

# CURRICULUM VITAE

## PERSONAL INFORMATION

Name  
Address  
Telephone  
E-mail  
Nationality  
Date of birth

**RICCARDO MUSENICH**  
C/O INFN, via Dodecaneso 33, 16146 –Genova, ITALY  
+39 010 353 6445  
riccardo.musenich@ge.infn.it  
ITALIAN

## WORK EXPERIENCE

Dates

Name and address of employer

Type of business or sector

Occupation or position held

Main activities and responsibilities

1988-present

Istituto Nazionale di Fisica Nucleare (INFN)

Scientific and technologic research

Dirigente di ricerca (I level senior scientist), 2019-present

Primo ricercatore (II level senior scientist), 2002-2019

Ricercatore (scientist), until 2002

Research on superconducting materials for radiofrequency applications.

Research on superconducting cables for high energy physics applications.

R&D on joints between large superconducting cables.

Development of a method to measure critical current of superconducting cables up to 100000 A.

R&D for the CMS magnet at LHC (CERN).

Deputy Project Leader for the manufacturing of the CMS magnet.

Coordinator of the Technological Research Group of INFN-Ge.

Responsible for the INFN research activity on MgB<sub>2</sub> applications (P.I. of the projects Ma-Bo, MARIMBO and PUMA).

Scientific and Technical manager of the EU-FP7 SR2S project (Space Radiation Superconducting Shields).

Responsible of R&D on superconductive proton diverter for the Athena X-ray telescope (LAPUTA project).

Responsible of the R&D on high temperature superconductive canted solenoid dipoles (BISCOTTO project).

Dates

Name and address of employer

Type of business or sector

Occupation or position held

Main activities and responsibilities

1985-1988

Ansaldi Componenti

R&D on superconducting magnets

Technologist (permanent position)

Cryogenic tests of superconducting magnets.

Development of superconducting joints for MRI magnets.

Responsible for the cryogenic tests of the HERA dipole magnets.

Responsible of R&D activity on superconducting dipole magnets.

Dates

Name and address of employer

Type of business or sector

Main activities and responsibilities

1984

Università degli studi di Genova

Scientific research

Study of the interaction between hydrogen and silver surface

## EDUCATION AND TRAINING

Dates

Name and type of organization providing education and training

Title of qualification awarded

Principal subjects/occupational skills covered

1977-1983

Università degli studi di Genova

Doctor in Chemistry

Specialized in solid state chemical-physics. Thesis about the interaction of hydrogen (n-H<sub>2</sub>, p-H<sub>2</sub> and D<sub>2</sub>) with silver surface studied by means of molecular beam scattering.

**ADDITIONAL INFORMATION**

Member of INFN MAC (2020-present)  
 Member of the Scientific National Board 5 (Technologic and Interdisciplinary Research) of INFN (1997-2003 and 2009-2016).  
 Member of the International Organizing Committee of the *International Conference on Magnet Technology* (2005-present).  
 Reviewer of *IEEE Transaction on Applied Superconductivity, Superconducting Science and Technology, Cryogenics, IEEE Transaction on Nuclear Science*.  
 Technical editor of *IEEE Transaction on Applied Superconductivity* (2005-2013, 2017-2018).

**PUBLICATIONS**

Author of 490 articles on peer reviewed international journals, 110 of which related to magnet technology and applied superconductivity.

### List of publications related to magnet technology and applied superconductivity

#### 1. Papers on peer reviewed journals

- (1.1) "Superconducting properties of B1 nitrides films obtained by gas metal reaction"  
 P.Fabbricatore, P.Fernandes, G.C.Gualco, R.Musenich, R.Parodi,  
*IEEE Trans Magn.*, 25, 1865-1867, 1989
- (1.2) "Self field effects in the critical current measurements of superconducting wires and cables"  
 P.Fabbricatore, R.Musenich, R.Parodi, S.Pepe, R.Vaccarone  
*Cryogenics*, 29, 920-925, 1989
- (1.3) "Study of niobium nitrides for superconducting r.f. cavities"  
 P.Fabbricatore, P.Fernandes, G.C.Gualco, F.Merlo, R.Musenich, R.Parodi  
*Journal of Applied Physics*, 66(12), 5944-5949, 1989
- (1.4) "Effect of the n-value and the field inhomogeneity on the quench current of superconducting cables"  
 P.Fabbricatore, R.Musenich, R.Parodi, R.Vaccarone  
*IEEE Trans. Magn.*, 26(6), 3046-3051, 1990
- (1.5) "Design and preliminary test of a superconducting current transformer to charge a prototype s.c. power transmission line"  
 P.Fabbricatore, R.Musenich, R.Parodi, G.Canepa, L.Ottonello, F.Vivaldi  
*Cryogenics*, 30 Supplement, 804-807, 1990
- (1.6) "Rf surface resistance measurements of superconducting Y-Ba-Cu-O and Bi-Sr-Ca-Cu-O samples"  
 P.Fabbricatore, R.Musenich, R.Parodi, R.Scianca, B.Zhang  
*Cryogenics*, 30 Supplement, 877-881, 1990
- (1.7) "Inductive method for critical current measurement of superconducting cables for high energy physics applications"  
 P.Fabbricatore, R.Musenich, R.Parodi  
*Nuclear Instruments and Method in Physics Research*, A302, 27-35, 1991
- (1.8) "A simple digital system for ac magnetic measurements on superconductors"  
 P.Fabbricatore, U.Gambardella, F.Gömöry, R.Musenich, M.Occhetto, R.Parodi, P.Pompa  
*Rev.Sci. Instrum.*, 62 (7), 1796-1800, 1991
- (1.9) "Critical current of prototype conductors for LHC dipole magnets"  
 P.Fabbricatore, R.Musenich, R.Parodi, D.Truffelli, G.Zappavigna  
*IEEE Trans Mag.*, 27 (2), 1818-1821, 1991
- (1.10) "DC features and rf losses of Nb-based superconducting thin films"  
 D. Di Gioacchino, P.Fabbricatore, S.Frigerio, U.Gambardella, R.Musenich, R.Parodi, G.Paternò, S.Rizzo, C.Vaccarezza  
*IEEE Trans Mag.*, 27 (2), 1302-1305, 1991
- (1.11) "Multi-phase structure of thermally diffused niobium nitride"  
 P.Fabbricatore, R.Musenich, M.Occhetto, R.Parodi, P.Pompa  
*IEEE Trans Mag.*, 27 (2), 1291-1294, 1991
- (1.12) "Simple numerical model to interpret the ac magnetic measurements on type-II superconductors"  
 P.Fabbricatore, G.Gemme, R.Musenich, M.Occhetto and R.Parodi

- Cryogenics*, 32 (6), 559-568, 1992
- (1.13) "Electrical measurements up to 8 T on the cables for LHC dipole magnets"  
 P.Fabbricatore, R.Musenich, R.Parodi, S.Pepe, A.Menicatti, G.Zappavigna  
*IEEE Trans on Mag.*, 28 (1), 822-825, 1992
- (1.14) "Preparation and characterization of YBCO superconducting films deposited by electrophoresis"  
 B.Zhang, P.Fabbricatore, G.Gemme, R.Musenich, R.Parodi, L.Rizzo  
*Physica C*, 193, 1-7, 1992
- (1.15) "Preparation and characterization of YBCO samples for microwave applications"  
 P.Fabbricatore, A.Gauzzi, G.Gemme, R.Musenich, R.Parodi, D.Romanengo, B.Zhang  
*Journal of Superconductivity*, 5 (1), 55-65, 1992
- (1.16) "Observation of anomalous rf dissipation in thick films of superconducting  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ "  
 P.Fabbricatore, G.Gemme, R.Musenich, R.Parodi, B.Zhang, P.Copobianco  
*Physica C*, 203, 51-58, 1992
- (1.17) "Niobium and niobium-titanium nitrides for rf applications"  
 P.Fabbricatore, G.Gemme, R.Musenich, R.Parodi, M.Viviani, B.Zhang  
*IEEE Trans on Appl. Superconductivity*, 3 (1), 1761-1764, 1993
- (1.18) "First measurement of a NbTi rf cavity"  
 P.Fabbricatore, G.Gemme, R.Musenich, R.Parodi, M.Viviani, B.Zhang  
*IEEE Trans on Appl. Superconductivity*, 3 (1), 197-199, 1993
- (1.19) "Development and tests of electrical joints and terminations for a CICC Nb<sub>3</sub>Sn, 12 T solenoid"  
 A.Bonito Oliva, P.Fabbricatore, A.Martini, R.Musenich, S.Patrone, R.Penco, N.Valle.  
*IEEE Trans on Appl. Superconductivity*, 3 (1), 468-471, 1993
- (1.20) "Ac low frequency magnetic measurements of the proximity effect between fine filaments of superconducting NbTi wires"  
 P.Fabbricatore, G.Gemme, A.Menicatti, R.Musenich, R.Parodi, B.Zhang  
*J.Appl.Phys.*, 73 (4), 1993
- (1.21) "Ac magnetic measurements on superconductors using a 2-channel dynamic analyzer"  
 P.Fabbricatore, S.Farinon, G.Gemme, R.Musenich, R.Parodi, B.Zhang  
*Cryogenics*, 33 (12), 1170-1173, 1993
- (1.22) "Determination of the irreversibility line in Bi-2212 Ag sheathed wires"  
 P.Fabbricatore, G.Gemme, P.Moreschi, R.Musenich, R.Parodi, B.Zhang  
*Physica C*, 213, 200-210, 1993
- (1.23) "AC magnetic susceptibility measurements to determine the superconducting parameters related to morphology and structure of Nb<sub>0.4</sub>Ti<sub>0.45</sub>Ta<sub>0.075</sub>Zr<sub>0.075</sub>tapes"  
 H.R.Khan, B.Zhang, P.Fabbricatore, G.Gemme, R.Musenich, R.Parodi  
*J. of Alloys and Compounds*, 201, 239-243, 1993
- (1.24) "An experimental apparatus for the characterization of rf properties of superconducting samples near the transition temperature"  
 G.Gemme, P.Fabbricatore, R.Musenich, R.Parodi, T.Rossi, B.Zhang  
*Rev.Sci. Instrum.*, 65 (6), 2075-2081, 1994
- (1.25) "Growth of niobium nitrides by nitrogen-niobium reaction at high temperature"  
R.Musenich, P.Fabbricatore, G.Gemme, R.Parodi, M.Viviani, B.Zhang, V.Buscaglia, C.Bottino  
*J. of Alloys and Compounds*, 209, 319-328, 1994
- (1.26) "Effects of fluxon dynamics on higher harmonics of ac susceptibility in type II superconductors"  
 P.Fabbricatore, S.Farinon, G.Gemme, R.Musenich, R.Parodi, B.Zhang  
*Physical Review B*, 50 (5), 3189-3199, 1994
- (1.27) "Fluxon dynamics and higher harmonics of ac susceptibility in HTSC"  
 P.Fabbricatore, S.Farinon, G.Gemme, R.Musenich, R.Parodi, B.Zhang  
*Il Nuovo Cimento*, 16 D (10-11), 1917-1924, 1994
- (1.28) "Study of superconducting Nb coated 1.5 GHz accelerating cavity"  
 S.Rizzo, C.Gualco, Y.Shen, M.Viviani, F.Rosatelli, P.Fabbricatore, G.Gemme, R.Musenich, R.Parodi, B.Zhang  
*Cryogenics*, 34 supplement, 765-768, 1994
- (1.29) "Development and test of Bi-2212/Ag coils"  
 M.Ariante, G.Baccaglioni, P.Fabbricatore, G.Gemme, A.Matrone, R.Musenich, R.Parodi, E.Petrillo, C.Priano, L.Rossi, A.Sciutti, B.Zhang  
*Cryogenics*, 34 supplement, 809-812, 1994
- (1.30) "Critical current measurements of the cable for the superconducting dipole prototypes for the Large Hadron Collider"  
 G.Baccaglioni, P.Fabbricatore, R.Garré, R.Musenich, R.Parodi, L.Rossi, G.Volpini  
*IEEE Trans on Mag.*, 30 (4), 1827-1830, 1994

- (1.31) "Field inhomogeneity effect on the quench current of LHC dipole magnets"  
 P.Fabbricatore, R.Musenich, G.Gemme, R.Parodi, B.Zhang  
*IEEE Trans on Mag.*, 30 (4), 2336-2339, 1994
- (1.32) "Electrical properties of superconducting Bi-based silver sheathed wires and coils"  
 P.Fabbricatore, G.Gemme, P.Moreschi, R.Musenich, R.Parodi, B.Zhang, G.Baccaglioni, L.Rossi, P.Caracino, G.Vellego  
*IEEE Trans on Magn.* 30 (4), 2332-2335, 1994
- (1.33) "Rf surface resistance measurements of binary and ternary niobium compounds"  
 G.Gemme, P.Fabbricatore, R.Musenich, R.Parodi, T.Rossi, M.Viviani, B.Zhang  
*J.Appl.Phys.*, 77 (1), 257-264, 1995
- (1.34) "Headway in cavity design through genetic algorithms"  
 A.Chincarini, P.Fabbricatore, G.Gemme, R.Musenich, R.Parodi  
*IEEE Trans. on Magn.* 31 (3), 1566-1569, 1995
- (1.35) "Stability of Al-stabilized conductors for LHC detector magnets"  
 F.P.Juster, J.C.Lottin, L.Boldi, R.DeLorenzi, P.Fabbricatore, R.Musenich, D.E.Baynham, P.L.Sampson  
*IEEE Trans. on Appl. Superc.*, 5 (2), 377-380, 1995
- (1.36) "Preparation method and rf behaviour of Nb<sub>3</sub>Sn thin films obtained by bronze process"  
 M.J.Durante, R.Musenich, R.Parodi, G.Gemme, P.Fabbricatore, B.Zhang, U.Gambardella, V.Boffa, C.Bottino, V.Buscaglia  
*IEEE Trans. on Appl. Superc.*, 5 (2), 837-840, 1995
- (1.37) "Superconducting magnets for detectors of large colliders"  
 P.Fabbricatore, R.Musenich  
*Nuclear Physics B*, 44, 667-671, 1995
- (1.38) "Nitridation of niobium-46 wt.% titanium alloy in nitrogen at 1300°C"  
R.Musenich, P.Fabbricatore, G.Gemme, R.Parodi, B.Zhang, P.Parodi, V.Buscaglia, C.Bottino  
*Journal of Alloys and Compounds*, 226, 232-241, 1995
- (1.39) "Flux pinning in Bi-2212/Ag-based wires and coils"  
 P.Fabbricatore, C.Priano, A.Sciutti, G.Gemme, R.Musenich, R.Parodi, F.Gomory and J.R.Thompson  
*Physical Review B* 54 (17), 12543-12550, 1996
- (1.40) "Critical current measurements on the cables for LHC detector magnets"  
 P.Fabbricatore, R.Musenich, R.Parodi, G.Gemme  
*IEEE Trans on Mag* 32 (4), 2731-2734, 1996
- (1.41) "Conductor developments for the ATLAS and CMS magnets"  
 F.Kircher, H.Desportes, B.Gallet, J.C.Lottin, J.M.Rey, P.Regnier, P.Fabbricatore, R.Musenich  
*IEEE Trans on Magn.* 32 (4), 2870-2873, 1996
- (1.42) "Stability of Al-stabilised conductors for high energy physics application"  
 P.Fabbricatore, L.Boldi, R.Musenich, R.Parodi, G.Gemme  
*IEEE Trans. on Appl. Superconductivity* 7 (2), 633-637, 1997
- (1.43) "Field distribution effect on the performances of coils wound with Ag/Bi-2223 tape"  
 P.Fabbricatore, C.Priano, M.P.Testa, R.Musenich, P.Kovac, A.Matrone, E.Petrillo, M.Ariante  
*Superconductors Science and Techology*, 11, 304-310, 1998
- (1.44) "Effect of pressure on the composition and superconducting Tc value of NbN prepared by combustion synthesis"  
 V.Buscaglia, F.Caracciolo, M.Ferretti, M.Minguzzi, R.Musenich  
*J. of Alloys and Compounds*, 266, 201-206, 1998
- (1.45) "Developments of electrical joints for aluminum stabilized superconducting cables"  
 P.Fabbricatore, S.Farinon, R.Musenich, C.Priano, B.Curé, I.Horvath  
*IEEE Trans on Appl.Superconductivity* 9 (2), 197-200, 1999
- (1.46) "Status report on the CMS superconducting solenoid for LHC"  
 F.Kircher, B.Levesy, Y.Pabot, D.Campi, B.Curé, H.Hervé, I.Horvath, P.Fabbricatore, R.Musenich  
*IEEE Trans on Appl.Superconductivity* 9 (2), 837-840, 1999
- (1.47) "Design and testing of the 1.5 T superconducting solenoid for the BaBar detector at PEP-II in SLAC"  
 T.G.O'Connor, S.Shen, P.Fabbricatore, S.Farinon, R.Musenich, C.Priano, R.A.Bell, M.Berndt, W.Burgess, W.Craddock, L.Keller, O.Dormicchi, P.Moreschi, R.Penco, P.Valente, N.Valle  
*IEEE Trans on Appl.Superconductivity* 9 (2), 847-851, 1999
- (1.48) "The BaBar superconducting coil: design, construction and test"  
 R.A.Bell, M.Berndt, W.Burgess, W.Craddock, O.Dormicchi, P.Fabbricatore, S.Farinon, L.Keller, P.Moreschi, R.Musenich, T.G.O'Connor, R.Penco,

- C.Priano, S.Shen, P.Valente  
*Nuclear Physics B* 78, 559-564, 1999
- (1.49) "High temperature nitridation of Nb-Ti alloys in nitrogen"  
V.Buscaglia, A.Martinelli, R.Musenich, W.Mayr, W.Lengauer  
*J. of Alloys and Compounds*, 283, 241-259, 1999
- (1.50) "Growth of ordered lamellar precipitates during nitridation of Nb-10 at.% Ti at 1300°C"  
V.Buscaglia, A.Martinelli, C.Bottino, R.Musenich  
*J. of Alloys and Compounds*, 283, 260-264, 1999
- (1.51) "The CMS conductor"  
I.L. Horvath, B.Dardel, H.P.Marti, J.Neuenschwander, R.P.Smith, P.Fabbricatore, R.Musenich, A.Calvo, D.Campi, B.Curé, A.Desirelli, G.Favre, P.L.Riboni, S.Sgobba, T.Tardy, S.Sequeira Lopes Tavares  
*IEEE Trans on Appl.Superconductivity* 10 (1), 395-398, 2000
- (1.52) "Final design of the CMS solenoid cold mass"  
F.Kircher, P.Brédé, A.Calvo, B.Curé, D.Campi, A.Desirelli, P.Fabbricatore, S.Farinon, A.Hervé, I. Horvath, V.Klioukhine, B.Levesy, M.Losasso, J.P.Lottin, R.Musenich, Y.Pabot, A.Payn, C.Pes, C.Priano, F.Rondeaux, S.Sgobba  
*IEEE Trans on Appl.Superconductivity* 10 (1), 407-410, 2000
- (1.53) "Experimental study of CMS conductor stability"  
P.Fabbricatore, S.Farinon, F.P.Juster, R.Musenich, C.Priano  
*IEEE Trans on Appl.Superconductivity* 10 (1), 424-427, 2000
- (1.54) "EPMA of spinodal-like decomposition pattern in  $(\text{Ti}_x\text{Nb}_{1-x})\text{N}$ "  
B.Wollein, V.Buscaglia, W.Lengauer, M.Bohn, R.Musenich, P.Ettmayer,  
*Surface and Interface Analysis*, 30, 368-371, 2000
- (1.55) "Evolution of the ohmic voltage drop in connections of superconductors under time-varying current"  
R.Musenich, S.Farinon, C.Priano, P.Fabbricatore  
*Cryogenics*, 40, 45-52, 2000
- (1.56) "Pre-industrialization activities related to CMS coil winding"  
Fabbricatore P, Farinon S, Musenich R, et al.  
*IEEE Trans on Appl.Superconductivity* 11 (1), 1717-1720, 2001
- (1.57) "A voluminized fiber-glass insulation for large superconducting magnets"  
Musenich R, D'Urzo C, Fabbricatore P, et al.  
*IEEE Transactions on Applied Superconductivity*, 12 (1), 1242-1243 2002
- (1.58) "A superconducting magnet for a beam delivery system for carbon ion cancer therapy"  
Priano C, Fabbricatore P, Farinon S, Musenich R et al.  
*IEEE Transactions on Applied Superconductivity*, 12 (1), 988-992, 2002
- (1.59) "The winding line for the CMS reinforced conductor"  
Fabbricatore P, Campi D, D'Urzo C, Musenich R et al.  
*IEEE Trans on Appl.Superconductivity* 12 (1), 358-361, 2002
- (1.60) "The CMS conductor"  
Blau B, Campi D, Cure B, et al.  
*IEEE Trans on Appl.Superconductivity* 12 (1), 345-348, 2002
- (1.61) "Electrical joints in the CMS superconducting magnet"  
Farinon S, Chesny P, Cure B, et al.  
*IEEE Trans on Appl.Superconductivity* 12 (1), 462-464, 2002
- (1.62) "Critical current measurements on the CMS stabilized conductor"  
Greco M, Fabbricatore P, Musenich R  
*IEEE Trans on Appl.Superconductivity* 12 (1), 381-384, 2002
- (1.63) "CMS coil design and assembly"  
Kircher F, Brédy P, Campi D, et al.  
*IEEE Trans on Appl.Superconductivity* 12 (1), 395-398, 2002
- (1.64) "Design, construction, and quality tests of the large Al-alloy mandrels for the CMS coil"  
Sgobba S, D'Urzo C, Fabbricatore P, et al.  
*IEEE Trans on Appl.Superconductivity* 12 (1), 428-431, 2002
- (1.65) "Self-field effects on critical current measurements of large multi-strand conductors"  
Greco M, Fabbricatore P, Musenich R, et al.  
*IEEE Trans on Appl.Superconductivity*, 13 (2), 3374-3377, 2003

- (1.66) "Influence of the sintering process on critical currents, irreversibility lines and pinning energies in multifilamentary MgB<sub>2</sub> wires"  
 Fabbricatore P, Greco M, Musenich R, et al.  
*Superconductor Science & Technology*, 16 (3), 364-370, 2003
- (1.67) "Critical current and n-value modifications from superconducting strands to Rutherford cables"  
 Greco M, Fabbricatore P, Farinon S, Musenich R  
*Physica C - Superconductivity and its Applications*, 401 (1-4), 124-128, 2004
- (1.68) "Determination of the V-I characteristic of NbTi wires in a wide resistivity range"  
Musenich R, Fabbricatore P, Farinon S, Greco M  
*Physica C - Superconductivity and its Applications*, 401 (1-4), 260-264, 2004
- (1.69) "A superconducting cyclotron as driver for radioactive beam facilities"  
 Calabretta L, Maggiore M, Re M, Rifuggiato D, Farinon S, Fabbricatore P, Musenich R  
*Nuclear Physics A*, 734, 378-381, 2004
- (1.70) "Construction and tests of MgB<sub>2</sub> react & wind coils"  
Musenich R, Fabbricatore R, Fanciulli C, et al.  
*IEEE Trans on Appl. Superconductivity*, 14 (2), 365-367, 2004
- (1.71) "Status of the construction of the CMS magnet"  
 Herve A, Blau B, Bredy PH, et al.  
*IEEE Trans on Appl. Superconductivity*, 14 (2), 542-547, 2004
- (1.72) "The construction of the modules composing the CMS superconducting coil"  
 P.Fabbricatore, D.Campi, C.D'Urzo, S.Farinon, A.Gaddi, M.Greco, B.Levesy, L.Loché, R.Musenich, F.Rondeaux, R.Penco  
*IEEE Trans on Appl. Superconductivity*, 14 (2), 552-555, 2004
- (1.73) "The winding method and model of a superconducting bending dipole for hadrontherapy"  
 Farinon S, Cereseto R, Cuneo S, Fabbricatore P, Musenich R, et al.  
*IEEE Trans on Appl. Superconductivity*, 14 (2), 585-588, 2004
- (1.74) "Electrical characterization of S/C conductor for the CMS solenoid"  
 Fabbricatore P, Greco M, Musenich R, et al.  
*IEEE Trans on Appl. Superconductivity*, 15 (2), 1275-1278, 2005
- (1.75) "Behavior of MgB<sub>2</sub> react & wind coils above 10 K"  
Musenich R, Fabbricatore P, Farinon S, et al.  
*IEEE Trans on Appl. Superconductivity*, 15 (2), 1452-1456, 2005
- (1.76) "MgB<sub>2</sub> coils for particle accelerators"  
 Author(s): Bellomo G, Musenich R, Sorbi M, et al.  
*IEEE Trans on Appl. Superconductivity*, 16 (2), 1439-1441, 2006
- (1.77) "Behavior of MgB<sub>2</sub> reacted and wound coils from 14 K to 32 K in a cryogen free apparatus"  
 Modica M, Grasso G, Greco M, Marabotto R, Musenich R, Nardelli D, Penco R, Tassisto M  
*IEEE Trans on Appl. Superconductivity*, 16 (2), 1449-1452, 2006
- (1.78) "The behaviour of cryogen-free MgB<sub>2</sub> react and wind coils"  
R.Musenich, P.Fabbricatore, S.Farinon, M.Greco, M.Modica, R.Marabotto, R.Penco, M.Razeti, D. Nardelli  
*Superconductor Science & Technology*, 19 (3), S126-S131, 2006
- (1.79) "Behavior of a 14 cm bore solenoid with multifilament MgB<sub>2</sub> tape"  
 Alessandrini M, Musenich R, Penco R, et al.  
*IEEE Trans on Appl. Superconductivity* 17 (2), 2252-2257, 2007
- (1.80) "Investigation of magnetization behavior of Nb<sub>3</sub>Sn wires for the Next European Dipole (NED) activity"  
 Greco M, Bernini C, Fabbricatore P, Ferdeghini, C, GambardellaU, Musenich R  
*IEEE Trans on Appl. Superconductivity* 17 (2), 2722-2725, 2007
- (1.81) "Electrical characterization of a multi-strand MgB<sub>2</sub> cable"  
Musenich R, Greco M, Razeti M, Tavilla G  
*Supercond. Sci. Technol.* 20, 1-4, 2007
- (1.82) "Development of a curved fast ramped dipole for FAIR SIS300"  
 Fabbricatore R, Alessandria F, Bellomo G, Farinon, S, Gambardella, U., Kaugerts, J., Marabotto, R., Musenich, R., Moritz, G., Sorbi, M., Volpini, G.  
*IEEE Trans on Appl. Superconductivity* 18 (2), 232-235, 2008

- (1.83) "A MgB<sub>2</sub> superferric racetrack magnet"  
R.Musenich, M.Sorbi, G.Tavilla, G.Volpini, R.Marabotto, M.Modica, D.Nardelli  
*Supercond. Sci. Technol.*, 21 (10) Article Number: 105014, 2008
- (1.84) "A Model Dipole for FAIR SIS300: Design of the Mechanical Structure "  
Farinon S, Fabbricatore P, Musenich R, et al.  
*IEEE Trans on Appl. Superconductivity* 19 (3), 1141-1145, 2009
- (1.85) "Electromagnetic Design of the Coil-Ends for the FAIR SIS300 Model Dipole"  
Sorbi M, Alessandria F, Bellomo G, Sorbi M, Alessandria F, Bellomo G, Fabbricatore P, Farinon S, Gambardella U, Musenich R, Volpini G  
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# Curriculum Vitae

## Personal information

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## Work experience

position held from 1996 to 2006

position held since 2007

main research project and scientific collaboration

since 2020	<u>Position:</u> deputy project leader Design and construction of a single aperture 12-14 T dipole demonstrator (FalconD experiment)
since 2019	<u>Position:</u> design engineer Design and construction of two prototype of high temperature superconductive CCT dipoles for the INFN experiment BISCOTTO
2015-2019	<u>Position:</u> responsible for INFN WP5 activities Design of a Nb <sub>3</sub> Sn 16 T superconducting dipole for the Future Circular Collider at CERN for the European experiment EuroCircol.
since 2014	<u>Position:</u> deputy project leader Design and construction of a model and a prototype of the superconducting dipole D2 for the High Luminosity upgrade of the Large Hadron Collider at CERN
2014-2016	<u>Position:</u> design engineer Design and construction of a vacuum calorimeter to measure with high accuracy the heat generated by a 100kCi <sup>144</sup> Ce- <sup>144</sup> Pr antineutrino generator for the SOX (Short distance neutrino Oscillations with BoreXino) experiment.
2014-2015	<u>Position:</u> design engineer Design and construction of the first prototype out of 27 modules of the Transport Solenoid for the Mu2e experiment at Fermilab
since 2013	<u>Position:</u> design engineer Participation to the upgrade study of the gravitational wave detector Virgo (analysis of the electromagnetic and Newtonian noise)
2013-2015	<u>Position:</u> design engineer Design of a superconducting toroidal magnet for astroparticle shielding in interplanetary manned missions for the European experiment SR2S (Space Radiation Superconductive Shield).
2011-2013	<u>Position:</u> design engineer Design, construction and test of a model superconducting quadrupole for the interaction region of SuperB factory.
2005-2010	<u>Position:</u> design engineer and responsible of the mechanical design Design and construction of a fast ramped bent superconducting dipole for the FAIR SIS300 synchrotron.
1995-2005	<u>Position:</u> responsible for the quality assurance and design engineer Design and construction of the CMS superconducting solenoid at CERN LHC.
2005-2007	<u>Position:</u> responsible for INFN-Genoa activities Development of a high performance Nb <sub>3</sub> Sn conductor for the European NED project
2003-2004	<u>Position:</u> responsible for INFN-Genoa activities Design of the superconducting solenoid for the cyclotron SCENT (Superconducting Cyclotron for Exotic Nuclei and Therapy) at the LNS Laboratory of INFN.
2001-2003	<u>Position:</u> design engineer Design of a heavy ion gantry for oncologic radiotherapy at the CNAO center.

1994-1996	<p><b>Position:</b> design engineer  Design and construction of the BABAR superconducting solenoid for the SLAC facility at Stanford.</p>
Editorial tasks since 2005	<p><u>Editor</u> of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the Applied Superconductivity Conference and the Magnet Technology Conference.  <u>Chief Editor</u> of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 19<sup>th</sup> Magnet Technology Conference.  <u>Chief Editor</u> of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 20<sup>th</sup> Magnet Technology Conference.  <u>Lead Editor</u> of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 21<sup>st</sup> Magnet Technology Conference.  <u>Chief Editor</u> of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 2010 Applied Superconductivity Conference.  <u>Chief Editor</u> of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 22<sup>nd</sup> Magnet Technology Conference.  <u>Lead Editor</u> of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 2012 Applied Superconductivity Conference.  <u>Chief Editor</u> of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 23<sup>rd</sup> Magnet Technology Conference.  <u>Chief Editor</u> of "Journal of Physics: Conference Series" for 2013 European Conference on Applied Superconductivity  <u>Editor</u> of the regular issues of the journal "IEEE Transaction on Applied Superconductivity"</p>
Scientific committees	<p>Member of the Scientific Program Committee of the 23<sup>rd</sup> Magnet Technology Conference.  Member of the Scientific Program Committee of the 2013 European Conference on Applied Superconductivity.  Elected member of Applied Superconductivity Conference Board Committee.  Member of the Scientific Program Committee of the 2014 Applied Superconductivity Conference  Member of the Scientific Program Committee of the 2016 Applied Superconductivity Conference  Member of the Scientific Program Committee of the 2018 Applied Superconductivity Conference  Member of the Scientific Program Committee of the 2019 European Conference on Applied Superconductivity.</p>
<b>Education and training</b>	<p>1990-1994  Degree in Physics at University of Genoa  Thesis about the theoretical and experimental study of the spectral response of superconducting materials exposed to varying magnetic field</p>
<b>Personal skills and competences</b>	<p>Languages  Good English, in speaking and writing, poor knowledge of French  Technical skills and competences  in-depth knowledge of design through finite element tools</p>
<b>Publications</b>	<p>Full list by topic at <a href="https://www.ge.infn.it/~farinon/publications/pubsbytopic.html">https://www.ge.infn.it/~farinon/publications/pubsbytopic.html</a>, by year at <a href="https://www.ge.infn.it/~farinon/publications/pubbyyear.html">https://www.ge.infn.it/~farinon/publications/pubbyyear.html</a></p>

## More relevant publications:

1. **Baseline Design of a 16 T cos theta Bending Dipole for the Future Circular Collider**  
By: Valente, Riccardo; Bellomo, Giovanni; Caiffi, Barbara; et al.  
IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY Volume: 29 Issue: 5 Article Number: 4003005 Published: AUG 2019 DOI: 10.1109/TASC.2019.2901604
2. **The Design of Superconducting Separation Dipoles D2 for the High Luminosity Upgrade of LHC**  
By: Farinon, S.; Fabbricatore, P.; Curreli, S.; et al.  
IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY Volume: 26 Issue: 4 Article Number: 4001504 Published: JUN 2016 DOI: 10.1109/TASC.2016.2523060
3. **Modeling Experimental Magnetization Cycles of Thin Superconducting Strips by Finite-Element Simulations**  
By: Iannone, G.; Farinon, S.; De Marzi, G.; et al.  
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SUPERCONDUCTOR SCIENCE & TECHNOLOGY Volume: 23 Issue: 11 Article Number: 115004 Published: NOV 2010 DOI: 10.1088/0953-2048/23/11/115004
6. **The transverse resistivity in S/C multifilament wires studied through ac susceptibility measurements**  
By: Fabbricatore, P.; Farinon, S.; Incardone, S.; et al.  
JOURNAL OF APPLIED PHYSICS Volume: 106 Issue: 8 Article Number: 083905 Published: OCT 15 2009 DOI: 10.1063/1.3234378
7. **Nb<sub>3</sub>Sn wire layout optimization to reduce cabling degradation**  
By: Farinon, S.; Boutboul, T.; Devred, A.; et al.  
IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY Volume: 18 Issue: 2 Pages: 984-988 Published: JUN 2008 DOI: 10.1109/TASC.2008.922299
8. **Finite element model to study the deformations of Nb<sub>3</sub>SR wires for the next European dipole (NED)**  
By: Farinon, S.; Boutboul, T.; Devred, A.; et al.  
IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY Volume: 17 Issue: 2 Pages: 1136-1139 Part: 2 Published: JUN 2007 DOI: 10.1109/TASC.2007.899138
9. **Overview and status of the Next European Dipole Joint Research Activity**  
By: Devred, A; Baudouy, B; Baynham, DE; et al.  
SUPERCONDUCTOR SCIENCE & TECHNOLOGY Volume: 19 Issue: 3 Special Issue: SI Pages: S67-S83 Published: MAR 2006 DOI: 10.1088/0953-2048/19/3/010
10. **Status of the next European Dipole (NED) activity of the Collaborated Accelerator Research in Europe (CARE) project**  
By: Devred, A; Baudouy, B; Baynham, DE; et al.  
IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY Volume: 15 Issue: 2 Pages: 1106-1112 Part: 2 Published: JUN 2005 DOI: 10.1109/TASC.2005.849506

# CURRICULUM VITAE

EUROPEAN FORMAT

## PERSONAL INFORMATION

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Address	
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Nationality	<b>Italian</b>
Place and Date of birth	

## WORK EXPERIENCE

Since 11/12/2013 Associate Professor Qualification A2/B1.

From May 5<sup>th</sup>, 2003: Tenure Track position as Researcher at CNR-SPIN (**Su**Perconductors, oxides and other **I**NNovative materials and devices Institute of the Italian National Council of Research), Genova, Italy. This position has been converted to a Permanent Position starting from April 14<sup>th</sup>, 2008 (I.N. 27700). In possession of "dichiarazione di lodevole servizio" at CNR-SPIN (**prot. N. 0000932 del 01/03/2017**).

Career breaks: In the period 03-19-2010 to 03-18-2011, I was on 'sabbatical' as Visiting Assistant Scholar/Scientist at Applied Superconductivity Center, NHMFL, Tallahassee, FL, USA. **Prot. AMMCNT-CNR N.0020892 del 16/03/2010; AMMCNT-CNR N.0070908 del 05/10/2011**

In 2003 I was a founding member of the new company "Columbus Superconductors S.p.A." in Genova, Italy, which is now a worldwide leader company in MgB<sub>2</sub> wires and tapes production.

May 1<sup>st</sup>, 2001 – May 4<sup>th</sup>, 2003: fixed-term position as Researcher at INFM (National Institute for the Physics of Matter), Genova, Italy, in the framework of the European Project GSRD CT 2000 426 "BIGPOWA".

April 1<sup>st</sup>, 2000 – December 31<sup>st</sup>, 2000: INFM, Genova, Italy, Research Grant for research activity.

September 15<sup>th</sup>, 1999 – March 31<sup>st</sup>, 2000: INFM, Genova, Italy, Fellowship for research activity.

## EDUCATION AND TRAINING

April 21<sup>st</sup>, 2005: PhD in Material Science c/o the University of Genova, Italy.

July 14<sup>th</sup>, 1999: 'Laurea' degree (4 years curriculum) in Physics c/o the Physics Department of the University of Genova, Italy.

## RESEARCH ACTIVITIES

### **Scientific Research Activity**

During my research experience as a PhD and as a researcher, I have been working at the study of advanced and innovative materials, in particular at the preparation and characterization of different technological superconductors such as BiSCCO and MgB<sub>2</sub> for different applications at the forefront of the research. We first developed an industrial process to fabricate long length MgB<sub>2</sub> tapes. Such research work had always a strong applicative impact, as shown by the two international patents and by the numerous collaborations and contracts with industries.

My activities include also fruitful supervision of student work, participation to research project planning, referee for international scientific journals and setting-up of the laboratory.

#### *1. Bi-2223/Ag superconducting tapes.*

During the 'laurea' thesis work and until the beginning of 2001 I studied the superconducting High-T<sub>c</sub> superconductor HTS Bi<sub>2</sub>Sr<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>10+x</sub> (Bi-2223) Ag-sheathed.

I worked both at the preparation of the phase and at the fabrication of the tapes through the Powder-In-Tube (PIT) technique. I thoroughly investigated the precursors preparation through the study of the thermal treatments for their decomposition, their structural characterization through XRD and the effects of the stoichiometry variations. Tapes with novel geometrical configurations were fabricated, in particular aiming to the optimization of the radiofrequency receptors. I deeply studied the analysis of the radiofrequency response of the superconducting resonators, and demonstrated the possibility of fabricating a superconducting sensor for the biomedical MRI in collaboration with Esaote S.p.a. (IT).

#### *2. MgB<sub>2</sub> superconducting wires and tapes.*

After the superconductivity at 40K was discovered in MgB<sub>2</sub> in 2001, I changed my research topic. Based on our experience on BiSCCO, I first worked at the realization of a method to realize MgB<sub>2</sub> tapes through the PIT: I studied the cold deformation process, the metallic sheaths, the possible geometrical configurations and the effects of the thermal treatment on the behaviour of the conductors in magnetic field. I found correlations between the stress induced on the MgB<sub>2</sub> cell and the mechanical working procedure, the irreversibility field and the critical current. In particular, the transport properties in field were studied, and resulted to be very much dependent on the thermal treatment: the optimal conditions were found to develop conductors useful for applications at high or low field.

I worked at the development of a standard process for the fabrication of MgB<sub>2</sub> conductors of lengths of interest for industrial applications. We reached, first worldwide, the production of 1.6 km long multifilamentary tapes in 2005. Such tapes have been used to build solenoids. At 4.2K a critical current of 350A was measured and 0.75T were generated, showing the feasibility of MgB<sub>2</sub> magnets.

#### *3. Bi-2212/Ag superconducting wires*

During my 1 year as visiting scientist at ASC-NHMFL, I have been involved in the *Very High Field Superconducting Magnet Collaboration (VHFSMC)* project, a laboratory-university-industry collaboration for the development of magnets with field >22 Tesla using HTS conductor: in particular I have been working on understanding and developing high J<sub>c</sub> Bi-2212 round wire through systematic studies of connectivity, phase development, reactions, and variable heat treatment parameters. At present I am leading on this activity at CNR-SPIN focused in particular on the development of new Bi-2212 wires with improved superconducting transport properties through an innovative process based on a proper alternation of groove-rolling and drawing processes, carrying on collaborations with ASC (US), CERN (CH), ENEA (IT) as well as EnGimat.(US).

#### *4. Fe-based superconductors*

In parallel, I am working on the activity on Fe-based superconductor. I am exploring the feasibility to transfer my know-how on practical conductors to such new superconducting materials, in particular I am trying to develop Fe-based superconducting wires trough the P.I.T. method and suitable oriented metallic substrate to realize coated conductors. This activity is going on also in collaboration with CERN (CH) and ENEA (IT).

### **Expertise on experimental techniques:**

- X-ray diffraction (XRD) for characterization of powders and tapes.
- Scanning Electron Microscopy (SEM) and Energy Dispersive Spectrometry (EDS) for microstructural and chemical analysis of powders and wires.

- Solid state reactions for synthesis of powders of superconductors.
- Powder-In-Tube (PIT) technique for the fabrication of superconducting wires and tapes and metallurgic techniques.
- Transport properties characterization of samples vs. temperature and magnetic field (resistivity, magnetoresistivity, use of PPMS, transport critical current by I-V characteristics vs. temperature and field, AC transport measurements). In particular, I built three new sample holders working in the 13T magnet at GHMFL, Grenoble (F) and in a 7T magnet at CNR-SPIN at variable temperature (4.2K – 40K).
- Magnetic properties characterization (magnetization, critical current, use of SQUID).

**Experience in large-scale facilities:**

- ILL, Grenoble (F): Neutron Diffraction on MgB<sub>2</sub> bulk / tapes and Bi-2212 wires.
- ESRF, Grenoble (F): High-energy XRD on MgB<sub>2</sub> tapes and Bi-2212 wires.
- GHMFL, Grenoble (F): transport I-V measurements in the 21T and 13T resistive magnet on superconducting MgB<sub>2</sub> and Bi-2212 tapes/wires. From 2006 to 2013 I have been the coordinator of the project “Transport properties of MgB<sub>2</sub> superconducting wires with improved behavior in magnetic field” .

**Roles:**

- Responsabile Unico del Procedimento (RUP) della Stazione Appaltante dell'Istituto SPIN – sede di Genova per le forniture di beni e servizi di importo inferiore a 40.000,00 euro. **prot. CNR-SPIN N°1206 del 16/05/2019**
- Responsabile delegato per le attività della sede di Genova dell'istituto CNR-SPIN dal 01/05/2019 **prot. CNR-SPIN N°808 del 08/04/2019**
- Responsabile dell'attività di ricerca dell'istituto CNR-SPIN “Novel superconducting and functional materials for energy and environment”; **prot. CNR-SPIN N°0004751 del 02/11/2016**
- Membro Rappresentante CNR del comitato tecnico CT/90 “Supercondutività” del Comitato Elettrotecnico Italiano. **prot. CNR N°78133 del 20/11/2018**
- Responsabile della commessa dell'istituto CNR-SPIN “MD.P04.023 Materiali e meccanismi della superconduttività e sue applicazioni di potenza”; **prot. CNR-SPIN N°0005935 del 05/12/2014**
- Co-fondatore dello Spin-Off INFM-CNR “Columbus Superconductors”; **delibera GE n.1778/02 del 25/06/2002**
- Membro del comitato organizzatore della conferenza EUCAS 2013; **prot. CNR-SPIN N°0001673 del 04/04/2012**
- Editor for Journal of Physics: conference series (JPCS-IOP); **prot. CNR-SPIN N°0004652 del 22/10/2013**
- Membro di commissione di valutazione per la selezione delle candidature relative al Bando n. INFM AR 26/2006; **prot. INFM-CNR N°0008546 del 04/10/2006**
- Membro di commissione di valutazione per la selezione delle candidature relative al Bando n. SPIN AR 003/2017 **prot. CNR-SPIN\_0001424 del 22/03/2017**
- Preposto del Laboratorio Deformazione Meccanica; **prot. CNR-SPIN N°0001854 del 24/09/2010**
- Responsabile di attrezzatura e strumentazione di laboratorio dal 2012 al presente; **prot. CNR-SPIN N°0005272 del 27/12/2011, N°0005747 del 18/12/2012; N°0000033 del 02/01/2013; N°0000302 del 15/01/2015, N° 0003959 del 27/12/2018**
- Membro commissione per ricognizione inventario CNR-SPIN; **prot. CNR-SPIN N°0001922 del 23/04/2014**
- Supervisor of the master thesis: “*Perdite in corrente alternata di nastri superconduttori in diboruro di Magnesio*” (candidate: Biasotti Michele, University of Genova, 2005)
- Supervisor of PhD thesis: “*Fe(Se,Te) wires for current transport*” (candidate: Palombo Marco, University of Genova, 2013/14)

- Supervisor of bachelor thesis: “Realizzazione di fili superconduttori a base di Ferro della famiglia a122” (candidate: Sylva Giulia, University of Genova, 2014)
- Supervisor of the master thesis: “Realizzazione e caratterizzazione di nastri superconduttori a base Ferro della fase Ba-122” (candidate: Contarino Daniele, University of Genova, 2015)
- Supervisor of the master thesis: “Sviluppo di fili multifilamentari di Bi-2212 e dipendenza della corrente critica dal doping di ossigeno” (candidate: Zunino Vittoria, University of Genova, 2016)
- Addetto antincendio; **prot. CNR-SPIN N°0000371 del 02/02/2011**

**Principal Investigator in the following projects:**

- Transport properties of MgB<sub>2</sub> superconducting wires with improved behavior in high magnetic field; 6th framework European program "Transactional Access-Specific Support Action" N°RITA-CT-2003-505474 from 03/09/1997 to 31/12/2008 (INFM-CNR non protocollava gli incarichi di questa tipologia).
- "Transport properties Of MgB<sub>2</sub> superconducting wires with improved behavior in high magnetic field"; 7th framework European program "Transactional Access" - EuroMagNET II – Integrating Activities N°228043 form 01/01/2009 to 31/12/2009 (INFM-CNR non protocollava gli incarichi di questa tipologia).
- "Programma di ricerca per l'affinamento delle proprietà superconduttrive di nastri di diboruro di magnesio e per ottenere nastri/fili prototipi"; **prot. CNR-SPIN N°0005654 del 31/07/2006**
- "Caratterizzazione di materiali" funded by ASG Superconductors S.p.A.; **prot. CNR-SPIN N°0000170 del 18/01/2013**
- "Sviluppo di fili innovativi superconduttori a base di ferro per applicazioni in alto campo magnetico" funded by Compagnia di San Paolo, **prot. CNR-SPIN N°0005183 del 04/12/2013**
- "Caratterizzazione di campioni di cavi e precursori" funded by Columbus Superconductors S.p.A.; **prot. CNR-SPIN N°0003589 del 23/07/2014**
- "Misura e caratterizzazione di fili superconduttori in MgB<sub>2</sub>" funded by Columbus Superconductors S.p.A.; **prot. CNR-SPIN N°0002290 del 29/04/2015**
- "Caratterizzazione della corrente critica a 4.2K e a 2T di fili multifilamentari a base di diboruro di Magnesio" funded by Columbus Superconductors S.p.A.; **prot. CNR-SPIN N°0002325 del 07/06/2016**
- "New concept for the development of Bi-2212 wires for high field applications"; **prot. CNR-SPIN N. 0005370 del 23/10/2015**
- sub-project "New processing concept for Bi-2212 wires" within the Addendum FCC-GOV-CC-0086, EDMS 1750320 to the Memorandum of Understanding for the FCC study with CERN; **prot. CNR-SPIN N. 0000614 del 1/03/2018**.
- Work Package Leader in the project "Alternative HTS wires" within the Enabling Research Program of the EUROfusion Consortium; Euratom research and training programme 2014-2018 under grant agreement No 63305301; Jan-2017 – 31-Dec-2018

**Participant in the following projects:**

- European Projects GSRD CT 2000 426 "BIG POWA" and GSRD-CT-2000-00219 "SUITABLE" on Bi-2223
- GSRT-CT-2002-005077 "SCENET 2"; EU-FP6 STRP NMP3-CT-2004-505724 "HIPERMAG" Atto del Direttore Generale N. 348/04 del 03/08/2004 on MgB<sub>2</sub>;
- "MgB<sub>2</sub>: from microscopic mechanisms to large scale applications" funded by the Italian Foreign Affairs Ministry (MAE) – General Direction for the Cultural Promotion and Cooperation in the framework of the scientific and technological bilateral cooperation Italy – USA, years 2008 and 2009 **prot. INFM-CNR N. 0013354 del 30/07/2008 e N. 0007580 del 27/05/2009**

- U.S. DOE funded project "VHFSMC" on Bi-2212.
- FP7-NMP-2011-EU-Japan GA n. 283204 "SUPER-IRON" 2011-2014 prot. CNR-SPIN N. 0004099 del 28/10/2011 on Fe-based superconductors

### Conferences and meetings:

More than 40 papers were presented at international conferences and workshops with the results of my research. In particular, I gave

#### **selected lecture at:**

- CIMTEC06, Catania, Italy, 2006

#### **invited talks at:**

- WAMHTS- Workshop on Accelerator Magnets in HTS, Hamburg, Germany, 2014;
- International Conference on Superconductivity and Magnetism, ICSM2016, Fethiye, Turkey, 2016.
- 15<sup>th</sup> International Conference on Advanced Materials ,IUMRS-ICAM, Kyoto, Japan, 2017
- European Conference on Applied Superconductivity, EUCAS2017, Geneva, Switzerland, 2017

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| Books | <ol style="list-style-type: none"> <li>1. G. Grasso, V. Braccini, <u>A. Malagoli</u>, N. Scati, S. Roncallo, A.S. Siri, Fabrication and characterization of unsintered MgB2 tape conductors with large critical current densities, Chapter 22 in Superconducting Magnesium Diboride, Studies of High Temperature Superconductors, A. Narlikar, ed. by, Nova Science Publisher vol. 38 (2001).</li> <li>2. <u>A. Malagoli</u> and V. Braccini, MgB2 wires fabricated using the ex situ technique, Chapter 4b in MgB2 superconducting wires, Basics and applications, ed. by R. Flükiger, published by World Scientific in Applications of Superconductivity and Related Phenomena, vol. 2 (2016)</li> </ol> |
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**My h-index is 22**

### **List of publications:**

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| Articles | <ol style="list-style-type: none"> <li>1. Sylva, G; <u>Malagoli, A</u>; Bellingeri, E; Putti, M; Ferdeghini, C; Vannozzi, A; Celentano, G; Hopkins, SC; Lunt, A; Ballarino, A and Braccini, V; "Analysis of Fe(Se,Te) Films Deposited On Unbuffered Invar 36"; IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY VOL. 29, NO. 5, AUG 2019, 7300105.</li> <li>2. Leoncino, L; Celentano, G; Chiarelli, S; Leveratto, A; Putti, M; Ferdeghini, C; Ballarino, A; Hopkins, SC and <u>Malagoli, A</u>; "Evidence for Longitudinal Homogeneity and No J(e) Degradation in Bi-2212 Wires Realized by the GDG Process", IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY VOL. 29, NO. 5, AUG 2019, 6400305</li> <li>3. A. Martinelli, E. Bellingeri, A. Leveratto, L. Leoncino, C. Ritter and <u>A. Malagoli</u>, "In situ X-ray and neutron diffraction investigation of Bi-2212 in multifilamentary wires during thermal treatment", Phys. Rev. M., vol. 2, 2018, Art. No. 084801</li> <li>4. Pallecchi I, Leveratto A, Braccini V, Zunino V and <u>Malagoli A</u>, <i>Investigation of inter-grain critical current density in Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+infinity</sub> superconducting wires and its relationship with the heat treatment protocol.</i>, SUPERCONDUCTOR SCIENCE &amp; TECHNOLOGY, vol. 30, 2017.</li> <li>5. A. Leveratto, V. Zunino, I. Pallecchi, V. Braccini, C. Ferdeghini, and <u>A. Malagoli</u> <i>Measurements of Magnetic Field and Temperature Dependence of the Critical Current in Bi-2212 Superconducting Wires</i> IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY VOL. 27, NO. 4, JUNE 2017, 6400303</li> <li>6. D. Contarino, C. Löhner, D. Johrendt, A. Genovese, C. Bernini, <u>A. Malagoli</u>, and M. Putti <i>Development and Characterization of P-doped Ba-122 Superconducting Tapes</i> IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY VOL. 27, NO. 4, JUNE 2017, 7300504</li> </ol> |
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7. A Leveratto, V Braccini, D Contarino, C Ferdeghini and A Malagoli, *New concept for the development of Bi-2212 wires for high-field applications*, Superconductor Science and Technology, 29, (2016), 4
8. G Bovone, D Matera, C Bernini, E Bellingeri, A S Siri, A Malagoli, M Vignolo, *Synthesis temperature effects on ex-situ manufactured MgB<sub>2</sub> wires useful for power applications*, Journal of Alloys and Compounds 660, (2016), Pages 342–346
9. I Pallecchi, M Eisterer, A Malagoli and M Putti, *Application potential of Fe-based superconductors*, Superconductor Science and Technology, Volume 28, Number 11 (2015)
10. A Malagoli, E Wiesenmayer, S Marchner, D Johrendt, A Genovese and M Putti, *Role of heat and mechanical treatments in the fabrication of superconducting Ba<sub>0.6</sub>K<sub>0.4</sub>Fe<sub>2</sub>As<sub>2</sub> ex situ powder-in-tube tapes*, Superconductor Science and Technology, Volume 28, Number 9 (2015)
11. M. Palombo, A. Malagoli, M. Pani, C. Bernini, P. Manfrinetti, A. Palenzona and M. Putti, *Exploring the feasibility of Fe(Se,Te) conductors by ex-situ powder-in-tube method*, J. Appl. Phys. 117, 213903 (2015)
12. Tixador P; Bruzek CE; Vincent B; Malagoli A; Chaud X, *Mechanically Reinforced Bi-2212 Strand*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY 25 (2015) 6400404
13. G Bovone, D Matera, C Bernini, A S Siri, A Malagoli, M Vignolo, *The Influence of Wire Heat Treatment on PIT MgB<sub>2</sub> Conductors Manufactured Using Laboratory-Made Boron*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY 25 (2015) 6200504
14. A Malagoli, V Braccini, M Vignolo, X Chaud, M Putti, *Groove-rolling as an alternative process to fabricate Bi-2212 wires for practical applications*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 27 (2014) 055022
15. G Bovone, M Vignolo, G Romano, A Palenzona, A Malagoli, A S Siri, *Improved Performances of MgB<sub>2</sub> Conductor by Using of Innovative Amorphous and Nano-Structured Boron*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY 23 (2013) 6200504
16. A Morandi, M Breschi, M Casali, M Fabbri, C Ferdeghini, U Gambardella, A Malagoli, S Pace, P L Ribani, G Romano, A Saggese, M Vignolo, *Quench Behavior of MgB<sub>2</sub> PancakeCoil for FCL Applications*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY 23 (2013) 5644004
17. A Malagoli, P J Lee, A K Ghosh, C Scheuerlein, M Di Michiel, J Jiang, U P Trociewitz, E E Hellstrom, D C Larbalestier, *Evidence for length-dependent wire expansion, filament dedensification and consequent degradation of critical current density in Ag-alloy sheathed Bi-2212 wires*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 26 (2013) 055018
18. A Malagoli, C Bernini, V Braccini, G Romano, M Putti, X Chaud, F Debray, *Large critical current density improvement in Bi-2212 wires through the groove-rolling process*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 26 (2013) 045004
19. C Scheuerlein, M Di Michiel, M Scheel, J Jiang, F Kametani, A Malagoli, E E Hellstrom, D C Larbalestier, *Void and phase evolution during the processing of Bi-2212 superconducting wires monitored by combined fast synchrotron micro-tomography and x-ray diffraction*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 24 (2011) 115004
20. A Malagoli, F Kametani, J Jiang, U P Trociewitz, E E Hellstrom, D C Larbalestier, *Evidence for long range movement of Bi-2212 within the filament bundle on melting and its significant effect on J(c)*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 24 (2011) 075016
21. F Kametani, T Shen, J Jiang, C Scheuerlein, A Malagoli, M Di Michiel, Y Huang, H Miao, J A Parrell, E E Hellstrom, D C Larbalestier, *Bubble formation within filaments of melt-processed Bi2212 wires and its strongly negative effect on the critical current density*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 24 (2011) 075009
22. M Vignolo, G Romano, E Bellingeri, A Martinelli, D Nardelli, A Bitchkov, C Bernini, A Malagoli, V Braccini, C Ferdeghini, *In situ high-energy synchrotron x-ray diffraction investigation of phase formation and sintering in MgB<sub>2</sub> tapes*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 24 (2011) 065014
23. A Malagoli, V Braccini V, C Bernini, G Romano, M Vignolo, M Putti, C Ferdeghini, *Study of the MgB<sub>2</sub> grain size role in ex situ multifilamentary wires with thin filaments*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 23 (2010) 025032
24. A Malagoli, C Bernini, V Braccini, C Fanciulli, G Romano, M Vignolo, *Fabrication and superconducting properties of multifilamentary MgB<sub>2</sub> conductors for AC purposes: twisted tapes and wires with very thin filaments*, SUPERCONDUCTOR SCIENCE & TECHNOLOGY 22 (2009) 105017
25. A Malagoli, M Tropeano, V Cubeda, C Bernini, V Braccini, C Fanciulli, G Romano, M Putti, C Ferdeghini, *Study of the Superconducting and Thermal Properties of ex situ GlidCop-Sheathed Practical MgB<sub>2</sub> Conductors*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY 19 (2009) 3670

26. G Romano, M Vignolo, C Bernini, V Braccini, A Malagoli, M Tropeano, C Fanciulli, M Putti, C Ferdeghini, *High-Energy Ball Milling and Synthesis Temperature Study to Improve Superconducting Properties of MgB<sub>2</sub> Ex-situ Tapes and Wires*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY, 19 (2009) 2706
27. M Vignolo, G Romano, A Malagoli, V Braccini, M Tropeano, E Bellingeri, C Fanciulli, C Bernini, V Honkimäki, M Putti, C Ferdeghini, *Role of the Grain Oxidation in Improving the In-Field Behavior of MgB<sub>2</sub> Ex-Situ Tapes*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY 19 (2009) 2718
28. I Pallecchi, C Fanciulli, M Tropeano, A Palenzona, M Ferretti, A Malagoli, A Martinelli, I Sheikin, M Putti, C Ferdeghini, *Upper critical field and fluctuation conductivity in the critical regime of doped SmFeAsO*, PHYSICAL REVIEW B 79 (2009) 104515
29. A Malagoli, V Braccini, M Tropeano, M Vignolo, C Bernini, C Fanciulli, G Romano, M Putti, C Ferdeghini, E Mossang, A Polyanskii, D C Larbalestier, *Effect of grain refinement on enhancing critical current density and upper critical field in undoped MgB<sub>2</sub> ex situ tapes*, JOURNAL OF APPLIED PHYSICS 104 (2008) 103908
30. M Vignolo, G Romano, A Malagoli, V Braccini, C Bernini, M Tropeano, A Martinelli, V Cubeda, A Tumino, M Putti, C Ferdeghini, A S Siri, *Development of MgB<sub>2</sub> powders and study of the properties and architecture of ex-situ PIT wires*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY 18 (2008) 1175
31. V Braccini, A Malagoli, A Tumino, M Vignolo, C Bernini, C Fanciulli, G Romano, M Tropeano, A S Siri, G Grasso, *Improvement of magnetic field behavior of Ex-Situ processed magnesium diboride tapes*, IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY 17 (2007) 2766
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#### International Patents

1. "Method including a heat treatment of manufacturing superconducting wires based on MgB<sub>2</sub> with improved properties in the presence of a static magnetic field", by G Grasso, A Malagoli, Patent Nr. Pct/ep 02/11567, 16/10/2002, Appl. N.US20040492791 20040416.
2. "Superconducting composite wire made from Magnesium Diboride", by G Grasso, A Malagoli, A S Siri, Patent Nr. Pct/it 2004/000437, 30/07/2004, Pub. No. WO2006011170.

