Federico Cacciafesta

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Academic appointments, qualifications and education

Mar. 2020–present	**Associate Professor**, Department of Mathematics, University of Padova.
2023	Italian National Scientific Qualification for the position of Full Professor, sector 01/A3 (now MATH-03/A).
2018	Italian National Scientific Qualification for the position of Associate Professor, sector 01/A3 (now MATH-03/A).
Mar. 2017–Mar. 2020	Fixed-term Researcher (type B), University of Padova.
Jan.–Mar. 2017	Fixed-term Researcher (type A), Polytechnic University of Turin.
Mar. 2016–Jan. 2017	Postdoctoral Research Fellow, University of Milano-Bicocca.
Mar. 2013–Feb. 2016	Postdoctoral Research Fellow under the FIRB 2012 project "Dispersive Dynamics, Fourier Analysis and Variational Methods", Sapienza University of Rome.
2015	*Qualification aux fonctions de Maître de conférences*, France.
2012	PhD in Mathematics, Sapienza University of Rome. Dissertation: *Dispersive properties of the Dirac equation*. Supervisor: P. D'Ancona. Examination committee: L. Vega, V. Georgiev, S. Selberg.
2008	Master's degree in Mathematics, Sapienza University of Rome, 110/110 cum laude. Dissertation: *Hardy spaces, duality H^1–BMO and applications*. Advisor: A. Pisante.
2006	Bachelor's degree in Mathematics, Sapienza University of Rome, 110/110 cum laude.

Research funding and leadership

Funding awarded as Principal Investigator

2019	**STARS–Starting Grant**, University of Padova. Project: *Linear and Nonlinear Problems for the Dirac Equation* (LANPDE). Role: Principal Investigator. Funding: **EUR 85,000**.
2015	"Research Start-up" project, Sapienza University of Rome. *Dispersive Dynamics for the Dirac Equation*. Funding: EUR 2,400.
2014	"Research Start-up" project, Sapienza University of Rome. *Dispersive Partial Differential Equations with Variable Coefficients*. Funding: EUR 2,500.
2013	"Research Start-up" project, Sapienza University of Rome. *Static and dynamical aspects of the nonlinear Dirac equation*. Funding: EUR 2,000.

Participation in funded research projects

2026	Member of the PRIN project *Order and randomness in Hamiltonian dynamics and dispersive PDEs*, grant code 2026PHMPHK (total funding EUR 1,127,998).
2026	Member of the GNAMPA project *Linear and nonlinear phenomena for Dirac equations* (EUR 2,000).
2024	Member of the GNAMPA project *Dispersive properties of Dirac equations* (EUR 2,500).
2023	Member of the GNAMPA project *Spectral Analysis for the Dirac Equation and Applications* (EUR 2,500).
2021	Member of the PRIN project *Hamiltonian and Dispersive PDEs*, grant code 2020XB3EFL (total funding EUR 540,000).
2010–2012	Participated in three GNAMPA projects on dispersive equations and hyperbolic systems.

Research supervision

PhD students

2025–present **Simone Mundula**, PhD student in Mathematics, University of Padova. Supervisor.
2021–2024 **Elena Danesi**, PhD graduate in Mathematics, University of Padova. Supervisor; Degree awarded in 2024.

Postdoctoral researchers

2021–2022 **Jérémy Sok**, postdoctoral research supervision.
2021–2022 **Long Meng**, postdoctoral research supervision.

Scientific publications

1. F. Cacciafesta, P. D'Ancona, Z. Yin, J. Zhang, *Dispersive estimates for Dirac equations in Aharonov–Bohm magnetic fields: massless case*, **Journal of Functional Analysis** 290 (2026), 111267.

2. F. Cacciafesta, A. S. de Suzzoni, L. Meng, J. Sok, *Large time well-posedness for a Dirac–Klein–Gordon system*, **Nonlinear Analysis** 239 (2024), 113420.

3. F. Cacciafesta, E. Danesi, L. Meng, *Strichartz estimates for the half-wave/Klein–Gordon and Dirac equations on compact manifolds without boundary*, **Mathematische Annalen** 389 (2024), no. 3, 3009–3042.

4. F. Cacciafesta, A. S. de Suzzoni, L. Meng, *Strichartz estimates for the Dirac equation on asymptotically flat manifolds*, **Annali della Scuola Normale Superiore di Pisa, Classe di Scienze** (5) 25 (2024), 1799–1812.

5. F. Cacciafesta, E. Séré, J. Zhang, *Asymptotic estimates for the wave functions of the Dirac–Coulomb operator and applications*, **Communications in Partial Differential Equations** 48 (2023), no. 3, 355–385.

6. J. Ben-Artzi, F. Cacciafesta, A. S. de Suzzoni, J. Zhang, *Global-in-time Strichartz estimates for the Dirac equation on spherically symmetric spaces*, **Forum of Mathematics, Sigma** 10 (2022), e25, 1–38.

7. F. Cacciafesta, A. S. de Suzzoni, *Local-in-time Strichartz estimates for the Dirac equation on spherically symmetric spaces*, **International Mathematics Research Notices** 2022, no. 4, 2729–2771.

8. F. Cacciafesta, Z. Yin, J. Zhang, *Generalized Strichartz estimates for wave and Dirac equations in Aharonov–Bohm magnetic fields*, **Dynamics of Partial Differential Equations** 19 (2022), no. 1, 71–90.

9. F. Cacciafesta, M. Strani, B. Texier, *Dispersive regularization for phase transition*, **Pure and Applied Analysis** 3(4), (2021), pp. 765-788.

10. F. Cacciafesta, A. S. de Suzzoni, *Invariance of Gibbs measures under the flows of Hamiltonian equations on the real line*, **Communications in Contemporary Mathematics** 22 (2020), no. 2, 1950012.

11. F. Cacciafesta, A. S. de Suzzoni, D. Noja, *A Dirac field interacting with point nuclear dynamics*, **Mathematische Annalen** 376 (2020), 1261–1301.

12. F. Cacciafesta, A. S. de Suzzoni, *Weak dispersion for the Dirac equation on curved spaces*, **Discrete and Continuous Dynamical Systems** 39 (2019), no. 8, 4359–4398.

13. F. Cacciafesta, L. Fanelli, *Weak dispersive estimates for fractional Aharonov–Bohm–Schrödinger groups*, **Dynamics of Partial Differential Equations** 16 (2019), no. 1, 95–103.

14. F. Cacciafesta, P. D'Ancona, R. Lucà, *A limiting absorption principle with variable coefficients*, **Journal of Spectral Theory** 8 (2018), no. 4, 1349–1392.

15. F. Cacciafesta, L. Fanelli, *Dispersive estimates for the Dirac equation in an Aharonov–Bohm field*, **Journal of Differential Equations** 263 (2017), no. 7, 4382–4399.

16. F. Cacciafesta, E. Séré, *Local smoothing estimates for the massless Dirac–Coulomb equation in two and three space dimensions*, **Journal of Functional Analysis** 271 (2016), no. 8, 2339–2358.

17. F. Cacciafesta, P. D'Ancona, R. Lucà, *Helmholtz and dispersive equations with variable coefficients on exterior domains*, **SIAM Journal on Mathematical Analysis** 48 (2016), no. 3, 1798–1832.

18. F. Cacciafesta, R. Lucà, *Singular integrals with angular integrability*, **Proceedings of the American Mathematical Society** 144 (2016), 3413–3418.

19. F. Cacciafesta, A. S. de Suzzoni, *Invariant measures for the Schrödinger equation on the real line*, **Journal of Functional Analysis** 269 (2015), no. 1, 271–324.

20. F. Cacciafesta, A. S. de Suzzoni, *Continuity of the flow of KdV with regard to the Wasserstein metrics and application to an invariant measure*, **Journal of Differential Equations** 259 (2015), no. 3, 1024–1067.

21. F. Cacciafesta, *Smoothing estimates for variable-coefficient Schrödinger equations with electromagnetic potential*, **Journal of Mathematical Analysis and Applications** 402 (2013), 286–296.

22. F. Cacciafesta, P. D'Ancona, *Endpoint estimates and global existence for the nonlinear Dirac equation with a potential*, **Journal of Differential Equations** 254 (2013), 2233–2260.

23. F. Cacciafesta, P. D'Ancona, *Weighted L^p estimates for powers of selfadjoint operators*, **Advances in Mathematics** 229 (2012), 501–530.

24. F. Cacciafesta, *Virial identity and dispersive estimates for the n-dimensional Dirac equation*, **Journal of Mathematical Sciences, University of Tokyo** 18 (2011), 1–23.

25. F. Cacciafesta, *Global small solutions to the critical Dirac equation with potential*, **Nonlinear Analysis** 74 (2011), 6060–6073.

Proceedings

- F. Cacciafesta, E. Séré, J. Zhang, *Dispersive estimates for the Dirac–Coulomb equation*, Springer INdAM Series 52, 2021.
- F. Cacciafesta, L. Fanelli, *Hankel transforms and weak dispersion*, Matrix Annals 2019–20.
- F. Cacciafesta, *Dispersive dynamics of the Dirac equation on curved spaces*, Proceedings of HYP 2018, AIMS on Applied Mathematics 10, 346–352.
- F. Cacciafesta, *Stability of invariant measures and continuity of the KdV flow*, Bulletin of the Brazilian Mathematical Society 47 (2016), 1–10.
- F. Cacciafesta, *The cubic nonlinear Dirac equation*, Actes des Journées EDP 2012.

Preprints and submitted papers

- F. Cacciafesta, E. Danesi, E. Séré, *Generalized Strichartz estimates for the massive Dirac equation with critical potentials*, submitted, https://arxiv.org/abs/2510.23283.
- F. Cacciafesta, S. Mundula, *Global well-posedness and growth of Sobolev norms for nonlinear Dirac equations with Yukawa potential on compact manifolds*, submitted, https://arxiv.org/abs/2607.03242.
- F. Cacciafesta, P. D'Ancona, Z. Yin, J. Zhang, *Dispersive estimates for Dirac equations in Aharonov–Bohm magnetic fields: massive case*, submitted, https://arxiv.org/abs/2510.23283.

International scientific activities

International research programmes and visits

2015 **Mathematical Sciences Research Institute (MSRI), Berkeley**. Research Member of the programme *New Challenges in PDE: Deterministic Dynamics and Randomness in High and Infinite Dimensional Systems*, three weeks.

2014–2016 **CEREMADE, Université Paris-Dauphine**. Four research visits at the invitation of Prof. E. Séré, totalling approximately ten months.

2014 **Hausdorff Research Institute for Mathematics (HIM), Bonn**. Participant in the programme *Harmonic Analysis and Partial Differential Equations*, two months.

2013 **Institut Henri Poincaré (IHP), Paris**. Participant in the three-month programme *Variational and Spectral Methods in Quantum Mechanics*, three months.

Invited seminars

2026
- Sapienza University of Rome.

2025
- Gran Sasso Science Institute (GSSI), L'Aquila.

2024
- University of Edinburgh (online).

2023
- University of Basel.

2022
- Universität Bielefeld (online).

2020
- Cardiff University.

2018
- SISSA, Trieste.
- Sapienza University of Rome.

2017
- University of Padova.

2016
- University of Zürich.
- University of Rome Tor Vergata.
- University of Milano-Bicocca.

2015
- Université Paris 13.

2013
- Institut Henri Poincaré, Paris.
- Sapienza University of Rome.

2012
- Université de Cergy-Pontoise.
- Sapienza University of Rome.

Invited conference and workshop talks

2025
- Workshop *Singular Interactions and Effective Models in Mathematical Physics*, Como.

2024
- Workshop *Hamiltonian and Dispersive PDEs*, Milan.
- Conference *Running START in Analysis*, Caserta.
- Conference on *Dirac Operators: Analysis and Geometry*, Beijing Institute of Technology (online).

2022
- Workshop on *Hamiltonian and Dispersive PDEs*, Pisa.

2021
- Workshop *Qualitative Properties of Dispersive PDEs*, Rome.

2019
- ICIAM, Valencia, minisymposium *Dirac Hamiltonians with Critical Singularities*.
- Workshop *Nonlinear Effects in PDEs and Related Problems*, École Polytechnique, Palaiseau.

2018
- Mini-workshop *Gibbs Measures for Nonlinear Dispersive Equations*, Oberwolfach.
- Workshop *The Analysis of Dirac Equations*, Orsay.
- Workshop *Nonlinear Dirac Equations and Related Problems*, Bielefeld.
- Workshop *Trails in Quantum Mechanics and Surroundings*, Polytechnic University of Turin.

2017
- Workshop *Linear and Nonlinear Dirac Equation: Advances and Open Problems*, Como.

2016
- 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando (two invited talks).

2014
- Workshop *KAM and Dispersive Methods in Hamiltonian PDEs*, Milan.
- Workshop *Analysis of Relativistic and Non-relativistic Models in Quantum Mechanics*, Rome.

2013
- Workshop *Linear and Nonlinear Hyperbolic Equations*, Pisa.

2012
- Journées EDP, Biarritz.
- Workshop *Blow-up, Dispersion and Solitons*, Rome.

Other conference presentations

2018 HYP 2018, Penn State University: *Dispersive dynamics of the Dirac equation on curved spaces*.

2015 IperGSSI 2015, L'Aquila: *Weak dispersion for the massless Dirac–Coulomb model*.

2014 HYP 2014, IMPA, Rio de Janeiro: *Continuity of the KdV flow with respect to Wasserstein metrics*.

Confirmed invitations not taken up due to force majeure

2020
- RIMS, Kyoto University; seminar and visit cancelled due to the public health emergency.
- Osaka University; seminar and visit cancelled due to the public health emergency.

Conference organisation and service to the scientific community

Organisation of scientific events

2027
- Organiser of the conference *Waves and Dispersion in Venice*, Ca' Foscari University of Venice (scheduled).

2024
- Organiser of the conference *Dispersion and Geometry*, University of Padova.

2023
- Organiser of the workshop *Dirac Days in Padova*, University of Padova.

2022
- Organiser of the conference *Waves in Venice*, Ca' Foscari University of Venice.

2021
- Organiser of the workshop *Equilibria in Dispersive and Kinetic Equations*, CIRM; event scheduled but subsequently cancelled due to the public health emergency.

2020
- Organiser of the workshop *PDEs in Quantum Mechanics*, University of Padova; event scheduled but subsequently cancelled due to the public health emergency.

Refereeing and research evaluation

Referee for more than twenty international journals, including *Advances in Mathematics*, *Analysis & PDE*, *Annales Henri Poincaré*, *Communications in Partial Differential Equations*, *Journal of Functional Analysis*, *Journal of Differential Equations*, *Transactions of the American Mathematical Society*, *Journal of Fourier Analysis and Applications*, *Journal of Geometric Analysis*, *Nonlinear Analysis* and *ZAMP*. Reviewer for the Austrian Science Fund (FWF).

Teaching

Continuous teaching responsibilities since 2016 in degree programmes in Mathematics and Engineering, with more than 1,000 documented hours as course lecturer or co-lecturer. Since 2021, annually responsible for two sections of Mathematical Analysis 1 in the Mathematics degree programme, totalling 124 teaching hours per academic year.

Courses taught as lecturer in charge

2021/22–2026/27	**Mathematical Analysis 1, Module A**, Mathematics degree programme, University of Padova: two course sections of 62 hours each per academic year.
2020/21	**Mathematical Analysis 1**, Chemical and Materials Engineering (72 hours); **Mathematical Analysis 2-B**, Mathematics (52 hours), University of Padova.
2019/20	**Mathematical Analysis 1, Module A**, Mathematics (62 hours); co-teaching of **Linear Algebra and Geometry**, DEI (24 hours), University of Padova.
2017/18–2018/19	**Mathematical Analysis 1**, Aerospace Engineering, University of Padova (72 hours per year).
2016/17	**Fundamentals of Linear Algebra and Geometry**, Civil and Environmental Engineering, University of Padova (32 hours).
2012/13	**Geometry**, Civil Engineering, Sapienza University of Rome.

Tutoring and supplementary teaching activities

From 2007 to 2016, regularly delivered tutoring and preparatory courses in Mathematical Analysis, Geometry and Mathematics at Sapienza University of Rome and LUISS Guido Carli.

Supervision of degree theses

Total: 14 theses supervised or co-supervised, including 5 master's and 9 bachelor's theses.

2026	*Giovanna Perrino, Andrea Soave and Ilaria Camilla Merico*: three bachelor's theses in Mathematics.
2025	*Francesco Cocco*: master's thesis in Mathematics, co-supervisor, MAPPA programme.
2024	*Mirko Gabriel Briglia*: master's thesis in Statistical Sciences; *Lamberto Tresoldi*: master's thesis in Mathematics, co-supervisor, MAPPA programme; *Nicola Polliero*: bachelor's thesis in Mathematics.
2023	*Valentina Moletta*: bachelor's thesis in Mathematics; *Tommaso Pistillo and Davide Massenz*: master's theses in Mathematics, co-supervisor, MAPPA programme.
2022	*Nicolò Tedesco, Lamberto Tresoldi and Annalisa Maricchio*: three bachelor's theses in Mathematics.
2020	*Alessandro Berardi*: bachelor's thesis in Mathematics.

Institutional and administrative service

2026	Member of the selection committee for a tenure-track researcher (RTT) position, disciplinary group 01/MATH-03, profile MATH-03/A, Department of Mathematics, University of Padova.
2023–2026	Chair of the Degree Programmes in Mathematics (bachelor's and master's levels), University of Padova.
2019–present	Member of the PhD Programme Board in Mathematics, University of Padova.
2022	Chair of the SID Research Projects and Research Fellowships Committee, Department of Mathematics, University of Padova.
2022	Member of the Joint Faculty–Student Committee, School of Science.
2020	Member of the Accreditation and Evaluation Group (GAV), Department of Mathematics, University of Padova.
2018–2022	Member of the Resources Committee, Department of Mathematics, University of Padova.
2018, 2019, 2026	Member of the Admissions Committee of the Galilean School of Higher Education, Science Division.
2020	Member of the final PhD examination committee for Long Meng, Université Paris-Dauphine.
2020-2023	Served as a member or alternate member on six selection committees for postdoctoral research fellowships at the Department of Mathematics, University of Padova.
2019–2023	External Galilean School tutor in Mathematical Analysis.

Public engagement, outreach and teaching innovation

MOOCs and teaching innovation

2019 Coordinator of the “Mathematical Analysis 1” MOOC developed for the open-access Federica platform. Activity recorded in the institutional IRIS repository of the University of Padova (identifiers FCO-0875 and FCO-0269).

Mathematics outreach and public engagement

2025 Invited speaker at TEDx Noventa Vicentina with the talk *Numeri* (Numbers). Activity recorded in IRIS: PEN-13299.

2024 Designed and produced the institutional introductory video for the Mathematics degree programme. Activity recorded in IRIS: PEN-1876.

2022–2023 Participated in editions of the science outreach event *Science for All*. Activity recorded in IRIS: PEN-1948.

Language skills

Italian: native; English: fluent; French: good.