

PERSONAL INFORMATION

Gianrico LAMURA



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male | italian

Enterprise	University	EPR
<input type="checkbox"/> Management Level	<input type="checkbox"/> Full professor	<input type="checkbox"/> Research Director and 1st level Technologist / First Researcher and 2nd level Technologist
<input type="checkbox"/> Mid-Management Level	<input type="checkbox"/> Associate Professor	<input checked="" type="checkbox"/> Level III Researcher and Technologist
<input type="checkbox"/> Employee / worker level	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

WORK EXPERIENCE

Since 01/012005

Researcher

National Research Council of Italy (CNR)

SuPerconducting and other INnovative materials and devices institute (CNR-SPIN)

(INFN Tenure Track researcher from 1/1/05 to 15/2/09, INFN being part of CNR since 2006)

Main research interests and investigation techniques:

Superconductivity

- **Topological superconductivity** by muons spectroscopy (μ SR) and dc magnetization. Compounds: CaSn_3 (published-2022) SnNbSe_2 and $\text{Cu}_x\text{Bi}_2\text{Se}_3$ (ongoing). *Particularly relevant is the case of the CaSn_3 topological semimetal* where we could put in evidence the breaking of the rotational symmetry of the underlying cubic lattice while the time reversal symmetry is preserved. These experimental evidences are indicative of a pairing state in a multidimensional representation indicating such compound as an important example of nematic superconductor. Besides that, this work suggests the possibility that unconventional or simply non-Abrikosov-like vortices could be realized in topological superconductors.
- **Nanostructured superconductors** by DC-Mag and μ SR:
 - ✓ Study of the magnetic properties of thin niobium/permalloy (S/F) heterostructures in view of *SFS Josephson junctions quantum devices*.
 - ✓ layered scandium borocarbide: $\text{Sc}_{20}\text{BC}_{27}$ by μ SR as a function of temperature and applied pressure (0-20 kbar).
 - ✓ Iron based superconductors belonging to 11, 1111 and 122 families as polycrystalline, single crystals and thin film samples by DC-Mag and μ SR.
 - ✓ Graphite intercalation compounds (GICs-IJL, Nancy, France). Additional techniques: resonant cavity (in GHz range) and mutual inductance (RF).
 - ✓ Inductive measurement of the effective first penetration field (BC_1) by third harmonic analysis.

Magnetism

- **Multiferroic magnetic materials** as the Fe-doped $\text{Ca}_3\text{Ru}_2\text{O}_7$ where a novel **skyrmion phase** can be stabilized.
- Heavy Fermions compound $\text{Yb}_2\text{Pd}_2(\text{In}_{1-x}\text{Sn}_x)$ near a **quantum criticality** by μ SR as a function of temperature, pressure and applied magnetic field, by DC-Mag and μ SR.
- Magnetic graphite intercalation compounds (GIC) by DC-Mag and μ SR in collaboration with Dr. C. Hérold and Dr. S. Cahen (IJL, France). Compound: EuC_6 ; frustrated antiferromagnet.
- Pyrochlores by DC-Mag and μ SR in collaboration with Prof. S. Sanna (Università di Bologna), Joost van Duijn (University of Cordoba, Spain) and Carlo Castellano (Università degli Studi di Milano).
- Spectroscopic (Raman Effect) and magnetic (by DC-Mag) properties of carbon nanotubes (CNTs) synthesized by arc discharge, before and after purification in collaboration with Dr. C. Hérold and Dr. S. Cahen (IJL, France).

Replace with First name(s) Surname(s)

- Optimization of NdFeB permanent magnet configurations to improve in-vivo drug delivery for cancer therapy. Magnetic properties of rotaxanes and Fe(II) complexed rotaxanes for Magnetic Resonance Imaging (MRI). Collaboration with Prof. M. Lucarini, University of Bologna. Dc-magnetization (DC-mag) technique.
- Cyclodextrin-Polynitroxides by DC-Mag for MRI applications.
- Ferrites and Fe- or Mn- doped calcium apatite superparamagnetic nanoparticles by DC-Mag for hyperthermia.

December 2001 - January 2003 Pos-Doc at the University of Naples "Federico II".

December 2002 - June 2002 Research Associate: Imperial College, London (Uk).

May 2002 - February 2001 Post-Doc: research grant "section d", INFN, Naples.

EDUCATION AND TRAINING

Dec. 2000 - Sep. 1997

PHD in solid-state physics at Ecole Supérieure de Physique et Chimie Industrielle de la Ville de Paris (ESPCI), Université Paris VI, Paris (France). Title: "Study of low energy excitations by means of magnetic penetration depth measurements in low and high critical temperature superconductors. Marks: "très honorable avec félicitations". Supervisors: Prof. J. Bok and Dr. A. Gauzzi

April 1997 - Sept. 1997.

Training stage at ESPCI, Paris (France).

May 1996 - March 1997

Training stage at Department of Physics, University of Genoa. Research field: biophysics. Supervisor: Prof. A. Gliozzi.

July 1995

Degree in Physics at University of Genoa. Master Thesis (Laurea). Research field: biophysics. Supervisors: Prof. M. Bolognesi, Dr. P. Facci

PERSONAL SKILLS

Mother tongue(s)

Italian

Other language(s)

French: excellent. English: good

Job-related skills

Cryogenics, instrumentations; interfacing.

Digital skills

Os: Debian-Linux and Windows. Programs/software: Labview, Matlab, Origin, Office, Latex, C.

ADDITIONAL INFORMATION

Bibliometric indices

H-index: 21 (<https://www.scopus.com/authid/detail.uri?authorId=55887549700>)

107 documents as author; 1283 citations by 947 documents.

Professorship Habilitations

2020 **Qualification N. 20128160780** as "Pr2" (second class Professorship); **section 28** - "Milieux denses et matériaux" (Condensed Matter physics), French Ministry of National Education; from 07/02/2020 to 31/12/2024

2020 National Scientific Habilitation (**ASN**) for **II class Professorship; section: 02/B1** "Experimental Condensed Matter physics"; Italian Ministry of Education; from 06/07/2020 to 06/07/2029.

Teaching at University

- 2018-2022 Contract Professor for the course of Superconductivity (10 h - co-teaching with Prof. M. Putti), Department of Physics, University of Genoa (UG).
- 2016-2022 Contract Professor for "General physics I" (electromagnetism), Pleasure Craft Engineering, UG, Polo G. Marconi, La Spezia.
- 2016-2018, Assistant of Prof. M. Putti for "Classical mechanics". Chemical and Electrical Engineering, UG.
- 2012-2018, Assistant of Prof. A. S. Siri for "Electromagnetism". Chemical and Electrical Engineering, UG.
- 2012-2015, Assistant of Prof. M. Putti for "Classical mechanics and electromagnetism", Informatics, UG.
- 2008-2007 Contract Professor for "General physics I" (Classical Mechanics and thermodynamics), Mechanical and Naval Engineering, University of Naples, Federico II (UNFII).
- 2006-2005 Contract Professor for "General physics I" (Classical Mechanics and thermodynamics), Informatics Engineering, UNFII.
- 2009-2003 Assistant of Prof. A. Andreone for the "General physics I" (Classical Mechanics, thermodynamics and electromagnetism), Informatics Engineering, UNFII.
- 1998-1997 Contract Professor for "Laboratory of physics" (first year course), Faculty of "Science et Technologie", former Université Paris XII-Val de Marne (Paris Est)

Supervisor (Thesis - Stages)	<ul style="list-style-type: none"> ✓ 2016 Research stage tutor for Alice Bach. "MASTER-1" (Polytech Paris-UPMC). ✓ 2016 Co-Tutor for Silvia Vita's Master Thesis in Chemical Sciences. Chemistry Department, UG. ✓ 2016-2013 Co-tutor for F. Cagliaris's PhD thesis work, Physics Department, UG. ✓ 2007-2008 Co-tutor for two masters in Information-Communication Engineering, UNFII. ✓ 2006 Tutor. Project for student training, UNFII. ✓ 2003 Master in Electronic engineering, UNFII.
Member of jury at University	<ul style="list-style-type: none"> ○ 01/07/2016 Jury for the "Habilitation à Diriger des Recherches" (HDR) en "Chimie" de l'Université de Lorraine. S. Cahen. ○ 31/03/2011 Jury for HDR. Chemistry, University of Nancy, (France). B. Vigolo. ○ 18/03/2011 Jury for the PhD Degree in "Physique et Chimie de la Matière et des Matériaux" (PCMM). Chemistry, University of Nancy, (France). H. Rida. ○ 25/09/07 Jury for the PhD Degree in PCMM, University of Nancy, (France). N. Emery.
Invited Professor/Researcher	<ul style="list-style-type: none"> i) CNR "Short Term Mobility-2020" (STM) grant. "superconductivity in ternary carbon based materials". IJL-Nancy, France. October 2021. ii) CNR STM. "Electronic phase diagram of $\text{Yb}_2\text{Pd}_2(\text{In}_{1-x}\text{Sn}_x)$ heavy fermion compound". Faculty of Humanities and Natural Science, Prešov University, Prešov, Slovak Republic. January 2017. iii) Invited Prof. at IJL, University of Lorraine, France. Duration: one month. Equipe 205 directed by Dr. C. Hérold. Periods: from 2010 to 2016. iii) Invited researcher at the University of Nancy, France. Duration: one month. Equipe 205 directed by Dr. C. Hérold. Periods: from 2008 to 2009.
Measurements in International Facilities	<p><u>Accepted proposals for μSR at Paul Scherrer Institute, Villigen, Switzerland (PSI):</u></p> <ul style="list-style-type: none"> (i) superconductivity versus applied pressure in carbon based layered compounds ($\text{Sc}_{20}\text{BC}_{27}$); (ii) superconductivity in hydrogen-doped 1T-TiSe_2 single crystals (20202502); (iii) Topological superconductivity in $\text{Cu}_x\text{Bi}_2\text{Se}_3$ (20211394), SnNbSe_2 (20202496) and CaSn_3 (20190248); (iv) Properties of the multiferroic magnetic materials Fe-doped $\text{Ca}_3\text{Ru}_2\text{O}_7$ (20192068); (v) Bi-based layered superconductors (20121675); (vi) Magnetic properties $\text{Dy}_2\text{Ru}_2\text{O}_7$ and $\text{Yb}_2\text{Ru}_2\text{O}_7$ pyrochlores (20161033) and of $\text{Yb}_2\text{Pd}_2\text{In}_{1-x}\text{Sn}_x$ heavy fermion (20161632, 20152171, 20152102, 20150987, 20141777, 20141776); (vii) iron based superconductors (20141880, 20131761, 20130786, 20121709, 20120795, 20111569, 20101494, 20101439, 20100699, 20091439, 20091438, 20090625, 20081438, 20080683, 20080681). (viii) Irradiated HOPG: 20081413. (ix) GICs: EuC_6 and Li_xEuC_4 (magnetic) 20071252; CaC_6 and $\text{Li}_3\text{Ca}_2\text{C}_6$ (superconducting) 20071162.
Seminars	12 seminars presented in different universities.
Talks and posters at International Conferences	12 talks and 54 posters presented at international meetings/conferences/workshops
Reviewer for peer-reviewing journals	<ul style="list-style-type: none"> ○ American Physical Society (APS): Physical Review Letters, Physical Review B. ○ Institute of Physics (IOP): Journal of Physics: condensed Matter, New Journal of Physics. ○ Elsevier: Journal of Alloys and Compounds.
Editorial/Conference Committees	<ul style="list-style-type: none"> • Member of the local Committee of $\mu\text{SR}2020$ conference (reported to 2021 because of Covid-19 pandemic emergency). • International Advisory Committee member of "$\mu\text{SR}2014$" conference. https://indico.psi.ch/event/2039/page/230-committees. • "Guest Editor" for the section "Electronics" of 11th European Conference on Applied Superconductivity (EUCAS2013).
Participation to financed projects	<ul style="list-style-type: none"> ✓ Subcontracting within EU project N. 720834 (H2020-NMBP-2016), CUPIDO (www.cupidoproject.eu). ✓ Coordinator of Work Package 2 (Advanced characterization) for FP7 project. n. 283204 (SUPER-IRON). Title: "Exploring the potential of Iron-based Superconductors" (NMP.2011.2.2-6 NMP). Coordinator: Prof. Marina Putti. ✓ PRIN 2008: "Alta Tc nei superconduttori a base di Fe: una nuova sfida per la ricerca". National coordinator: Prof. Marina Putti, UG. prot. 2008XWLF9. ✓ PRIN 2004-2006: National coordinator: Prof. Marina Putti, University of Genoa.

Publications (last four years)

The five publication relevant to Spoke-5 are highlighted in bold

1. Siddiquee H, ..., Lamura G, *et al.*, "**Nematic superconductivity in the topological semimetal CaSn₃**", *Phys. Rev. B*, vol. 105, 094508 (2022).
2. Lamura G, *et al.*, " **μ SR investigation of the Fe-doped Ca₃Ru₂O₇ polar metal**", *J. of Mag. and Magn. Mat.*, 551, 169138 (2022).
3. M. Meineri, ...and G. Lamura, "**Mn-induced Fermi-surface reconstruction in the SmFeAsO parent compound**" *Scientific Reports* 11, 14737 (2021).
4. R. Satariano, ..., G. Lamura, *et al.*, "**Inverse magnetic hysteresis of the Josephson supercurrent: Study of the magnetic properties of thin niobium/permalloy (Fe₂₀Ni₈₀) interfaces**" *Phy. Rev. B*, 103, 224521 (2021).
5. C. Castellano, ..., G. Lamura et al., *Journal of Alloys and Compounds*, 865, 158958 (2021).
6. A. Omelyanchik, G. Lamura, et. al., *Journal of Magnetism and Magnetic Materials*, 522, 167491 (2021).
7. S. Cahen, I. El-Hajj, ...G. Lamura, , C. Hérold, *New Journal of Chemistry*, 44, 100505 (2020).
8. L. Melone, A. Bach, G. Lamura et al., *ChemPlusChem*, 85, pp. 1171 (2020).
9. E. Villa, ..., G. Lamura, F. Canepa, *Journal of Materials Research and Technology*, 9, 2259 (2020).
10. **G. Lamura, et al., "Pressure-induced antiferromagnetic dome in the heavy-fermion Yb₂Pd₂In_{1-x}Sn_x system" *Phys. Rev. B* 101, 054410 (2020).**
11. Adamiano,....., G. Lamura et al., *Nanomedicine (Lond.)* 14, 1267 (2019).
12. M. Meineri, G. Lamura, ..., *Journal of J. Phys.: Condens. Matter* 31,214003 (2019).
13. M.Y. Hacisalihoglua, ... G. Lamura et al., 134, 319 (2019).
14. A Martinelli, S Sanna, G Lamura et al., *J. Phys.: Condens. Matter* 31, 385802 (2019).
15. M. Bolmont ... G. Lamura, P. Lagrange and C. Hérold, *Carbon* 133, 379 (2018).
16. M. Meineri, F. Caglieris, G. Lamura, et al., *Phys. Rev. B* 98, 155116 (2018).
17. R. Kappenberger, ..., G. Lamura, et al., *Phys. Rev. B* 97, 054522 (2018).
18. Pallecchi,, G. Lamura, ..., *Phys. Rev. Mat.* 2, 075403 (2018).

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV.

Genova, 13th April 2022

Gianrico Lamura

