

**SELECTION OF ONE PROFESSOR (LEVEL 1), FOR ACADEMIC RECRUITMENT FIELD 09/F2 "TELECOMMUNICATION" AT THE INSTITUTE OF COMMUNICATION, INFORMATION AND PHOTONICS (TECIP) - ACADEMIC CLASS OF EXPERIMENTAL AND APPLIED SCIENCES, RESERVED, PURSUANT TO ART. 24, SUBSECTION 6, OF ITALIAN LAW 240/2010, FOR ASSOCIATE PROFESSORS EMPLOYED AT THE SCHOOL, ISSUED BY RECTOR DECREE. NO. 80 DATED 13/02/2024.**

### **MINUTES OF THE THIRD MEETING**

The Review Committee for the selection of one professor (level 1) for the Academic Recruitment Field 09/F2 "Telecommunication" at the Institute of Communication, Information and Photonics (TeCIP) of the Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna di Pisa, reserved for associate professors employed at the School to be selected pursuant to art. 24, subsection 6 of the Italian law 240/2010, nominated by decree No. 169 dated 26/03/2024 by the Rector, that consists of:

- Prof. Giuseppe Bianchi, Full Professor of Academic Recruitment Field 09/F2 "Telecommunication" at the University of Roma Tor Vergata, as expert designated by the TeCIP Institute;
- Prof. Franco Chiaraluce, Full Professor of Academic Recruitment Field 09/F2 "Telecommunication" at the University of Politecnica delle Marche;
- Prof. Francesca Cuomo, Full Professor of Academic Recruitment Field 09/F2 "Telecommunication" at the University of Roma La Sapienza;
- Prof. Piet Demeester, Full Professor at the Ghent University (Belgio), as foreign expert designated by the Rector;
- Prof. Carmen Mas Machuca, Full Professor at the University of the Bundeswehr Munich, as foreign expert designated by the Rector.

convened for the third time, via teleconference, on June 21, 2024 at 2 p.m. from the following locations:

- Prof. Bianchi located in Rome, connected via Microsoft Teams;
- Prof. Chiaraluce located in Ancona, connected via Microsoft Teams;
- Prof. Cuomo located in Rome, connected via Microsoft Teams;
- Prof. Demeester located in Ghent, connected via Microsoft Teams;
- Prof. Mas Machuca located in Munich, connected via Microsoft Teams.

The President, having ascertained the presence of all the members, opened the session and verified that the assessment criteria defined in the previous session had been published on the website of the School.

The members of the Committee states that the Personnel Office of the School has provided them

with an electronic copy of the documentation submitted by the applicants containing: application, curriculum, publications with a declaration in lieu of an affidavit certifying compliance with the original, letters of recommendation, and a list of all the documents accompanying the application.

The members of the Committee state that they have examined the publications, curriculum and teaching activities of the candidates and made their individual assessments, which are reported in Annex 1 of these minutes.

The Committee then examines the publications, curriculum and teaching activities of the candidates, confronts their individual assessments and reviews the collegiate assessments annexes sub 2 attached to the minutes of which they are an integral part.

Then after an extensive discussion, unanimously the Committee declares that the winning candidate is:

- **Prof. Luca Valcarenghi**

The Committee then draws up a report summarizing the work carried out.

Then the Members send to the President their declarations of approval. These declarations form an integral part of this agreed minute. The President will send a signed copy of these agreed minutes to Staff Office, together with the declarations of approval by the other members of the Committee, in order for these proceedings to be verified, with a decree from the Rector.

The session closed at 5:30 pm.

Read, approved and signed.

Prof. Giuseppe Bianchi, President of the Commission.

## ANNEX 1 – INDIVIDUAL ASSESSMENTS

Candidate: *PROF. 4078 del 05/03/2024*

### Giuseppe Bianchi's assessment

Prof. ( ) presents a significant research track in terms of participation to projects funded by public national and international agencies/bodies, although mostly in the role of local/unit project manager. Worth of further note is the leadership in an ASI project on Quantum RNG, two leaderships in bilateral project initiatives (with India and China), and a past FP7-PEOPLE project. In terms of PhD mentoring activities, he has supervised a total of 7 PhD students. In the period 2002-2008 he has further acted as supervisor for experimental activities for other 5 PhD/postdocs. As per professional roles, Prof. ( ) has been intense, serving as area/associate editor for two letters (IET Electronic Letters and the very prestigious IEEE Communication Letters), as well as associate editor for three journals of somewhat less relevance. He has also had chairing roles in three events and in a few focused workshops. Within the university, the candidate has been delegate of the TeCIP Institute for Public Engagement since 2021, and is currently representing his university in GTTI since 2021. He has been involved in international university relationship programs, including being one of the responsible for an Erasmus+ initiative

Prof. ( ) was awarded in 2009 an 8-month "Visiting Professor Fellowship at Osaka University, Japan" under the FY2009 JSPS Invitation Fellowship Program for Research in Japan by the Japan Society for the Promotion of Science (JSPS). His technology transfer efforts are highlighted by the filing of 7 patents. Teaching activities, in the last 5 years, account for two modules at PhD level, for a total of 7 ECTS.

Prof. ( ) has a substantial publication record, encompassing 109 peer-reviewed journal articles that span telecommunications, electronics, and physics. His research addresses optoelectronic devices, broadband optical transmission, photonic integrated circuits, all-optical signal processing techniques, and practical applications of semiconductor lasers and optical amplifiers. The 20 publications submitted for assessment appeared in quite diverse venues, underscoring the interdisciplinary nature of his work. In addition to journals typical of the photonic sector, these venues further include three prestigious journals within the "Nature" portfolio. These contributions have garnered nearly 900 Scopus citations, highlighting their impact. Apart from one single-name publication in IEEE Photonics Technology Letters, all others involve collaboration, averaging 5.8 authors per paper. Nonetheless, Prof. ( ) significant individual contributions are evident across most publications.

Considering all the above, my assessment is:

<i>Projects, coordination, mentoring</i>	<i>Very good</i>
<i>Professional &amp; university services</i>	<i>Very good</i>
<i>Awards, technology transfer</i>	<i>Very good</i>
<i>Teaching</i>	<i>Very good</i>
<i>Publications and scientific production</i>	<i>Excellent</i>
<b>O verall</b>	<b>Very good</b>

### Franco Chiaraluze's assessment

Prof. [redacted] holds the position of Associate Professor in the SSD ING-INF/03 - Telecomunicazioni, at the Scuola Superiore Sant'Anna di Studi Universitari e Perfezionamento, Pisa, since November 2018. He has achieved the National Scientific Qualification as Full Professor in the Sector Competition 09/F2 – Telecomunicazioni, on Sep. 12, 2019 (date of expiry Sep. 12, 2030). He has also achieved the National Scientific Qualification as Full Professor in the Sector Competition 09/E3 - Elettronica, on Nov. 7, 2023 (date of expiry Nov. 7, 2034) and the National Scientific Qualification as Full Professor in the Sector Competition 02/B1 – Fisica Sperimentale della Materia, on Jul. 26, 2018 (date of expiry Jul. 26, 2029).

#### 1. International and National positioning

The international positioning of Prof. [redacted] research is very high. At the date of June 5, 2024, according to Scopus, his h index was 29 and the total number of citations (starting from 1998, date of his first registered publication) was 3127. As regards the indicators set by the National Academic Qualification, Prof. [redacted] largely exceeds the thresholds for both positions of full professor and commissioner.

My assessment on the international and national positioning of Prof. [redacted] is: **excellent**.

#### 2. Publications

The research activities of Prof. [redacted] has focused on various topics in the field of optoelectronic devices and broadband optical transmission in fibers and free space, with special emphasis on the study and experimental demonstration of novel schemes and techniques for the all-optical processing of high speed signals, on the design and exploitation of novel photonic integrated circuits, and in the characterization and application of semiconductor lasers and semiconductor optical amplifiers.

The quantity and quality of the scientific production is very high, with a good temporal continuity. At the date of the application, Prof. [redacted] had published:

- 109 international journal papers (5 invited),
- 131 international conference papers (12 invited),
- 18 national journal and conference papers.

Looking, in particular, at the 20 papers presented for evaluation, they are coherent with the scientific sector relevant for the selection and all of them show the propensity of Prof. [redacted] to privilege experimental demonstrations and practical realizations, which makes his work of very high practical impact. A bit less evident is instead the originality since, as indeed natural, some of the research outputs are strictly related one each other. As a matter of fact, however, most of the experimental results presented by Prof. [redacted] can be seen as first demonstrations. The relevance of the practical results obtained are certified also by the 7 international patents (3 pending) Prof. [redacted] co-owns. The average number of authors for the 20 papers is 5.8, which is a rather high value, while the average number of citations is 45, which is a rather high value in its turn. The contribution of Prof. [redacted] to each publication can be clearly enucleated and seems noticeable.

The publishing activities of Prof. [redacted] is intense; he is currently: Area Editor of IET Electronics Letters (SJR Q3) and Associate Editor of IEEE Communication Letters (SJR Q1), Frontiers in Communications and Networks for Optical Communications and Networks (SJR Q1), MDPI Photonics (SJR Q2) and MDPI Applied Sciences (SJR Q2). Looking at honors and fellowships, it deserves to be mentioned the 2009 (May-December) Fellowship "Visiting Professor at Osaka University (Japan)", awarded by the Japan Society for Promotion of Science (JSPS).

As regards conferences organization, Prof. [redacted] has served as General Co-chair of Photonics in Switching and Computing (PSC) 2019 (Fukuoka, Japan, July 2019), as Technical Co-chair of Photonics in Switching 2017 (New Orleans, Louisiana, USA, July 2017) and as Organizer and scientific Co-chair of the 4th Edition of the EPIXfab Silicon Photonics Summer School (Pisa, 1-5 July 2019). Moreover, he has organized or co-organized 3 workshops for possible cooperation with India, Japan and China. He was also TPC member of major conferences, like OFC (from 2019 to 2021), ECOC (in 2018) and IPR (in 2018), and he participated as TPC member in at least 15 conferences and workshops. In January 2018, being the recipient of a "Huazhong University of Science and Technology Visiting Fellowship" at Wuhan, Hubei province, China, Prof. Contestabile has been invited for a series of seminaries on photonic integrated circuits for telecom and microwave photonics applications at the same university.

My assessment on the scientific production and related issues of Prof. [redacted] is: **good**.

### 3. Teaching

Teaching activities of Prof. [redacted] have been substantially addressed to the students of the International PhD Program in Emerging Digital Technologies at Scuola S. Anna. From 2011 to now, he has taken the lectures for the course of "Photonic Technologies" (4 ECTS) and from 2019 to now the lectures for the course of "Photonic Integrated Circuits, Technologies and Platforms" (3 ECTS), both in the International PhD Program in Emerging Digital Technologies. Besides these, he also matured teaching experience in the previous years (from 2010 to 2016) in some courses addressed to undergraduate and graduate students, as well as in the Erasmus Mundus Master. At the beginning of his career, he also took laboratory exercises and seminars. Prof. [redacted] did not provide any report about students' evaluation of his teaching activities. He has been the PhD Tutor/Supervisor of 5 PhD students, the PhD Co-Tutor/Co-Supervisor of 2 PhD students, the PhD Tutor/Supervisor of 7 PhD students and the Supervisor for the experimental activities of 5 PhD students and PostDoc Researchers.

My assessment on the teaching activities and related issues of Prof. [redacted] is: **good**.

### 4. University services

Since 2022, Prof. [redacted] is the Coordinator of the Research Unit "Photonics" of the TeCIP Institute of the Scuola Superiore Sant'Anna. Due to this role, he is an invited member of the TeCIP Institute Board of Governors. From 2012 to 2015, he covered the same role as elected member. From 2021, Prof. [redacted] is the TeCIP Institute Delegate to the Public Engagement Activities. From the same year, he is also the elected Delegate of Scuola Sant'Anna Research Unit to the GTTI. From 2011, he is member of the PhD Selection Committee and PhD Coordination and Scientific Board of the TeCIP Institute. Previously, from 2010 to 2016, he has been member of the Erasmus Mundus Master "MAPNET" Program Selection Committee; from 2010 to 2012, he was Area Leader of the "Photonic Integrated Circuit" Area at Scuola Superiore Sant'Anna; from 2002 to 2009, he was Deputy Area Leader of the "Transmission Systems" Area of Scuola Superiore Sant'Anna.

My assessment on the university services of Prof. [redacted] is: **good**.

### 5. Projects and Funding

As regards international projects funded through competitive calls, Prof. [redacted] has been the Project Leader of an FP7-PEOPLE Project (from 2011 to 2013), the Unit Project Leader of an ESA Tender (in 2024, ongoing) and an expert and Local Project Manager for 4 projects supported by the EU, among which 1 Horizon 2020 (from 2022, ongoing) and 1 FP7 (from 2013 to 2017). The other two projects are temporally located between 2017 and 2021 and between 2019 and 2023, respectively.

Prof. [redacted] has been also very active in the Leadership of National projects funded through competitive calls. He has been 4 times Project Leader, 3 times Sant'Anna Unit Project Leader, 2 times

Technical Coordinator and 1 time Project Co-Manager. These roles have been assumed seamlessly since 2011 to now.

He has also participated, as a Researcher, in 4 international projects funded by the EU, 2 projects funded by the Italian Ministry of University and 3 projects funded by the Ministry of Foreign Affairs.

As regards industrial relations, since 1997, Prof. [redacted] has been consultant of important telecom enterprises, like Huawei Italy, Ericsson, Alenia Difesa (now Leonardo Group) and Opto Speed CH.

My assessment of Prof. [redacted] : activity for projects and funding is: **excellent**.

**Based on the evaluations above, my overall assessment on Prof. [redacted] : very good.**

### **Francesca Cuomo's assessment**

Prof. is an Associate Professor at Scuola Superiore Sant'Anna of University Studies and Doctoral Research of Pisa, Italy in "09/F2 Telecomunicazioni". (from November 2018). He holds the National Qualification to Full Professor in: - 09/F2 – TELECOMUNICAZIONI (Telecommunications). (For the period: 12 September 2019 to 12 September 2030). He has other two National Qualifications as Full Professor, in 09/E3 - ELETTRONICA (Electronic Engineering) and in 02/B1 - FISICA SPERIMENTALE DELLA MATERIA (Experimental Physics).

### **TEACHING**

Prof. has a good teaching activity record, focusing primarily on advanced courses in photonics and optical technologies. Since 2011, he has taught "Photonic Technologies" and "Photonic Integrated Circuits, Technologies and Platforms" in the International PhD Program in Emerging Digital Technologies. He has also taught courses such as "Photonics Switching," "Optical Communication and Technologies," and "Laboratory of Networks, Systems and Components" at Pisa Sant'Anna and other institutions. Additionally, he has supervised numerous PhD students and postdoctoral researchers, contributing significantly to their academic and experimental development. His teaching activities demonstrate a deep commitment to education and mentorship in the ING-INF/03 field.

He has been a member of the PhD Selection Committee and PhD Coordination and Scientific Board for multiple cycles of the "International PhD in Emerging Digital Technologies" program from 2011 to 2023. Additionally, he was part of the Erasmus Mundus Master "MAPNET" Program Selection Committee from 2010 to 2016.

My assessment on the teaching activities and related issues of Prof. is: **good**.

### **RESEARCH**

Prof. participated and coordinated several research projects, indicating a high level of expertise and leadership in his field. Notable projects include:

- National Recovery and Resilience Plan Mission 4 Component 2 Investment 1.3 funded by the European Union – Next Generation EU, where he serves as the Sant'Anna unit Project Leader.
- PRIN ("Progetti Di Ricerca Di Rilevante Interesse Nazionale") LINUS and TOSCA, where he had leadership roles.
- Ministry of Foreign Affairs (MAE) projects, such as INPATIENT and CANTON, with India and China, respectively, where had leadership role.
- Italian Space Agency (ASI) projects like QRNG and QCommSpaceOne, where he was a project leader or unit project leader.
- European Space Agency (ESA) tender on Application of Photonics Technology For PNT User Equipment, demonstrating his capability in leading high-impact projects.

Prof. Contestabile has acquired substantial funding for his projects, testifying his ability to attract financial support for his research.

Various other projects under EU Horizon 2020, FP7, and collaborations with industrial partners like Huawei and Ericsson, further validate his research leadership and influence.

; research activities showcase a robust and continuous engagement with high-impact projects across national and international platforms. His leadership in these projects, combined with significant funding achievements, highlights his strong research capabilities and contributions to the field of

photonics and optical communications. The diversity and scale of his projects reflect his versatility and commitment to advancing scientific knowledge and technological innovation.

Prof. [redacted] has made notable contributions to the scientific community through a range of editorial, conference, and institutional roles. He serves as an Area Editor for IET Electronics Letters and holds Associate Editor positions for several journals, including IEEE Communication Letters and Frontiers in Communications and Networks. His regular review work for high-impact journals such as IEEE Photonics Technology Letters and Nature Photonics underscores his expertise and commitment to maintaining high academic standards.

As for organizations capabilities, Prof. [redacted] has taken on significant organizational roles, including General Co-chair of the Photonics in Switching and Computing 2019 conference and Technical Co-chair of the Photonics in Switching 2017 conference. He also organized and co-chaired the EPIXfab Silicon Photonics Summer School in 2019. His involvement extends to being a member of the Technical Program Committees for major conferences like OFC, ECOC, and IPR.

Within his institution, Prof. [redacted] has been an elected member of the TeCIP Institute Board of Governors and has served as a delegate for public engagement activities. Additionally, he represents his research unit in the Italian Telecommunication Professors Association (GTTI). His leadership is further evidenced by his role in the PhD Selection Committees and Coordination Boards for the International PhD in Emerging Digital Technologies program at the TeCIP Institute.

My assessment on the research activities and related aspects of Prof. [redacted] is **excellent**.

#### PUBLICATIONS

The scientific production of Dr [redacted] is fully consistent with his scientific national sector (ING-INF/03). He has authored or coauthored more than 109 journal papers (5 invited) and more than 130 conference papers (12 of them invited), most of which are in the most relevant journals and conferences in his sector. The overall publication track record is very strong, consistent, and full-aligned with the Telecommunications research field. The topics covered include innovative techniques such as all-optical signal regeneration, wavelength conversion in SOAs, and the integration of novel materials like quantum dots and graphene into photonic devices. This is supported by excellent bibliometric indexes that are: 281 papers, 3136 citations, 30 H index (statistics measured on 19th June 2024 - from Scopus website).

As for the 20 presented publications [redacted] is the first author in 5 papers. Four papers are published in high-impact journals such as Nature Scientific Reports, Nature Photonics, Nature Quantum Information and IEEE JSAC. Eight articles have more than 5 co-authors.

The research topics cover a wide range of advanced photonics and optical communication technologies, including integrated optical frequency modulators, monolithically integrated transmitters, quantum-key distribution, and graphene-silicon modulators.

My assessment on the research activities and related aspects of Prof. [redacted] is **Excellent**.

#### THIRD MISSION AND TECHNOLOGY TRANSFER

He performed dissemination activities to the general public. He filed 4 patents as an inventor and 3 more that are pending. This underscores his good achievements and expertise in optical networking. His ability to innovate, collaborate, and lead in this highly specialized field makes them a valuable asset to any organization or research endeavor focused on advancing optical communication systems.

My assessment on the third mission and technology transfer activities of Prof. [redacted] is **good**.



## **Carmen Mas Machuca's assessment**

### **1 Teaching - Very Good**

Prof. [redacted] is currently giving two courses on the International PhD Program Emerging Digital Technologies with [redacted] a total of 7 ECTS. Previously, he has offered different courses in different universities (University of Trento and University of Pisa). Up to 2016, Prof. [redacted] also offered courses to master students at different programs as well as seminars. One of the courses was a "Laboratory of networks, systems and components". Prof. [redacted] has been member of the PhD Selection Committee and PhD Coordination and Scientific Board of different PhD programs since 2011. He has a vast experience in the supervision of students from undergraduate to doctoral level (being the main supervisor of 7 PhD candidates).

### **2 Publications - Outstanding/Very Good**

Prof. [redacted] has published 109 journal papers, 131 conference papers, 18 papers in Italian press. He has also 7 patents showing high potentials for technology transfer. The journal papers include five invited journals: one IEEE/OSA JLT, two at IEEE Journal Selected Topics of Quantum Electronics, one at Fiber and Integrated Optics, one at MDPI Applied Science. Furthermore, Prof. [redacted] has also publications in Nature Photonics and Nature Scientific Reports. Prof. [redacted] has 12 invited presentations at international conferences, included ECOC and OFC. Although he does not appear as a first author of a journal paper since 2014, he appears as last author as main supervisor of the work. The average of number of co-authors of the last years is usually rather high. According to Google Scholar, he has more than 4000 citations (1386 since 2019), which is yearly increasing. His h-index is 32.

His work focuses on photonic integrated circuits applied to different areas such as free space optics links, quantum devices, etc. Prof. [redacted] is also published on semiconductor lasers and their use in combs, as well as semiconductor optical amplifiers. His work is not only theoretical but also practical, as he has also demonstrators of the proposed technologies. In particular, it is important to highlight that he has contributed several first experimental demonstrators (e.g., the first experimental test-bed demonstrating QKD on FSO link using a silicon photonic integrated transmitter and the first demonstrator of high-speed pure phase modulation in silicon-graphene device).

Concerning international conferences, Prof. [redacted] has been general chair of the Photonics in Switching and Computing (2019) and technical co-chair of Photonics in Switching (2017). He has organized and chaired the 4th Edition of the-EPIXfab Silicon Photonics Summer school in Pisa (2019).

### **3 Scientific Research - Outstanding**

The research topics of Prof. [redacted] in the field of PIC, Semiconductor lasers and SOAs and their applications. His findings are not only the modeling, design and characterization of new PICs but also their experimental demonstration as well as testbeds. His record on demonstrations and testbeds is impressive.

Prof. [redacted] has a large experience on projects (national and international such as EU IST), in a wide set of programs, showing his awareness and motivation to trigger collaborations and find funding. In some of these projects, he was project manager.

His research is well known by the scientific community, as shown by the important number of citations and invited talks. Prof. [redacted] special collaborations with Japan based on different fellowships.

### Piet Demeester's assessment

#### Research (excellent)

The research of Prof. [redacted] focusing on Photonic Integrated Circuits, semiconductor lasers and semiconductor optical amplifiers. He is recognized as international expert in this field as is illustrated by many high-quality publications in top journals and conferences. Examples of journals are IEEE/OSA JLT, IEEE JSAC, IEEE PTL, IEEE ACCES, Nature Photonics, Nature Quantum Information, ... and examples of conferences are: OFC, ECOC, ....

He has an excellent citation track record (google scholar) as illustrated below:

	All	Since 2019
Citations	4008	1389
h-index	33	16
i10-index	91	22

Many publications relate to experimental demonstrations of systems and photonic integrated circuits that typically require collaborations with many people.

Prof. [redacted] very active as associate or area editor of important journals in the field and took important responsibilities in the technical program committees (TPC) of several conferences (e.g. Photonics in Switching). He participated in a considerable number of international research projects (H2020, FP7, ESA).

He has been supervisor of 7 PhD students.

#### Education (good)

Prof. [redacted] s gained quite some experience in teaching, resulting today in a focus on 2 courses in the "International PhD Program Emerging Digital Technologies".

#### Services (very good)

Over the years, Prof. [redacted] took more and more responsibilities in leading research activities, culminating in his current position as coordinator of the research unit "Photonics" of the TeCIP institute.

The scientific work resulted in 7 patents.

Candidate: *Prot. 4061 del 05/03/2024*

Giuseppe Bianchi's assessment

Prof. [redacted] s major project coordination achievement is a large national FIRB project (COTONE) in 2012-2015. Industry collaborations with Huawei are also worth of mention, as well as his role as local coordinator for a PNRM project (National Program for Military Research). In terms of PhD mentoring activities, he has supervised a total of 7 PhD students, acting as the primary supervisor for 5 and co-supervisor for 2. In terms of professional roles, Prof. [redacted] s been an associate editor for the prestigious IEEE Transactions on Communications journal and has co-organized three international events. Within the university, his responsibilities align with those expected by an Associate Professor, including membership on institute and PhD advisory boards, and chairing selection committees.

Prof. Secondini's achievements include two "top scored paper" awards, one of which notably from the OFC conference, a key event in optical communications. His technology transfer efforts are highlighted by the filing of 13 patents. Teaching activities, previously limited, have expanded since 2023 with three modules totaling 90 hours of frontal lectures.

Professor [redacted] scholarly publications in optical communications span critical areas such as information theory of optical fibers, fiber nonlinearity modeling, high-capacity transmission techniques, modulation formats, quantum key distribution, and nonlinear constellation shaping. The majority among the 20 publications presented for this assessment have appeared in the prestigious Journal of Lightwave Technology, and two have been published in the renowned IEEE Transactions on Communications. Collectively, these papers have made a substantial impact, with over 800 Scopus citations. Particularly notable appears the individual contribution of the candidate, with one single-author paper and 9 of the remaining 19 having the candidate as first author in a list of non-alphabetic order (the average number of authors being 3,9).

Considering all the above, my assessment is:

<i>Projects, coordination, mentoring</i>	<i>Very good</i>
<i>Professional &amp; university services</i>	<i>Good</i>
<i>Awards, technology transfer</i>	<i>Excellent</i>
<i>Teaching</i>	<i>Good</i>
<i>Publications and scientific production</i>	<i>Excellent</i>
<b>Overall</b>	<b>Very good</b>

### Franco Chiaraluca's assessment

Prof. [redacted] holds the position of Associate Professor in the SSD ING-INF/03 - Telecomunicazioni, at the Scuola Superiore Sant'Anna di Studi Universitari e Perfezionamento, Pisa, since 2021. He has achieved the National Scientific Qualification as Full Professor in the Sector Competition 09/F2 – Telecomunicazioni, in 2018 (year of expiry 2029).

#### 1. International and National positioning

The international positioning of Prof. [redacted] research is very high. At the date of June 5, 2024, according to Scopus, his h index was 26 and the total number of citations (starting from 2001, date of his first registered publication) was 2478. As regards the indicators set by the National Academic Qualification, Prof. [redacted] largely exceeds the thresholds for both positions of full professor and commissioner.

My assessment on the international and national positioning of Prof. [redacted] is: **excellent**.

#### 2. Publications

The research activities of Prof. [redacted] have focused on different topics in the area of optical communications, with emphasis on: information theory of optical fibers; fiber nonlinearity modeling and mitigation; transmission techniques for high-capacity long-haul fiber links; efficient modulation formats for short-reach optical links; quantum key distribution for secure communication; nonlinear constellation shaping. The quantity and quality of the scientific production is extremely high, with a good temporal continuity. At the date of the application, Prof. [redacted] published:

- 5 books and book chapters (2 invited),
- 58 international journal papers (9 invited),
- 64 international conference papers (15 invited),
- 7 national conference papers.

He has been co-recipient of 1 Best Student Paper Award (2nd prize) at Progress In Electromagnetics Research Symposium (PIERS), Toyama, Japan, August 1–4, 2018, and of 2 Top Scored Paper Awards, one at Optical Fiber Communication (OFC) conference, San Diego, CA, USA, March 5-9, 2023 and one at the International Conference on Optical Network Design and Modeling (ONDM) 2015, Pisa, Italy.

Looking, in particular, at the 20 papers presented for evaluation, all coherent with the scientific sector relevant for the selection, I see that 16 of them have been published in the Journal of Lightwave Technology. The latter is undoubtedly one of the most relevant journals in the field of optical communications. However, a greater variety of the publication venues would be appreciated, in view of demonstrating the recognition of the value of the research by a wider and more heterogeneous audience. Other 2 papers, out of the 20, have been published in the IEEE Transactions on Communications (one of the most prestigious venues for the entire telecom sector) and also the other 2 were both SJR Q1 at the time of publication. Apart from this consideration, the presented papers exhibit a very high level of originality, with an excellent mix between theoretical issues and practical aspects having significant technical impact, as certified by the 13 international patents Prof. [redacted] own. The average number of authors for the 20 papers is 3.9 and the average number of citations is 38.7, both values being quite appreciable. The contribution of Prof. [redacted] to each publication can be clearly enucleated and seems noticeable.

In 2016, Prof. [redacted] received the Top Reviewer Award for the IEEE – OSA Journal of Lightwave Technology. As regards publishing activities, from February 2018 to March 2023, Prof. Secondini has been Associate Editor for IEEE Transaction on Communications. He is currently serving as a Guest Editor of the Special Issue "Next-generation optical communications and networking" for the prestigious IEEE Journal of

Selected Areas in Communications, and in 2020 he guest-edited a special issue on "Information Theory of Optical Fiber" for the Journal Entropy.

As regards conferences organization, Prof. [redacted] as the Chair of the Technical Program Committee (TPC) of the Tyrrhenian International Workshop on Digital Communications (TIWDC) 2015, Fiber Nonlinearities in Coherent Optical Communications", Florence, Italy, and the co-organizer of two symposium workshop: the Rank Prize Funds Symposium on "Challenges to Achieving Capacity in Nonlinear Optical Networks, Grasmere, UK, June 18-21, 2018 and the Workshop "Nonlinear Fourier Transform in Optical Communications", Italy, February 21, 2018. Moreover, he has been 14 times TPC Member in important conferences (e.g., OFC, APC, ECOC, Globecom, ICC, OSA Topical Meeting on Photonics in Switching). He has been also invited to take talks in relevant conferences on optical communications: twice at OFC (2016 and 2020) and twice at ECOC (2017 and 2021) as well as lectures and seminars in some of the most important universities in Europe (e.g., Chalmers University, Sweden; University College London, UK).

My assessment on the scientific production and related issues of Prof. Marco [redacted] is: **excellent**.

### 3. Teaching

Teaching activities of Prof. [redacted] though recently intensified (3 courses in 2023, for a total of 90 hours), have been generally limited. In particular, from 2019 to 2022 he has taken only 1 course of 30 hours addressed to students of the Doctoral School in Emerging Digital Technologies of Scuola Superiore Sant'Anna, Pisa, but also open to master and Erasmus Mundus Program. In the previous years, up to 2007, some other courses were sporadically added, also addressed to Master and PhD students. Regarding students' evaluations, Prof. [redacted] was not able to expose the results of students' questionnaires since the online evaluation system used by Scuola Sant'Anna was active for his courses only for the last two years, during which the number of completed surveys was not sufficient to achieve the minimum required to produce a report and ensure anonymity (as defined by Scuola Sant'Anna). So, Prof. [redacted] was attached to the application the evaluation reports he collected individually for some of his courses in the previous years. These reports are extremely positive but, clearly, they cannot be assimilated to the official Sant'Anna's reports. Prof. [redacted] has been the PhD Tutor/Supervisor of 5 PhD students, the PhD Co-Tutor/Co-Supervisor of 2 PhD students, the Supervisor of 3 Research Fellows, the Supervisor of 3 Visiting Students, the Thesis Supervisor of 6 Master Students, the Thesis Co-Supervisor of 4 Master Students and the Internship Tutor of 2 Students. He has been appointed as an external (independent) expert in various Italian (University of Parma, Politecnico di Torino, University of Brescia) and foreign (University of Edinburgh, UK; University of Toronto, Canada; Chalmers University, Sweden; Eindhoven University of Technology, The Netherlands; University College London, UK; KTH Royal Institute of Technology, Sweden; Ben-Gurion University, Israel; Institut Polytechnique de Paris, France; Technical University of Denmark) universities for several PhD committees and recruiting committees.

My assessment on the teaching activities and related issues of Prof. [redacted] is: **good**.

### 4. University services

Since July 1, 2022 Prof. [redacted] a Member of the Board of the Institute of Telecommunications, Computer Engineering, and Photonics (TeCIP), at Scuola Superiore Sant'Anna. Since 2017 he is a Member of the Advisory Board of the International Doctoral School in "Emerging Digital Technologies". Prof. [redacted] has been President/Member of 14 recruitment committees (e.g., PhD admission thesis, Post-doc, Scholarship, Master).

My assessment on the university services of Prof. [redacted] is: **sufficient**.

### 5. Projects and Funding

From 2012 to 2015, Prof. Secondini has been the Principal Investigator (PI) of a FIRB project. Then, from 2016 to 2020, he was the Scientist in Charge for the Sant'Anna partner unit of an H2020-Marie -Skłodowska-Curie action.

At present, he is involved as Activity leader for Scuola Superiore Sant'Anna in 1 PNRR project, and as Local Principal Investigator in a PNRM Project funded by the Italian Ministry of Defense (the project started in Feb. 2021 and has three phases). In 2017, he was the Local PI for the Sant'Anna research unit of a national project. Moreover, he has been Task leader in 1 PNRR Project and in 1 POR (Regione Toscana) project. He has also participated in 1 FP7-ICT Project, in 1 EU-GEANT project and in 1 MAECI Italy-USA bilateral project.

The collaborations with industries (Huawei, Ericsson, SITI, Fiberhome, Marconi Communications, in particular) are relevant, as Prof. Secondini since 2007, has been the Principal Investigator (or the co-Principal Investigator) of 6 research collaboration projects and, since 2002, he has also participated to at least one project/year funded by these companies.

My assessment of Prof. Secondini's research activity for projects and funding is: **very good**.

**Based on the evaluations above, my overall assessment on Prof. Secondini is: very good.**

### Francesca Cuomo's assessment

Prof. [redacted] ; Associate Professor of Telecommunications, Institute of Telecommunications, Computer Engineering, and Photonics (TeCIP), Scuola Superiore Sant'Anna, Pisa, from 2021. He achieved in 2018 the Italian National Academic Qualification (Abilitazione Scientifica Nazionale) as Full Professor of Telecommunications.

### TEACHING

Prof. [redacted] teaching activities encompass quite a range of courses and supervisory roles, highlighting a significant contribution to both doctoral and master's programs, most of them in the field of Optical Communications and Information Theory. A total of six courses have been taught, including four for the doctoral school, two of which are structured at 30 hours per year and 20 hours per year, respectively. The remaining courses for the doctoral school cover advanced topics such as "Information Theoretic Tools for Optical Communication Engineers" and "Information Theory and Its Applications." For the master's program, two courses have been conducted: "Stochastic Processes and Queue Theory," which spans 7 hours, and "Introduction to Markov Chain and Multicanonical Monte Carlo Simulation." Additional courses such as "Performance Evaluation of Communication Systems Techniques" and "Fundamentals of Optical Communications" have also been offered, showcasing a diverse and in-depth curriculum.

In terms of advisory roles, he had a position as a member of the Advisory Board for the International Doctoral School in "Emerging Digital Technologies" since 2017. He also participated in 14 activities serving as an external supervisor, opponent, or final examiner in various PhD held in international universities. Supervisory responsibilities are extensive, involving guidance for 3 visiting students, direct supervision of 5 PhD students, and co-supervision of 2 PhD students. Additionally, there is supervision of 3 research fellows and the supervision or co-supervision of 10 Master's students for their theses. These activities reflect a strong commitment to mentoring and developing future researchers and professionals in the ING/INF-03 sector.

My assessment on the teaching activities and related issues of Prof. [redacted] is: **good.**

### RESEARCH ACTIVITIES

The research activities of Prof. [redacted] demonstrate a very good commitment to advancing knowledge and collaboration within the field of optical communications. He has been the local principal investigator (PI) for several significant projects such as the PNRM Project "QUASAR" funded by the Italian Ministry of Defense, with EUR 280,000 for a three-phase, three-year project, and the FIRB project "COTONE," with a funding of EUR 810,200 from the Italian Ministry for Education University and Research (MIUR). Additionally, he has led the Sant'Anna research unit in the "NOSTRUM" project funded by Cassa di Risparmio di Firenze and was a scientist in charge for the H2020 Marie Skłodowska-Curie action COFUND project "Multiply." His industry collaborations include projects with Huawei on nonlinear constellation shaping and digital backpropagation, and advanced fiber nonlinear compensation technology, as well as projects with Ericsson on digital signal processing algorithms. These projects reflect his expertise in tackling complex issues in optical fiber communications, including the development of novel techniques for mitigating nonlinear propagation effects and enhancing optical communication systems' performance.

The dissemination of research findings has been marked by a total of seven invited talks, including two delivered at the industry level, underscoring recognition and influence in both academic and professional circles. The quality of research is further validated by some awards, including a second prize for the Best Student Paper Award, a top-scored paper award, and a top reviewer recognition, reflecting a high level in research and peer review.

Editorial responsibilities include serving as an Associate Editor for the IEEE Transaction on Communications, as well as a Guest Editor for two special issues, highlighting contributions to the scholarly community.



Additional involvement as a Technical Program Committee (TPC) member for six conferences and as the General Chair for one workshop emphasizes a proactive role in guiding the direction of research and fostering academic discourse.

My assessment on the research activities and related issues of Prof. [REDACTED] is: **very good.**

#### PUBLICATIONS

The scientific production of Dr [REDACTED] is fully consistent with his scientific national sector (ING-INF/03). He has authored or coauthored overall 5 book chapters, more than 58 journal papers (9 of them invited), and more than 70 conference papers, most of which are in the most relevant journals and conferences in his sector. His research has been published in prominent journals such as the Journal of Lightwave Technology and IEEE Communications Letters. Additionally, he has contributed to some books and book chapters, including "Advances in Optical Communications" and "Optical Fiber Telecommunications VII". His publications are recognized for their quality and impact, evidenced by awards such as the Top Scored Paper at OFC 2023 and the Best Student Paper Award at PIERS 2018. The overall publication track record is strong, consistent, and well-aligned with his research field. This is supported by very good bibliometric indexes that are 2482 citations, 154 papers and 26 as h index (statistics measured on 19th June 2024- from Scopus website).

As for the 20 presented papers Prof. [REDACTED] is listed as the first author in 10 of the publications and only 4 of them have more than 5 co-authors. The publications cover a range of topics within the field of optical communications, including constellation shaping, probabilistic amplitude shaping, nonlinear shaping gains, and capacity bounds in optical fiber channels. Two articles are published in a prominent and high quality journal that is IEEE Transactions on Communications, while 16 in the Journal of Lightwave Technology. By looking at the topics of these papers and the journals, I observe that it emerges a very focused research rather than broad exploration.

My assessment on the publications of Prof. [REDACTED] is: **excellent.**

#### THIRD MISSION AND TECHNOLOGY TRANSFER

Prof. [REDACTED] filed 13 patents as an inventor and in 4 of them he is the first inventor. This is an **excellent** achievement as for the third mission and testifies his ability to innovate and transfer the technological know-how in the industry field.



### Piet Demeester's assessment

#### Research (excellent)

Prof. [redacted] s focused his research in the field of optical communications and optical transmission systems. Based on his scientific output and a number of invited papers at top conferences (OFC, ECOC), it is clear that he has a very good international recognition. Journal papers include IEEE/OSA JLT (a very large number in this journal), IEEE JSAC, IEEE PTL, Optics Express and conferences papers include OFC and ECOC. He has an excellent citation track record (google scholar) as illustrated below:

Cited by	VIEW ALL	
	All	Since 2019
Citations	3359	1620
h-index	27	18
i10-index	60	37

Prof. [redacted] as already experience with the supervision of 7 PhD students. He has some experience in organizing conferences.

#### Education (good)

Prof. [redacted] has initial teaching experience with regular students, his teaching activities did increase however recently.

#### Services (good)

At the university he was mainly involved in committees, not yet with a major responsibility.

It is remarkable that his work resulted already in 13 patents, illustrating his interest in further valorisation of the research results.

## Carmen Mas Machuca's assessment

### 1 Teaching -Very Good

Prof. [redacted] has been teaching since 2007. His most important course is "Fundamentals of Optical Communications" which has been offered since 2008 to students of the doctoral school and different master programs. Furthermore, he has started offering two new courses in 2023. Although he has not submitted any evaluation of the current courses, Prof. [redacted] has submitted some previous reports, which are very positive.

Prof. [redacted] has a vast experience in the supervision of students from undergraduate to doctoral level (being the main supervisor of 5 PhD candidates). This experience has been supported by the participation in Master and PhD examinations (e.g., external examiner of 15 PhD defenses in Italy and abroad). Prof. [redacted] is currently a member of the advisory board of the International Doctoral school in Emerging technologies.

### 2 Publications - Outstanding/Very good

Prof. [redacted] has published a book (as editor), 4 book chapters, 58 journal papers (of which 9 invited papers), and more than 80 conference papers in international conferences. In the list of provided papers, he is first or second author in more than half of the papers. The journals are highly ranked such as IEEE/OSA JLT (more than 16), IEEE Transactions on Communications, etc.. According to Google Scholar, he has more than 3000 citations (1522 since 2019), which is yearly increasing. He has the top scored paper at OFC 2023. His h-index is 26. In comparison with the other candidates, he has the lowest number of co-authors. He has been invited speaker at several conferences, including ECOC and OFC.

His research topics are in the area of physical optical transmission to improve the efficiency of current WDM systems but other systems (e.g., QKD) by looking into different techniques (probability shaping, non linear mitigation, etc.).

Concerning international conferences, Prof. [redacted] has been TPC Chair at the Tyrrhenian International Workshop on Digital Communications (TIWDC, 2015) and Co-organizer of the Workshop "Nonlinear Fourier Transform in Optical Communications" (2018). He is/has been TPC member of important conferences such as ECOC, OFC and APC.

### 3 Scientific Research - Very Good

The research topics of Prof. [redacted] are related with next generation optical communication networks, looking into physical transmission to overcome the capacity limits (e.g., non-linearities). His research is well known by the scientific community, as shown by the large number of citations and invited talks. His research is extended towards new technologies and new cases as for example, QKD.

Prof. [redacted] is/has been PI of several national projects (PNRM 3 years 280.000€, COTONE 4 years 810.2000€, NOSTRUM 1 year 20.000€). He has participated in 7 other national and European projects. Furthermore, he has also been PI of some industrial collaborations with Huawei and Ericsson. The experience as PI shows the capacity to lead and coordinate the work of his group as well as with other national and international partners.

Prof. [redacted] has a list of collaborators with 8 national and 7 international (Europe, USA and Russia).

## Candidate: Luca Valcarenghi

### Giuseppe Bianchi's assessment

Prof. Luca Valcarenghi exhibits an extensive academic and research leadership experience throughout his career. Within the IEEE Communications Society, he held pivotal roles including Chair of the Optical Networking Technical Committee (ONTC) for 2 years, vice-chair for 2 years, and secretary for 2 years. His project coordination includes leading one EU Horizon project and participating in 5 open calls, as well as managing three national/regional projects, including a PNRM project (National Program for Military Research). He represented his unit at GTTI for 5 years and at CNIT for 4 years. In terms of PhD mentoring activities, he has supervised a total of 10 PhD students, acting as the primary supervisor for 6 and co-supervisor for 4. Professionally, Prof. Valcarenghi has served as associate editor for two major journals, general chair for an IEEE workshop, and technical chair for 30 events. He has been involved in various capacities such as panel organization, tutorial leadership, and publicity chair. At the university, he currently holds the position of vice-rector for digitalization and IT services, served as elected representative in the academic senate for 9 months, and has been coordinating a PhD course since 2018, in addition to his longstanding membership on PhD college boards.

In terms of achievements, Prof. Valcarenghi has received numerous prestigious awards, including major IEEE prizes and distinguished paper awards in optical communications and networking. His contributions have been recognized with best demos and papers at IEEE conferences such as NFV-SDN, Globecom, and Asia Communications and Photonics Conference. He holds 5 patents and has actively contributed to international telecommunication standardization within ITU-T Study Group 15. Teaching activities have primarily involved short courses (3-4 ECTSs) or shorter modules at the Master's and PhD levels, totaling an average of 50-60 hours per year in recent years within a range of 40 to 90 hours/year.

His scholarly publications encompass a wide range of topics in wireless and wired communications, particularly focusing on optical network design, reliability, energy efficiency, and integration of wired and wireless networks. All 20 publications provided for assessment have been published in major Q1 journals and magazines in the field, collectively garnering over 600 Scopus citations. Despite collaborative efforts with an average of 4.7 authors per paper, Prof. Valcarenghi's individual contributions are substantial and notable in nearly all works.

Considering all the above, my assessment is:

<i>Projects, coordination, mentoring</i>	E <i>xcellent</i>
<i>Professional &amp; university services</i>	E <i>xcellent</i>
<i>Awards, technology transfer</i>	<i>Excellent</i>
<i>T eaching</i>	<i>Very good</i>
<i>Publications and scientific production</i>	E <i>xcellent</i>
<b>O verall</b>	E <b>xcellent</b>

### Franco Chiaraluce's assessment

Prof. Luca Valcarengi holds the position of Associate Professor in the SSD ING-INF/03 - Telecomunicazioni, at the Scuola Superiore Sant'Anna di Studi Universitari e Perfezionamento, Pisa, since December 22, 2014. He has achieved the National Scientific Qualification as Full Professor in the Sector Competition 09/F2 – Telecomunicazioni, on July 17, 2017 (date of expiry Jul. 17, 2028). He has also achieved the National Scientific Qualification as Full Professor in the Sector Competition 09/H1 - Sistemi di Elaborazione delle Informazioni, on Apr. 14, 2021 (date of expiry Apr. 14, 2032).

#### 1. International and National positioning

The international positioning of Prof. Valcarengi's research is very high. At the date of June 5, 2024, according to Scopus, his h index was 25 and the total number of citations (starting from 1998, date of his first registered publication) was 2899. As regards the indicators set by the National Academic Qualification, Prof. Valcarengi largely exceeds the thresholds for both positions of full professor and commissioner.

My assessment on the international and national positioning of Prof. Luca Valcarengi is: **excellent**.

#### 2. Publications

The research activities of Prof. Luca Valcarengi embrace many topics in the field of wireless and wired communications. Among them: optical networks design, analysis, and optimization; communications networks reliability; energy efficiency in communications networks; optical access networks; wired-wireless network integration; 5G technologies and beyond; experiential networked intelligence; zero touch network and service management.

The quantity and quality of the scientific production is very high, with a good temporal continuity. At the date of the application, Prof. Valcarengi had published:

- 10 book chapters,
- 71 international journal papers (2 invited),
- 213 international conference papers (12 invited).

He has been co-recipient of 1 best paper award IEEE/OSA Journal of Optical Communications & Networking and 4 best paper/demo awards in IEEE conferences.

Looking, in particular, at the 20 papers presented for evaluation, all of them have been published in SJR Q1 journals, most of them with high reputation in the telecom community. All presented papers are coherent with the scientific sector relevant for the selection and exhibit a very good level of originality, innovation and methodological rigor. The average number of authors for the 20 papers is 4.7 and the average number of citations is 31.7. The contribution of Prof. Valcarengi to each publication can be clearly enucleated and is noticeable. The impact of the research outcomes is certified, among the others, by 4 international patents and 1 national patent of which Prof. Valcarengi is co-owner.

Among the honours and fellowships he has received in recognition of the value of his scientific activity, it is worth mentioning the Fulbright Research Scholar fellowship in 2009 and the Japan Society for the Promotion of Science (JSPS) Invitation fellowship in 2013. He has also received 2 IEEE COMSOC Optical Networking Technical Committee (ONTC) Awards: the 2022 Malathi Veeraraghavan IEEE ComSoc Optical Networking Technical Committee (ONTC) Service Award and the 2022 IEEE ComSoc Certificate of Appreciation for serving as Chair of the IEEE ComSoc Optical Networking Technical Committee (ONTC) in the years 2020 and 2021, role he has covered after having served as co-chair and elected as secretary.

As regards publishing activities, since 2017 to 2021 Prof. Valcarengi has been Editor of IEEE Communications Magazine (SJR Q1), first as Associate Technical Editor and then as Technical Editor. He is currently Editor of

Elsevier Computer Networks (since 2019 - SJR Q1) and Elsevier "Optical Switching and Networking" (since 2016 - SJR Q2). He has been co-guest editor of an IEEE/OSA JOCN Special Issue and Lead Guest Editor Feature Topic for an issue of the IEEE Communications Magazine. The conference organization activity is also very intense; Prof. Valcarengi has been the General Co-Chair of the "5G from Theory to Practice (5GToP) Workshop", co-located with the 2020 IEEE 5G World Forum, 30 times TPC Chair/Co-Chair of important conferences and more than 30 times TPC member. He has also held 21 invited lectures at international schools and events.

My assessment on the scientific production and related issues of Prof. Luca Valcarengi is: **very good**.

### 3. Teaching

The teaching activities of Prof. Luca Valcarengi, particularly in the most recent years, have been mainly addressed to Master and PhD courses. The number of hours/year is rather variable but usually not lower than 40, with some peaks, like in the A.Y. 2020/2021 with 94 hours. The students' evaluations reported by Prof. Valcarengi are very high and although a comparison with the average score of the Scuola Superiore S. Anna is not possible (data not available), it is realistic to guess an over average evaluation. Prof. Valcarengi has been the PhD Tutor/Supervisor of 6 PhD students, the PhD Co-Tutor/Co-Supervisor of 4 PhD students, the Supervisor of 5 Research Fellows, the Supervisor of 3 Research Scholars, the Thesis Supervisor of 11 Master Students, the Thesis Co-Supervisor of 2 Master Students, the Thesis Supervisor of 6 Undergraduate Students, the Thesis Co-Supervisor of 1 Undergraduate Student and the Internship Tutor of 3 Students. Since 2018, he is the Coordinator of the PhD in "Emerging digital technologies (EDT) at the Scuola Superiore di Studi Universitari e Perfezionamento Sant'Anna. He has taken part in several Master and PhD graduation Committees, in Italy and abroad.

My assessment on the teaching activities and related issues of Prof. Luca Valcarengi is: **excellent**.

### 4. University services

Since Oct. 13, 2023 (expiry date May 7, 2025) Prof. Valcarengi is the Vice-Rector for Digital Strategy and Information Technology at the Scuola Superiore Sant'Anna. From Jan. 1, 2023 to Oct. 9, 2023 he was the Representative of the Associate Professors in the Scuola Superiore Sant'Anna Academic Senate. Since Nov. 2022 he is a Member of the Steering Committee of the Health Science Interdisciplinary Center at Scuola Superiore Sant'Anna and from the same date he is a member of the UO Alta Formazione. From Nov. 2016 to Jul. 2019 he was Vice-president of the Corso di Laurea Magistrale in Informatica e Networking (Master of Science in Computer Science and Networking) (LM-18) at Scuola Superiore Sant'Anna. Prof. Valcarengi has been President/Member of more than 60 recruitment committees (e.g., RTD-A, Associate Professors, Post-doc).

My assessment on the university services of Prof. Luca Valcarengi is: **excellent**.

### 5. Projects and Funding

Involvement in, and leadership of, International and National projects funded through competitive calls is one of the strengths of Prof. Valcarengi. He has been the Project Coordinator of 6 EU Projects (1 Horizon Europe (KDT-JU), 3 H2020 Open calls, 1 FP7 Open call, 1 KIC EIT-ICT Labs Open call), the Sant'Anna Research Unit Coordinator of 5 EU Projects (1 Horizon Europe, 3 H2020, 1 FP7) and 1 Indo-Italian Project. Moreover, he has been the Coordinator of 2 Tuscany Region projects (1 Bando Ricerca Salute 2018 - 5GSOSIA, 1 joint higher education project - NO'E) and the Sant'Anna Research Unit Coordinator of the 2020 National Program for Military Research. He has also been the Principal Investigator or Co-Principal Investigator of 6 Corporate-Sponsored Research Projects with TIM, Trenitalia and RFI. Moreover, he has taken part, as component of the

Research Unit, in 18 International projects funded through competitive calls, 13 National projects funded through competitive calls, and 9 National and International projects funded through private contracts.

Prof. Valcarengi has been also the Reviewer/Evaluator for 7 National project/evaluation campaigns and for 4 International projects (among which: proposal evaluator for H2020 projects).

Since 2011, Prof. Valcarengi has participated , as Academia Member, to the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) Study Group 15 (Networks, Technologies and Infrastructures for Transport, Access and Home). Moreover, he is currently the Scuola Superiore Sant'Anna representative in the 6G-IA and involved in the activities of the 6G-IA "Test, Measurement and KPIs Validation" Work Group.

My assessment of Prof. Luca Valcarengi's activity for projects and funding is: **outstanding**.

***Based on the evaluations above, my overall assessment on Prof. Luca Valcarengi is: excellent.***

### Francesca Cuomo's assessment

Prof. LUCA VALCARENGHI is Associate Professor (Professore Associato), SSD ING-INF/03 - Telecomunicazioni, Scuola Superiore Sant'Anna di Studi Universitari e Perfezionamento, Pisa, Italy from 2014. He has two National Scientific Qualification (ASN — Abilitazione Scientifica Nazionale) as Full Professor (Professore di I Fascia) one in the Settore Concorsuale 09/F2 Telecomunicazioni (date of expiry Jul. 17, 2028) and another in the Settore Concorsuale 09/H1 Sistemi di Elaborazione delle Informazioni (date of expiry Apr. 14, 2032).

### TEACHING

Prof. Valcarengi teaching activities were very intense and exemplary, having taught over 36 graduate-level courses (PhD and Master's) with an outstanding bi-annual PhD course evaluation score of 9.7/10. Additionally, he has taught 8 undergraduate courses and currently serves as the Director of the PhD program in Emerging Digital Technologies at Scuola Superiore Sant'Anna, a position held since October 1, 2018. His leadership roles include serving as vice-president of the Master of Science in Computer Science and Networking program from November 2016 to July 2019, and being a three-time co-coordinator of the Seasonal School ARTIST. The candidate has also contributed significantly to academic governance, being a member of 16 Ph.D. graduation committees and 12 other graduation committees, and participating in the annual verification exam committee for engineering students at Scuola Superiore Sant'Anna. Furthermore, he has actively engaged in outreach, participating in an orientation activity.

In terms of mentorship and student supervision, the candidate has demonstrated exceptional dedication and effectiveness. He has mentored 4 Research Fellows and 3 Research Scholars, supervised 10 Ph.D. students (6 as the main supervisor and 4 as a co-supervisor), 13 Master students (11 as the main supervisor and 2 as a co-supervisor), and 7 Bachelor students (6 as the main supervisor and 1 as a co-supervisor). This extensive involvement in guiding and supporting students and early-career researchers highlights the candidate's commitment to fostering academic growth and excellence.

My assessment on the teaching activities and related aspects of Prof. Luca Valcarengi is: **excellent**.

### RESEARCH ACTIVITIES

The candidate has demonstrated remarkable leadership in international research projects, coordinating six major projects, including one Horizon Europe (KDT-JU), three H2020 Open calls, one FP7 Open call, and one KIC EIT-ICT Labs Open call. Additionally, he has served five times as the Sant'Anna Research Unit Coordinator for one Horizon Europe, three H2020, and one FP7 project, as well as the Indo-Italian Sant'Anna Research Unit Coordinator. On the national and regional levels, the candidate has coordinated two Region of Tuscany projects, one focused on health research (Bando Ricerca Salute 2018 - 5GSOSIA) and one joint higher education project (NO'É). He has also been the Sant'Anna Research Unit Coordinator for the 2020 National Program for Military Research (PNRM 2020). As for the research in collaboration with industries, the candidate has been a principal investigator or co-principal investigator for six contracts with prominent companies such as TIM, Trenitalia, and RFI.

As overall comment, he has an excellent experience in leading and managing diverse research initiatives across various scales and projects' programs, highlighting the candidate's exceptional capability in driving innovative research and also securing significant funding. The candidate has also a distinguished record in conference organization activities, showcasing his leadership and expertise in the field. He served as the General Co-Chair for the "5G from Theory to Practice (5GToP) Workshop" at the IEEE 5G World Forum. Additionally, he has held the role of Technical Program Committee (TPC) Chair or Co-Chair 30 times, overseeing significant conferences and symposia such as ICC ONS 2024, ICC ONS 2015, ICC ONS 2011, Globecom SAC-ANS 2016, and numerous ICTON GOC events from 2011 to 2023. His involvement also extends to serving as a TPC member over 30 times, contributing to high-profile conferences like OFC N4: Optir

Access Networks for Fixed and Mobile Services, ICC ONS, and Globecom ONS. This extensive and sustained contribution to conference organization highlights the candidate's commitment to advancing his research field in Optical Communications and Networks, fostering academic exchange, and facilitating the dissemination of cutting-edge research.

My assessment on the research activities and related aspects of Prof. Luca Valcarengi is: **excellent**.

#### PUBLICATIONS

The scientific production of Prof. Valcarengi is fully consistent with his scientific national sector (ING-INF/03). He has authored or co-authored 10 book chapters, 71 international journal papers (52 in Q1 SJR journals, 11 in Q2 SJR journals), and 213 international conference papers. His publication track record is robust and aligns well with the research of the scientific sector. This is supported by strong bibliometric indexes like 2914 citations, 297 papers and 25 as index (statistics measured on 19th June 2024 - from Scopus website).

As for the 20 presented publications Prof. Valcarengi results first author in 3 of them while 5 of them have more than 5 co-authors. I appreciate the broad range of topics covered in Prof. Valcarengi's publications. Four publications are in prestigious journals like IEEE Transactions on Network and Service Management, IEEE Transactions on Wireless Communications and IEEE JSAC.

This diversity not only showcases his expertise across various facets of optical communications and networking but also significantly contributes to advancements in the field. The innovative solutions, comprehensive analyses, and practical impacts of his research demonstrate a profound understanding of both current challenges and future directions in telecommunications.

My assessment on the publications of Prof. Luca Valcarengi is: **excellent**.

#### THIRD MISSION AND TECHNOLOGY TRANSFER

The candidate has made significant contributions to the Third Mission and Communication. He has organized and co-organized seven major events, including four BRIGHT Researcher Nights and three Internet Festivals. Additionally, he has participated in other communication activities, such as the Sant'Anna Science Cafe and national news interviews.

This impact extends to practical innovation and technology transfer, evidenced by 5 patents. This blend of public engagement, effective communication, and industry collaboration underscores the candidate's dedication to making scientific research accessible and impactful beyond academia.

My assessment on the third mission and technology transfer activities of Prof. Luca Valcarengi is: **very good**.



### Piet Demeester's assessment

#### Research (excellent)

Prof. Valcarengi has an excellent research track record in the field of optical networking and he recently also expanded this to wireless communications. His research has high international impact as illustrated by the number of citations (Google Scholar):

Cited by	VIEW ALL	
	All	Since 2019
Citations	4344	1604
h-index	30	21
i10-index	123	54

The publications are in major conferences and journals (ECOC, OFC, IEEE/OSA JLT, IEEE TNSM, IEEE-WCS, IEEE ACCESS, ...). Prof. Valcarengi was also involved in the organization of many international conferences and workshops and he was chair of IEEE ONTC. His work received many international awards.

Prof. Valcarengi has already experience with the supervision of 10 PhD students. He has also an extensive experience with leading international and national projects, and he was also involved in multiple projects directly by industry.

#### Education (excellent)

Prof. Valcarengi has a very broad experience in teaching and this is very much appreciated by the students. He also took important responsibilities in management functions in education.

#### Services (very good)

Prof. Valcarengi took important responsibilities in the university (Vice-rector for digital strategy and information technology), roughly one year member of academic senate.

His work resulted in 5 patents.

## Carmen Mas Machuca's assessment

### 1 Teaching - Outstanding

Prof. Valcarengi has extensive teaching experience at both graduate (more than 36) and pre-graduate (8) level. The courses offered cover a wide range of expertise from network design to resource management, energy and mobility. Prof. Valcarengi has also offered practical courses such as the "Traffic Engineering Laboratory". His teaching has been highly rated by students (9.7/10 in the last bi-annual evaluation). His commitment has been extended by becoming, since 2018, the director of the "PhD in Emerging Digital Technologies (EDT)" at the Scuola Superiore Sant'Anna. Furthermore, he has been 3 times coordinator of the Seasonal School ARTIST, Scuola Superiore Sant'Anna and Vice-President of the Master of Science in Computer Science and Networking programme from 2016 to 2019. Last but not least, Prof. Valcarengi has a vast experience in the supervision of students from undergraduate to doctoral level (being the main supervisor of 6 PhD candidates). This experience has been supported by an important participation in Master and PhD examinations.

### 2 Publications - Outstanding

Prof. Valcarengi has more than 70 journal papers and 130 conference papers. He has published at important journals such as IEEE/OSA JOCN (more than 9), IEEE/OSA JLT, IEEE TNSM, IEEE COMMAG, etc. He also has 5 patents at the European, International and National level showing high potentials for technology transfer. According to Google Scholar, he has more than 4300 citations (1603 since 2019), which is yearly increasing. His h-index is 30. Prof. Valcarengi is first or second author of many of his publications, showing his active contribution in the research and its dissemination. However, he appears also as last author of many publications as a supervisor of the presented work.

His work covers a large research area related to optical networks from access to core, from control and management to data plane, considering not only capacity but also resilience, energy efficiency, etc. Some papers on these topics were ahead to standards and received 5 best paper awards (e.g., Globecom 2019 paper).

Regarding his participation in conferences and similar events, Prof. Valcarengi has been active in the organizing committee of almost 100 IEEE conferences, of which 30 he has been TPC Chair/Co-Chair. He has been invited as panelist or speaker of several conferences including ECOC, ITU-T and ONDM. Prof. Valcarengi has been/is an editor of two SJR Q1 journals, such as IEEE Communications Magazine and Elsevier Computer Networks.

### 3 Scientific Research - Outstanding

Prof. Valcarengi's research is in the area of optical communication and networks. During these 20 years of research, he has worked on a wide area of topics such as network design and optimization, control and management, energy efficiency, network reliability, optical access networks, etc.

His participation in national and international projects, not only as collaborator but also as coordinator and PI is impressive. Specially, the load and challenge of coordinating European FP7, H2020 projects.

His list of collaborators is extremely large and includes national and international relevant researchers from Europe, Asia and America.

## Candidate:

**I. CV:** Prof. [redacted] has distinguished himself with significant achievements in his academic and research career. He has led major research initiatives, including the notable national FIRB project (COTONE) from 2012 to 2015, and has successfully collaborated with major industry stakeholders in the telecommunication field. Additionally, he has served as the local coordinator for a project under the National Program for Military Research (PNRM). In his role at the university, Prof. [redacted] had relatively limited responsibilities, including participating on institute and PhD advisory boards and chairing selection committees. His research, which focuses on optical communications, has attracted substantial funding from both national and international agencies, underscoring his ability to secure significant research support. As regards conferences organization, Prof. [redacted] has served as the TPC Chair in 1 conference, and Organizer of a workshop and a symposium. Prof. [redacted] has also made notable contributions to academia as an associate editor for the IEEE Transactions on Communications journal. He has supervised 7 PhD students, serving as the primary supervisor for 5 and co-supervisor for 2. His scholarly work has earned him two "top scored paper" awards, one of which was from the prestigious OFC conference. His commitment to technology transfer is particularly evident from the 13 patents he has filed, highlighting his impact in both academic and industrial spheres. Overall, the collegial assessment of Prof. [redacted] is: very good.

**II. Teaching activities:** Prof. [redacted] teaching activities primarily focus on optical communications and information theory at both the master's and doctoral levels. His teaching portfolio has recently expanded, with a significant increase in involvement since 2023, when he delivered three courses totaling 90 hours of lectures. This marks an increase from his previous teaching schedule, which was more limited and/or sporadic. Despite limitations in obtaining formal student evaluations due to insufficient responses for generating a report as defined by Scuola Sant'Anna, the individual feedback collected by Prof. [redacted] on some of his courses has been extremely positive. As a complement of his teaching responsibilities, Prof. [redacted] has played an extensive role in mentoring and supervising students, as well as research fellows and visiting students. He has contributed to the academic community beyond his institution by serving as an external expert on various PhD and recruitment committees at Italian and international universities. Overall, the collegial assessment of Prof. Secondini's teaching activities is: good.

**III. Publications:** With almost 60 high quality journal publications, several of them invited (9), Prof. Marco Secondini has established a strong reputation in the field of high-capacity optical communications through his extensive publication record. His scholarly work covers a broad spectrum of critical topics, including the information theory of optical fibers, fiber nonlinearity modeling, high-capacity transmission techniques, modulation formats, quantum key distribution, and nonlinear constellation shaping. The 20 publications submitted for this assessment have had a significant impact, as evidenced by over 800 Scopus citations. The majority of them have been published in the prestigious Journal of Lightwave Technology, with two notable papers appearing in the renowned IEEE Transactions on Communications. These works highlight Prof. Secondini's substantial individual contribution: he is the sole author of one paper and the first author in 9 out of 19 papers in a list of non-alphabetic order, with an average of 3.9 authors per paper. His editorial roles in prestigious journals further affirm his authoritative standing in the field of optical communications, and his research has been recognized with two top-scored paper awards, reflecting the high regard in which his work is held by the academic community. Overall, the collegial assessment of Prof. Secondini's publications is: excellent.

**Overall Summary Assessment:** Taking into account all the factors above mentioned, the Evaluation Commission unanimously agrees on the following summary assessment: very good.

## ANNEX 2 – COLLEGIATE ASSESSMENTS

### Candidate: /

**I. CV:** Prof. \_\_\_\_\_ has established a distinguished track record in photonics and opto-electronic devices, with a significant standing also beyond the Telecommunications sector, as evidenced by his national scientific qualifications as Full Professor in both the Electronics sector (09/E3) and Experimental Physics sector (02/B1). He has actively contributed to the advancement of photonics technology through various significant technological projects, and his work has received substantial support from public national and international agencies. He has participated in numerous national and international research projects, playing the role of Unit Project Leader in an ASI project on Quantum RNG and Project Leader in two bilateral project initiatives with India and China, and local coordination roles in several other initiatives. Notable is the successful application to a past FP7-PEOPLE project where he was Project Leader. He has also been influential in academic and professional roles, serving as area and associate editor for several prestigious journals, including the IEEE Communication Letters and IET Electronic Letters. As regards conferences organization, Prof. \_\_\_\_\_ has served in 3 conferences, as General Co-chair, Technical Co-chair and Organizer and Scientific Co-chair, respectively. Within his university, Prof. \_\_\_\_\_ has been the delegate for the TeCIP Institute for Public Engagement since 2021 and represents his university in the GTTI since the same year. His involvement in international university relations include coordination roles in Erasmus+ initiatives. Furthermore, Prof. \_\_\_\_\_ as a strong commitment to mentoring, having supervised 7 PhD students. He also holds / patents. Overall, the collegial assessment of Prof. \_\_\_\_\_ CV is: very good.

**II. Teaching activities:** Prof. \_\_\_\_\_ teaching activities over the last five years have been primarily focused on the International PhD Program in Emerging Digital Technologies at Scuola S. Anna. He has taught two courses: "Photonic Technologies" (4 ECTS) since 2011 and "Photonic Integrated Circuits, Technologies and Platforms" (3 ECTS) since 2019, totaling 7 ECTS at the PhD level. Besides his current teaching duties, Prof. \_\_\_\_\_ a history of engaging with graduate students through various courses and laboratory exercises from 2010 to 2016, including participation in the Erasmus Mundus Master program. From the CV it is not possible to determine whether the candidate has engaged in below-PhD-level students' supervision, although early in his career, he also conducted laboratory exercises and seminars. No reports on student evaluations of his teaching activities have been provided. Overall, the collegial assessment of Prof. \_\_\_\_\_ teaching activities is: good.

**III. Publications:** Prof. \_\_\_\_\_ has an extensive publication record, with 109 peer-reviewed journal articles (5 invited) that cover a broad range of topics including telecommunications, electronics, and physics. Besides advancing the scientific community's understanding of key photonic concepts, his scientific production also emphasized practical applications that impact the broader field of optical communications. The interdisciplinary nature of his work is reflected in the diversity of publication venues, which includes three prestigious journals within the "Nature" portfolio among others, illustrating the broad impact of his research. The 20 publications submitted for assessment have collectively garnered nearly 900 Scopus citations, indicating significant influence in the field. Apart from one single-authored paper in IEEE Photonics Technology Letters, most of his work involves collaboration, with an average of 5.8 authors per paper. However, Prof. \_\_\_\_\_ substantial individual contributions are evident across the publications. Overall, the collegial assessment of Prof. \_\_\_\_\_ publications is: excellent.

**Overall Summary Assessment:** Taking into account all the factors above mentioned, the Evaluation Commission unanimously agrees on the following summary assessment: very good.

## **Candidate: Luca Valcarenghi**

**I. CV:** Prof. Luca Valcarenghi has demonstrated a solid track record in leadership and academic roles throughout his career. He has two National Scientific Qualifications as Full Professor: one in the Telecommunications sector (09/F2) and another one in the Information Processing Systems sector (09/H1). He is currently the Vice-Rector for Digital Strategy and Information Technology at his university and has previously served as an elected representative in the academic senate for 9 months. In his capacity as an educator, Prof. Valcarenghi has supervised 10 PhD students, acting as the primary supervisor for 6 and co-supervisor for 4. He coordinates a PhD course and is a member of various PhD college boards. His leadership experience extends to professional organizations like the IEEE Communications Society, where he has served as Chair, Vice-Chair, and Secretary of the Optical Networking Technical Committee. Prof. Valcarenghi has led significant research projects, including coordination of 6 EU Projects (1 Horizon Europe (KDT-JU), 3 H2020 Open calls, 1 FP7 Open call, 1 KIC EIT-ICT Labs Open call) and several national and regional projects. As for the research in collaboration with industries, Prof. Valcarenghi has been a principal investigator or co-principal investigator for six contracts with prominent companies. As regards conferences organization, Prof. Valcarenghi has served as General Co-chair of 1 IEEE workshop, and 30 times TPC Chair/Co-chair. His contributions to the field of telecommunications and optical networking have been recognized with several prestigious awards. Prof. Valcarenghi holds 5 patents and has been involved in international standardization activities with ITU-T Study Group 15. His editorial roles include positions as associate editor for two major journals in his field. Overall, the collegial assessment of Prof. Valcarenghi's CV is: excellent.

**II. Teaching activities:** Prof. Luca Valcarenghi has significantly contributed to educational programs at the university, teaching over 36 graduate-level courses with high evaluation scores from students. His teaching efforts predominantly include short courses and modules at the Master's and PhD levels, with a yearly teaching load averaging between 40 and 90 hours, and reaching up to 94 hours in the academic year 2020/2021. Where available, the students' evaluations reported by Prof. Valcarenghi are very high and although a comparison with the average score of the Scuola Superiore S. Anna has not been provided, it is realistic to guess an over-average evaluation. In his administrative roles, Prof. Valcarenghi has further demonstrated leadership through his directorship of the PhD program and coordination of various seasonal schools at the Scuola Superiore di Studi Universitari e Perfezionamento Sant'Anna, since 2018. From Nov. 2016 to Jul. 2019 he was Vice-president of the Master of Science in Computer Science and Networking. Additionally, Prof. Valcarenghi has supervised a significant number of research and academic theses, and has served as the internship tutor for various students and participated in numerous Master's and PhD graduation committees both in Italy and internationally. Overall, the collegial assessment of Prof. Valcarenghi's teaching activities is: very good.

**III. Publications:** Prof. Luca Valcarenghi has a robust publication record with over 70 journal papers (2 invited) and numerous conference presentations, extensively covering optical communications and networking. His research, particularly focused on optical network design, reliability, energy efficiency, and the integration of wired and wireless networks, has made significant advances in the field. His scholarly work is not only highly cited, but also recognized with several awards. All 20 publications submitted for assessment have been published in major Q1 journals and magazines, demonstrating their high quality and impact (with over 600 Scopus citations). Although these works often involve collaboration with an average of 4.7 authors per paper, Prof. Valcarenghi's individual contribution appears substantial and notable in nearly all published works. Overall, the collegial assessment of Prof. Valcarenghi's publications is: excellent.

**Overall Summary Assessment:** Taking into account all the factors above mentioned, the Evaluation Commission unanimously agrees on the following summary assessment: excellent.

