

CURRICULUM VITAE

SURNAME AND NAME	Ummarino Giovanni
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E-mail address	giovanni.ummarino@polito.it
Nationality	Italian
Birth date	25/04/1965, married with a daughter

Academic Recruitment Field (" <i>Settore Concorsuale</i> ")
02/B2

Academic Position	
Qualification/Title	Associate professor
University	Politecnico di Torino
Department	Dipartimento di Scienza Applicata e Tecnologia DISAT
Academic Recruitment Field (if the candidate holds a position in an Italian University, she/he should insert the " <i>Settore Concorsuale</i> ")	02/B2
Academic Discipline (formally named " <i>Settore Scientifico Disciplinare</i> ", only for candidates who hold a position in an Italian University)	FIS/03

Working experience

Dates	From 01/01/1997 to 31/12/1998
Name and address of the Employer (Public or/and private institution/body)	Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino (Italy)
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department; in case of Italian Universities the candidate is also requested to indicate the "Settore Scientifico Disciplinare")	Post doctorate fellowship. Title: Tunneling spectroscopy and coupling mechanism in HTCS
Main activities/responsibilities	I worked in the group of Professor Renato Gonnelli in Physics Department of Politecnico di Torino. I was the theoretician of the group and I elaborated models for explaining the experimental results of my group in the field of superconductivity. I worked also in the numerical solution of Eliashberg equations and in the formal generalization of this theory at cuprate superconductors.
Dates	From 01/01/2000 to 31/12/2003

Name and address of the Employer (Public or/and private institution/body)	INFM, Corso F. M. Perrone 24 - 16152 Genova (Italy)
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department; in case of Italian Universities the candidate is also requested to indicate the "Settore Scientifico Disciplinare")	Researcher
Main activities/responsibilities	I keep on the previous work but also I studied the formal generalization and numerical solution of Eliashberg equations for describing the new superconductor MgB ₂ and in general a multiband superconductor.
Dates	From 01/01/2004 to 31/05/2016
Name and address of the Employer (Public or/and private institution/body)	Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino (Italy)
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department; in case of Italian Universities the candidate is also requested to indicate the "Settore Scientifico Disciplinare")	Assistant professor, researcher Department of Physics (up to 2012), Department of Applied Science and Technology (2012 – now) SSD: FIS/03
Main activities/responsibilities	I continue to work in the group of Professor Renato Gonnelli and I collaborate also with international institutions as the European Commission, Joint Research Center, Institute for Transuranium Elements, Postfach 2340, D-76125 Karlsruhe, Germany (prof R. Caciuffo) on transuranic superconducting materials (PuCoGa and NpPdAl). I continue in the generalization of Eliashberg theory to explain the experimental results for the new superconductors discovered in 2008 (iron pnictides). My last interest is on effect of electric fields on critical temperature of a superconductor.
Dates	From 01/06/20016 to today
Name and address of the Employer (Public or/and private institution/body)	Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino (Italy)
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department; in case of Italian Universities the candidate is also requested to indicate the "Settore Scientifico Disciplinare")	Associate Professor of Theoretical Physics of Matter Department of Applied Science and Technology SSD: FIS/03
Main activities/responsibilities	I continue in the generalization of Eliashberg theory to explain the experimental results for the new superconductors discovered in 2008 (iron pnictides) and on effect of electric fields on critical temperature of a superconductor.

Education and Training

Date	April 2017
Institution which issued the degree	ASN
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Abilitazione Scientifica Nazionale per il settore concorsuale 02/B2 Professore di Prima Fascia
Date	December 2013
Institution which issued the degree	ASN
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Abilitazione Scientifica Nazionale per il settore concorsuale 02/B2 Professore di Seconda Fascia
Date	July 1997
Institution which issued the degree	Politecnico di Torino
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	PhD in Physics Dissertation: "Tunnel spectroscopy and Josephson effect in high- T_c superconductors" Supervisor: Prof. R.S. Gonnelli (Politecnico di Torino)
Date	July 1992
Institution which issued the degree	Ministero Pubblica Istruzione
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Abilitazione Scuole Superiori, Classe di Concorso XLIV-FISICA (decreto ministeriale del 23 marzo 1990)
Date	October 1989
Institution which issued the degree	Università di Torino
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Master of Science's Degree in Physics Dissertation: "Determination of the upper bound of the photon mass by light deflection in a gravitational field" Supervisor: Prof. E. Predazzi (Università di Torino)

INTERNATIONAL REFEREES

<i>Name</i>	<i>Institution of origin</i>	<i>Address</i>	<i>e-mail address (compulsory)</i>
Eva Pavarini	Institute for Theoretical Nanoelectronics (PGI-2) and Institute for Advanced Simulations (IAS-3)	Forschungszentrum Jülich GmbH Wilhelm-Johnen-Straße 52428 Jülich Germany	e.pavarini@fz-juelich.de
Andrey Varlamov	SPIN-CNR (Institute for Superconductivity and Innovative Materials of the Italian National Research Council)	Via del Politecnico 1, 00133, Roma, Italy	varlamov@ing.uniroma2.it andrey.varlamov@spin.cnr.it
Lara Benfatto	ISC-CNR c/o Department of Physics Sapienza University of	P.le A. Moro 5, 00185 Rome Italy	lara.benfatto@isc.cnr.it

	Rome		
Frank Marsiglio	University of Alberta Faculty of Sciences Department of Physics	Edmonton, Alberta Canada T6G 2E9	frank.marsiglio@ualberta.ca

EVALUTATIONS FIELDS

1) SCIENTIFIC ACTIVITY

I have a wide knowledge, mainly theoretical, of condensed matter physics and in particular superconductivity, a long and deep experience in numerical solution of complex integral-differential coupled equations and knowledge of the related technicalities and proved skills in the interpretation of experimental data from point-contact spectroscopy, Josephson effect, specific-heat measurements, microwave absorption, resistivity measurements, etc. within different theories for superconductivity (e.g. Ginzburg-Landau, BCS, Eliashberg). I used the Eliashberg theory and study its appropriate generalizations for explaining the properties of different strategic superconductive materials as HTCS, multiband phononic superconductors, PuCoGa₅ and Iron arsenide antiferromagnetic s+-wave multiband superconductors

I wrote 143 articles in an international journal with impact factor

I can count among my papers 1 Nature Comm, 1 Report on Progress in Physics, 8 PRL, 2 Sci Rep, 1 EPJ C, 1 Applied Physics Letters, 25 PRB, 1 Physics Letters B-

Future perspectives

In the theoretical field I will keep on the research on iron-arsenides superconductor as so other different superconducting materials but, in recent years, I have also begun to be interested in the effects of intense electric fields on the properties of superconductors (critical temperature) and the interaction between gravitational field with a superconductive or superfluid condensate.

I wrote already more than ten papers on these last two topics.

2) COORDINATION OF RESEARCH AND TECHNOLOGY TRANSFER GROUPS AND PROJECTS

2.1) ACADEMIC SUPERVISION

I have been referee of Master's degree theses in Politecnico di Torino and in TTPU of Tashkent, as well as tutor of 1 PhD students in Physics: Sara Galasso, "Generalization of the Eliashberg equations and Density Functional Theory applied to the analysis of the fundamental properties of iron-based superconductors" (XXVII Ciclo, Dottorato in Fisica 2014, Politecnico di Torino).

I am referee of the more important scientific journals on topic of superconductivity as Physical Review Letters, Physical Review B, SUST, J. Phys.: Condens. Matter, Physica C etc.

2011-today Member of the teaching staff of the Ph.D. School of the Politecnico di Torino

2.2) NATIONAL AND INTERNATIONAL COLLABORATIONS

During the past 24 years I got in touch and have subsequently established strong relations of cooperation with various international and national institutions and groups. The most relevant are listed below. The vast majority of them are still collaborators and partners of my current research activities.

- International

- 1) P.N. Lebedev Physical Institute, Russian Academy of Sciences, Moscow, Russia (S.I. Vedeneev, V.A. Stepanov)
- 2) Institut für Festkörper-und-Werkstofforschung Dresden, Dresden, Germany (Kazumasa Iida, S.-L. Drechsler and S.V. Shulga)
- 3) Max-Planck Institut für Festkörperforschung, Stuttgart, Germany (J. Jens)
- 4) Eberhard-Karls-Universität Tübingen, Tübingen, Germany (O.V. Dolgov)
- 5) ETH di Zurigo, Zurigo, Svizzera (J. Karpinsky)
- 6) Ecole Polytechnique Federale de Lausanne, Departement de Microtechnique IPM, 1015 Lausanne, Switzerland (C. Grimaldi)
- 7) Laboratoire Leon Brillouin, CEA-CNRS, CE Saclay, 91191 Gif-sur-Yvette, France (A.H. Moudden)
- 8) European Commission, Joint Research Center, Institute for Transuranium Elements, Postfach 2340, D-76125 Karlsruhe, Germany (R. Caciuffo)
- 9) Universiteit Twente, Faculty of Science and Technology, Enschede, Netherlands (A.A. Golubov)
- 10) Max-Planck-Institut für Mikrostrukturphysik, Weinberg 2, D-06120 Halle, Germany (A. Sanna)
- 11) National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia (Yurii Aleshchenko)
- 12) Karlsruher Institut für Technologie, Institut für Festkörperphysik, D-76021 Karlsruhe, Germany (R. Heid)

- National

- 1) Istituto MASPEC del CNR, Parma, Italia (Francesca Licci)
- 2) Dipartimento di Chimica e Chimica Industriale, Università di Genova, Genova, Italia (M. Ferretti)
- 3) Edison S.p.A., Milano, Italia (G. Giunchi)
- 4) Dipartimento di Fisica, Università di Roma "La Sapienza", Roma, Italia (E. Cappelluti, A. Bianconi)
- 5) Dipartimento di Fisica, Università di Cagliari, Italia (S. Massidda)
- 6) Dipartimento di Fisica, Università dell'Aquila, Italia (G. Profeta)

2.3) Scientific responsibility of competitive National and International research projects, awarded through a peer-review process.

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| 1998-2000 | PRA project "Spectroscopic studies of the pseudo-gaps in underdoped high temperature superconductors", INFN |
| 2002-2004 | PRA project "Understanding MgB ₂ : Research and Applications", INFN |
| 2002-2005 | INTAS project "Charge transport in diboride thin films and heterojunctions", CEE |
| 2002-2003 | ASI project "MgB ₂ -based Josephson junctions for space applications of superconducting microwave detectors", ASI |
| 2003-2005 | FIRB project "Superconducting nanoelectronics of metaldiboride heterostructures", MIUR |
| 2003-2004 | PAIS project "Local lattice distortions and electronic inhomogeneities in short coherence length superconductors", INFN |
| 2004-2006 | PRIN project "Two-gap superconductivity in MgB ₂ : role of disorder", MIUR |
| 2006-2008 | PRIN project "Multiband superconductivity: MgB ₂ and beyond", MIUR |
| 2007-2009 | INNESCO project "Electric-field modulation of superconductivity in MgB ₂ films on suspended SiN membranes", CNISM |
| 2008-2012 | PRIN "Alta Tc nei superconduttori a base di Fe: una nuova sfida per la ricerca", MIUR |
| 2011-2014 | FP7-NMP-2011-EU-Japan collaborative project "IRON SEA Establishing the basic science and technology for Iron-based superconducting electronics applications" |

2) NATIONAL AND INTERNATIONAL REPUTATION AND PROFESSIONAL ACTIVITY FOR THE SCIENTIFIC COMMUNITY

3.1) Official research and/or teaching and/or fellowship roles, positions as Scholar/ Visiting Professor in international highly qualified universities and research centres.

2012-today Professor of Physics II (Mechanical engineering) TTPU Tashkent (Uzbekistan)

2015-today Professor of Physics I (Mechanical engineering) TTPU Tashkent (Uzbekistan)

2015-today professor of Ph.D lectures at National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia

3.2) PRIZES AND AWARDS

- a) At the 6th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors (20-25/02/00 Houston, Texas USA) I won the price for “Young Investigator Travel Awards” with the work: “s- and d-wave solution of Eliashberg equations with finite bandwidth”.
- b) One my paper had the cover of *Symmetry*, Volume 11, Issue 11 (November 2019)

c) INVITED REVIEW ARTICLES

In the last twelve years our scientific activity received a large international recognition proved, for example, by the two invited review articles in the Topical Issues of Physica C on MgB₂ (Physica C 385, 2003 and Physica C 456, 2007). Recently we have written three invited review articles on point-contact Andreev-reflection spectroscopy in Fe based superconductors (Physica C 469, 2009; Rep. Prog. Phys. 74, 2011; Supercond. Sci. Technol. 25, 2012). The paper in Rep. Prog. Phys., in particular, is very prestigious because it is the only contribution to this International Special Issue on Fe-based superconductors coming from an Italian group (3 in total from Europe). I wrote also a review of Eliashberg theory for the Autumn School “Emergent Phenomena in Correlated Matter” in Julich (Germany), organised by Forschungszentrum Julich and the German Research School for Simulation Science 23-27 September 2013 (“Eliashbeg theory”, “Emergent Phenomena in Correlated Matter” edited by Eva Pavarini, Erik Koch and Ulrich Schollwock, published by Forschungszentrum Julich GmbH and Institute for Advanced Simulations, 23-27 September 2013 Volume 3, Pag 13.1-13.36,ISSN 2192-8525 ISBN 978-3-89336-884-6). We have written a chapter: “Andreev Reflection and Related Studies in Low-Dimensional Superconducting Systems”, in the book: “The Oxford Handbook of Small Superconductors” edited by A.V. Narlikar, Part I: Basic Studies, chapter 5, ISBN: 9780198738169. Finally we wrote a paper “Decoupling of critical temperature and superconducting gaps in irradiated films of Fe-based superconductor” in the special issue “Focus on Irradiation Effects in Superconductors”, edited by Michael Eisterer Ruslan Prozorov and Marina Putti, published on Supercond. Sci. Technol 31, 2018. In total we wrote eight invited review papers.

3.4) ORGANIZATION OF CONFERENCES AND WORKSHOPS

I was among the organizers of the 7th National Conference of high T_c superconductivity (SATT7, Turin October 4-7, 1994) and among the organizers of 3rd edition of SuperFox, Conference on Superconductivity and Functional Oxides (Turin, September 19-21, 2016)

4) SUMMARY UNIVERSITY TEACHING ACTIVITIES

- 1) Politecnico di Torino, Turin (Italy)
- 2) TTPU Tashkent (Uzbekistan)
- 3) National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, (Russia)
- 4) Forschungszentrum Jülich, Germany

Formal responsibility of PhD courses in Italian and/or foreign universities

Politecnico di Torino

- A.A. 2006/07 Professor of Superconductivity and Eliashberg theory (Ph.D lectures)
- A.A. 2006/07 Professor of Many body theory: the Green functions formalism (Ph.D lectures)
- A.A. 2007/08 Professor of Superconductivity and Eliashberg theory (Ph.D lectures)
- A.A. 2007/09 Professor of Many body theory: the Green functions formalism (Ph.D lectures)
- A.A. 2008/09 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2009/10 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2010/11 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2011/12 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2012/13 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2013/14 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2014/15 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2016/17 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2018/19 Professor of Physics of Superconductivity (Ph.D lectures)
- A.A. 2020/21 Professor of Physics of Superconductivity (Ph.D lectures)

Foreign universities

- A.A. 2013/14 Professor of Eliashberg Theory (Ph.D lectures at Autumn School on Correlated Electrons: Emergent Phenomena in Correlated Matter 23-27 September 2013, Forschungszentrum Jülich, Germany)
- A.A. 2015/16 Professor of Theory of Superconductivity (Ph.D lectures at National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia)
- A.A. 2016/17 Professor of Theory of Superconductivity (Ph.D lectures at National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia)
- A.A. 2017/18 Professor of Theory of Superconductivity (Ph.D lectures at National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia)
- A.A. 2018/19 Professor of Theory of Superconductivity (Ph.D lectures at National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia)
- A.A. 2019/20 Professor of Physics of Superconductivity (Ph.D lectures) Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia)
- A.A. 2020/21 Professor of Physics of Superconductivity (Ph.D lectures) Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia)

In last year I have more than 520 students in the 2 courses of Physics II of Politecnico di Torino and more or less 1200 students in the two courses (Physics I and Physics II) in TTPU of Tashkent (Uzbekistan) and in the previous years I had more than 600 students in Turin.

5) Institutional offices and roles in Italian and foreign Universities and/or public and private institutions with scientific and/or technology transfer aims

- 1. 2007-today Captain of the Engineers Corps in the Selected Reserve of Italian Army
As part of the Voluntary Completion Forces, for the sole category of Officers, the Italian Army has launched the "Selected Reserve" project in order to have a pool of personnel - men and women - in possession of particular professional skills of interest not fully available within the same to meet any operational, training and logistics needs.**
2. Evaluation Committee Member in the evaluation Process for a place of researcher in "Settore concorsuale FIS 03", committee president prof. Attilio Rigamonti, November 2009 Pavia.
3. 2011-today Member of the teaching staff of the Ph.D. School of the Politecnico di Torino.
4. Evaluation Committee President, PhD in Physics, Final Dissertation, Politecnico di Torino, Torino, 9 February 2012.
5. Evaluation Committee President, PhD in Physics, Final Dissertation, Politecnico di Torino, Torino, 16 March 2017
6. Evaluation Committee Member, PhD in Physics, Final Dissertation, Politecnico di Torino, Torino, 22 May 2017
7. Evaluation Committee Member, PhD in Physics, Final Dissertation, Politecnico di Torino, Torino, 24 October 2017
8. Evaluation Committee Member, PhD in Physics, Final Dissertation, Politecnico di Torino, Torino, 13 February 2018
 9. Contribution to the creation of a database for the Physics entrance test for Politecnico students (2018)
 10. Member of the editorial board of the journal "Magnetochemistry" and Guest Editor for the special issue "Superconductivity and Magnetism" (2019)
 11. A class B proposals has been accepted by ISCRA procedure (2019).
12. Evaluation Committee Member, PhD in Physics, Final Dissertation, Politecnico di Torino, Torino, 14 October 2020

Torino 21/01/2021

Signature

