute of Solid State Electronics – Italian National Research Council. From 1990 Leader of the laboratory on biomagnetism
- 1986-1987 Elettronica S.p.A. Scholarship on the development of software for acquisition and analysis of biomagnetic signals.
- March 1986 Italian “Laurea” in Physics at the University of Rome, “La Sapienza”.

Institutional responsibilities

- 2017-2020 Director of the Department of Neuroscience, Imaging and Clinical Sciences of the University “G. d’Annunzio” of Chieti-Pescara (UdA), Italy
- 2013-present Member of the Board of Teachers of the PhD course on “Neuroscience and Imaging” UdA, Italy
- 2002-2012 Member of the Board of Teachers of the PhD course on “Biomedical Technologies” and “Functional Neuroimaging”, UdA, Italy
- 2000-present Council Member of the Institute for Advanced Biomedical Technologies, UdA, Italy
- 2000-present Head of the MEG laboratory at the Institute for Advanced Biomedical Technologies, UdA, Italy
- 1990-1999 Responsible of the laboratory of biomagnetism at the Institute of Solid State Electronics – Italian National Research Council.

Bibliometric data (Feb 2023)

N of journal articles: 140
H-index (scopus): 44
N citations (scopus): 5667
Indexed in the “Top Italian scientists” ranking (Neurosciences).

Scientific activity

The scientific activity of Vittorio Pizzella spans from the development of instrumentation for neuroimaging, where he pioneered the development and use of magnetoencephalographic (MEG) devices in Italy, to the study of the human brain, where his current interests mainly cover the role of brain oscillations and inter-areal synchronization in cognitive processes.

From 1988 to 1999 Vittorio Pizzella is team leader at the National Research Council for the development of several MEG devices, including the 28-channel system in operation until 2012. During this timeframe, Vittorio Pizzella is actively involved in the development of the first Italian whole-head MEG device (153-channel) and presently in operation at the University of Chieti-Pescara (UdA), where Vittorio Pizzella was appointed as an Associate Professor in Physics in 1999. In the last decade, Vittorio Pizzella enlarges his interests in the development of new instrumentation thanks to the involvement in two EU projects targeted at building novel MEG-MRI integrated devices. Presently, he is responsible of the MEG lab at the Institute for Advanced Biomedical Technologies (UdA), where he leads the development of a second generation whole-head MEG dcSQUID-based device. Vittorio Pizzella’s scientific interest in neuroimaging stems from exploiting the excellent time resolution of magnetoencephalography and companion non-invasive electrophysiological technique, electroencephalography (EEG). The guiding thread of his activity in neuroscience has been the combination of electrophysiology with other functional neuroimaging techniques (e.g., functional MRI) and, recently, neurostimulation techniques (e.g., Transcranial Magnetic Stimulation) towards a multimodal functional mapping of the brain.

In the last 10 years, Vittorio Pizzella's interest in systems neuroscience focused to the investigation the role of brain oscillations and inter-areal phase-synchronization as a mechanism for dynamic organisation of brain networks subserving cognitive processes, including the development of novel multivariate connectivity metrics and for real time applications. As part of the ConnectToBrain EU project, he is presently involved in the study of connectivity modulations induced by neurostimulation for feedback-controlled approaches.

Project leadership

MIUR Departments of Excellence 2018-2022, Coordinator for the Dept. of Neuroscience, Imaging and Clinical Sciences as department director (8 M€)

PRIN 2010-2011. "Connettività funzionale cerebrale e neuroplasticità nell'invecchiamento fisiologico e patologico". PI of the UdA research unit (150k€).

PRIN 2006. "Ritmi cerebrali a bassa frequenza e apprendimento nel sonno e nella veglia in soggetti normali e con patologie neurologiche: uno studio neurofisiologico multi-modale". PI of the UdA research unit (58k€).

Progetto Finalizzato Sanità 2000. "Studio multidisciplinare degli effetti degli ormoni estrogeni sulle funzioni cognitive e la malattia di Alzheimer (AD)". PI of the UdA research unit.

Progetto Finalizzato Sanità 1999. "Neurodegenerazione, invecchiamento cerebrale fisiologico e demenza: approccio integrato per una diagnosi precoce, per predittori di evoluzione, per trattamenti innovativi, per un'organizzazione d'assistenza avanzata". PI of the UdA research unit.

Teaching

- 1999-present Responsible professor for several courses on applied physics in the School of Medicine and Health Sciences of the University "G d'Annunzio" of Chieti-Pescara.
- 2008-2011 Professor for general physics in M.Sc. in Engineering (Tecniche del costruire) at the University "G d'Annunzio" of Chieti-Pescara
- 2008-2011 Professor for general physics in M.Sc. in Engineering (Ingegneria delle costruzioni) at the University "G d'Annunzio" of Chieti-Pescara
- 2000-present Teacher at PhD courses on Neuroscience and Imaging, Functional Neuroimaging, Biomedical Technologies.

Supervision of graduate students and postdoctoral fellow

Supervised 12 postdoctoral fellows; panel member and tutor of 17 students in PhD Courses

Major contribution to the early career of excellent researchers

Two former postdoctoral fellows and four former PhD students obtained tenured positions; six PhD students got Postdoc or Junior researcher positions in Italy or abroad.

Organization of international scientific conferences, symposia and professional memberships

- 2019 Co-organizer of the International Summer "Body, senses and Neural Oscillations: an integrated approach to human perception and behavior - Adriatica2019"
- 2018 Co-organizer of a symposium on Electrophysiological Functional Connectivity Analysis at the IOP2018 Conference
- 2018 Co-organizer of a symposium on Neuronal Oscillations at Multiple Spatio-Temporal Scales at the BIOMAG2018 Conference
- 2015 Co-organizer of the international MEG workshop: "Disentangling the brain Web: a perspective from MEG"
- 2006 Co-Chairman of the ISBET2006 Conference
- 2003 Co-Chairman of the NFSI2003 Conference

International invited presentations

Vittorio Pizzella gave more than 35 invited talks in international conferences and advanced schools, relevant seminars, workshops.

Commissions of trust

- 2019-present Member of the Ad-Hoc Committee for constitution of the “Board of Italian Professors in Applied Physics”
- 2015-2021 Member of the Academic Senate of the University “G. d’Annunzio” of Chieti-Pescara, Italy
- 2013-2015 Member of the National Scientific Qualification Board for the Competition Sector 02/B3 - Applied Physics, Italian Ministry of Education, University and Research.
- 2005–2008 Member of the Ethical Committee of the Fatebenefratelli Hospital Isola Tiberina, Rome, Italy
- 2000-2004 Member of the Board of Directors of the Interuniversity Consortium “Istituto Italiano di Neuroscienze Cognitive”

Opponent for PhD defense of Bushra Riaz Syeda at the Gothenburg University, Sweden
Reviewer for PhD thesis of Giuseppe Noce – Sapienza University of Rome Italy, Alberto Sorrentino - University of Genova Italy, and Rasmus Zetter - Aalto University Finland.

Ad hoc reviewer for the major journals in the field (~20) such as Cerebral Cortex, Neuroimage, Human Brain Mapping, Brain Topography, Clinical Neurophysiology, Experimental Brain Research, Brain Research Bulletin, IEEE Transaction on Biomedical Engineering, Neuropsychologia, Journal of Neuroscience Methods, Neuroscience, Neurological Sciences, PloS One.

List of publication (last 20 years)

1. Verrotti A, Pizzella V, Trotta D, Madonna L, Chiarelli F, Romani GL. “Magnetoencephalography in pediatric neurology and in epileptic syndromes”, *Pediatr Neurol* (2003), **28**: 253-261.
2. Tecchio F, Babiloni C, Zappasodi F, Vecchio F, Pizzella V, Romani GL, Rossini PM. “Gamma synchronization in human primary somatosensory cortex as revealed by somatosensory evoked neuromagnetic fields”, *Brain Res* (2003), **986**: 63-70.
3. Verrotti A, Pizzella V, Madonna L, Franciotti R, Trotta D, Morgese G, Chiarelli F, Romani GL. “Magnetoencephalographic and electroencephalographic evaluation in patients with cryptogenetic partial epilepsy”, *Neurophysiologie clinique* (2003), **33**: 174-179.
4. Verrotti A, Salusti B, Trotta D, Madonna L, Chiarelli F, Pizzella V. “Epilepsy evaluation by electroencephalography and magnetoencephalography in Lafora-body disease: a case report”, *Acta Pediatr* (2003), **92**: 1218-1222.
5. Torquati K, Pizzella V, Della Penna S, Franciotti R, Babiloni C, Romani GL, Rossini PM. “Gating effects of simultaneous peripheral electrical stimulations on human secondary somatosensory cortex: a whole-head MEG study”, *Neuroimage* (2003), **20**: 1704-1713.
6. Della Penna S, Del Gratta C, Cianflone F, Ern  SN, Granata C, Pentiricci A, Pizzella V, Russo M, Romani GL. “An AC Magnetizing Field Biosusceptometer Using a SQUID Based Sensor With Additional Compensation Module”, *IEEE Trans Appl Sup* (2003) **13**: 348-351.

7. Babiloni C, Babiloni F, Carducci F, Cincotti F, Del Percio C, Della Penna S, Franciotti R, Pignotti S, Pizzella V, Rossini PM, Sabatini E, Torquati K, Romani GL. "Human alpha rhythms during visual delayed choice reaction time tasks: A magnetoencephalography study", *Hum Brain Mapp* (2005) **24**: 184-192.
8. Babiloni C, Vecchio F, Babiloni F, Brunelli GA, Carducci F, Cincotti F, Pizzella V, Romani GL, Tecchio F, Rossini PM. "Coupling between "hand" primary sensorimotor cortex and lower limb muscles after ulnar nerve surgical transfer in paraplegia", *Behavioural Neuroscience* (2004), **118**:214-222.
9. Brancucci A, Babiloni C, Babiloni F, Galderisi S, Mucci A, Tecchio F, Zappasodi F, Pizzella V, Romani GL, Rossini PM. "Inhibition of auditory cortical responses to ipsilateral stimuli during dichotic listening: evidence from magnetoencephalography", *European Journal of Neuroscience* (2004), **19**:2329-2336.
10. Della Penna S, Torquati K, Pizzella V, Babiloni C, Franciotti R, Rossini PM, Romani GL. "Temporal dynamics of alpha and beta rhythms in human SI and SII after galvanic median nerve stimulation. A MEG study", *Neuroimage* (2004), **22**:1438-1446.
11. Rossini PM, Altamura C, Ferretti A, Vernieri F, Zappasodi F, Caulo M, Pizzella V, Del Gratta C, Romani GL, Tecchio F. "Does cerebrovascular disease affects decoupling between neuronal activity and local hemodynamics?", *Brain* (2004), **127**: 99-110.
12. Babiloni C, Brancucci A, Pizzella V, Romani GL, Tecchio F, Torquati K, Zappasodi F, Arendt-Nielsen L, Chen AC, Rossini PM. "Contingent negative variation in the parasyllian cortex increases during expectancy of painful sensorimotor events: a magnetoencephalographic study", *Behav Neurosci* (2005) **119**:491-502.
13. Babiloni C, Cassetta E, Chioventa P, Del Percio C, Ercolani M, Moretti DV, Moffa F, Pasqualetti P, Pizzella V, Romani GL, Tecchio F, Zappasodi F, Rossini PM. "Alpha rhythms in mild demented during visual delayed choice reaction time tasks: A MEG study", *Brain Res Bull* (2005) **65**:457-470.
14. Brunetti M, Belardinelli P, Caulo M, Del Gratta C, Della Penna S, Ferretti A, Lucci G, Moretti A, Pizzella V, Tartaro A, Torquati K, Olivetti Belardinelli M, Romani GL. "Human brain activation during passive listening to sounds from different locations: An fMRI and MEG study", *Hum Brain Mapp* (2005), **26**:251-261.
15. Ferretti A, Caulo M, Del Gratta C, Di Matteo R, Merla A, Montorsi F, Pizzella V, Pompa P, Rigatti P, Rossini PM, Salonia A, Tartaro A, Romani GL. "Dynamics of male sexual arousal: distinct components of brain activation revealed by fMRI", *Neuroimage* (2005), **26**:1086-1096.
16. Tecchio F, Zappasodi F, Pasqualetti P, Tombini M, Salustri C, Oliviero A, Pizzella V, Vernieri F, Rossini PM. "Rhythmic brain activity at rest from rolandic areas in acute mono-hemispheric stroke: A magnetoencephalographic study", *Neuroimage* (2005), **28**:78-83.
17. Torquati K, Pizzella V, Babiloni C, Del Gratta C, Della Penna S, Ferretti A, Franciotti R, Rossini PM, Romani GL. "Nociceptive and non-nociceptive sub-regions in the human secondary somatosensory cortex: a MEG study using fMRI constraints", *Neuroimage* (2005) **26**:48-56.
18. Franciotti R, Iacono D, Della Penna S, Pizzella V, Torquati K, Onofri M, Romani GL. "Cortical rhythms reactivity in AD, LBD and normal subjects: a quantitative MEG study", *Neurobiology of Aging* (2006), **27**:1100-1109

19. Porcaro C, Zappasodi F, Barbatì G, Salustri C, Pizzella V, Rossini PM, Tecchio F. "Fetal auditory responses to external sounds and mother's heart beat: detection improved by Independent Component Analysis", *Brain Res* (2006), **1101**:51-58.
20. Tecchio F, Zappasodi F, Tombini M, Oliviero A, Pasqualetti P, Vernieri F, Ercolani M, Pizzella V, Rossini PM. "Brain plasticity in recovery from stroke: An MEG assessment", *Neuroimage* (2006), **32**:1326-1334.
21. Zappasodi F, Pasqualetti P, Tombini M, Ercolani M, Pizzella V, Rossini PM, Tecchio F. "Hand cortical representation at rest and during activation: Gender and age effects in the two hemispheres", *Clin Neurophysiol* (2006), **117**:1518-1528
22. Belardinelli P, Ciancetta L, Pizzella V, Del Gratta C, Romani GL. "Localizing complex neural circuits with MEG data", *Cogn Process* (2006) **7**:53-55
23. Altamura C, Torquati K, Zappasodi F, Ferretti A, Pizzella V, Tibuzzi F, Vernieri F, Pasqualetti P, Landi D, Del Gratta C, Romani GL, Maria Rossini P, Tecchio F. "fMRI-vs-MEG evaluation of post-stroke interhemispheric asymmetries in primary sensorimotor hand areas", *Exp Neurol* (2007) **204**:631-639.
24. Belardinelli P, Ciancetta L, Staudt M, Pizzella V, Londei A, Birbaumer N, Romani GL, Braun C. "Cerebro-muscular and cerebro-cerebral coherence in patients with pre- and perinatally acquired unilateral brain lesions", *Neuroimage* (2007), **37**:1301-1314.
25. Della Penna S, Brancucci A, Babiloni C, Franciotti R, Pizzella V, Rossi D, Torquati K, Rossini PM, Romani GL. "Lateralization of Dichotic Speech Stimuli is Based on Specific Auditory Pathway Interactions: Neuromagnetic Evidence", *Cereb Cortex* (2007), **17**:2303-2311.
26. Stavrinou ML, Della Penna S, Pizzella V, Torquati K, Cianflone F, Franciotti R, Bezerianos A, Romani GL, Rossini PM. "Temporal Dynamics of Plastic Changes in Human Primary Somatosensory Cortex after Finger Webbing", *Cereb Cortex* (2007), **17**:2134-2142.
27. Torquati K, Franciotti R, Della Penna S, Babiloni C, Rossini PM, Romani GL, Pizzella V. "Conditioning transcutaneous electrical nerve stimulation induces delayed gating effects on cortical response: A magnetoencephalographic study", *Neuroimage* (2007) **35**:1578-1585.
28. Sestieri C, Pizzella V, Cianflone F, Luca Romani G, Corbetta M. "Sequential Activation of Human Oculomotor Centers During Planning of Visually-Guided Eye Movements: A Combined fMRI-MEG Study", *Front Hum Neurosci* (2007), **1**:1-5.
29. Barbatì G, Porcaro C, Hadjipapas A, Adjamian P, Pizzella V, Romani GL, Seri S, Tecchio F, Barnes GR. "Functional source separation applied to induced visual gamma activity", *Hum Brain Mapp* (2008), **29**:131-141.
30. Brancucci A, Penna SD, Babiloni C, Vecchio F, Capotosto P, Rossi D, Franciotti R, Torquati K, Pizzella V, Rossini PM, Romani GL. "Neuromagnetic functional coupling during dichotic listening of speech sounds", *Hum Brain Mapp* (2008), **29**:253-264.
31. Brunetti M, Della Penna S, Ferretti A, Del Gratta C, Cianflone F, Belardinelli P, Caulo M, Pizzella V, Olivetti Belardinelli M, Romani GL. "A Frontoparietal Network for Spatial Attention Reorienting in the Auditory Domain: A Human fMRI/MEG Study of Functional and Temporal Dynamics", *Cereb Cortex* (2008), **18**:1139-1147.
32. Mantini D, Franciotti R, Romani GL, Pizzella V. "Improving MEG source localizations: an automated method for complete artifact removal based on independent component analysis", *Neuroimage* (2008), **40**:160-173.

33. Babiloni C, Pizzella V, Del Gratta C, Ferretti A, Romani GL. "Fundamentals of electroencephalography, magnetoencephalography, and functional magnetic resonance imaging", *Int Rev Neurobiol* (2009), **86**:67-80.
34. Franciotti R, Ciancetta L, Della Penna S, Belardinelli P, Pizzella V, Romani GL. "Modulation of alpha oscillations in insular cortex reflects the threat of painful stimuli", *Neuroimage* (2009), **46**:1082-1090.
35. Anzellotti F, Franciotti R, Bonanni L, Tamburro G, Perrucci MG, Thomas A, Pizzella V, Romani GL, Onofri M. "Persistent genital arousal disorder associated with functional hyperconnectivity of an epileptic focus", *Neuroscience* (2010), **167**: 88-96
36. de Pasquale F, Della Penna S, Snyder AZ, Lewis C, Mantini D, Marzetti L, Belardinelli P, Ciancetta L, Pizzella V, Romani GL, Corbetta M. "Temporal dynamics of spontaneous MEG activity in brain networks", *PNAS* (2010), **107**: 6040-6045.
37. Mantini D, Della Penna S, Marzetti L, de Pasquale F, Pizzella V, Corbetta M, Romani GL. "A Signal-Processing Pipeline for Magnetoencephalography Resting-State Networks", *Brain Connectivity* (2011), **1**: 49-59
38. Chella F, Zappasodi F, Marzetti L, Della Penna S, Pizzella V. "Calibration of a multichannel MEG system based on the Signal Space Separation method", *Phys Med Biol* (2012), **57**: 4855-4870
39. de Pasquale F, Della Penna S, Snyder AZ, Marzetti L, Pizzella V, Romani GL, Corbetta M. "A cortical core for dynamic integration of functional networks in the resting human brain", *Neuron* (2012), **74**: 753-764
40. Di Lanzo C, Marzetti L, Zappasodi F, De Vico Fallani F, Pizzella V. "Redundancy as a graph-based index of frequency specific MEG functional connectivity", *Comput Math Methods Med.* (2012), **2012**: 207305
41. Larson-Prior LJ, Oostenveld R, Della Penna S, Michalareas G, Prior F, Babajani-Feremi A, Schoffelen JM, Marzetti L, de Pasquale F, Di Pompeo F, Stout J, Woolrich M, Luo Q, Bucholz R, Fries P, Pizzella V, Romani GL, Corbetta M, Snyder AZ; for the WU-Minn HCP Consortium. "Adding dynamics to the Human Connectome Project with MEG", *Neuroimage* (2013), **80**: 190-201.
42. Marzetti L, Della Penna S, Snyder AZ, Pizzella V, Nolte G, de Pasquale F, Romani GL, Corbetta M. "Frequency specific interactions of MEG resting state activity within and across brain networks as revealed by the multivariate interaction measure", *Neuroimage* (2013), **79**: 172-183
43. Sinibaldi R, De Luca C, Nieminen JO, Galante A, Pizzella V, Sebastiani P, Pannetier-Lecoer M, Manna A, Chiacchiaretta P, Tamburro G, Sotgiu A, Fermon C, Romani GL, Della Penna S. "NMR detection at 8.9 mT with a GMR based sensor coupled to a superconducting Nb flux transformer", *PIER* (2013) **142**: 389-408
44. Brunetti M, Zappasodi F, Marzetti L, Perrucci MG, Cirillo S, Romani GL, Pizzella V, Aureli T. "Do you know what I mean? Brain oscillations and the understanding of communicative intentions", *Front Hum Neurosci* (2014), **8**: 36
45. Chella F, Marzetti L, Pizzella V, Zappasodi F, Nolte G. "Third order spectral analysis robust to mixing artifacts for mapping cross-frequency interactions in EEG/MEG", *NeuroImage* (2014), **91**: 146-161

46. Della Penna S, Pizzella V, Romani GL. "Impact of SQUIDs on functional imaging in neuroscience", *Supercond Sci Technol* (2014) **27**: 044004
47. Notturmo F, Marzetti L, Pizzella V, Uncini A, Zappasodi F. "Local and remote effects of transcranial direct current stimulation on the electrical activity of the motor cortical network", *Hum Brain Mapp* (2014), **35**: 2220-2232
48. Sebastiani V, de Pasquale F, Costantini M, Mantini D, Pizzella V, Romani GL, Della Penna S. "Being an agent or an observer: Different spectral dynamics revealed by MEG", *Neuroimage* (2014) **102**: 717-728
49. Zappasodi F, Olejarczyk E, Marzetti L, Assenza G, Pizzella V, Tecchio F. "Fractal dimension of EEG activity senses neuronal impairment in acute stroke", *PLoS One* (2014) **9**: e100199
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51. Pizzella V, Marzetti L, Della Penna S, De Pasquale F, Zappasodi F, Romani GL. "Magnetoencephalography in the study of brain dynamics", *Funct Neurol* (2014) 29:241-253
52. Zappasodi F, Marzetti L, Olejarczyk E, Tecchio F, Pizzella V. "Age-Related Changes in Electroencephalographic Signal Complexity", *PLoS One* (2015), **10**: e0141995
53. Finoia P, Mitchell DJ, Hauk O, Beste C, Pizzella V, Duncan J. "Concurrent brain responses to separate auditory and visual targets", *J Neurophysiol* (2015) **114**: 1239-1247.
54. Galante A, Sinibaldi R, Conti A, De Luca C, Catallo N, Sebastiani P, Pizzella V, Romani GL, Sotgiu A, Della Penna S. "Fast Room Temperature Very Low Field-Magnetic Resonance Imaging System Compatible with MagnetoEncephaloGraphy Environment", *PLoS One*. (2015) **10**: e0142701
55. Chella F, Pizzella V, Zappasodi F, Marzetti L. "Impact of the reference choice on scalp EEG connectivity estimation", *J Neural Eng* (2016) **13**: e036016
56. Chella F, Pizzella V, Zappasodi F, Nolte G, Marzetti L. "biPISA - bispectral Pairwise Interacting Source Analysis for identifying systems of cross-frequency interacting brain sources from EEG/MEG signals", *Phys Rev E* (2016), **93**: e052420
57. Brunetti M, Marzetti L, Sepede G, Zappasodi F, Pizzella V, Sarchione F, Vellante F, Martinotti G, Di Giannantonio M. "Resilience and cross-network connectivity: A neural model for post-trauma survival", *Prog Neuropsychopharmacol Biol Psychiatry* (2017), **77**: 110-119
58. Olejarczyk E, Marzetti L, Pizzella V, Zappasodi F. "Comparison of connectivity analyses for resting state EEG data", *J Neural Eng* (2017) **14**: e036017
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77. Spadone S, Betti V, Sestieri C, Pizzella V, Corbetta M, Della Penna S. "Spectral signature of attentional reorienting in the human brain", *NeuroImage* (2021), **244**: 118616
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Chieti, Feb 25, 2023

Vittorio Pizzella

