

Prof. Fabio Sciarrino

Full Professor in Physics of Matter

Deputy Rector for International Competitive Research Strategies, Sapienza Università di Roma

Deputy Director of the Sapienza School for Advanced Studies (SSAS)

Senior Fellow Sapienza School for Advanced Studies (SSAS)

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Nationalities:

Date and place of birth:

Researcher ORCID: 0000-0003-1715-245X

Research/Academic experience

- 2021 - Deputy Rector for International Competitive Research Strategies, Sapienza Università di Roma
- 2020 - Chair of the PhD program in Physics, Sapienza Università di Roma
- 2019 - Full Professor of Experimental Physics of Matter
Dipartimento di Fisica, Sapienza Università di Roma
- 2019 - Deputy Director - Sapienza School for Advanced Studies (SSAS): <https://web.uniroma1.it/ssas/>
- 2018 - 2021 Senior Research Fellow
Sapienza School for Advanced Studies (SSAS): <https://web.uniroma1.it/ssas/>
- 2014 - 2018 Associate Professor of Experimental Physics of Matter
Dipartimento di Fisica, Sapienza Università di Roma
Head of the research group of Quantum Information Lab
www.quantumlab.it
- 2013 - 2016 Junior Research Fellow
Sapienza School for Advanced Studies (SSAS): <https://web.uniroma1.it/ssas/>
- 2014 - 2017 Pesquisador Visitante Especial (Special Visiting Researcher) - Conselho Nacional de Desenvolvimento Científico e Tecnológico; Universidad Federal de Minas Gerais, Brazil
- 2013 Italian National Habilitation to Full and Associate Professor with maximum score
- 2008 - 2014 Permanent Researcher, Dipartimento di Fisica, Sapienza Università di Roma

2006 - 2008 **New Talent Research Fellowship**, Centro Studi e Ricerche "Enrico Fermi", Rome, Italy
 2005 Qualification for "Maître de Conférences", France
 2004 - 2005 **Post-Doctoral Fellow** at the Istituto Nazionale di Fisica della Materia, Rome, Italy

Education

February 2000 **PhD in Physics** at Sapienza Università di Roma, Italy
Supervisor: Prof. Francesco De Martini; *Grade:* Outstanding

July 1996 **Master degree (Laurea)** in Physics at Università di Napoli "Federico II", Italy
Advisor: Prof. Salvatore Solimeno; *Grade:* 110/110 *cum laude*

Awards and Honors

2021 Award for excellent teaching activity, Science Faculty, Sapienza University of Rome.
 2020 ERC Advanced Grant awarded by the European Research Council.
 2017 Award for excellent teaching activity, Science Faculty, Sapienza University of Rome.
 2016 Honoured as Young Scientist at the Annual Meeting of the New Champions 2016.
 2015 Honoured as Young Scientist at the Annual Meeting of the New Champions 2015¹ - World Economic Forum (WEF) Summer Davos - Dalian (Overall 40 Young Scientists selected worldwide).
 2014 "Sapio Junior per la Ricerca Italiana" Award (€15.000) – XIV Edizione, given each year to an Italian researcher under the age of 36 years working in any field (www.premiosapio.it).
 2014 Talent award within the "Spinning the Wheel" project organized by Pirelli².
 2012 ERC Starting Grant - Consolidator awarded by the European Research Council.
 2012 Italian Habilitation as Full Professor in the topic 02/B1 – Experimental Physics of Matter.
 2011 The "Sapienza Ricerca 2011- Under 40's Prize" [Premio Fondazione Sapienza].
 2008 "Medaglia Le Scienze per la Fisica" Award for young Italian researcher in physics
 Medal for scientific merits awarded by the President of Italian Republic
 2006 New Talent scientist award, Academia Ponteficia delle Scienza, Vatican.
 2006 Award "Premio di operosità scientifica" from Società Italiana di Fisica.

Supervision of graduate students and postdoctoral fellows

2010 - Present >20 Postdocs
 2008 - Present >20 PhD students
 2008 - Present >60 Master students; >50 Bachelor students

Selected research project leadership

| Years | Role | Project | Funding |
|-----------|------------------------------|---|-------------------------------------|
| 2020-2024 | European Coordinator | European Project H2020-FET: PHOQUSING QUantum advantage via non-linear BOSon Sampling | Total: 3306 k€ Sapienza: 812 k€ |
| 2020-2025 | Principal Investigator | ERC Advanced Grant – QU-BOSS QUantum advantage via non-linear BOSon Sampling | Total: 2890 k€ Sapienza: 2300 k€ |
| 2019-2022 | Coordinator of Sapienza Unit | Templeton Foundation "Quantum Information Structure of Spacetime" | Total: 2 M€ Sapienza: 70 k€ |

¹ <https://erc.europa.eu/media-and-events/events/annual-meeting-new-champions-2015>

² "10 young people work on the "Spinning the wheel" project with the renowned tutor, the British writer Hanif Kureishi"
http://www.pirelli.com/corporate/en/media/spinning_the_wheel/default.html

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| 2019-2022 | Coordinator | QUSHIP (Taming complexity with quantum strategies: a hybrid integrated photonics approach) PRIN-MIUR Italy | Total: 900 k€ Sapienza: 300 k€ |
| 2019-2024 | Coordinator of Sapienza Unit | European Project H2020 -FET OPEN Cancer Scan | Sapienza: 1060 k€ |
| 2019-2022 | Co-PI | SINFONIA - Lazio Innova, Regione Lazio | 75 k€ |
| 2018-2020 | Principal Investigator | Templeton Foundation “Causality in the quantum world: harnessing quantum effects in causal inference problem” | Total: 178 k€ Sapienza: 90 k€ |
| 2018-2021 | Co-PI of Sapienza -CNR | QuantERA ERANET Cofund 2017 Project HiPhoP | Total: 1 M€ CNR-Sapienza: 100 k€ |
| 2017-2022 | Coordinator of Sapienza Unit | European Project ERC Advanced Grant 2016 – CAPABLE Composite integrated photonic platform by femtosecond laser micromachining Principal Investigator: Roberto Osellame, CNR | Total: 2.3 M€ Sapienza: 300 k€ |
| 2016-2017 | Principal Investigator | ERC-Proof of Concept: 3D COUNT 3D Integrated Single Photon Detectors | Total: 150 k€ Sapienza: 76 k€ |
| 2016-2021 | Coordinator of Sapienza Unit | European Project ERC Advanced Grant 2015 – PHOSPHOR Photonics of Spin–Orbit Optical Phenomena Principal Investigator: Lorenzo Marrucci, Università degli Studi di Napoli Federico II | Total: 1.7 M€ Sapienza: 190 k€ |
| 2015-2018 | European Coordinator | European Project H2020-FETPROACT-2014-641039: QUCHIP Quantum Simulation on a Photonic Chip | Total: 2.7 M€ Sapienza: 430 k€ |
| 2014-2017 | Coordinator of Sapienza Unit | National project PRIN - AQUASIM Advanced Quantum Simulation and Metrology | Total: 250 k€ Sapienza: 75 k€ |
| 2013-2017 | European Coordinator | European Project FP7-PEOPLE-2013-ITN-608062: PICQUE Photonic Integrated Compound Quantum Encoding | Total: 4 M€ Sapienza: 550 k€ |
| 2013-2016 | Co-Investigator of Sapienza Unit | European Project STREP-FP7-ICT-2011-600838: QWAD – Quantum Waveguides Application and Development | Total: 1.6 M€ Sapienza: 350 k€ |
| 2012-2017 | Principal Investigator | ERC Starting Grant – Consolidator – 3D-QUEST 3 Dimensional Quantum Integrated Optical Simulation | Total: 1.5 M€ Sapienza: 1.3 M€ |
| 2018-2013 | Coordinator of Sapienza Unit | European Project STREP-FP7-FET OPEN PHORBITECH | Total: 2 M€ Sapienza: 350 k€ |
| 2010-2015 | Principal Investigator | National project FIRB 2008 - HYTEQ Hybrid technologies for quantum information processing | Total: 350 k€ Sapienza: 180 k€ |

Selected organization of scientific meetings (2013-2021)

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| 2021 | General Chair , Quantum Information and Measurement – OSA; Washington. |
| 2019 | Co-director , Quantum Information and Measurement - OSA. |
| 2019 | Chair , Quantum Information and Measurement – OSA; Rome |
| 2017 | Chair , International Conference on Integrated Quantum Photonics, Rome. |
| 2016 | Chair , Scientific Committee, 9th Italian Quantum Information Science Conference, Rome. |
| 2015 | Chair , PICQUE Scientific School in Integrated photonics quantum applications, Rome. |

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| 2015 | Co-chair , Symposium on Integrated Quantum Optics, CLEO/Europe-EQEC 2015, Munich |
| 2013 - 2015 | Member of Program Committee, SPIE International Symposium on Optics and Optoelectronics, Prague, Czech Republic. |
| 2015 | Member of Program Committee, 14th ICSSUR, Poland. |
| 2015 | Member of Program Committee, Quantum Electronics-Frontier of Optics - OSA, San Jose. |
| 2015 | Member of Scientific Committee, Scientific School In Integrated Photonics, Varenna, Italy. |
| 2013 - 2015 | Member of Scientific Committee, Workshop: "Quantum Correlations", Brazil. |

Selected dissemination activities

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|----------------|---|
| 2010 - present | Coordinator of the "Lauree Scientifiche" (Scientific degrees) for photonics project- Sapienza |
| 2015 | Dissemination lectures carried out within the International Year of Light (> 1000 attendees). |
| 2011 - 2014 | Invited dissemination seminars in secondary schools (> 1000 attendees). |
| 2014 - 2016 | Participation in Science Coffee and Master Classes for students (overall > 300 attendees). |

Teaching activities (2010-2021)

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| 2016 - 2021 | Laboratory of Optics (3 rd year, Bachelor in Physics), Sapienza Università di Roma. |
| 2017 - 2021 | Photonic technologies, Sapienza School for Advanced Studies-SSAS. |
| 2014 - 2016 | Laboratory of Mechanics (1 st year, Bachelor in Physics), Sapienza Università di Roma. |
| 2015 - 2016 | Foundations of Quantum Mechanics (Students in Science and Technology), Sapienza School for Advanced Studies-SSAS. |
| 2014 - 2015 | Photonics (medical students), Sapienza School for Advanced Studies-SSAS. |
| 2010 - 2018 | Quantum Information and Computation (2 nd year master students in Physics), Sapienza. |
| 2008 - 2015 | Quantum Information (Lectures for PhD students), Sapienza. |

Invited external examiner in PhD exams (2010-2019)

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| 2019 | University of Oxford (UK) |
| 2019 | ICFO - The Institute of Photonic Sciences (Spain) |
| 2018 | Université de Saclay – CNRS (France) |
| 2017 | Institut d'Optique (France) |
| 2017 | University of Nice (France) |
| 2017 | Griffith University (Australia) |
| 2016 | Université Paris Diderot (France) |
| 2015 | ICFO - The Institute of Photonic Sciences (Spain) |
| 2014 | University of Oxford (UK) |
| 2014 | University of Bristol (UK) |
| 2012 | ICFO - The Institute of Photonic Sciences (Spain) |
| 2014 | Université Pierre et Marie Curie (France) |
| 2012 | University of Bristol (UK) |
| 2012 | University of Milano (Italy) |
| 2010 | University of Camerino (Italy) |

Selected editorial/review activities and membership of societies

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|----------------|---|
| 2019 - | Member of the working on Quantum Computing (European Quantum Flagship) |
| 2019 - | Member Editorial Board of Springer Quantum Machine Intelligence |
| 2018 - | Academic editor for PLOSone |
| 2012 - Present | Reviewer for scientific journals (including <i>Nature</i> , <i>Science</i> , <i>Nature Phys.</i> , <i>Nature Photonics</i> , <i>Nature Communications</i> , <i>Science Advances</i> , <i>Optica</i> , <i>Light Science & Applications</i> , <i>PRL</i>). |
| 2010 - Present | Reviewer for national and international funding agencies (European Research Council and EU-FP7 program, EU; NSF, USA; ANVUR, MIUR, Italy; ANR, France; GACR, Czech Republic; Poland; Germany; Switzerland) |

2012 - Present Member of the Optical Society of America OSA and International Society for Optics -SPIE
2010 - Present Member of the American Physical Society (APS)

Early achievement track record

Fabio Sciarrino has pioneered the use of photonics for quantum information first with seminal bulk optics contributions on quantum teleportation and cloning, and subsequently with contributions on photonics orbital angular momentum. In the last few years he has consolidated his leadership by introducing, in collaboration with the Italian National Research Council, femtosecond-written waveguides for quantum photonics. An important advance in his career was his appointment as **Principal Investigator** of the **ERC Starting Grant - Consolidator project: 3D-QUEST**, which led to various publications devoted to integrated photonics experiments: www.3dquest.eu. *Since receiving the 3D-QUEST grant, the applicant's h-index increased from 18 to 35* (ISI Web of Science). The relevance of the role played by the Quantum Information Lab led by Fabio Sciarrino was further consolidated with his appointment as: **European Coordinator** of the Marie Curie Initial Training Network project PICQUE (Photonic Integrated Compound Quantum Encoding) in 2013; **European Coordinator** of the Future and Emerging Technologies project QUCHIP (Photonics Quantum Simulator on a Chip) in 2014; and **Principal Investigator** of an ERC Proof of Concept project in 2015 3D-COUNT (3D-Integrated single photon detector). In recognition of his seminal contributions, the applicant is frequently invited to deliver lectures in Italy and abroad, and has received a large number of awards (notably, the Pirelli Young Talent award, **the Sapio award, and the Young Scientist award at WEF-2015 and WEF-2016**). He is also a member of the Executive Board of the Sapienza School for Advanced Studies and National Evaluation Committee. In 2020 he was awarded an **ERC Advanced Grant - QU-BOSS** dedicated to the demonstration of the regime of quantum advantage with a photonics approach. He is currently the European Coordinator of the Future and Emerging Technologies project PHOQUSING on Photonics Quantum Sampling Machine. He is **Deputy Rector for International Competitive Research Strategies, Sapienza Università di Roma** and **Deputy Director of the Sapienza School for Advanced Studies (SSAS)**.

Bibliometric data

- 200 publications in scientific journals (>100 papers in high impact factor journals $IF > 5$):
 - >30 in *Physical Review Letters*, *Physical Review X*, and *Review of Modern Physics*
 - >30 publications in journals belonging to *Nature* and *Science* groups
 - >12000 in Google Scholar
 - h-index >55 in Google Scholar
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Selected invited presentations at international conferences (overall >150)

2019 - "Open Quantum System Dynamics: Quantum Simulators" KITP – Santa Barbara
2019 - "European Quantum Technologies" Conference – Grenoble
2019 - "Machine Learning for Quantum Technology" workshop – Max Planck Institute, Erlangen
2018- Workshop Quantum Techniques in Machine Learning 2018", Durban
2018 - CLEO Pacific Rim 2018, Hong Kong
2018 -Workshop "Quantum Machine Learning and Biomimetic Quantum Technologies" Bilbao.
2017 - Workshop "Principles and applications of Control in Quantum Systems" Seattle (USA).
2017 - Workshop "Quantum-Classical Transition in Many-Body Systems", Dresden (Germany).
2017 - Scalable Architectures for Quantum Simulation, Bad Honnef (Germany).
2016 - Frontier of Optics – OSA centennial, Rochester-NY (USA).
2016 - DPG Annual Meeting, Revensburg (Germany).
2015 - Plenary talk - Photonics Ireland 2015, Cork (Ireland).
2015 - 3rd International Conference on Optical Angular Momentum (ICOAM), New York (USA).

- 2015 - 14th International Conference on Squeezed States and Uncertainty Relations, Gdansk.
 2015 - Bristol Quantum Information Technologies Workshop 2015, Bristol (UK).
 2014 - French Quantum Information Research Group Colloquium, Lyon (France).
 2014 - Frontier of Optics-OSA, Tucson (USA).
 2014 - ECIO MOC 2014 European Conference on Integrated Optics, Nice (France).
 2014 - Quantum 2014, INRIM Turin (Italy).
 2014 - Workshop CERN "Questioning Fundamental Physical Principles", CERN (Switzerland).
 2014 - Spring Meeting of the German Physical Society (DPG), Berlin (Germany).
 2014 - Workshop "Discrete and Analogue Quantum Simulators", Bad Honnef (Germany).
 2013 - Laser Physics 2013, Prague (Czech Republic).
 2013 - Quantum Information Processing and Communication QIPC 2013, Florence (Italy).
 2013 - 2nd International Conference on Optical Angular Momentum ICOAM, Glasgow (UK).
 2013 - Lasers and Electro-Optics Europe (CLEO/Europe - IQEC) 2013, Munich (Germany).
 2013 - APS (American Physical Society) March meeting, Baltimore (USA).
 2012 - Quantum Science Symposium, Cambridge (UK).
 2012 - Quantum Simulations, Bilbao (Spain).
 2012 - Laser Physics, Calgary (Canada).
 2012 - SPIE Photonics Europe, Bruxelles (Belgium).
 2011- Plenary talk, Bienal de Fisica, Santander (Spain).
 2011 - European workshop on Quantum Science and Technologies, Rovereto (Italy).
 2011 - The 13th Meeting on Optical Engineering and Science in Israel, Tel Aviv (Israel).

Patents

1. R. Osellame, A. Crespi, G. Corrielli, F. Sciarrino, "Method for realizing an optical waveguide in a substrate by means of a femtosecond laser", EP12724721.1
2. A. Crespi, P. Mataloni, R. Ramponi, L. Sansoni, F. Sciarrino, G. Vallone, R. Osellame, "An integrated optics logic gate for polarization-encoded quantum qubits and a method for the production and use thereof", WO/2012/150568
3. V. D'Ambrosio, N. Spagnolo, L. Del Re, S. Slussarenko, L. Marrucci, Y. Ling, C. Kwek, S. Walborn, L. Aolita, F. Sciarrino, "Ultra-sensitive photonic tiltmeter utilizing the orbital angular momentum of the light, and relevant angular measurement method", EP14425066.9

Review articles

1. Emanuele Pelucchi, et al., "The potential and global outlook of integrated photonics for quantum technologies" *Nature Physics Review* (in press)
2. J. Wang, F. Sciarrino, A. Laing, M.G. Thompson, "Integrated Photonic Quantum Technologies", *Nature Photonics* (2019). <https://doi.org/10.1038/s41566-019-0532-1>
3. F. Flamini, N. Spagnolo, F. Sciarrino, "Photonic quantum information processing: a review", *Rep. Progr. Phys.* **82**, 016001 (2019)
4. L. Sansoni, N. Spagnolo, C. Vitelli, F. Sciarrino, and P. Mataloni, "Simulating quantum physics by integrated photonic circuits in detector technology", *Nuovo Saggiatore* **5**, 5 (2013).
5. F. De Martini, and F. Sciarrino, "Multiparticle quantum superpositions and the quantum-to-classical transition", review article *Review of Modern Physics* **84**, 1765 (2012).
6. L. Marrucci, E. Karimi, S. Slussarenko, B. Piccirillo, E. Santamato, E. Nagali, and F. Sciarrino, "Spin-to-orbital conversion of the angular momentum of light and its classical and quantum applications", *J. Opt.* **13**, 064001 (2011).
7. F. De Martini, and F. Sciarrino, "Non-linear Parametric Processes in Quantum Information", review article *Progress in Quantum Electronics* **29**, 165-256 (2005).

Invited articles

1. T. Oni, F. Sciarrino, G. Adesso, and R. Knight, “Let researchers try new paths”, *Nature* **538**, 451 (2016).
 2. F. Sciarrino, “Quantum optics: Micro meets macro”, *Nature Physics* **9**, 529 (2013).
 3. L. Marrucci, C. Vitelli, N. Spagnolo, F. Sciarrino, “Quantum multiplexing in photons”, review article *SPIE Newsroom* (2013) doi: 10.1117/2.1201308.005020
 4. F. Sciarrino, and P. Mataloni “Advanced integrated photonics for quantum simulation”, review article *SPIE Newsroom* (2013) doi:10.1117/2.1201304.004796.
 5. F. Sciarrino, “Integrated photonic quantum circuits for polarization qubits”, review article *SPIE Newsroom* (2012) doi:10.1117/2.1201206.004293.
 6. F. Sciarrino, and P. Mataloni, “Insight on future quantum networks,” Commentary on Proceedings of the National Academy of Sciences, (2012).
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List of publications in peer-reviewed journals

1. D. Poderini, E. Polino, G. Rodari, A. Suprano, R. Chaves and Fabio Sciarrino. Ab-initio experimental violation of Bell inequalities, [arXiv:2108.00574]
2. G. Carvacho, E. Roccia, M. Valeri, F. Basso Basset, D. Poderini, C. Pardo, E. Polino, L. Carosini, M. B. Rota, J. Neuwirth, S. F. Covre da Silva, A. Rastelli, N. Spagnolo, R. Chaves, R. Trotta and F. Sciarrino. Quantum violation of local causality in urban network with hybrid photonic technologies, [arXiv:2109.06823]
3. V. Cimini, E. Polino, F. Belliardo, F. Hoch, B. Piccirillo, N. Spagnolo, V. Giovannetti and F. Sciarrino. Non-asymptotic Heisenberg scaling: experimental metrology for a wide resources range, [arXiv:2110.02908]
4. N. Spagnolo, D. J. Brod, E. F. Galvão, F. Sciarrino, Non-linear Boson Sampling (2021), [arXiv:2110.13788]
5. F. Hoch, S. Piacentini, T. Giordani, Z.N. Tian, M. Iuliano, C. Esposito, A. Camillini, G. Carvacho, F. Ceccarelli, N. Spagnolo, A. Crespi, F. Sciarrino, R. Osellame. Boson Sampling in a reconfigurable continuously-coupled 3D photonic circuit, [arXiv:2106.08260]
6. I. Agresti, D. Poderini, B. Polacchi, N. Miklin, M. Gachechiladze, A. Suprano, E. Polino, G. Milani, G. Carvacho, R. Chaves, F. Sciarrino. Experimental test of quantum causal influences, [arXiv:2108.08926]
7. A. Laneve, A. Gherardi, F. Hamiti, P. Mataloni, F. Caruso. Experimental multi-state quantum discrimination through a Quantum network, [arXiv:2108.08926]
8. A. Suprano, D. Zia, E. Polino, T. Giordani, L. Innocenti, M. Paternostro, A. Ferraro, N. Spagnolo and F. Sciarrino. “Enhanced detection techniques of orbital angular momentum states in the classical and quantum regimes”, *New J. Phys.* **23**, 073014 (2021)
9. R. Chaves, G. Moreno, E. Polino, D. Poderini, I. Agresti, A. Suprano, M. R. Barros, G. Carvacho, E. Wolfe, A. Canabarro, R. W. Spekkens, F. Sciarrino, “Causal networks and freedom of choice in Bell’s theorem”, *PRX Quantum* **2**, 040323 (2021)
10. I. Agresti, B. Polacchi, D. Poderini, E. Polino, A. Suprano, I. Šupić, J. Bowles, G. Carvacho, D. Cavalcanti, F. Sciarrino, “Experimental robust self-testing of the state generated by a quantum network”, *PRX Quantum* **2**, 020346 (2021)
11. T. Giordani, C. Esposito, F. Hoch, G. Carvacho, D. J. Brod, E. F. Galvão, N. Spagnolo, and F. Sciarrino, “Witnesses of coherence and dimension from multiphoton indistinguishability tests”, *Phys. Rev. Research* **3**, 023031 (2021)
12. V. Cimini, E. Polino, M. Valeri, I. Gianani, N. Spagnolo, G. Corrielli, A. Crespi, R. Osellame, M. Barbieri and F. Sciarrino, “Calibration of Multiparameter Sensors via Machine Learning at the Single-Photon Level”, *Phys. Rev. Applied* **15**, 044003 (2021)
13. F. Basso Basset, M. Valeri, E. Roccia, V. Muredda, D. Poderini, J. Neuwirth, N. Spagnolo, M. B. Rota, G. Carvacho, F. Sciarrino, R. Trotta, “Quantum key distribution with entangled photons generated on-demand by a quantum dot”, *Science Advances* Vol. **7**, no. 12, eabe6379 (2021) doi: 10.1126/sciadv.abe6379
14. T. Giordani, L. Innocenti, A. Suprano, E. Polino, M. Paternostro, N. Spagnolo, F. Sciarrino, A. Ferraro, “Entanglement transfer, accumulation and retrieval via quantum-walk-based qubit–qudit dynamics”, *New J. Phys.* **23** 023012 (2021)
15. F. Sciarrino, N. Spagnolo, The race towards quantum computational advantage: milestone photonic experiment, *Science Bulletin* (2021)

16. F. Bouchard, A. Sit, Y. Zhang, R. Fickler, F. M. Miatto, Y. Yao, F. Sciarrino and E. Karimi, “Two-photon interference: the Hong-Ou-Mandel effect”, *Rep Prog Phys.* **84**, 012402 (2021)
17. Valeri, E. Polino, D. Poderini, I. Gianani, G. Corrielli, A. Crespi, R. Osellame, N. Spagnolo and F. Sciarrino, Experimental adaptive Bayesian estimation of multiple phases with limited data, *npj Quantum Information* **6**, 92 (2020)
18. A. Suprano, T. Giordani, I. Gianani, N. Spagnolo, K. Pinker, J. Kupferman, S. Arnon, U. Klemm, D. Gorpas, V. Ntziachristos, F. Sciarrino, Propagation of structured light through tissue-mimicking phantoms, *Optics Express* **28**, 35427 (2020)
19. D. Poderini, S. Brito, R. Nery, F. Sciarrino, R. Chaves, Criteria for nonclassicality in the prepare-and-measure scenario, *Phys. Rev. Research* **2**, 043106 (2020)
20. A. Z. Goldberg, I. Gianani, M. Barbieri, F. Sciarrino, A. M. Steinberg, N. Spagnolo, Multiphase estimation without a reference mode, *Phys. Rev. A* **102**, 022230 (2020).
21. K. Rambhatla, S. E. D’Aurelio, M. Valeri, E. Polino, N. Spagnolo, F. Sciarrino, *Phys. Rev. Research* **2**, 033078 (2020).
22. F. Flamini, M. Walschaers, N. Spagnolo, N. Wiebe, A. Buchleitner, F. Sciarrino, Validating multi-photon quantum interference with finite data, *Quantum Sci. Technol.* **5**, 045005 (2020).
23. E. Polino, M. Valeri, N. Spagnolo, and F. Sciarrino, Photonic quantum metrology, *AVS Quantum Sci.* **2**, 024703 (2020)
24. T. Giordani, A. Suprano, E. Polino, F. Acanfora, L. Innocenti, A. Ferraro, M. Paternostro, N. Spagnolo and Fabio Sciarrino, Machine Learning-Based Classification of Vector Vortex Beams, *Phys. Rev. Lett.* **124**, 160401 (2020)
25. Á. Cuevas, A. Gerdali, C. Liorni, L. D. Bonavena, A. De Pasquale, F. Sciarrino, V. Giovannetti and P. Mataloni, Author Correction: All-optical implementation of collision-based evolutions of open quantum systems, *Scientific Reports* volume 10, Article number: 4379 (2020)
26. V. Cimini, M. G. Genoni, I. Gianani, N. Spagnolo, F. Sciarrino, and M. Barbieri, Diagnosing Imperfections in Quantum Sensors via Generalized Cramér-Rao Bounds, *Phys. Rev. Applied* **13**, 024048 (2020)
27. I. Agresti, D. Poderini, L. Guerini, M. Mancusi, G. Carvacho, L. Aolita, D. Cavalcanti, R. Chaves, F. Sciarrino, Experimental device-independent certified randomness generation with an instrumental causal structure, *Communications Physics* volume 3, article number: 110 (2020)
28. I. Gianani, A. Suprano, T. Giordani, N. Spagnolo, F. Sciarrino, D. Gorpas, V. Ntziachristos, K. Pinker, N. Biton, J. Kupferman, S. Arnon, Transmission of vector vortex beams in dispersive media, *Advanced Photonics* **2**(3), 036003 (2020)
29. D. Poderini, I. Agresti, G. Marchese, E. Polino, T. Giordani, A. Suprano, M. Valeri, G. Milani, N. Spagnolo, G. Carvacho, R. Chaves and F. Sciarrino. Experimental violation of n-locality in a star quantum network, *Nature Communications* **11**, 2467 (2020)
30. T. Giordani, D. J. Brod, C. Esposito, N. Viggianiello, M. Romano, F. Flamini, G. Carvacho, N. Spagnolo, E. F. Galvao, F. Sciarrino, Experimental quantification of genuine four-photon indistinguishability, *New Journal of Physics* **22**, 043001 (2020)
31. C. Antón, J. C. Loredó, G. Coppola, H. Ollivier, N. Viggianiello, A. Harouri, N. Somaschi, A. Crespi, I. Sagnes, A. Lemaître, L. Lanco, R. Osellame, F. Sciarrino, P. Senellart, “Interfacing scalable photonic platforms: solid-state based multi-photon interference in a reconfigurable glass chip”, *Optica* **6**, Issue 12, pp. 1471-1477 (2019).
32. V. Cimini, I. Gianani, N. Spagnolo, F. Leccese, F. Sciarrino, M. Barbieri, “Calibration of quantum sensors by neural networks”, *Phys. Rev. Lett.* **123**, 230502 (2019)
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