

Curriculum



Nome Name:	Paolo
Cognome Surname:	COLANTONIO

ORCID:	https://orcid.org/0000-0002-5788-1262
Scopus Author ID:	25630137500
WOS Author ID:	D-5811-2012
Sito WEB WEB site:	n.d.

POSIZIONE PROFESSIONALE ATTUALE / CURRENT PROFESSIONAL POSITION:

Posizione attuale Current position:	In servizio
Qualifica Qualification:	Professore Ordinario (L. 240/10)
Ateneo/Ente/Azienda University/Institution/Company:	Università degli Studi di ROMA "Tor Vergata"
Nazione Ateneo/Ente/Azienda University/Institution/Company Country:	ITA
Anno inizio Start Year:	2018
Anno fine End Year:	n.d.

PRECEDENTI ESPERIENZE LAVORATIVE (ULTIMI 10 ANNI) / PREVIOUS WORK EXPERIENCE (LAST 10 YEARS):

LINGUE / LANGUAGES:

Lingua Language:	Inglese
Scrittura Writing:	C1
Comunicazione Communication:	C1

AREA/SETTORE SCIENTIFICO-DISCIPLINARE / AREA/SECTOR SCIENTIFIC-DISCIPLINARY

Area scientifico-disciplinare Area scientific-disciplinary:	Ingegneria industriale e dell'informazione
Area scientifico-disciplinare codice Area scientific-disciplinary code:	09
Settore scientifico-disciplinare codice Sector scientific-disciplinary code:	-Elettronica
Settore scientifico-disciplinare codice Sector scientific-disciplinary code:	-IINF-01/A

DESCRIZIONE DEI PRINCIPALI RISULTATI SCIENTIFICI CONSEGUITI NEGLI ULTIMI 10 ANNI (CON ANNESSO ELENCO DI MASSIMO 10 PUBBLICAZIONI) / DESCRIPTION OF THE MAIN SCIENTIFIC RESULTS ACHIEVED IN THE LAST 10 YEARS (WITH ATTACHED LIST OF MAXIMUM 10 PUBLICATIONS):

Descrizione Description:	<p><i>Produced significant and lasting contributions in the field of designing microwave and millimeter-wave power amplifiers. Power amplifiers are a key component of any high-frequency communications or radar system. Their design, however, is a very complex task, because of demanding specifications on the one hand and the nonideal properties of the active devices on the other. Therefore, a proper design strategy is crucial to allow for an efficient and target-oriented procedure. In this context, by exploiting the "waveform engineering" new theory have been proposed which led to breakthrough design strategies for power amplifiers that boost power efficiency by 20 percentage points and more. Designs exploit the different possibilities of harmonic terminations at both the output and the input of the active device, in combination with the proper choice of transistor biasing conditions. Furthermore, comprehensive guidelines for the design of Doherty power amplifiers have also been developed. Today, Doherty amplifiers are the most popular power amplifier concept in modern wireless communications. They ensure energy efficiency for signals with a high peak-to-average ratio (peak-to-average power ratio) as required for high-bitrate transmission. Starting from the theoretical analysis, the gaps and critical conditions in which traditional approaches fail or yield non-optimum results have been identified, and new synthesis criteria have been defined. It</i></p>
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	<p><i>has also been proposed a closed-form formulation suitable for a direct computer-aided design synthesis of a Doherty amplifier. These design concepts received great interest among the community, and the results were adopted by both research and industry and applied by power amplifier designers around the world to improve their components in terms of efficiency. Today, these achievements belong to the basic tool set applied in power amplifier circuit design, and have been widely employed in industry also, examples are TTI in Santander (Spain) and Thales Alenia Space, a European space company.</i></p>
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PUBBLICAZIONI / PUBLICATIONS:

Anno della pubblicazione Year of publication:	2025
Citazione Citation:	Ramella, Chiara, Florian, Corrado, Del Rocío García, Maria, Davies, Iain, Pirola, Marco, Colantonio, Paolo (2025). Development of a space-grade Ka-band MMIC power amplifier in GaN/Si technology for SAR applications. IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, vol. 73, p. 977-987, ISSN: 0018-9480, doi: 10.1109/tmtt.2024.3443607

Anno della pubblicazione Year of publication:	2024
Citazione Citation:	Piacibello, Anna, Figueiredo, Ricardo, Quaglia, Roberto, Giofre, Rocco, Colantonio, Paolo, Carvalho, Nuno Borges, Camarchia, Vittorio (2024). Design and extensive NPR characterization of a highly linear SatCom GaN MMIC Doherty PA. IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, p. 1-11, ISSN: 0018-9480, doi: 10.1109/tmtt.2024.3474092

Anno della pubblicazione Year of publication:	2024
Citazione Citation:	Javid-Hosseini, Sayyed-Hosseini, Ghazanfarianpoor, Poorya, Nayyeri, Vahid, Colantonio, Paolo (2024). A unified neural network-based approach to nonlinear modeling and digital predistortion of RF power amplifier. IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, vol. 72, p. 5031-5038, ISSN: 0018-9480, doi: 10.1109/tmtt.2024.3374092

Anno della pubblicazione Year of publication:	2023
Citazione Citation:	Giofre, Rocco, Cabria, Lorena, Leblanc, Rémy, López, Mariano, Vitobello, Fabio, Colantonio, Paolo (2023). An Efficient and Linear SSPA With Embedded Power Flexibility for \$Ka\$-Band Downlink SatCom Applications. IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, p. 1-12, ISSN: 0018-9480, doi: 10.1109/TMTT.2023.3322866

Anno della pubblicazione Year of publication:	2023
Citazione Citation:	Giofre, Rocco, Piacibello, Anna, Colantonio, Paolo, Camarchia, Vittorio (2023). Gallium Nitride Power Amplifiers for Ka-Band Satcom Applications: Requirements, Trends, and the Way Forward. IEEE MICROWAVE MAGAZINE, vol. 24, p. 74-86, ISSN: 1527-3342, doi: 10.1109/MMM.2023.3314321

Anno della pubblicazione Year of publication:	2022
Citazione Citation:	Piacibello, Anna, Camarchia, Vittorio, Colantonio, Paolo, Giofre, Rocco (2022). 3-Way Doherty Power Amplifiers: Design Guidelines and MMIC Implementation at 28 GHz. IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, p. 1-13, ISSN: 0018-9480, doi: 10.1109/TMTT.2022.3225316

Anno della pubblicazione Year of publication:	2020
Citazione Citation:	Ali, Abdul, Yun, Jongwon, Kucharski, Maciej, Ng, Herman Jalli, Kissinger, Dietmar, Colantonio, Paolo (2020). 220-360-GHz Broadband Frequency Multiplier Chains (x8) in 130-nm BiCMOS Technology. IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, p. 2701-2715, ISSN: 0018-9480, doi: 10.1109/TMTT.2020.2988869

Anno della pubblicazione Year of publication:	2025
Citazione Citation:	Manni, Francesco, Colantonio, Paolo, Camarchia, Vittorio, Piacibello, Anna, Bosi, Gianni, Vadalà, Valeria, Giofre, Rocco (2025). A waveform engineering approach for class F operation in a class C biased peaking branch of GaN MMIC Doherty power amplifiers. SCIENTIFIC REPORTS, vol. 15, ISSN: 2045-2322, doi: 10.1038/s41598-025-95964-1

Anno della pubblicazione Year of publication:	2024
Citazione Citation:	Giofre, Rocco, Piacibello, Anna, Camarchia, Vittorio, Colantonio, Paolo (2024). A Two-Way GaN Doherty Amplifier for 5G FR2 With Extended Back-Off Range. IEEE MICROWAVE AND WIRELESS TECHNOLOGY LETTERS, p. 1-4, ISSN: 2771-957X, doi: 10.1109/LMWT.2024.3350435

Anno della pubblicazione Year of publication:	2024
Citazione Citation:	Piacibello, Anna, Quaglia, Roberto, Giofre, Rocco, Figueiredo, Ricardo, Colantonio, Paolo, Carvalho, Nuno Borges, Valenta, Vaclav, Camarchia, Vittorio (2024). High-Gain and High-Linearity MMIC GaN Doherty Power Amplifier With 3-GHz Bandwidth for Ka-Band Satellite Communications. IEEE MICROWAVE AND WIRELESS TECHNOLOGY LETTERS, p. 1-4, ISSN:

DESCRIZIONE DEI PRINCIPALI PROGETTI DI RICERCA E PREMI CONSEGUITI NEGLI ULTIMI 10 ANNI (CON ANNESSO ELENCO DI MASSIMO 10 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, PRINCIPAL INVESTIGATOR O COORDINATORE LOCALE DI PROGETTI DI RICERCA COMPETITIVI NAZIONALI O INTERNAZIONALI, SIGNIFICATIVI PREMI CONSEGUITI PER LA PROPRIA ATTIVITÀ DI RICERCA)/ DESCRIPTION OF THE MAIN RESEARCH PROJECTS AND AWARDS AWARDED IN THE LAST 10 YEARS (WITH ATTACHED LIST OF MAXIMUM 10 ACHIEVEMENTS, INCLUDING, FOR EXAMPLE, PRINCIPAL INVESTIGATOR OR LOCAL COORDINATOR OF NATIONAL OR INTERNATIONAL COMPETITIVE RESEARCH PROJECTS, SIGNIFICANT AWARDS AWARDED FOR YOUR RESEARCH ACTIVITY):

<p>Descrizione Description:</p>	<p><i>Paolo Colantonio was involved in several national and international projects. With regard to the last 10 years, the 3 most important projects are detailed below. 'Development and evaluation activities of power amplifiers with high efficiency and performance based on GaN-HEMT technology for application in the C and X bands'. It was a national project supported by Agenzia Spaziale Italiana (ASI, Contract no. 2013-076-R.0), where he acts as PI, with the aim of evaluating the technology developed by Leonardo Company for the realization of active devices (HEMT) based on GaN technology. In this project, several demonstrators, including power bars and MMIC amplifiers, were realized and tested to check the capabilities and, most useful, the reliability of the developed technology, which play a critical role in the EU context and in the recent EU Chips Act initiative. The EU-H2020 FLEXGAN Project (G.A. No. 821830) "Ka-band GaN-based SSPA for flexible payloads and multicarrier operation for 5G satellite concept", aimed to realize a 125W SSPA for 5G SATCOM applications (17.3-20.2GHz). In this context, he acts as responsible for the Unit Tor Vergata, which was in charge for the design of 10W MMIC power amplifiers on GaN/Si 100nm technology provided by OMMIC (now MACOM EU) and for the overall RF Tray. In this activity, a large experience on the critical aspects related to the thermal issue due to the Si substrate has been matured, together with the experience in a suitable design trade-off to be fully compliant with space rating constraints. As a result, a state-of-the-art 10W MMIC PA was demonstrated in the full 17.2-20.3GHz bandwidth, with a PAE larger than 30% (peak of 40% in the bandwidth center), with a maximum channel temperature below 160 ° C in the worst-case condition of 80 ° C of MMIC backside temperature. The developed MMICs were combined using a Radial structure (16x),</i></p>
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	<p><i>and integrated into a complete SSPA module, which resulted in an output power of more than 125W with an overall PAE between 20-30% (including an isolator at the output), with a total weight of roughly 3.6Kg, with a TRL between 5 and 6. The European Space Agency (ESA) project H2020-ESA-009 'High Power Amplifiers Technology' (ESA Contract No. 4000119150) where he acts as responsible for the Tor Vergata Unit, which was in charge of designing the RF tray of a 300W SSPA for the L-band Galileo system. For this aim, several power modules based on the UMS 0.5mm GaN/SiC power bars were designed. In particular, with the smaller device (CHK8101) a PA was realized that delivered 41dBm of output power with 55% PAE at 1575 MHz, while with the larger device (CHKA012) two PAs with an output power of 48dBm and 51dBm, and associated efficiency of 70% in both cases, were realized as well. The complete SSPA of more than 300W with an overall efficiency larger than 45% (state-of-the-art) including the power consumption of the EPC was successfully demonstrated.</i></p>
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Descrizione Description:	IEEE Fellow, with the citation: 'for contributions to microwave power amplifiers'
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Descrizione Description:	Diploma of Appreciation, awarded by the IEEE President of MTT-S and Polish Academy of Sciences: 'In recognition of outstanding contributions to the technical program of MIKON Conferences over the years and the promotion of MIKON among the world's microwave community'
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Descrizione Description:	PI - Agenzia Spaziale Italiana ASI - Contract no. 2013-076-R.0 for the project 'Development and evaluation activities of power amplifiers with high efficiency and performance based on GaN-HEMT technology for application in C-band and X'
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Descrizione Description:	PI - PRIN2015 (2015CPC2MA) - Millimetre-wave GaN based radar system for early detection of micro unmanned aerial vehicles
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Descrizione Description:	Unit Responsible: H2020 - Action MSCA-ITN-2015-ETN - Project CELTA - Convergence of Electronics and Photonics Technologies for Enabling Terahertz Applications (G.A. No. 675683)
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Descrizione Description:	Unit Responsible: H2020 Call: H2020-SPACE-2018-2020; Topic: SPACE-15-TEC-2018: Satellite communication technologies; Project: FLEXGAN 'Ka-band GaN-based SSPA for flexible payloads and multicarrier operation for 5G satellite concept' (G.A. No. 821830)
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Descrizione Description:	Unit Responsible: European Space Agency - Project: High Power Amplifiers Technology H2020-ESA-009 (ITT: AO/1-8708/16/NL/IA)
Descrizione Description:	Unit Responsible: European Space Agency - Project: Ka-Band HPA MMIC (ITT: AO/1-9145/17/NL/AI)
Descrizione Description:	Unit Responsible: European Space Agency - Project: VHF High Power Solid State Power Amplifier (ITT: AO/1-11569/22/NL/VA)
Descrizione Description:	PI - Research Contract with Huawei Technologies Co., Ltd. on 'A reconfigurable High Linearity Doherty PA for WiFi6'.

DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI DI SVILUPPO DI RETI E RELAZIONI SCIENTIFICHE NAZIONALI E INTERNAZIONALI (CON ANNESSO ELENCO DI MASSIMO 5 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, PARTECIPAZIONE O ORGANIZZAZIONE DI CONVEGNI NAZIONALI E INTERNAZIONALI; CONTRIBUTI A CONSORZI DI RICERCA) / DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10 YEARS IN TERMS OF DEVELOPMENT OF NATIONAL AND INTERNATIONAL SCIENTIFIC NETWORKS AND RELATIONS (WITH ATTACHED LIST OF MAXIMUM 5 RESULTS, INCLUDING, FOR EXAMPLE, PARTICIPATION OR ORGANIZATION OF NATIONAL AND INTERNATIONAL CONFERENCES; CONTRIBUTIONS TO RESEARCH CONSORTIA):

Descrizione Description:	<i>In 2014 he was TPC Chair for the International Conference 'European Microwave Integrated Circuit' EuMIC 2014, in the framework of European Microwave Week, held in Roma (Italy) on 6-7 October 2014. During this event he also organized the Graduate Student Industrial Career Platform and a workshop (full day) on 'GaN technology for space applications.' In the same year, he was also an invited speaker at the International Symposium on Microwave and Optical Technology, ISMOT, held in Kuala Lumpur, Malaysia, January 2014, with the talk 'GaN Power Amplifiers: Results and Prospective.' Since 2015 he has been a member of the TPC for the International Conference 'European Microwave Integrated Circuit' EuMIC Since 2016 TPC has been a member of the International Conference 'Power Amplifiers for Wireless and Radio Applications' PAWR He organized several workshops during the EUMW events from 2014 to 2018, and since 2018 he is the organizer of the successful and well attended every year Short Course (full day) on 'Fundamentals of Microwave PA Design'. He serves as TPC member for the APMC International Conference on Asia Pacific</i>
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	<p><i>Microwave Circuit in 2016. Since 2017 he has been a TPC member of the International Workshop on Integrated Nonlinear Microwave and Millimeter-wave Circuits, INMMIC In 2022 he was the Chair of the International Conference 'European Microwave Integrated Circuit' EuMIC 2022, held in Milan Since March 2006 he has been the delegate for the University of Rome Tor Vergata in the Management Committee of the Microwave Engineering Center for Space Applications (MECSA), an interuniversity center that brings together the research activity in the field of electronics and electromagnetism of the University of Rome Tor Vergata, Rome 'Sapienza', L'Aquila, Bologna, Ferrara, Firenze, Marche, Messina, Modena and Reggio Emilia, Padova, Palermo, Perugia, Salerno and Polytechnic of Turin. He is responsible for the Unit of University of Roma Tor Vergata in the SIE (Società Italiana di Elettronica) He is also president of GAAS Association, a cultural scientific non-profit-making European association to promote researchers in the field of microwave electronics.</i></p>
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Descrizione Description:	Chair of EuMIC 2022
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Descrizione Description:	TPC Chair of EuMIC 2014
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Descrizione Description:	Member of Scientific Committee of MECSA
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Descrizione Description:	Unit Responsible for Roma Tor Vergata in the SIE society
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Descrizione Description:	President of GAAS Association
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DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI DI SUPPORTO ALLA COMUNITÀ SCIENTIFICA (CON ANNESSO ELENCO DI MASSIMO 5 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, RESPONSABILITÀ DI DIREZIONE DI COMITATI EDITORIALI; INCARICHI DI VALUTAZIONE DELLA RICERCA PRESSO ISTITUZIONI NAZIONALI O INTERNAZIONALI; RESPONSABILITÀ ISTITUZIONALI ALL'INTERNO DELL'ISTITUZIONE DI APPARTENENZA O DI ALTRE ISTITUZIONI) / DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10 YEARS IN TERMS OF SUPPORT TO THE SCIENTIFIC COMMUNITY (WITH

ATTACHED LIST OF MAXIMUM 5 RESULTS, INCLUDING, FOR EXAMPLE, MANAGEMENT RESPONSIBILITIES OF EDITORIAL COMMITTEES; RESEARCH EVALUATION ROLES AT NATIONAL OR INTERNATIONAL INSTITUTIONS; INSTITUTIONAL RESPONSIBILITIES WITHIN THE INSTITUTION OF AFFILIATION OR OTHER INSTITUTIONS):

<p>Descrizione Description:</p>	<p>Since March 2006 he has been the delegate for the University of Rome Tor Vergata in the Management Committee of the Microwave Engineering Center for Space Applications (MECSA), an interuniversity center that brings together the research activity in the field of electronics and electromagnetism of the University of Rome Tor Vergata, Rome 'Sapienza', L'Aquila, Bologna, Ferrara, Firenze, Marche, Messina, Modena and Reggio Emilia, Padova, Palermo, Perugia, Salerno and Polytechnic of Turin. He is Responsible of the Unit of University of Roma Tor Vergata in the SIE (Società Italiana di Elettronica) He has been member of the following committees for National Academic Positions: 2017 - N.1 Research Position SSD ING-INF/01 at the University of L'Aquila (D.R. 3162 of Feb. 02, 2017) 2018 - N.1 Research Position SSD ING-INF/01 at the Polytechnic of Turin (D.R. 222 of March 5, 2018) 2018 - N.1 Research Position SSD ING-INF/01 at the Polytechnic of Turin (D.R. 225 of March 5, 2018) 2019 - N.1 Associate Professor SSD ING-INF/01 at the University of Roma Tor Vergata (DR 1189 of May 16, 2019) 2019 - N.1 Full Professor SSD ING-INF/01 at the University of Roma Campus bio-medico (DR 264 of Sept 19, 2019) 2021 - N.1 Associate Professor SSD ING-INF/01 at the University of Perugia (DR 2323 of Sept. 30, 2021) 2021 - N.1 Associate Professor SSD ING-INF/01 at the University of Rome Tor Vergata (DR 2249 of Oct. 11, 2021) 2022 - N.1 Associate Professor SSD ING-INF/01 at the University of Palermo (DR 310 of Jan. 21, 2022) N.1 Associate Professor SSD ING-INF/01 at the University of Perugia (DR 700 of March 28, 2022) He has also been a Member of the National committee for the enabling process for the qualification of Full/Associate professor in Electronics sector ('Abilitazione Scientifica Nazionale') ASN2021-23. He acts as an evaluators for the following International Projects: 2014 - Horizon 2020 call on H2020-COMPET-2014 -Space (Expert Contract Number: CT-EX2014D170651-101). 2015 - The Research Foundation - Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO), Belgium 2018 - Croatian Science Foundation (HRZZ), call IP-2018-01, Sc. Area 5296, 'Next-generation Semiconductor Devices and Integrated Circuits for the Internet-of-Things Era' 2019 and 2020 - Deutsche Forschungsgemeinschaft (German Research Foundation) 2021 - Reviewer for the National Science Centre (NSC) Poland (ID: 501721; Funding scheme: OPUS-20; Panel: ST3 Condensed matter physics) 2022 and 2023- Evaluator for Latvian Council of Science as</p>
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	<i>Evaluators for National Projects He acts for the Region Campania (Italy) as Evaluator of Program Campania Start-up 2020 He is serving as Associate Editor for the following journals 2015 - now: International Journal of Microwave and Wireless Technologies 2019 - now: IEEE Microwave and Wireless Components Letters He is also president of GAAS Association, a cultural scientific non profit-making European association to promote researchers in the field of microw</i>
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Descrizione Description:	Membro della Commissione Nazionale per l'Abilitazione Scientifica ASN S.C. 09/E3-ELETTRONICA (Decreto Direttoriale n. 1693 del 09/07/2021)
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Descrizione Description:	Associate Editor IEEE Microwave and Wireless Components Letters
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Descrizione Description:	Associate Editor International Journal of Microwave and Wireless Technologies
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DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI VALORIZZAZIONE DELLE CONOSCENZE (CON ANNESSO ELENCO DI MASSIMO 3 RISULTATI, RELATIVI ALLA PARTECIPAZIONE DEL CANDIDATO ALLE ATTIVITÀ DI VALORIZZAZIONE DELLE CONOSCENZE) / DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10 YEARS IN TERMS OF KNOWLEDGE VALORIZATION (WITH ATTACHED LIST OF MAXIMUM 3 RESULTS, RELATING TO THE CANDIDATE'S PARTICIPATION IN KNOWLEDGE VALORIZATION ACTIVITIES):

Descrizione Description:	
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Informazioni aggiornate alla data di candidatura 08-06-2025

Paolo COLANTONIO

Il presente curriculum costituisce allegato e parte integrante dell'incarico sottoscritto