Curriculum vitae, Prof. Dr Angelo Di Bernardo

English version (last updated on 17th March 2024)

PERSONAL DETAILS

Family name, First name	Di Bernardo, Angelo
Nationality	Italian (primary), English (acquired citizenship)
Phone	+39 344 52 13986 (mobile)
Email	adibernardo@unisa.it or angelo.dibernardo@uni-konstanz.de
Date and place of birth	18-06-1987 – Naples, Italy
Italian fiscal code	DBRNGL87H18F839K
Researcher identifiers	Orcid ID: 0000-0002-2912-2023; Scopus ID: 55262979800
Research parameters (to February 2024)	Total times cited: **700** (Scopus) Total times cited without self-citations: **654** (Scopus) Average number of citations per year (since 2014): **70** h-index: **13** (Scopus)
URL for group website	https://www.dibernardo.uni-konstanz.de/ https://docenti.unisa.it/063974/home
Google Scholar	https://scholar.google.com/citations?user=z8-1ck4AAAAJ&hl=en

PROFESSIONAL POSITIONS

Title	**Associate Professor**
Scientific sector	Experimental condensed matter Physics (FIS/03).
Dates (from – to)	01/05/2023 – present
Place	University of Salerno, Department of Physics, Salerno, Italy
Role description	Associate Professor in the field of condensed matter Physics, doing research in the field of low-temperature Physics, nanomaterials and quantum material hybrids, nanotechnologies, novel devices for superconducting electronics and quantum computing. Teaching at the undergraduate level.

Title	**Joint (temporary) affiliation with University of Konstanz**
Scientific sector	Experimental condensed matter Physics (equivalent to Italian FIS/03, FIS/01).
Dates (from – to)	01/05/2023 – 31/08/2024 (currently planned)
Place	University of Konstanz, Department of Physics, Konstanz, Germany
Role description	Supervising students from own research group until Ph.D. graduation, writing scientific articles based on the results obtained by the research group.

Title	**Associate Professor (W2 Professor in Germany)**
Scientific sector	Experimental condensed matter Physics (equivalent to Italian FIS/03, FIS/01).
Dates (from – to)	01/08/2020 – 30/04/2023
Place	University of Konstanz, Department of Physics, Konstanz, Germany
Role description	Associate Professor with expertise in the field of condensed matter Physics, with focus on mesoscopic and low-temperature Physics, nanomaterials,

nanotechnologies, innovative devices for quantum computing. Teaching at the graduate and postgraduate (i.e., master and Ph.D.) degree level.

Title	**Sofja Kovalevskaja Research Group Leader**
Scientific sector	Experimental condensed matter Physics (equivalent to Italian FIS/03, FIS/01).
Dates (from – to)	01/10/2019 – 30/04/2023
Place	University of Konstanz, Department of Physics, Konstanz, Germany
Role description	Has led a group of researchers (counting up to 11 members) working on the fabrication of materials systems as well as on the engineering and testing of devices based on them for superconducting spintronics and superconducting electronics applications.

Title	**Junior Research Fellow**
Scientific sector	Experimental condensed matter Physics (equivalent to Italian FIS/03, FIS/01).
Dates (from – to)	01/10/2016 – 30/09/2019
Place	University of Cambridge, Department of Materials Science, Cambridge, UK
Role description	Most competitive position that can be taken at the University of Cambridge, within the first two years after the completion of the Ph.D. degree. The position allowed to carry out a research project of 3 years with complete academic independence (i.e., without any supervisor) and also provided a limited budget for consumables and travelling.

EDUCATION

Ph.D. degree, University of Cambridge, UK

Final grade	Passed the final 'viva voce examination' **without corrections** to the Ph.D. thesis. This result is considered as a rare and outstanding recognition at the University of Cambridge (less than 1% Ph.D. degrees are awarded in Cambridge with such final grade).
Dates (from – to)	01/10/2012 – 30/09/2016 (1 year M.Sc. followed by three years of Ph.D. research as part of the NanoDTC Ph.D. programme).
Awarding institution	University of Cambridge, Cambridge, UK
Ph.D. research area(s)	Condensed Matter Physics, Materials Physics, Nanoscience.
Thesis title	Unconventional superconducting states at superconductor interfaces.
Supervisor	Prof. Jason Robinson.
Thesis abstract	This Ph.D. thesis reports experimental results demonstrating evidence for the emergence of unconventional superconducting states at the interface between superconductors and other magnetic and non-magnetic materials like graphene. Exploiting the superconductor/ferromagnet (S/F) proximity effect, a S/F_1/F_2 (Nb/Co/Py) pseudo spin-valve is fabricated for which a variation of the superconducting critical temperature, ΔT_c, of ~120 mT is observed between the parallel-aligned and misaligned magnetization orientations of the two F layers due to the generation of long-ranged spin-triplet Cooper pairs. Fabricating both metallic and metal-oxide S/F heterostructures and performing scanning tunnelling microscopy (STM) and scanning tunnelling spectroscopic (STS) measurements in the superconducting state, spectral signatures for the generation of odd-frequency spin-triplet states at the S/F interface are found. In particular, our STM work on a metallic crystalline Nb/Ho heterostructure shows that the spin-triplet states induced in the S (Nb) layer can be tuned by properly controlling the degree of magnetic inhomogeneity in the F (Ho) layer. Low-energy muon spectroscopy measurements carried out on a Au/Ho/Nb multilayer thin film show an inverse (paramagnetic) Meissner effect induced in the Au layer by spin-triplet pairing correlations. This result suggests that

	the diamagnetic Meissner state is not a hallmark signature of superconductivity, but there exist unconventional superconducting states which can attract other than expel magnetic flux. This Ph.D. thesis also reports a tunneling spectroscopy study on single-layer graphene (SLG) in proximity coupling with a high-temperature *d*-wave superconductor (PCCO), where spectroscopic signatures for unconventional *p*-wave superconductivity triggered in SLG are found.
Scientific outcome	The work carried out as part of the thesis resulted in 8 scientific manuscripts in peer-reviewed journals (Paper No. 1-6, 9-10 from the list below), of which 3 were published as first contributing author. The first-author papers have all been published in high-impact factor (high-IF) journals (two in Nature Communications and one in Physical Review X). The importance of this thesis work for the field of superconducting spintronics has been acknowledged by three prestigious awards in the research field of superconductivity: the international IEEE Fellowship Award, the ESAS Prize for Young Researchers and the IOP Brian Pippard Prize.

M.Sc. degree, Arizona State University, USA

Final grade	Final graduate point average (GPA): 4.0/4.0
Dates (from – to)	01/09/2011 – 14/08/2012
Awarding institution	Arizona State University, Tempe, Arizona, USA
Final project	Project title 'Magnetic core-shell nanoparticles: electronic properties and thermal hysteresis effects.' Supervisor: Prof. Vladimiro Mujica.
Further details	The Master's degree programme was supported by a prestigious Fulbright Self-Placed scholarship – which was one of the three Fulbright Self-Placed scholarships awarded in Italy in the academic year 2021/2022. 11 courses and corresponding exams were undertaken as part of this master in subjects including Quantum Physics, Nanocharacterisation, Nanofabrication, Biophysics. The final project was carried out in the field of Physical Chemistry using time-dependent density functional theory (TD-DFT). The results of the thesis work were published in a Proceeding article for the 6th European Conference on Antennas and Propagation (EuCAP 2012).

Second Cycle Degree (M.Sc.) in Bioengineering, University of Naples, Italy

Final grade	110/110 cum laude; average exam grade: 29.91/30 (7 of 18 exams were awarded the grade 30 cum laude)
Dates (from – to)	1712/2008 – 23/02/2011
Awarding institution	University of Naples Federico II, Naples, Italy
Final project	The thesis project was carried out in the field of Electromagnetism with title 'On the optimal choice of exposure conditions and nanoparticle features in magnetic nanoparticle hyperthermia.' Supervisor: Prof. Mario Ovidio Bucci.

First Cycle Degree (M.Sc.) in Bioengineering, University of Naples, Italy

Final grade	110/110 cum laude; average exam grade: 29.83/30 (11 of 32 exams were awarded the grade 30 cum laude).
Dates (from – to)	01/09/2005 – 16/12/2008
Awarding institution	University of Naples Federico II, Naples, Italy
Final project	The thesis project was carried out in the field of Electromagnetism with title 'Evaluation of a measurement system for wideband spectrometry of ferrofluids for biomedical applications.' Supervisor: Prof. Mario Ovidio Bucci.
Further details	Graduated as the best student in the entire Engineering Department (i.e., across all Engineering subjects) with the highest average grade. Was awarded

the Guglielmo D'Ambrosio prize from the University of Naples Federico II for this achievement.

HONOURS AND AWARDS

Nicholas Kurti Science Prize for Europe 2022

Awarded by	International committee of senior academics, with financial support of Oxford Instruments
Month and year	September 2022
Details	Prestigious prize (8,000 €) awarded yearly to a European researcher working in the research field of low-temperature Physics.
Motivation	"*The Award recognises Di Bernardo's achievements in the spectroscopy of spin-polarised (spin-triplet) states in superconductor/ferromagnet hybrids and for the discovery of new coupling effects and quantum phases existing at the surfaces and interfaces of strongly-correlated electron materials and materials with low dimensionality*." (source: Oxford Instrument press release[1]).

Sofja Kovalevskaja Award 2019

Awarded by	Alexander von Humboldt Foundation, after evaluation of research proposals by referees from the applicant's research field.
Month and year	April 2019 (announcement date).
Details	One of six awards (out of several hundred applications) given in Germany in 2019 to an international researcher from any research fields or disciplines. The Sofja Kovalevskaja award is considered as Germany's most highly endowed research award (1.65 Million €) for early-career scientists, and it is conferred by the Alexander von Humboldt Foundation.
Motivation	Award given to establish and lead an independent research group working in the field of superconducting spintronics at the University of Konstanz (sources: press release[2] from the University of Konstanz and Alexander von Humboldt page[3]).

IOP Brian Pippard Prize 2019

Awarded by	Committee of academics nominated by the UK Institute of Physics (IOP)
Month and year	March 2018
Details	Most prestigious prize awarded to a UK-based scientist that has worked in the field of superconductivity over the few years before the year of the award. The prize is named in honor of Prof. Sir Brian Pippard.
Motivation	"*Dr Di Bernardo's work has provided the first direct (spectroscopic) experimental evidence for the emergence of unconventional superconducting states at the interface between superconductors and ferromagnets – which is a key result for the definitive establishment of the field of superconducting spintronics aiming at developing energy-efficient spintronics devices operating in the superconducting regime*." (source: email from the IOP announcing the award).

ESAS Prize for Young Researchers 2017

Awarded by	Committee of academics appointed by the European Society for Applied Superconductivity (ESAS)
Month and year	September 2017

[1] https://www.oxinst.com/news/oxford-instruments-nanoscience-announces-2022-nicolas-kurti-science-prize-winner/
[2] https://www.eurekalert.org/news-releases/752021
[3] https://www.humboldt-foundation.de/entdecken/newsroom/dossier-sofja-kovalevskaja-preis/sofja-kovalevskaja-preistraeger-2019#h18671

Details	Prize (500 €) for young researchers awarded at the biannual European Conference on Applied Superconductivity (EUCAS).
Motivation	For important experimental results that have contributed to the definite establishment of the field of superconducting spintronics.

Junior Research Fellowship 2016

Awarded by	St John's College, Cambridge, UK after a two-stage review process of the applications (first stage with internal experts and the second stage with external experts from the same research field of the applicant).
Month and year	October 2016
Details	One of 5 fellowships (total value ~ 100,000 GBP) awarded by St John's College in 2016 out of more than 700 applications from researchers of any disciplines and fields. The research fellowship is considered like an award at the University of Cambridge, and it allows to carry out an independent research project of which the awardee is the only principal investigator.
Motivation	Based on the track record of the applicant and the results already obtained, the fellowship is awarded to foster the applicant's academic career and it is meant as first step towards their establishment as an independent research group leader.

International IEEE Fellowship Award

Awarded by	Academic committee appointed by the IEEE Council on Superconductivity
Month and year	August 2015
Details	One of 5 international recipients (5,000 USD) selected by the IEEE annually.
Motivation	Awarded for important research contributions made during the graduate Ph.D. studies to the research field of superconductivity.

George and Lillian Schiff Foundation Studentship

Awarded by	Committee of academics from the University of Cambridge, UK
Month and year	August 2012
Details	Only Ph.D. studentship awarded in 2012 to a student pursuing a Ph.D. degree in any research fields related to Natural Sciences or Engineering. The studentship covered University fees, College fees and maintenance costs for the whole duration of Ph.D. programme.

Fulbright Self-Placed Scholarship

Awarded by	US-Italy Fulbright Commission
Month and year	August 2011
Details	One of the 3 Italian national recipients out of ~ 1000 applicants for all disciplines. The scholarship (38,000 USD) was given to purse a master's degree in Nanoscience and Quantum Physics at the Arizona State University.

Guglielmo D'Ambrosio award

Awarded by	Department of Engineering, University of Naples Federico II, Italy
Month and year	December 2008
Details	Graduated with the highest weighted average grade of the entire Department of Engineering during the academic year 2008-2009, among more than 3,000 students enrolled in his same first academic year (average grade 29.83/30, with 11 exams out of 30 awarded the distinction of Cum Laude). The award ceremony was reported in national newspapers such as *Il Corriere della Sera* and *Il Mattino.*

PARTICIPATION TO RESEARCH PROJECTS AS PRINCIPAL INVESTIGATOR (PI)

Since he became a PI in 2019, he has been awarded **~ 2.7 million euros** as individual contributions to carry out research project on a variety of different topics spanning from fundamental to applied research. He has also been selected twice for an interview (stage 2) of an EU ERC starting grant (ERC-StG 2022 and ERC-StG 2023 calls), and in one case (ERC-StG 2022 call) his proposal has also been approved for funding but put on the reserve list (due to budget limitation). The list of grants awarded to date (as PI or co-PI), which include very prestigious grants like a Sofja Kovalevskaja grant and an EU FET-Open grant, is reported below.

MAECI research grant

Funding agency/institution	Italian Ministry of Foreign Affairs and International Cooperation
Funding period	November 2023 – November 2025 (2 years)
Project title	Ultrafast dynamics and high-field transport of quantum material systems
Role	PI
Budget	~ 100,000 € (individual); ~ 372,000 € (cumulative)
Selection process	Evaluation of proposal from international peer-reviewers
Details	Research grant won as part of the MAECI call launched to strengthen the collaboration between Italian and German institutions. Awarded to carry out experiments on quantum material hybrids consisting of flakes of ferromagnetic insulators coupled to flakes of van der Waals superconductors using ultrafast spectroscopy in high magnetic fields at the Helmholtz-Zentrum Dresden Rossendorf.
Researchers hired/to hire	1 researcher (to hire)

Deutsche Forschungsgemeinschaft (DFG) SPP 2244 grant

Funding agency/institution	Deutsche Forschungsgemeinschaft
Funding period	March 2024 – March 2027 (3 years)
Project title	Towards 2D superconducting spintronics
Role	Co-PI
Budget	~ 112,000 € (individual); ~ 350,000 € (cumulative)
Selection process	Evaluation of academic committee based also on peer-review evaluation of research proposals from external experts.
Details	Awarded as extension of previous grant on the same topic, as part of the new SPP 2244 cycle for research on van der Waals heterostructures funded by the DFG (see further details below). The project will be carried out by Prof. Di Bernardo thanks to the joint (temporary) affiliation with the University of Konstanz.
Researchers hired/to hire	1 Ph.D. student (to hire)

Zukunftskolleg Research Fellowship

Funding agency/institution	University of Konstanz
Funding period	May 2021 – April 2026 (5 years initially planned; terminated in April 2024)
Project title	Superconducting spintronics
Role	Only PI
Budget	~ 350,000 € (individual)
Selection process	University committee based on peer-review evaluation of research proposals from external experts from the applicants' research fields.
Details	One of the 5 research fellowships (out of ~ 100 applications) awarded in the academic year 2021/2022 for applicants of any research fields or disciplines.
Researchers hired	1 Ph.D. student (Mr Leon Ruf).

Sofja Kovalevskaja grant

Funding agency/institution	Alexander von Humboldt Foundation
Funding period	October 2019 – September 2024 (5 years)
Project title	Superconducting spintronics with oxides and 2D materials
Role	Only PI
Budget	1,650,000 € (individual)
Selection process	Evaluation of academic committee based also on peer-review evaluation of research proposals from external experts from the applicants' research fields.
Details	One of the 5 Sofja Kovalevskaja research grants awarded in 2019 for international applicants (from any countries outside Germany) of any research fields or disciplines. The success rate[4] is ~ 10%. The grant is also awarded to establish a life-long connection between top researchers (awardees) and German institutions, and to encourage awardees to secure a permanent position in Germany.
Researchers hired	2 Ph.D. students (Mr Roman Hartmann and Ms Priyana Puliyappara-Babu).

EU FET-OPEN grant

Funding agency/institution	European Union
Funding period	March 2021 – August 2024 (3.5 years)
Project title	Gate Tunable Superconducting Quantum Electronics (SuperGate)
Role	Co-PI and **leader of Work Package 1**
Budget	~ 313,000 € (individual); ~ 3,000,000 € (cumulative).
Selection process	Evaluation of academic committee based also on peer-review evaluation of research proposals from external experts. The grant is highly competitive, with an average success rate of ~ 10%.
Details	The grant is awarded to a consortium of European Institutions and industrial partners to work towards increasing the technology readiness level (TRL) of a promising technology from which the European Union can benefit in the future. The superconducting technology developed as part of SuperGate can be combined with conventional metal-oxide semiconductor (CMOS) technology for the realization of hybrid computing platforms with low power dissipation.
Researchers hired	1 Ph.D. student (Ms Jennifer Koch) and 2 postdoctoral researchers (Dr Sara Khorshidian and Dr Sohaila Zaghloul Mohammed).

Deutsche Forschungsgemeinschaft (DFG) SPP 2244 grant

Funding agency/institution	Deutsche Forschungsgemeinschaft
Funding period	September 2020 – August 2023 (3 years)
Project title	Towards 2D superconducting spintronics
Role	Co-PI
Budget	~ 95,000 € (individual); ~ 300,000 € (cumulative)
Selection process	Evaluation of academic committee based also on peer-review evaluation of research proposals from external experts.
Details	The grant is assigned as part of the priority program SPP 2244 entitled 'Physics of van der Waals heterostructures' which the DFG has launched to foster research in the field of 2D van der Waals heterostructures in Germany. As part of the SPP2244 program, about 30 research projects[5] across Germany have been funded with a success rate < 30%.
Researchers hired	1 Ph.D. student (Mr Alfredo Spuri)

Young Scholar Fund (YSF) grant

Funding agency/institution	University of Konstanz

[4] https://www.humboldt-foundation.de/bewerben/foerderprogramme/sofja-kovalevskaja-preis
[5] https://2dmp.tu-dresden.de/projects/

Funding period	October 2020 – December 2021 (1 year and 2 months)
Project title	Superconducting molecular electronics (SuperMol)
Role	PI
Budget	~ 80,000 € (individual)
Selection process	Evaluation of an academic committee from the University of Konstanz
Details	The grant is assigned as seed funding to obtain preliminary results which can be used to write a more extensive research proposal for third party funding. The focus of the project is to study the fundamental physics of hybrid systems consisting of a self-assembled monolayer of molecules chemisorbed on the surface of a superconducting thin film or 2D superconductor. Another aim of the project is to fabricate devices where the properties of the superconductor (e.g., its critical temperature) can be manipulated through a self-assembled molecular monolayer chemisorbed on its surface (e.g., via optical excitation).
Researchers hired	1 Ph.D. student (Mr Marcel Strohmeier)

RESEARCH GRANTS CURRENTLY UNDER EVALUATION

ERC Consolidator grant 2024

Funding agency/institution	European Union
Funding period	60 months from beginning of grant
Project title	Highly efficient information technology with quantum material hybrids (Acronym 'HiQMAT')
Role	PI
Budget	2,580,148 €
Selection process	Evaluation of an academic committee (step 1) and interview with the same committee further to peer-review evaluation from external experts from the applicants' research field (step 2).
Status	Under evaluation.
Details	The development of quantum technologies relies on the discovery of secure and energy-efficient ways to transport information encoded in one of the quantum degrees of freedom offered by material systems. Superconducting spintronics (superspintronics) and magnonics are promising fields for the development of devices, where information is encoded in the spin degree of freedom. In superspintronics, the spin is carried by Cooper pairs with parallel spins (spin triplets) generated at the interface between superconductors (Ss) and magnetically-inhomogeneous materials. In magnonics, the spin is carried by spin-wave excitations (magnons) driven in magnetic insulators (MIs). Both superspintronics and magnonics, however, have limitations. A triplet supercurrent is non-dissipative and can be generated with local contacts (to S), but its propagation is limited to tens of nanometres in most magnetic materials. On the other hand, magnons propagate over longer distances (up to tens of micrometres) already at room temperature, but their generation via local current injection is a dissipative process. The main goal of HiQMAT is to combine superspintronics and magnonics by studying MI/S hybrids that support both spin-triplet supercurrent and magnon propagation, to exploit the advantages offered by each of them. Although the generation of magnons by non-superconducting currents is established, the equivalent effect using a superconducting current is still an open question. Therefore, one of the objectives of HiQMAT is to determine if a triplet supercurrent in a S can excite magnons. Demonstrating triplets-into-magnons interconversion would be of tremendous scientific relevance. From a fundamental point of view, it would show that magnons and triplets, which have different nature, can interact. From a technological point of view, it would lead to devices supporting transport of spin over long scales, thanks to their magnonic component, with simultaneous low energy dissipation, thanks to the supercurrent used as input.

2nd edition of Fondo Italiano per la Scienza (FIS2)

Funding agency/institution	Italian Ministry for University and Research (MUR)
Funding period	36 months from beginning of grant
Project title	Highly efficient information technology with quantum material hybrids (Acronym 'HiQMAT')
Role	PI
Budget	~ 1,899,059 €
Selection process	Evaluation of academic committee (step 1), peer review of external experts from the applicant's research field (step 2) and interview with awarding committee (step 3).
Status	Under evaluation
Details	See details of ERC Consolidator grant reported above (the topic of the research proposal is the same).

NQSTI research grant

Funding agency/institution	National Quantum Science and Technology Institute (NQSTI)
Funding period	18 months
Project title	High-performance Josephson junctions for ferrotrasmons (Acronym 'Conjunctions')
Role	co-PI
Budget	~ 575,000 € (cumulative)
Selection process	Peer-review evaluation of research proposal.
Status	Under evaluation
Details	The research grant is offered as part of the cascade calls of the NQSTI and sponsored by the Italian Ministry of University and Research through the Italian national Plan for Recovery and Resilience (PNRR). The goal of the research project is to optimize superconductor/ferromagnet/superconductor devices for their integration with superconductor/insulator/superconductor Josephson junctions used for the realization of superconducting qubits. This will be done to realize superconducting qubits (ferrotrasmons) with new functionalities obtained by controlling the magnetic properties of the ferromagnetic layers through an applied magnetic field.

REVIEWING AND EDITORIAL ACTIVITIES

Associate Editor, Journal of Low Temperature Physics

Dates (from – to)	July 2022 – to date
Name of editorial group	Springer Nature Ltd, The Campus, 4 Crinan Street – London, N1 9XW, UK
Details	Editor handling submission of articles with focus on Superconductivity and Materials Physics.

Guest Editor, Frontiers in Electronic Materials

Dates (from – to)	November 2022 – to date
Name of editorial group	Frontiers Media Ltd, New Board Street House, 35 New Broad St– London, EC2M 1NH, UK
Details	Guest editor for special issue 'Topological effects and unconventional transport phenomena in low-dimensional systems' to be published in 2023.

Referee for peer-reviewed journals

Dates (from – to)	2014 – to date
Details	Referee for more than 20 international scientific journals including: • Nature • Nature Communications • npj Quantum Materials

- Scientific Reports
- Physical Review X
- Physical Review Letters
- Physical Review Research
- Nano Letters
- ACS Nano
- ACS Applied Electronic Materials
- Europhysics Letters
- Applied Physics Letters
- APL Materials
- Phys. Status Solidi B
- Beilstein Journal of Nanotechnology
- Thin Solid Films
- Advanced Materials
- Advanced Electronic Materials
- Nanoscale

Referee for research grants

Dates (from – to)	2019 – to date
Details	Referee for the following research grant schemes: • EU ERC-Advanced grant • DFG research grant • Alexander von Humboldt postdoctoral fellowships

Referee for professorial positions

Dates (from – to)	2023 – to date
Details	Referee for professorship applications at the following institutions: • KU Leuven, Belgium

SUPERVISION/MENTORING OF STUDENTS AND POSTDOCS

To date, he has hired and supervised/mentored **2 postdoctoral researchers** and **7 Ph.D. students**, in addition to several Master and Bachelor students, a detailed list of whom is provided below together with their corresponding research project. Currently, Prof. Di Bernardo is hiring new members to join his new research group at the University of Salerno.

Mentor of postdoctoral researchers

Full Name	Dr Sara Khorshidian
Research Institution	University of Konstanz, Germany
Dates (from – to)	October 2021 – August 2023
Grant on which hired	EU FET-Open SuperGate
Research project	Fabrication of superconducting electric-field transistors (EF-Trons) based on the high-temperature superconductor $YBa_2Cu_3O_{7-\delta}$ and on other elemental superconductors (e.g., Nb) decorated with magnetic impurities (e.g., Co).

Full Name	Dr Sohaila Zaghloul Mohammed
Research Institution	University of Konstanz, Germany
Dates (from – to)	March 2021 – August 2022
Grant on which hired	EU FET-Open SuperGate
Research project	Fabrication of EF-Trons based on elemental metal superconductors like Nb and Ta.

Supervisor of Ph.D. students

Full Name	Ms Jennifer Koch
Dates (from – to)	September 2022 – present (graduation expected in September 2025)
Research Institution	University of Konstanz, Germany
Grant on which hired	EU FET-Open SuperGate
Research project	Fabrication and characterization of EF-Trons based on non-centrosymmetric superconductors (e.g., $Nb0_{.18}Re_{0.82}$) and on A15-type superconductors (e.g., Nb_3Ge, Nb_3Sn).

Full Name	Mr Leon Ruf
Research Institution	University of Konstanz, Germany
Dates (from – to)	June 2021 – present (graduation expected in December 2024)
Grant on which hired	Zukunftskolleg Research Fellowship
Research project	Determination of optimal working parameters (e.g., lowest switching voltage, best geometry etc.) for EF-Trons based on metallic superconductors.

Full Name	Ms Priyana Puliyappara Babu
Research Institution	University of Konstanz, Germany
Dates (from – to)	October 2021 – to date (graduation expected in August 2024)
Grant on which hired	Sofja Kovalevskaja award
Research project	Fabrication of Sr_2RuO_4 thin film by pulsed laser deposition with reproducible superconducting properties and of devices based on the same thin films as well as on exfoliated Sr_2RuO_4 flakes.

Full Name	Mr Alfredo Spuri
Research Institution	University of Konstanz, Germany
Dates (from – to)	October 2021 – present (graduation expected in June 2024)
Grant on which hired	DFG SPP 2244 grant
Research project	Superconducting devices based on two-dimensional van der Waals (vdW) superconductors (e.g., NbS_2, $NbSe_2$) coupled to other ferromagnetic flakes both of vdW (e.g., $CrGeTe_3$, Fe_3GeTe_2) and of non-vdW (e.g., $Cr_{1/3}NbS_2$) for vdW superconducting spintronics.

Full Name	Mr Marcel Strohmeier (co-supervisor; main supervisor is Prof. Elke Scheer)
Research Institution	University of Konstanz, Germany
Dates (from – to)	March 2020 – present (graduation expected in September 2024)
Grant on which hired	Young scholar funds (beginning) and currently on EU-FET Open
Research project	Study of hybrid systems consisting of a self-assembled molecular monolayer on a superconducting thin film, and realization of optically switchable devices based on them.

Full Name	Mr Roman Hartmann
Research Institution	University of Konstanz, Germany
Dates (from – to)	October 2019 – present (graduation expected in May 2024)
Grant on which hired	Sofja Kovalevskaja award
Research project	Investigation of the spectroscopic properties of novel superconducting systems by low-temperature scanning tunneling microscopy and low-energy muon spectroscopy. Fabrication of devices based on nanoflakes of materials exfoliated from ionic or covalently bonded nanoflakes for their integration into superspintronic devices.

Full Name	Ms Carla Palomares Garcia (co-supervisor; main supervisor was Prof. Jason Robinson)
Research Institution	University of Cambridge, United Kingdom
Dates (from – to)	October 2016 – June 2020
Grant on which hired	Hired by Prof. Jason Robinson

Research project	Determination of the growth condition and structural properties of Sr_2RuO_4 thin films with reproducible superconducting properties.

Supervisor of Master students

Full name	Mr Jan Chris
Research Institution	University of Konstanz, Germany
Dates (from – to)	October 2022-February 2024
Thesis title	Superconducting diode effect in a van der Waals heterostructure

Full name	Ms Annika Mechnich
Research Institution	University of Konstanz, Germany (in collaboration with the group of Prof. Mete Atatüre at the University of Cambridge)
Dates (from – to)	September 2022-September 2023
Thesis title	Probing edge currents in a van der Waals superconductor by diamond quantum magnetometery

Full name	Mr Nico Sprinkart
Research Institution	University of Konstanz, Germany
Dates (from – to)	May 2022-July 2023
Thesis title	Anomalous and quantum spin hall effect in 2D topological insulators

Full name	Mr Stefan Petersen
Research Institution	University of Konstanz, Germany
Dates (from – to)	January 2022-February 2023
Thesis title	Ferromagnetic $SrRuO_3$ oxide nanomembranes for superconducting Berrytronics

Full name	Ms Jennifer Koch
Research Institution	University of Konstanz, Germany
Dates (from – to)	September 2021-August 2022
Thesis title	Superconducting field-effect devices with A15 and non-centrosymmetric superconductors

Supervisor of Bachelor students

Full name	Mr Ben Schwanewedel
Research Institution	University of Konstanz, Germany
Dates (from – to)	October 2022-March2023
Thesis title	Investigation of the superconducting diode effect in the topological semimetal $Ce_3Bi_4Pd_3$

Full name	Ms Laura Gorzawski
Research Institution	University of Konstanz, Germany (in collaboration with the group of Prof. Jason Robinson at the University of Cambridge)
Dates (from – to)	April 2022-November 2022
Thesis title	Optimization of superconducting and ferromagnetic thin film heterostructures for superconducting spintronics

Full name	Mr Jan Chris
Research Institution	University of Konstanz, Germany
Dates (from – to)	November 2021-March 2022
Thesis title	2D superconductor/2D ferromagnet heterostructures for superconducting spintronics

Full name	Ms Coralie Ose
Research Institution	University of Konstanz, Germany
Dates (from – to)	May 2021-September 2021

Thesis title	Investigation of 2D superconductors in proximity coupling with ferromagnetic insulators

In addition to the above students whom he has supervised/mentored as PI, Prof. Di Bernardo has trained more than 30 researchers including Ph.D. students and postdoctoral researchers on the usage of research equipment and experimental lab techniques in the Device Materials Group of the University of Cambridge during the years from 2014 to 2019.

TEACHING ACTIVITIES

Physics of materials and nanotechnologies for renewable energies

Academic year(s)	Winter and Summer Semester 2023/2024
Degree programme	2nd year students of B.Sc. degree programme in Sciences and Nanotechnology for Sustainability
Institution and Department	University of Salerno, Department of Physics
Number of lectures (hours)	Two per week (5 hours/week) for a total of 120 hours. The course consists mostly of lectures, but also of exercise classes and lab activities with students.

Fundamentals of Solid-State Physics (experimental module)

Academic year(s)	Summer Semester 2023/2024
Degree programme	3rd year students of B.Sc. in Physics
Institution and Department	University of Salerno, Department of Physics
Number of lectures (hours)	Two per week (5 hours/week) for a total of 20 hours. The module of the course consists of lectures and of lab activities with students to verify the application of the concepts explained during the same lectures. This module combines with another theoretical module (taught by Prof. Carmine Ortix) to make the full lecture course.

Superconductivity: from fundamentals to applications (full lecture course)

Academic years	Winter Semester 2020/2021, Winter Semester 2021/2022, Winter Semester 2022/2023
Degree programme	Master students in Physics and Nanotechnology
Institution and Department	University of Konstanz, Department of Physics
Number of lectures (hours)	26 lectures (two per week, 1.5 hours each) plus exercises (1 hour a week)

Nanofabrication and nanocharacterisation technique (full lecture course)

Academic years	Summer Semester 2020/2021.
Degree programme	Master students in Physics and Nanotechnology
Institution and Department	University of Konstanz, Department of Physics
Number of lectures (hours)	26 lectures (two per week, 1.5 hours each) plus exercises (1 hour a week)

Advances in Nanomaterials (seminar course)

Academic years	Summer Semester 2021/2022
Degree programme	Master students in Physics and Nanotechnology
Institution and Department	University of Konstanz, Department of Physics
Number of lectures (hours)	Seminar course with one introductory lecture (2 hours) plus weekly meetings with students (2 hours per week) to help them prepare the final report and presentation on a mutually agreed topic related to the course subject.

Material Aspects of Microdevices (small lecture course)

Academic years	2018/2019

Degree programme	Part III students (4th year students) in Materials Science
Institution and Department	Department of Materials Science, University of Cambridge
Number of lectures (hours)	Six lectures (two per week) of 2 hours each.

Mathematical methods (small lecture course)

Academic years	2018/2019
Degree programme	part II students (3rd year students) in Materials Science
Institution and Department	Department of Materials Science, University of Cambridge
Number of lectures (hours)	Three lectures of 2 hours each.

Nanomagnetism (small lecture course)

Academic years	2017/2018 and 2018/2019
Degree programme	M. Phil. and NanoDTC Ph.D. students in Materials Science
Institution and Department	Department of Materials Science, University of Cambridge
Number of lectures (hours)	Three lectures of 2 hours each.

In addition to the above lecture courses, he has acted as teaching assistant and lab demonstrator during the years from 2015 to 2018 for the classes and tutorials listed below.

Teaching assistant

Courses and year	Mathematical methods (2015/2016 and 2016/2017), Materials Aspects of Microdevices (2015/2016), Nanomagnetism (2015/2016, 2016/2017)
Institution	University of Cambridge
Degree programme	Part II (Mathematical methods), part III (Materials Aspect of Microdevices), M. Phil., NanoDTC Ph.D. students in Materials Science (Nanomagnetism)

Lab demonstrator

Courses and year	BP2 and BP3 lab tutorials for Materials for devices (2015/2016)
Institution	University of Cambridge
Degree programme	Part IA students (1st year students) in Materials Science

Student supervisor

Courses and year	Literature review project (2016/2017), Techniques project (2015/2016, 2016/2017, 2017/2018)
Institution	University of Cambridge
Degree programme	Part III students (Literature review project and Techniques project) in Materials Science

ORGANISATION OF SCIENTIFIC MEETINGS

Co-organizer of international workshop

Name of scientific meeting	SUPERGATE 2024 workshop on gate-controlled superconductivity
Location and date	Planned for 6th-9th October 2024, location currently being defined (possibly Ischia in Italy)
Role	Workshop chair and member of the organizing committee together with Dr Mario Cuoco (from CNR-Spin in Italy), Prof. Elke Scheer (from the University of Konstanz) and Dr Francesco Giazotto (from CNR-Nano in Italy). The event is currently being organized as final workshop of the EU-FET Open project SuperGate, and several international scientists working on control of superconductivity by gate voltage will be invited.

Co-organizer of colloquium at international conference

Name of scientific meeting	EPS CMD conference (EPS CMD30) FisMAT
Location and date	Milan, 4th-7th September 2023
Role	Organizer (together with Roberto Lo Conte from the University of Hamburg, Prof. Carmine Attanasio from the University of Salerno, and Prof. Wolfgang Belzig from the University of Konstanz) of a mini-colloquium session. Wrote a scientific proposal for the mini-colloquium topic which was then approved. Invited several international scientists to participate with an oral contribution to this mini-colloquium entitled "Magnet/superconductor hybrids for quantum information science and technology."

Co-organizer of international workshop

Name of scientific meeting	Unconventional Superconducting Phenomena
Location and date	Schloss Ringberg, 30th May-2nd June 2023
Role	One of three organizers (together with Prof. Stuart Parkin and Dr Banabir Pal from the Max Planck Institute in Halle, and Prof. W. Belzig from the University of Konstanz) of the workshop. Responsible also for suggesting and inviting international speakers.

Co-organizer, focused session at International conference

Name of scientific meeting	DPG Spring meeting 2023
Location and date	Dresden, 26th-31st March 2023
Focused session title	Unconventional transport in low-dimensional heterostructures
Role	Responsible (together with Prof. W. Belzig from the University of Konstanz) for proposing the topic of the session. The session was then chosen by the members of the low-temperature division of the DPG with voting rights from the list of all the focused sessions proposed. Responsible also for suggesting and inviting speakers for the focused session.

Co-organizer, colloquium at International conference

Name of scientific meeting	CMD2020GEFES
Location and date	Universidad Autonoma de Madrid + online, 31thAugust-4th September 2020
Focused session title	Symmetry and non-linearity in low-dimensional systems
Role	Responsible for proposing and inviting speakers for the focused session (along with Prof. M. Amado and Dr J. Quereda Bernabeu from the University of Salamanca, and Dr J. Caridad from the Technical University of Denmark).

Co-organizer, scientific symposium

Name of scientific meeting	Superconducting Spintronics and Majorana Physics
Location and date	Cambridge, 15th-16th March 2018
Role	Co-organizer in charge of the symposium programme and responsible for proposing and inviting speakers (together with Prof. M. Blamire and Prof. J. Robinson from the University of Cambridge, Prof. O. Millo and Y. Paltiel from the Racah Institute of Physics and Prof. L. Cohen from Imperial College London).

SCIENTIFIC HABILITATION, OTHER EQUIVALENCE CERTIFICATES

Italian Scientific habilitation as Full Professor

Scientific sector	02/B1 (Condensed Matter Physics)
Dates (from – to)	06/12/2023 – 06/12/2034
Name of issuing organization	Italian Ministry of University and Research
Reference	Application No. 93075 (ASN 2021/2023)

Italian Scientific habilitation as Associate Professor

Scientific sector	02/B1 (Condensed Matter Physics)
Dates (from – to)	27/01/2022 – 27/01/2032
Name of issuing organization	Italian Ministry of University and Research
Reference	Application No. 35678 (ASN 2021/2023)

Equivalence of UK Ph.D. degree to an Italian Ph.D. degree

Issued on date	31/05/2022
Name of issuing organization	Italian Ministry of University and Research
Reference	Equipollenza dottorato, Official Registry No. 2022_0000756

TECHNOLOGY TRANSFER, SPIN-OFF

Co-founder startup

Name	Digital Superconducting Quantum Machines (DSQM)
Affiliation	Recognized as spin-off of the Centro Nazionale delle Ricerche (CNR) in the meeting of their Administration Council (CDA) on 26/01/2022
Other co-founders	Dr F. Giazotto, Dr E. Strambini, Dr G. De Simoni and Dr C. Puglia (from CNR-Nano and Scuola Normale Superiore, Italy), Prof. S. Gasparinetti (from Chalmers University of Technology, Sweden).
Startup focus	Design and commercialization of hardware solutions for superconducting electronics and quantum computing applications, mostly based on gate-controlled superconducting devices.

PATENTS

Patent application (filed and deposited)

Name	Superconducting variable inductance transistor
Deposited on	27/10/2021
Application No.	Italian Patent Application No. 202100027515
Details and status	Patent application filed via the CNR office for technology transfer (ref. Giulio Bollino) together with the other co-founder of startup DSQM. Received already assessment from the patent examiner and replied to their questions. Currently waiting for approval of the revised patent.

INSTITUTIONAL RESPONSIBILITIES

Faculty member

Institution	University of Salerno
Department	Department of Physics
Date (from – to)	01/05/2023 – present
Responsibilities	Organization of the teaching schedule, planning of outreach activities for the public, definition of the orientation programme for incoming students, other general business including the allocation of core funds within the Department. Member of the committee for the selection of teaching assistants that would support the lecturers of the Department of Physics in their courses.

Faculty member

Institution	University of Konstanz
Department	Department of Physics
Date (from – to)	01/08/2020 – 30/04/2023
Responsibilities	Organization of the teaching schedule, planning of outreach activities for the public, definition of the orientation programme for incoming students, other general business including the allocation of core funds within the Department.

Undergraduate and Graduate student advisor

Institution	University of Konstanz
Department	Department of Physics
Date (from – to)	01 October 2019 – to date
Responsibilities	Supervision of students wishing to pursue a scientific project at the bachelor, master, or Ph.D. level.

Deputy Dean of Discipline

Institution	St John's College, Cambridge
Date (from – to)	01/11/2017 – 30/09/2019
Responsibilities	Responsible for overseeing good conduct of College students and handling improper behavior of students on the College's grounds or at public events.

Doctoral thesis examination committee

Ph.D. candidate	Yao Junxiang (Ph.D. supervisor: Prof. Jan Aarts)
Defense date	05/07/2023
Institution	Leiden University, The Netherlands
Ph.D. candidate	Thomas Löthman (Ph.D. supervisor: Prof. Annika Black-Schaffer)
Defense date	25/01/2021
Institution	Uppsala University, Sweden
Ph.D. candidate	Lennart Bours (Ph.D. supervisor: Dr Francesco Giazotto)
Defense date	10/11/2021
Institution	Scuola Normale Superiore, Italy

Master thesis examination committee

Candidate	Henning Hugdal (Ph.D. supervisor: Prof. Jacob Linder)
Defense date	08/09/2016
Institution	Trondheim University, Norway
Candidate	Morten Amundsen (Supervisor: Prof. Jacob Linder)
Defense date	09/06/2016

Institution	Trondheim University, Norway

EXPERIENCE IN SETTING UP NEW EXPERIMENTAL LABORATORIES

Laboratory of oxide thin film and 2D materials fabrication

Institution	University of Konstanz, Department of Physics
Date (from – to)	01/10/2019 – to date
Equipment personally acquired and setup	Ultrahigh vacuum deposition chamber with KrF excimer laser for pulsed laser deposition (cost ~ 500,000 USD), transfer stage for assembly of 2D van Waals heterostructures in N_2 glovebox with damping stage (cost ~ 70,000 €), glovebox evaporator (~ 60,000 €).
Funded by	Sofja Kovalevskaja grant (personal research grant), Infrastructure grant (from the University of Konstanz).

Laboratory for low temperature magnetotransport measurements

Institution	University of Konstanz, Department of Physics
Date (from – to)	01/10/2019 – to date
Equipment personally acquired and setup	Dry cryostat (Cryogenic Ltd) with base temperature of 1.5 K (with ^{4}He dip stick) or 300 mK (with ^{3}He dip stick) and an applied magnetic field of up to 7 Tesla (cost ~ 150,000 €). The system has been equipped with custom-designed switch box with filtered lines, measurement electronics (Keitlhey sourcemeter and nanovoltmeter), and optical sources for magnetotransport measurements under optical illumination at low temperatures. Additional dry cryostat without magnetic field and base temperature of ~ 3 K (ICE Oxford Ltd) (cost ~ 70,000 €).
Funded by	EU FET-Open grant (personal research grant), YSF grant (personal grant), Infrastructure grant (from the University of Konstanz).

Laboratory for microstructural characterization of materials

Institution	University of Konstanz, Department of Physics
Date (from – to)	01/10/2019 – to date
Equipment personally acquired and setup	X-ray diffractometer (Rigaku) equipped with additional setup for micro-XRD measurements (to restrict beam size down to ~ 400 μm^2).
Funded by	Infrastructure grant (from the University of Konstanz).

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

European Physical Society (EPS)

Date (from – to)	17/01/2024 – present
Details	Member of the EPS (upon payment of annual membership fee).

Italian Physical Society (SIF)

Date (from – to)	01/08/2023 – present
Details	Member of the SIF (upon payment of annual membership fee).

Italian Association of Engineers

Date (from – to)	05/04/2022 – present
Details	Passed the national exam (professional habilitation for engineers) in the year 2013 and joined the national association (‘Albo Ingegneri’) in 2022.

Deutsche Physikalische Geselleschaft (DPG)

Date (from – to)	01/12/2019 – 31/12/2023
Details	Academic member of the DPG (upon payment of annual membership fee).

SEMINARS, CONFERENCES AND LECTURES (INVITED ONLY

To date (February 2024), Prof. Di Bernardo has given or been invited to give a total of **47 invited talks** including invited talks at scientific meetings, invited seminars at research institutions and invited series of lectures. A list of these invited talks is provided below.
In addition to these invited talks, Prof. Di Bernardo has also given 4 contributed talks and presented about 10 posters at international scientific meetings, mostly during his Ph.D. (not reported below).

Invited talks at scientific workshops, and conferences and prize talks

28. *Generation of spin-triplet states at a helimagnet/superconductor van der Waals interface* (**invited**), International workshop on superconducting spintronics (organised by Prof. T. Yokoyama and Prof. J. Linder), online meeting, 27th September 2023 and 3rd October 2024.

27. *Voltage-driven control of superconducting currents* (**invited**), National congress of the Italian Physical Society (SIF) 2023, Salerno, Italy, 11th - 15th September 2023.

26. Gate control of superconducting currents (**invited**), International conference Superstripes 2023 "Quantum in Complex Matter", Ischia, Italy, 26th June - 1st July 2023.

25. *Gate-controlled superconducting currents* (**invited**), International symposium on "Unconventional superconducting phenomena", Ringberg Schloss, Germany, 30th May - 2nd June 2023.

24. *Reversible tuning of a supercurrent in superconducting nanoconstrictions* (**invited**), MonteSuper2023: Superconducting quantum materials and nanodevices, Budva, Montenegro, 17th - 21st April 2023.

23. *Superconducting spintronics: open challenges and new materials platforms* (**invited**), 776th WEH Seminar, Bad Honnef, Germany, 3rd-6th January 2023.

22. *Signature of spin-triplet generation across two-dimensional van-der Waals superconductor/ ferromagnet interfaces* (**invited**), OSS2022 meeting, Vietri sul Mare, 14th-17th Novembre 2022.

21. *Orbital loop magnetism in Sr_2RuO_4* (**invited**), DPG meeting, Regensburg, Germany, 4th-9th September 2022.

20. *Evidence for surface magnetism in the superconductor Sr_2RuO_4* (**invited**), Superstripes 2022, Rome, Italy, 20th-24th June 2022.

19. *Spectroscopic evidence for unconventional superconducting and magnetic states* (**invited**), 769th WEH seminar, Bad Honnef, Germany, 29th May-2nd June 2022.

18. *Exchange coupling between ferromagnetic insulators mediated by a nodal superconductor* (**invited**), Oxide SuperSpintronics (OSS) Workshop 2021 (attended online due to Covid-19 pandemic), Kyoto University, Japan, 13th-17th December 2021.

17. *Orbital loop current magnetism in an unconventional superconductor* (**invited**), International workshop QuSpin 2021 (attended online due to Covid-19 pandemic), Norwegian University of Science and Technology (NTNU), Norway, 1st-2nd December 2021.

16. *Exchange coupling between ferromagnetic insulators mediated by a nodal superconductor* (**invited**), 7th International Conference on Superconductivity and Magnetism (ICSM), Bodrum, Turkey, 21th-27th October 2021.

15. *Unconventional superconductivity in a hybrid molecule/superconductor system* (**invited**), International scientific meeting "Low-dimensional superconducting hybrids for novel quantum functionalities", College de France, Paris, 12th-14th October 2021.

14. *Signatures of unconventional states at superconductors interfaces and surfaces* (**invited**), International seminar series (attended online due to Covid-19 pandemic), Centre for Quantum Spintronics (QuSpin), Norwegian University of Science and Technology (NTNU), Norway, 26th May 2021.

13. *Talk for early-career scientists* (**invited**) as part of the international Early Career Scientist Symposium organised by the Diamond Light Source, online event, 26th-30th October 2020.

12. *Unconventional states probed by low-energy muon spectroscopy****** (**invited**), Moscow International Symposium on Magnetism 2020, June 2020.

*event postponed due to COVID-19 pandemic

11. *Nodal superconducting exchange coupling* (**invited**), 14th International Workshop on Magnetism and Superconductivity, Coma-Ruga, Spain, 1st July 2019.

10. *Novel phenomena at superconducting oxide interfaces* **(invited)**, OSS meeting 2019, Hoam Faculty House, Seoul, South Korea, 27th June 2019.

9. *Nodal superconducting exchange coupling* (**invited**), 697th WE-Heraeus seminar, Bad Honnef, Germany, 4th June 2019.

8. *Fingerprints of spin-triplet states for superconducting spintronics* (**invited**), IOP Brian Pippard Prize award talk, University of Bristol, UK, 10th January 2019.

7. *Probing superconducting at the YBCO/SRO interface* (**invited**), OSS-IS 2018, Sapporo, Japan, 7th-9th August 2018.

6. *Oxide superconducting spintronics* (**invited**), 6th International Conference on Superconductivity and Magnetism (ICSM), Antalya, Turkey, 29thApril - 4th May 2018.

5. *Superconducting spintronics with oxides* (**invited**), Superconducting Spintronics and Majorana Physics Symposium, Cambridge, UK, 15th-16th March 2018.

4. *Towards oxide-super-spintronics* (**invited**), OSS meeting, Cambridge, UK, 2nd May 2017.

3. *Unconventional superconducting states at superconductor interfaces* (**invited**), 628th Wilhelm and Else Heraeus Seminar: Trends in Mesoscopic Superconductivity, Bad Honnef, Germany, 14th-18th November 2016.

2. P-wave superconductivity in graphene on a metal-oxide high-temperature superconductor (**invited**), UFOX conference: Unveiling Complex Phenomena in Functional Oxides, Salerno, Italy, 7th-8th July 2016.

1. *Odd-frequency spin-triplet states at superconductor interfaces* (**invited**), International Conference on Superconductivity and Magnetism (ICSM) 2016, Fethiye, Turkey, 24th-30th April 2016.

Invited talks/seminars at research institutions including prize talks

17. *Superconducting spintronics: from earliest evidence to current challenges* (**invited**), Prize lecture for Nicholas Kurti Science Prize, University of Oxford, Oxford, UK, 9th November 2023.

16. *Superconducting spintronics and gate-controlled superconducting logics* (**invited** by Prof. C. Degen), Condensed Matter Physics Seminar series, ETH Zürich, Switzerland, 24th February 2023.

15. *Evidence for unconventional superconductivity in a hybrid molecule/superconductor system* (**invited** by Prof. Carmine Attanasio), Physics Department seminar series, University of Salerno, Italy, 7th December 2021.

14. *Probing exotic states at superconductors' surfaces and interfaces* (**invited** by Prof. Annika Black-Schaffer). Uppsala University (attended online due to Covid-19 pandemic), Sweden, 24th May 2021.

13. *Superconducting spintronics: from its origins to its current challenges* (**invited** by Prof. Alessandro Bombardi), Diamond Light Source and ISIS seminar series on strongly correlated electron systems, 13th February 2020.

12. *Superconducting spintronics: a short review and future perspectives* (**invited** by Prof. Thomas Brückel), Forschungszentrum Jülich, Jülich, Germany, 12th December 2019.

11. *A paradigm shift towards energy-efficient computing: superconducting spintronics* (**invited** by Physics Department), Physics Colloquium, University of Konstanz, Germany, 5th November 2019.

10. *Superspintronics: from its origin to the first oxide devices* (**invited** by Prof. Hadar Steinberg), The Hebrew University of Jerusalem, Jerusalem, Israel, 19th September 2019.

9. *Novel phenomena at oxide interfaces for superspintronics* (**invited** by Dr Thomas Machon and Prof. James Annett), Theoretical Physics seminar, University of Bristol, Bristol, UK, 27th February 2019.

8. *The rise of superconducting spintronics* (**invited** by Prof. Alexander Buzdin), University of Bordeaux, Bordeaux, France, 29th January 2019.

7. *Unconventional states at superconductor interfaces with broken symmetry* (**invited** by Prof. Bernhard Keimer), Max Planck Institute, Stuttgart, Germany, 12th October 2018.

6. *Superconducting spintronics with oxides and 2D materials* (**invited** by Prof. Stefan Hofmann), JSPS-EPSRC Symposium on 'Innovation in Materials Characterization', Cambridge, UK, 17th April 2018.

5. *Unconventional states in superconductor/ferromagnet heterostructures* (**invited** by Prof. Sarnjeet Dhesi), Diamond Light Source, Didcot, UK, 19th March 2018.

4. *Probing unconventional superconducting states at superconductor interfaces* (**invited** by Dr Antonio Vecchione and Dr Mario Cuoco), University of Salerno, Italy, 16th November 2017.

3. *Nanoscience: when small things do make a difference* (**invited**), Videoconference with University students and professors from the Instituto Federal de Educação, Ciência, e Tecnologia do Piauí (IFPI), Teresina, Brazil, 12th June 2017.

2. *Paramagnetic Meissner effect in superconductor/ferromagnet heterostructures* (**invited** by Prof. Yoshiteru Maeno), Kyoto University Physics Department, 20th December 2015.

1. *Gapless superconductivity at superconductor/ferromagnet interfaces* (**invited** by Prof. Jacob Linder), Norwegian University of Science and Technology, 27th November 2015.

Invited lectures

2. **Two lectures** on hybrid superconducting devices (**invited**), OSS Workshop, Kyoto, Japan, 25th-29th November 2017.

1. **Three lectures** on superconductivity and magnetism (**invited**), ESAS winter school, Pozzuoli, Italy, 12th-16th December 2016.

FULL LIST OF PUBLICATIONS (citations are updated to Dec. 2022)

Since 2014, Prof. Di Bernardo has co-authored **38** scientific publications, of which **33** already published, **1** monograph in Nature News and Views and **4** currently under review.
For the manuscripts that have already been published, Prof. Di Bernardo has been first author of **4** manuscripts and last author (i.e., **main PI**) of **8** manuscripts. All the 4 first-author papers and most of the papers as main PI have been published in journals with very high impact factor including **Nature Materials**, **Nature Communications**, **Physical Review X**. Some of these articles have been advertised in several press releases and scientific news items (see also Scientific Activity section for details).

Manuscripts already published in peer-reviewed journals

Note: the symbol "*" denotes corresponding author.

33. J. Koch, C. Cirillo, S. Battisti, L. Ruf, Z. Makhdoumi Kakhaki, A. Paghi, A. Gulian, S. Teknowijoyo, G. De Simoni, F. Giazotto, C. Attanasio, E. Scheer, **A. Di Bernardo***

Gate-controlled supercurrent effect in dry-etched Dayem bridges of non-centrosymmetric niobium rhenium

Accepted in *Nano Research*
ISSN journal: 1998-0000 (online). IF journal (2022): 9.9.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 47/344. Quartile: Q1.
JCR Category: Nanoscience and Nanotechnology. Category Rank: 24/108. Quartile: Q1.
JCR Category: Physics, Applied. Category Rank: 18/160. Quartile: Q1.

32. R. Hartmann, I. Soldatov, M. Lammel, D. Lignon, X. Ai, G. Kiliani, R. Schäfer, A. Erb, R. Gross, J. Boneberg, M. Müller, S. T. B. Goennenwein, E. Scheer, **A. Di Bernardo****

Single-crystalline YIG nanoflakes with uniaxial in-plane anisotropy and diverse crystallograhic orientations, *APL Materials* **12**, 031121 (2024)

DOI: https://doi.org/10.1063/5.0189993
ISSN journal: 2166-532X (online). IF journal (2022): 6.1.
JCR Category: Physics, Applied. Category Rank: 35/160. Quartile: Q1.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 95/344. Quartile: Q2.

31. A. Spuri, D. Nikolić, S. Chakraborty, M. Klang, H. Alpern, O. Millo, H. Steinberg, W. Belzig, E. Scheer, **A. Di Bernardo****

Signature of long-ranged spin triplets across a two-dimensional superconductor/helimagnet van der Waals interface, *Physical Review Research* **6**, L012046 (2024).

DOI: https://doi.org/10.1103/PhysRevResearch.6.L012046
ISSN journal: 2643-1564 (online). IF journal (2022): 4.2.
JCR Category: Physics, Multidisciplinary. Category Rank: 21/111. Quartile: Q1.
Times cited: **n/a** (source - Web of Science); **n/a** (source – Scopus).
Average number of citations per year: n/a.

30. R. M. Sattigeri, G. Cuono, G. Hussain, X. Ming, **A. Di Bernardo**, C. Attanasio, M. Cuoco, C. Autieri

Dirac surface states, multiorbital dimerization, and superconductivity in Nb- and Ta-based A15 compounds, *Physical Review B* **109**, 075119 (2023).

DOI: https://doi.org/10.1103/PhysRevB.109.075119
Web of Science code: n/a
Scopus code: 2-s2.0-85184996585
ISSN journal: 2469-9969 (online). IF journal (2022): 3.7.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 157/344. Quartile: Q2.
JCR Category: Physics, Applied. Category Rank: 50/160.
JCR Category: Physics, Condensed Matter. Category Rank: 24/67. Quartile: Q2.
Times cited: **0** (source - Web of Science); **0** (source – Scopus).
Average number of citations per year: 0.

29. L. Ruf, T. Elalaily, C. Puglia, Y. P. Ivanov, F. Joint, M. Berke, A. Iorio, P. Makk, G. De Simoni, S. Gasparinetti, G. Divitini, S. Csonka, F. Giazotto, E. Scheer, **A. Di Bernardo****

Effect of fabrication routes and material parameters on the control of superconducting currents by gate voltage, *APL Materials* **11**, 091113 (2023).

DOI: https://doi.org/10.1063/5.0159750
Web of Science code: 001158949300001
Scopus code: 2-s2.0-85172691892 1
ISSN journal: 2166-532X (online). IF journal (2022): 6.1.
JCR Category: Physics, Applied. Category Rank: 35/160. Quartile: Q1.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 95/344. Quartile: Q2.
Times cited: **0** (source - Web of Science); **1** (source – Scopus).
Average number of citations per year: 0-1.

28. S. Chakraborty, D. Nikolić, J. C. Cuevas, F. Giazotto, A. Di Bernardo, E. Scheer, M. Cuoco, W. Belzig

Microscopic theory of supercurrent suppression by gate-controlled surface depairing, *Physical Review B* **108**, 184508 (2023).

DOI: https://doi.org/10.1103/PhysRevB.108.184508
Web of Science code: 001116618300001
Scopus code: 2-s2.0-85177982404
ISSN journal: 2469-9969 (online). IF journal (2022): 3.7.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 157/344. Quartile: Q2.
JCR Category: Physics, Applied. Category Rank: 50/160.
JCR Category: Physics, Condensed Matter. Category Rank: 24/67. Quartile: Q2.
Times cited: **1** (source - Web of Science); **0** (source – Scopus).
Average number of citations per year: 0-1.

27. R. Hartmann, M. Hogen, D. Lignon, A. K. C. Tan, M. Amado, S. El-Khatib, M. Egilmez, B. Das, C. Leighton, M. Atature, E. Scheer, **A. Di Bernardo****

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DOI: https://doi.org/10.1039/D3NR00467H
Web of Science code: 000987721000001
Scopus code: 2-s2.0-85159711565
ISSN journal: 2040-3372 (online). IF journal (2022): 6.7.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 83/344. Quartile: Q1.
JCR Category: Nanoscience and Nanotechnology. Category Rank: 37/108. Quartile: Q2.
JCR Category: Physics, Applied. Category Rank: 27/160. Quartile: Q1.
Times cited: **1** (source - Web of Science); **1** (source – Scopus).
Average number of citations per year: 1.

26. I. Keren, A. Gutfreund, N. Friedman, A. Noah, **A. Di Bernardo**, H. Steinberg, and Y. Anahory.

Chip-integrated vortex manipulation, *Nano Letters* **23**, 10, 4669-4674 (2023).

DOI: https://doi.org/10.1021/acs.nanolett.3c00324
Web of Science code: 000953992200001
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JCR Category: Materials Science, Multidisciplinary. Category Rank: 41/344. Quartile: Q1.
JCR Category: Nanoscience and Nanotechnology. Category Rank: 19/108. Quartile: Q1.
JCR Category: Physics, Condensed Matter. Category Rank: 10/67. Quartile: Q1.
Times cited: **1** (source - Web of Science); **1** (source – Scopus).
Average number of citations per year: 1.

25. M. Egilmez, S. El-Khatib, F. Mustafa, S. Ahmad, **A. Di Bernardo**, J. W. A. Robinson.

Concurrent weak localization and double Schottky barrier acros a grain boundary in bicrystal $SrTiO_3$, *Physical Review B* **107**, 104401 (2023).

DOI: https://doi.org/10.1103/PhysRevB.107.104401
Web of Science code: 000974465300002
Scopus code: 2-s2.0-85150878051
ISSN journal: 2469-9969 (online). IF journal (2022): 3.7.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 157/344. Quartile: Q2.
JCR Category: Physics, Applied. Category Rank: 50/160.
JCR Category: Physics, Condensed Matter. Category Rank: 24/67. Quartile: Q2.
Times cited: **1** (source - Web of Science); **1** (source – Scopus).
Average number of citations per year: 1.

24. M. Ozeri, T.R. Devidas, H. Alpern, E. Persky, A. Bjorlig, N. Sukenik, S. Yochelis, **A. Di Bernardo**, B. Kalisky, O. Millo and Y. Paltiel.

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DOI: https://doi.org/10.1002/admi.202201899
Web of Science code: 000924149100001
Scopus code: 2-s2.0-85147439671.
ISSN journal: 2196-7350 (online). IF journal (2022): 5.4.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 108/344. Quartile: Q2.
JCR Category: Chemistry, Multidisciplinary. Category Rank: 56/178. Quartile: Q2.
Times cited: **0** (source - Web of Science); **0** (source – Scopus).
Average number of citations per year: 0.

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ISSN journal: 2166-532X (online). IF journal (2022): 6.1.
JCR Category: Physics, Applied. Category Rank: 35/160. Quartile: Q1.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 95/344. Quartile: Q2.
Times cited: **7** (source - Web of Science); **7** (source – Scopus).
Average number of citations per year: 3.5.

22. R. Fittipaldi, R. Hartmann, M. T. Mercaldo, S. Komori, A. Bjorlig, W. Kyung, Y. Yasui, T. Miyoshi, L. A. B. Olde Olthof, C. M. Palomares Garcia, V. Granata, I. Keren, W. Higemoto, A. Suter, T. Prokscha, A. Romano, C. Noce, C. Kim, Y. Maeno, E. Scheer, B. Kalisky, J. W. A. Robinson, M. Cuoco, Z. Salman, A. Vecchione, **A. Di Bernardo****

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Web of Science code: WOS:000703617100016
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ISSN journal: 2041-1723 (online). IF journal (2022): 16.6.
JCR Category: Multidisciplinary Sciences. Category Rank: 6/73. Quartile: Q1.
Times cited: **12** (source - Web of Science); **11** (source – Scopus)
Average number of citations per year: 3.67-4.0.

21. H. Alpern, M. Amundsen, R. Hartmann, N. Sukenik, A. Spuri, S. Yochelis, T. Prokscha, V. Gutkin, Y. Anahory, E. Scheer, J. Linder, Z. Salman, O. Millo, Y. Paltiel, **A. Di Bernardo****.

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Scopus code: 2-s2.0-85119100729.
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JCR Category: Materials Science, Multidisciplinary. Category Rank: 174/344. Quartile: Q2.
Times cited: **14** (source - Web of Science); **10** (source – Scopus).
Average number of citations per year: 3.33-4.67.

20. C. Cirillo, V. Granata, A. Spuri, **A. Di Bernardo**, C. Attanasio.

NbReN: a disordered superconductor in thin film form for potential application as superconducting nanowire single photon detector.
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Times cited: **9** (source - Web of Science); **9** (source - Scopus)
Average number of citations per year: 3.0.

19. A. Stellhorn, A. Sarkar, E. Kentzinger, J. Barthel, **A. Di Bernardo**, S. Nandi, P. Zakalek, J. Schubert, T. Brückel.

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Web of Science code: WOS:000568312200001
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ISSN journal: 1367-2630 (online). IF journal (2022): 3.3.
JCR Category: Physics, Multidisciplinary. Category Rank: 31/85. Quartile: Q2.
Times cited: **6** (source - Web of Science); **6** (source - Scopus).
Average number of citations per year: 1.5.

18. C. Cirillo, C. Barone, H. Bradshaw, F. Urban, **A. Di Bernardo**, C. Mauro, J. W. A. Robinson, S. Pagano, C. Attanasio.

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DOI: https://doi.org/10.1038/s41598-020-70646-2
Web of Science code: WOS:000563546400025.
Scopus code: 2-s2.0-85089414421.
ISSN journal: 2045-2322 (online). IF journal (2022): 4.6.
JCR Category: Multidisciplinary Sciences. Category Rank: 22/73. Quartile: Q2.
Times cited: **9** (source - Web of Science); **8** (source - Scopus).
Average number of citations per year: 2.0-2.25.

17. C. M. Palomares Garcia, **A. Di Bernardo**, G. Kimbell, M. E. Vickers, F. C. P. Massabuau, S. Komori, G. Divitini, Y. Yasui, H. G. Lee, J. Kim, B. Kim, M. G. Blamire, A. Vecchione, R. Fittipaldi, Y. Maeno, T. W. Noh, J. W. A. Robinson.

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JCR Category: Materials Science, Multidisciplinary. Category Rank: 71/424. Quartile: Q1.
Times cited: **5** (source - Web of Science); **6** (source - Scopus).
Average number of citations per year: 1.25-1.5.

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Web of Science code: WOS:000504860400002.
Scopus code: 2-s2.0-85077499555.
ISSN journal: 2469-9969 (online). IF journal (2022): 3.7.
JCR Category: Physics, Condensed Matter. Category Rank: 14/67. Quartile: Q1.

Times cited: **2** (source - Web of Science); **2** (source - Scopus).
Average number of citations per year: 0.4.

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Scopus code: 2-s2.0-85073831379.
ISSN journal: 1476-4660 (online). IF journal (2022): 41.2.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 3/344. Quartile: Q1.
JCR Category: Physics, Applied. Category Rank: 1/161. Quartile: Q1.
Times cited: **14** (source - Web of Science); **16** (source - Scopus).
Average number of citations per year: 2.8-3.2.

14. E. M. Choi, **A. Di Bernardo**, B. Zhu, P. Lu, K.H.L. Zhang, H. Alpern, T. Shapira, J. Feighan, X. Sun, J.W.A. Robinson, Y. Paltiel, O. Millo, H. Wang, Q. Jia, J.L. MacManus-Driscoll.

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Scopus code: 2-s2.0-85065447637.
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JCR Category: Multidisciplinary Science. Category Rank: 7/73. Quartile: Q1.
Times cited: **28** (source - Web of Science); **29** (source - Scopus).
Average number of citations per year: 5.6-5.8.

13. G. J. Orchin, D. De Fazio, **A. Di Bernardo**, M. Hamer, D. Yoon, A. R. Cadore, I. Goykhman, K. Watanabe, T. Taniguchi, J. W. A. Robinson, R. V. Gorbachev, A. C. Ferrari, R. H. Hadfield.

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ISSN journal: 1077-3118 (online). IF journal (2022): 4.
JCR Category: Physics, Applied. Category Rank: 48/160. Quartile: Q2.
Times cited: **30** (source - Web of Science); **25** (source – Scopus).
Average number of citations per year: 5-6.

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Scopus code: 2-s2.0-85051767074.

ISSN journal: 1079-7114 (online). IF journal (2022): 8.6.
JCR Category: Physics, Multidisciplinary. Category Rank: 9/85. Quartile: Q1.
Times cited: **9** (source - Web of Science); **10** (source - Scopus).
Average number of citations per year: 1.5-1.67.

11. S. Ruiz-Gómez, A. Serrano, R. Guerrero, M. Muñoz, I. Lucas, M. Foerster, L. Aballe, J.F. Marco, M. Amado, L. McKenzie-Sell, **A. Di Bernardo**, J.W.A. Robinson, M.A.G. Barrio, A. Mascaraque, L. Perez.

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Web of Science code: WOS:000448958700012.
Scopus code: 2-s2.0-85055497371.
ISSN journal: 2166-532X (online). IF journal (2022): 6.1.
JCR Category: Physics, Applied. Category Rank: 35/160. Quartile: Q1.
JCR Category: Materials Science, Multidisciplinary. Category Rank: 95/344. Quartile: Q2.
Times cited: **5** (source - Web of Science); **5** (source - Scopus).
Average number of citations per year: 0.83.

10. **A. Di Bernardo**, Y. Kalcheim, M. Barbone, M. Amado, D. De Fazio, U. Sassi, A. Ott, J. Linder, A.C. Ferrari, O. Millo, J.W.A. Robinson.

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Web of Science code: WOS:000392178200001.
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ISSN journal: 2041-1723 (online). IF journal (2022): 16.6.
JCR Category: Multidisciplinary Sciences. Category Rank: 6/73. Quartile: Q1.
Times cited: **72** (source - Web of Science); **76** (source - Scopus).
Average number of citations per year: 10.3-10.8.

9. J.S. Bulmer, T.S. Gspann, F. Orozco, M. Sparkes, H. Koerner, **A. Di Bernardo**, A. Niemiec, J.W.A. Robinson, K.K. Koziol, J.A. Elliot, W. O'Neill.

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Scopus code: 2-s2.0-85031110840.
ISSN journal: 2045-2322 (online). IF journal (2022): 4.6.
JCR Category: Multidisciplinary Sciences. Category Rank: 22/73. Quartile: Q2.
Times cited: **13** (source - Web of Science); **13** (source - Scopus).
Average number of citations per year: 1.86.

8. A. Srivastava, L.A.B. Olde Olthof, **A. Di Bernardo**, S. Komori, M. Amado, C. Palomares-Garcia, M. Alidoust, K. Halterman, M.G. Blamire, J.W.A. Robinson.

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DOI: https://doi.org/10.1103/PhysRevApplied.8.044008
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Scopus code: 2-s2.0-85032278139.
ISSN journal: 2331-7019 (online). IF journal (2022): 4.6.
JCR Category: Physics, Applied. Category Rank: 43/160. Quartile: Q2.
Times cited: **45** (source - Web of Science); **44** (source - Scopus).
Average number of citations per year: 6.28-6.42.

7. J. Cao, D. Massarotti, M.E. Vickers, A. Kursumovic, **A. Di Bernardo**, J.W.A. Robinson, F. Tafuri, J.L. MacManus-Driscoll, M.G. Blamire.

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Web of Science code: WOS:000383983500013.
Scopus code: 2-s2.0-84985906377.
ISSN journal: 1361-6668 (online). IF journal (2022): 3.6.
JCR Category: Physics, Applied. Category Rank: 52/160. Quartile: Q2.
JCR Category: Physics, Condensed Matter. Category Rank: 25/67. Quartile: Q2.
Times cited: **11** (source - Web of Science); **18** (source – Scopus).
Average number of citations per year: 1.37-2.25.

6. J.A. Ouassou, **A. Di Bernardo**, J.W.A Robinson, J. Linder.

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Scopus code: 2-s2.0-84978890779.
ISSN journal: 2045-2322 (online). IF journal (2022): 4.6.
JCR Category: Multidisciplinary Sciences. Category Rank: 22/73. Quartile: Q2.
Times cited: **17** (source - Web of Science); **16** (source - Scopus).
Average number of citations per year: 2.0-2.12.

5. **A. Di Bernardo**, Z. Salman, X.L. Wang, M. Amado, M. Egilmez, M.G. Flokstra, A. Suter, S.L. Lee, J.H. Zhao, T. Prokscha, E. Morenzoni, M.G. Blamire, J. Linder, J.W.A. Robinson.

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Scopus code: 2-s2.0-84950340282.
ISSN journal: 2160-3308 (online). IF journal (2022): 12.5.
JCR Category: Physics, Multidisciplinary. Category Rank: 6/85. Quartile: Q1.
Times cited: **119** (source - Web of Science); **104** (source – Scopus).
Average number of citations per year: 11.55-13.22.

4. **A. Di Bernardo**, S. Diesch, Y. Gu, J. Linder, E. Scheer, M.G. Blamire, J.W.A. Robinson.

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ISSN journal: 2041-1723 (online). IF journal (2022): 16.6.
JCR Category: Multidisciplinary Sciences. Category Rank: 6/73. Quartile: Q1.
Times cited: **94** (source - Web of Science); **111** (source – Scopus).
Average number of citations per year: 10.44-12.3.

3. Y. Kalcheim, O. Millo, **A. Di Bernardo**, A. Pal, J.W.A. Robinson.

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ISSN journal: 2469-9969 (online). IF journal (2022): 3.7.
JCR Category: Physics, Condensed Matter. Category Rank: 14/67. Quartile: Q1.
Times cited: **52** (source - Web of Science); **52** (source - Scopus).
Average number of citations per year: 5.7.

2. Y. Kalcheim, I. Felner, O. Millo, T. Kirzhner, G. Koren, **A. Di Bernardo**, M. Egilmez, M.G. Blamire, J.W.A. Robinson.

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DOI: https://doi.org/10.1103/PhysRevB.89.180506
Web of Science code: WOS:000336247700004.
Scopus code: 2-s2.0-84901425630.
ISSN journal: 2469-9969 (online). IF journal (2022): 3.7.
JCR Category: Physics, Condensed Matter. Category Rank: 14/67. Quartile: Q1.
Times cited: **34** (source - Web of Science); **37** (source – Scopus).
Average number of citations per year: 3.4-3.7.

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Giant triplet proximity effect in superconducting pseudo spin valves with engineered anisotropy, *Physical Review B Rapid Communications* **89**, 140508 (2014).

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Web of Science code: WOS:000335793000001.
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ISSN journal: 2469-9969 (online). IF journal (2022): 3.7.

JCR Category: Physics, Condensed Matter. Category Rank: 14/67. Quartile: Q1.
Times cited: **79** (source - Web of Science); **83** (source – Scopus).
Average number of citations per year: 7.9-8.3.

Monographs

1. A. Di Bernardo*

Broken mirror symmetry boosts current conversion in a superconductor, *Nature* **613**, 446-447 (2023).

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Manuscripts currently under review in peer-reviewed journals

Note: the symbol "*" denotes corresponding author.

4. L. Ruf, C. Puglia, T. Elalaily, G. De Simoni, F. Joint, M. Berke, J. Koch, A. Iorio, S. Khorshidian, P. Makk, A. Vecchione, S. Gasparinetti, S. Csonka, W. Belzig, M. Cuoco, F. Giazotto, E. Scheer, **A. Di Bernardo***

Gate-control of superconducting current: mechanisms, parameters and technological potential

Under review in *Nature Reviews Electrical Engineering*, pre-print available at https://arxiv.org/abs/2302.13734

3. E. Wegner Hodt, C. Cirillo, **A. Di Bernardo**, C. Attanasio, J. Linder

Critical temperature of triplet superconductor-ferromagnet bilayers as a probe for pairing symmetry

Under review in *Physical Review B*, pre-print available at https://arxiv.org/abs/2402.10266

2. Z. Makhdoumi Kakhaki, A. Leo, A. Spuri, M. Ejrnaes, L. Parlato, G. P. Pepe, F. Avitabile, **A. Di Bernardo**, A. Nigro, C. Attanasio, C. Cirillo

Quasiparticle relaxation times in microstrips of Nb-Re-N for possible application in superconducting single-photon detectors

Under review in *Superconductor Science and Technology*

1. S. Battisti, J. Koch, A. Paghi, L. Ruf, A. Gulian, S. Teknowijoyo, C. Cirillo, Z. Makhdoumi Kakhaki, C. Attanasio, E. Scheer, **A. Di Bernardo**, G. De Simoni, F. Giazotto
Demonstration of nanosized high-impedance superconducting NbRe Dayem bridges

Under review, pre-print available at https://arxiv.org/abs/2312.04331

MAJOR COLLABORATIONS

Collaborator(s)	Prof. E. Scheer and Prof. W. Belzig
Institution	University of Konstanz, Department of Physics

Topics of collaboration	Superconducting spintronics based on 2D van der Waals materials (theory and experiment), gate-controlled superconductivity (theory and experiment), low-temperature scanning tunneling microscopy (theory and experiment)
Outcome	DFG SPP 2244 grant, Sofja Kovalevskaja award, EU FET-Open. Published papers No. 4, 16, 21, 22, 27-29, 31-33.
Collaborator(s)	Dr Z. Salman and Dr T. Prokscha
Institution	Paul Scherrer Institute, Switzerland
Topics of collaboration	Low-energy muon spin rotation spectroscopy of novel magnetic phases and superconducting systems
Outcome	Published papers No. 5, 21, 22.
Collaborator(s)	Prof. J. Linder
Institution	Norwegian University of Science and Technology, Norway
Topics of collaboration	Theory of superconductor/ferromagnet hybrids.
Outcome	Published papers No. 4, 5, 6, 10, 21.
Collaborator(s)	Prof. J. Robinson
Institution	University of Cambridge, UK
Topics of collaboration	Material hybrids and devices for superconducting spintronics
Outcome	Published papers No. 1-15, 17-18, 22.
Collaborator(s)	Prof. M. Atature
Institution	University of Cambridge, UK
Topics of collaboration	Diamond quantum magnetometry with nitrogen vacancy centers on 2D materials and other vdW hybrids
Outcome	Published paper No. 27.
Collaborator(s)	Prof. A. Ferrari
Institution	University of Cambridge, UK
Topics of collaboration	2D vdW materials and devices based on them
Outcome	Published papers No. 10, 13.
Collaborator(s)	Prof. O. Millo and Prof. Y. Paltiel
Institution	Racah Institute of Physics, Israel
Topics of collaboration	Low-temperature scanning tunneling microscopy on superconducting oxide thin film heterostructures, chiral molecules/superconductor hybrids
Outcome	Published papers No. 2-3, 10, 14, 21, 31.
Collaborator(s)	Prof. B. Kalisky and Prof. Y. Anahory
Institution	Racah Institute of Physics, Israel (Prof. Anahory) and Bar-Ilan University (Kalisky)
Topics of collaboration	Scanning superconducting quantum interference device (Scanning-SQUID) and SQUID-on-tip magnetometry to investigate emergence of new magnetic phases or vortex dynamics in superconducting heterostructures.
Outcome	Published paper No. 21-22, 26.
Collaborator(s)	Prof. C. Attanasio and Dr C. Cirillo
Institution	Università degli Studi di Salerno, Italy
Topics of collaboration	Investigation of the physical properties of hybrid materials systems and devices including gate-controlled superconducting devices based on the non-centrosymmetric superconductor $Nb_{0.18}Re_{0.82}$
Outcome	Published papers No. 18, 20, 33.
Collaborator(s)	Dr M. Cuoco and Dr A. Vecchione
Institution	Centro Nazionale delle Ricerche (CNR)-Spin, Italy

Topics of collaboration	Theory of strongly correlated electron systems (Dr Cuoco) and oxide single crystals for exfoliation of nanoflakes and fabrication of other devices
Outcome	EU FET-Open grant. Published papers No. 15, 17, 22-23.
Collaborator(s)	Prof. Y. Maeno
Institution	Kyoto University, Japan
Topics of collaboration	Superconductivity and novel quantum phases in Sr_2RuO_4 single crystals and thin films
Outcome	Published papers No. 17, 22.

SCIENTIFIC ACTIVITY AND CURRENT INTERESTS (summary)

The scientific activity of Prof. Di Bernardo covers a period of slightly more than 10 years since the beginning of his Ph.D. research activity at the University of Cambridge in September 2013.

During his Ph.D., Di Bernardo demonstrated the first direct (spectroscopic) evidence for the generation of spin-triplet states at the interfaces of superconductor/ferromagnet (S/F) systems. Di Bernardo showed that spin-triplet generation leads to the appearance of sub-gap states in the density of states of S/F systems, and to the appearance of an inverse Meissner response in S/F systems. These two results were obtained by Di Bernardo using low-temperature scanning tunneling microscopy (STM) and low-energy muon spin rotation spectroscopy (LE-μSR) and were reported in two manuscripts (papers No. 4 and 5), which are amongst those with the highest number of citations in superconducting spintronics. The significance of these studies, which have been important towards the establishment of superconducting spintronics, it has also been acknowledged by **several international prizes** that Di Bernardo was awarded for his Ph.D. research including the **IEEE Graduate Fellowship** award and the **ESAS prize for Young Researchers** (see also awards section).

Within the past seven years following the completion of his Ph.D. in November 2016, Di Bernardo has become first academically independent with a Junior Research Fellowship (JRF) at the University of Cambridge and then in 2019 he has been awarded a Sofja Kovalevskaja grant of ~ 1.65 M€ to lead and establish his own research group as principal investigator (PI) at the University of Konstanz. At the University of Konstanz, in 2020 Di Bernardo has also been appointed as Associate Professor (W2 Universitätsprofessor).

Towards the end of his Ph.D., whilst being awarded a JRF, Di Bernardo conceived the idea of an experiment which has unveiled the emergence of unconventional *p*-wave superconductivity in single-layer graphene once this is coupled to the high-temperature electron-doped S $Pr_{1.85}Ce_{0.15}CuO_4$. This manuscript (paper No. 10) has attracted extraordinary attention from scientific journals and newspapers like De Morgen and Physics World entering the 99th percentile amongst the most-cited articles on the web with similar age and it is currently ranked 5th amongst those of similar age published in Nature Communication. The manuscript has also been mentioned in the Financial Times[6] for the implications it can have for the development of superconducting devices based on graphene. Thanks also to this other research achievement, Di Bernardo was awarded the **Brian Pippard Prize** from the Institute of Physics in 2019, which is considered as the most prestigious prize in the UK for a researcher working in the field of superconductivity.

As a JRF, Di Bernardo designed another experiment, which then resulted in a publication in Nature Materials, where he investigated oxide heterostructures of $Pr_{0.8}Ca_{0.2}MnO_3/YBa_2Cu_3O_{7-\delta}/Pr_{0.8}Ca_{0.2}MnO_3$. This study (paper No. 15) has showed the existence of long-ranged coupling between the two ferromagnetic insulator (FI) layers of $Pr_{0.8}Ca_{0.2}MnO_3$ mediated by quasiparticles in the high-temperature superconductor $YBa_2Cu_3O_{7-\delta}$. Apart from unveiling a new physical mechanism which was unknown, this work has paved the way for new cryogenic spin valves, where a change in the S condensate energy (e.g., due to a temperature change) can set the magnetization alignment of the FIs, without any external magnetic field.

Whilst heading his research group at the University of Konstanz, Di Bernardo has already published eight other manuscripts as last and corresponding author (i.e., main PI), and written a few other papers also as main PI which are currently under review. In one of the manuscripts that have been published

[6] https://www.ft.com/content/08c4109c-d8f1-11e7-9504-59efdb70e12f

(paper No. 21), Di Bernardo and his group have showed the emergence of an unconventional Meissner effect due to spin triplets in chiral molecules/S hybrids – which paves the way for the application of these materials hybrids as alternative platform to S/F hybrids to do superconducting spintronics.
In another manuscript (paper No. 22), Di Bernardo and his group have unveiled the existence of a novel magnetic phase at the surface of the unconventional superconductor Sr_2RuO_4. This result has raised great attention also from scientific media because it can prove crucial to better understand the nature of the superconductivity in Sr_2RuO_4, which remains under debate after 30 years since its discovery in 1994.
In addition to the above, Di Bernardo and his group have shown that spin-triplet pairs can be generated not only at the superconductor/ferromagnet thin film interfaces, which feature strong covalent bonds, but also at the van der Waals interface between flakes of a superconductor and a ferromagnet stacked on top of each other (see paper No. 31). These results pave the way for the development of superconducting spintronics based on van der Waals materials.
Over the past years, Di Bernardo and their group have also devoted a great effort into the development of three-terminal superconducting devices, where superconductivity is controlled via the application of a gate voltage. This research is carried out as part of the FET-Open grant that Di Bernardo was awarded in 2021 with other collaborators, and which has already resulted in several publications from the group of Di Bernardo (see papers No. 29, 33).
For all these research achievements as PI, Prof. Di Bernardo has also been recently awarded the prestigious **Nicholas Kurti Science Prize for Europe**.
During the period spend at the University of Konstanz, in addition to the research that he has carried out as part of his Sofja Kovalevskaja grant, Prof. Di Bernardo has in fact got involved in an increasing number of collaborative third-party funded research grants, for which he also actively designed the research proposals. Thanks to these grants, which include a grant from the DFG for 2D materials (then renewed for three additional years in 2023) and a competitive EU FET-Open project, the group of Prof. Di Bernardo at the University of Konstanz has progressively expanded, both in terms of size and in terms of research interests.
The research group of Prof. Di Bernardo counted up to 11 members in 2021 and is currently involved in a variety of different research topics including: superconducting spintronics, gate-controlled superconductivity and devices based on this effect, superconducting diode effect, molecular/superconductor hybrids controlled via optical excitation, novel phases at materials surfaces and heterostructure interfaces.
To carry out these research activities, the group of Prof. Di Bernardo fabricate a wide range of materials in a variety of forms (e.g., exfoliated flakes, epitaxial or polycrystalline thin films) and using different techniques (e.g., magnetron sputtering for metal/metal-oxide thin films and pulsed laser deposition for oxide thin films). Starting from the as-produced materials, the group then investigate their structural and magnetotransport properties (down to low temperatures) to optimize these materials for the fabrication of devices based on them. The devices are made using conventional nanofabrication techniques (e.g., e-beam lithography, physical or chemical etching etc.) and are tested for their functionalities and usage for applications including superconducting spintronics, superconducting electronics, and quantum computing.
The group of Prof. Di Bernardo is also routinely granted access to beamline facilities like the Paul Scherrer Institute in Switzerland for low-energy muon spectroscopy, the Diamond Light Source in the UK for X-ray magnetic circular dichroism (XMCD), the Brookhaven National Laboratory in the US for resonant inelastic X-ray scattering (RIXS). At these beamline facilities, researchers working in the team of Prof. Di Bernardo study novel phases and

phenomena emerging at the interfaces or surfaces of materials hybrids. The study of these effects is also key to achieve control of devices that exploit those physical phenomena and quantum phases hosted by the same materials hybrids.
Thanks to the support of an extensive network of collaborators, the group of Prof. Di Bernardo can complement the studies done with the above-listed spectroscopy techniques with other local spectroscopy and magnetometry techniques including low-temperature STM, SQUID-on-tip and Diamond quantum magnetometry (see collaborations). These techniques are used to better understand the physics emerging at the interfaces or surfaces of new materials hybrids that are fabricated by the group.
For the next years, Prof. Di Bernardo intends to **continue the research activities listed above, but also explore exciting new research directions**, at the forefront of experimental condensed matter physics.
The development of three-terminal superconducting devices which have a logic state controlled electrically other than magnetically (as done instead today) represents a research direction with enormous technological potential. This research direction is already explored by the group of Prof. Di Bernardo within the EU FET-Open project SuperGate, and it may lead to the realization of a technology for superconducting logics which is much better than existing technologies. Compared to other technologies that are available commercially like rapid single flux quantum (RSFQ), where logic devices are controlled via an applied magnetic field (H), a superconducting logic based on gate-controlled devices would offer higher scalability due to the smaller size of the devices, it would be less sensitive to environmental magnetic noise, it would have higher energy efficiency and switching speeds, and it would be naturally interfaceable with voltage-driven CMOS. For all these reasons, voltage-driven superconducting logics offers enormous potential for the realization of hybrid large-scale supercomputers, where CMOS memories can be integrated with superconducting logics to reduce the energy dissipation of supercomputers. Voltage-controlled superconducting devices can also find applications in quantum computers, where they can be used, for instance, to drive spin qubits in an energy-efficient way, to enable cryogenic microwave signal routing at the single photon-level, to provide in-situ tuning of microwave modes for qubit readout, such as Purcell filters.
Voltage-controlled superconducting devices (including also superspintronic devices) will represent one of the main research directions that will be explored in the group of Prof. Di Bernardo, and which can give the University of Bologna a leading role towards the development of competitive innovative technologies for superconducting electronics and quantum computing. In the context of quantum computing, Prof. Di Bernardo has also got involved as co-PI in a research proposal for the cascade calls of the NQSTI (spoke 5). The aim of this project is to develop devices based on superconductor/ferromagnet hybrids that can be integrated with conventional superconducting qubits to enhance their performance. In addition, he is currently writing a new research proposal with other collaborators for a Pathfinder Challenge project to develop novel devices for the control of qubits based on the superconducting diode effect.