

**ALLEGATO B**

UNIVERSITÀ DEGLI STUDI DI MILANO

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**DAVIDE FERMI  
CURRICULUM VITAE**

**INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)**

COGNOME	FERMI
NOME	DAVIDE
DATA DI NASCITA	01/08/1988

Data

06/07/2020

Luogo

MILANO

# DAVIDE FERMI

## Curriculum Vitae et Studiorum

### Personal Data

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Name and surname: Davide Fermi  
 Place and date of birth: Melzo (Milan, Italy), 1 August 1988  
 Citizenship: Italian  
 Civil status: married with Erika Ghidini since 25 July 2015,  
 one child born on 7 October 2018  
  
 Work address: Classe di Scienze  
 Scuola Normale Superiore  
 Piazza dei Cavalieri, 7  
 I-56126 Pisa, Italy  
  
 Email addresses: `davide.fermi@sns.it`,  
`fermidavide@gmail.com`  
  
 Webpage: <https://fermidavide.com>  
  
 Spoken Languages: Italian: mother tongue  
 English: fluent  
  
 Orcid ID: 0000-0002-4651-1784  
 Scopus Author ID: 54383178400  
 Researcher ID: S-6536-2018  
 MR Author ID: 1142559



### Academic Positions

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02/03/2020 - present     **Postdoc**, Scuola Normale Superiore, Classe di Scienze (Pisa, Italy)  
 Project: “*Aspetti Matematici della Fisica della Materia Condensata*”  
 (transl. “*Mathematical Aspects of Condensed Matter Physics*”)  
 Supervisor: Prof. Michele Correggi  
 Expected end date: 01/03/2021 (tempo determinato)  
  
 01/12/2016 - 29/02/2020     **Postdoc**, Università degli Studi di Milano, Mathematics Department (Milano, Italy)  
 Project: “*Metodi Analitici e Geometrici per le Equazioni Differenziali e la Teoria Quantistica dei Campi*” (transl. “*Analytical and Geometrical Methods for Differential Equations and Quantum Field Theory*”)  
 Supervisors: Prof. Marco M. Peloso and Prof. Livio Pizzocchero  
  
 15/04/2016 - 30/11/2016     **Postdoc**, Università degli Studi dell’Insubria, DiSAT (Como, Italy)  
 Project: “*Problemi matematici nella fisica della materia condensata - FIR 2013*”  
 (transl. “*Mathematical Problems in Condensed Matter Physics*”)  
 Supervisors: Prof. Claudio Cacciapuoti and Prof. Andrea Posilicano

### Education

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2012 - 2016     **Ph.D. degree in Mathematics**, Università degli Studi di Milano, Math. Dep. (Milano, Italy)  
 (XXVIII cycle, with scholarship)  
 Thesis: “*A functional analytic framework for local zeta regularization and the scalar Casimir effect*”  
 defended in Milan, Italy on 22 February 2016  
 Advisor: Prof. Livio Pizzocchero  
  
 2010 - 2012     **Master degree in Physics**, Università degli Studi di Milano, Physics Dep. (Milano, Italy)  
 Thesis: “*L’Effetto Casimir e la Regolarizzazione Zeta*”  
 (transl. “*Zeta regularization and the Casimir effect*”)  
 defended in Milan, Italy on 24 July 2016  
 Marks: 110/110 *magna cum laude*  
 Advisor: Prof. Livio Pizzocchero  
 Co-advisor: Prof. Franco Gallone

- 2007 - 2010 **Bachelor degree in Physics**, Università degli Studi di Milano, Physics Dep. (Milano, Italy)  
 Thesis: “*Lo Spaziotempo di Alcubierre*” (transl. “*Alcubierre’s spacetime*”)  
 defended in Milan, Italy on 21 October 2010  
 Marks: 110/110 *magna cum laude*  
 Advisor: Prof. Livio Pizzocchero
- 2002 - 2007 **Italian High School diploma**, Liceo Scientifico Statale Giordano Bruno, Melzo (Milan, Italy)  
 (diploma di Maturità Scientifica PNI - Piano Nazionale Informatica)  
 Marks: 100/100

## Scientific Works

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### Preprints

2. M. Correggi, D. Fermi,  
*Magnetic perturbations of anyonic and Aharonov-Bohm Schrödinger operators*  
 arXiv:2006.09056 [math-ph] (2020); submitted
1. C. Cacciapuoti, D. Fermi, A. Posilicano,  
*The semiclassical limit on a star-graph with Kirchhoff conditions*  
 arXiv:2005.03790 [math-ph] (2020); submitted

### Books

1. D. Fermi, L. Pizzocchero,  
*Local zeta regularization and the scalar Casimir effect. A general approach based on integral kernels*  
 World Scientific Publishing (2017) [276 pages]  
 ISBN: 978-981-3224-99-5 (hardcover), ISBN: 978-981-3225-01-5 (ebook); arXiv:1505.00711, arXiv:1505.01044.

### Published papers

13. D. Fermi, M. Gengo, L. Pizzocchero,  
*Integrable scalar cosmologies with matter and curvature*  
 Nucl. Phys. B **957** (2020), 115095 [102 pages]  
 DOI:10.1016/j.nuclphysb.2020.115095; arXiv:2001.03228 [gr-qc]
12. C. Cacciapuoti, D. Fermi, A. Posilicano,  
*The semi-classical limit with a delta potential*  
 Annali di Matematica Pura ed Applicata (2020), online first [37 pages]  
 DOI:10.1007/s10231-020-01002-4; arXiv:1907.05801 [math-ph]
11. D. Fermi,  
*The Casimir energy anomaly for a point interaction*  
 Mod. Phys. Lett. A **35**(03) (2020), 2040008 [5 pages]  
 (special issue containing the “Proceedings of the 4th Casimir Symposium”, St. Petersburg, 24-28 June 2019)  
 DOI:10.1142/S0217732320400088; arXiv:1909.00604 [math-ph]
10. D. Fermi,  
*Some remarks on a new exotic spacetime for time travel by free fall*  
 pp. 243–265 in S. Cacciatori, B. Güneysu, S. Pigola (Eds.), “Einstein Equations: Physical and Mathematical Aspects of General Relativity. DOMOSCHOOL 2018”, Birkhäuser, Cham, Springer Nature Switzerland AG (2019) [23 pages]  
 DOI:10.1007/978-3-030-18061-4\_8; arXiv:1812.09021 [gr-qc]
9. D. Fermi, M. Gengo, L. Pizzocchero,  
*On the necessity of phantom fields for solving the horizon problem in scalar cosmologies*  
 Universe **2019**, 5(3) (2019), 76 [20 pages]  
 (invited feature article)  
 DOI:10.3390/universe5030076; arXiv:1901.11511 [gr-qc]
8. C. Cacciapuoti, D. Fermi, A. Posilicano,  
*Scattering from local deformations of a semitransparent plane*  
 J. Math. Anal. Appl. **473**(1) (2019), 215–257 [43 pages]  
 DOI:10.1016/j.jmaa.2018.12.045; arXiv:1807.07916 [math-ph]  
*Corrigendum*,  
 J. Math. Anal. Appl. **482**(1) (2020), 123554 [2 pages]  
 DOI:10.1016/j.jmaa.2019.123554
7. C. Cacciapuoti, D. Fermi, A. Posilicano,  
*On inverses of Krein’s  $Q$ -functions*  
 Rend. Mat. Appl. (7) **39**(2) (2018), 229–240 [12 pages]  
 Editor’s page; arXiv:1809.05150 [math.SP]

6. D. Fermi, L. Pizzocchero,  
*A time machine for free fall into the past*  
Class. Quant. Grav. **35**(16) (2018), 165003 [42 pages]  
DOI:10.1088/1361-6382/aace6e; arXiv:1803.08214 [gr-qc]
5. D. Fermi, L. Pizzocchero,  
*Local Casimir Effect for a Scalar Field in Presence of a Point Impurity*  
Symmetry **2018**, **10**(2) (2018), 38 [20 pages]  
(invited contribution in I. H. Brevik, K. A. Milton (guest Eds.), Special Issue of Symmetry “Casimir Physics and Applications”)  
DOI:10.3390/sym10020038; arXiv:1712.10039 [math-ph]
4. C. Cacciapuoti, D. Fermi, A. Posilicano,  
*Relative-Zeta and Casimir energy for a semitransparent hyperplane selecting transverse modes*  
pp. 71–97 in G.F. DellAntonio and A. Michelangeli (Eds.), “Advances in Quantum Mechanics: contemporary trends and open problems”, Springer (2017) [26 pages]  
DOI:10.1007/978-3-319-58904-6\_5; arXiv:1702.05296 [math-ph]
3. D. Fermi, L. Pizzocchero,  
*Local zeta regularization and the scalar Casimir effect IV. The case of a rectangular box*  
Int. J. Mod. Phys. A **31**(04&05) (2016), 1650003 [56 pages]  
DOI:10.1142/S0217751X16500032; arXiv:1505.03276 [math-ph]
2. D. Fermi, L. Pizzocchero,  
*Local zeta regularization and the scalar Casimir effect III. The case with a background harmonic potential*  
Int. J. Mod. Phys. A **30**(35) (2015), 1550213 [42 pages]  
DOI:10.1142/S0217751X15502139; arXiv:1505.01651 [math-ph]
1. D. Fermi, L. Pizzocchero,  
*Local Zeta Regularization and the Casimir Effect*  
Prog. Theor. Phys. **126**(3) (2011), 419–434 [15 pages]  
DOI:10.1143/PTP.126.419; arXiv:1104.4330 [math-ph]

## Invited Talks

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- 2019 “Casimir energy and relative zeta function for a semitransparent plane”,  
Dipartimento di Matematica, Università degli Studi di Genova, 21 May 2019.
- 2019 “Zeta regularization in the scalar Casimir effect”, invited talk at *1st Vacuum Fluctuations at Nanoscale and Gravitation conference: theory and experiments*,  
Orsei, 28 April – 3 May 2019.
- 2018 “Free fall into the past. A time-orientable spacetime model with closed timelike curves and no curvature singularity”,  
Dipartimento di Matematica, Università degli Studi di Milano, 18 January 2018.
- 2017 “Local Casimir effect and  $\zeta$ -regularization: scalar field in a rectangular box”, invited talk at *QFT Day in Milan: mathematical aspects of renormalization*,  
Dipartimento di Matematica, Università degli Studi di Milano, 13 April 2017.
- 2017 “Zeta regularization and Casimir effect for a scalar field with singular background potentials”, invited talk at *Microlocal analysis: a tool to explore the quantum world*,  
Dipartimento di Matematica, Università degli Studi di Genova, 12–13 January 2017.
- 2016 “Zeta-function regularization in Wightman scalar field theory and applications to the Casimir effect”, invited talk at *Workshop in Mathematical Physics*,  
ETH Zürich 28–30 November 2016.
- 2016 “Casimir energy for singular potentials concentrated on a plane”, invited talk at *Mathematical Challenges of Zero-Range Physics: rigorous results and open problems*,  
SISSA Trieste 7–10 November 2016.
- 2015 “A functional analytic framework for local zeta regularization and the scalar Casimir effect”,  
Dipartimento di Matematica, Università degli Studi di Trento, 5 October 2015.
- 2011 “La regolarizzazione zeta locale e l’effetto Casimir” (transl. “Local zeta regularization and the Casimir effect”),  
Dipartimento di Matematica, Università degli Studi di Milano, 28 June 2011.

## Contributed Talks

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- 2019 “*Scattering from local deformations of a semitransparent plane*”, contribution at *XXI Congresso dell’Unione Matematica Italiana*, Università degli Studi di Pavia, 2–7 September 2019.
- 2019 “*Scalar Casimir effect for delta-type potentials*”, contribution at *10th Alexander Friedmann International Seminar on Gravitation and Cosmology, and 4th Symposium on the Casimir Effect*, Saint Petersburg Polytechnic University, 23–29 June 2019.
- 2018 “*Free fall into the past*”, contribution at *DOMOSCHOOL - International Alpine School of Mathematics and Physics. Einstein’s Equations: Physical and Mathematical Aspects of General Relativity*, Domodossola, 16–20 July 2018.
- 2018 “*Some results on scattering theory for delta interactions concentrated on deformed planes*”, contribution at *Mathematical Challenges in Quantum Mechanics 2018*, “Sapienza” Università degli Studi di Roma, 19–24 February 2018.
- 2016 “*Zeta regularization and the Casimir effect: a functional analytic framework*”, contribution at *Mathematical Challenges in Quantum Mechanics 2016*, Bressanone, 8–13 February 2016.
- 2015 “*Local zeta regularization and the scalar Casimir effect*”, contribution at *Assemblea Scientifica GNFM*, Montecatini, 22–24 October 2015.

## Invited visiting

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- 2020 Visiting professor at Scuola Normale Superiore di Pisa, Pisa, 12–14 February 2020.
- 2016 Visiting scientist at SISSA (International School for Advanced Studies, Trieste), Trieste, 26–29 September 2016.

## Referee’s activity

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- *Communications in Mathematical Physics* (by Springer)
- *Classical and Quantum Gravity* (by IOP Science)
- *Journal of Statistical Physics* (by Springer)
- *International Journal of Geometric Methods in Modern Physics* (by World Scientific)
- *Journal of Physics G: Nuclear and Particle Physics* (by IOP Science)
- *European Journal of Physics* (by IOP Science)
- *European Physical Journal C* (by Springer)
- *Physica Scripta* (by IOP Science)
- *Universe* (by MDPI)

## Research Projects and Funding

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- INFN Project 2017-2019: “*BELL - Fundamental Problems in Quantum Physics*”  
National coordinator: Prof. Pierantonio Zanghì  
Local coordinator: Prof. Bassano Vacchini  
Role: participant
- Progetto Giovani GNFM 2017: “*Dinamica quasi classica per il modello di polarone*”  
(transl. “*Quasi-classical dynamics for the polaron model*”)  
Principal investigator: Prof. Raffaele Carlone  
Role: participant
- FIR project 2014-2017: “*COND-MATH - Condensed Matter in Mathematical Physics*”  
Principal investigator: Prof. Michele Correggi  
Role: participant (University of Insubria Unit, from 2016)
- MIUR - PRIN 2010 - 2011: “*Teorie geometriche e analitiche dei sistemi Hamiltoniani in dimensioni finite e infinite*” (transl. “*Geometric and analytic theories of Hamiltonian systems in finite and infinite dimensions*”)  
National coordinator : Prof. Boris A. Dubrovin  
Local coordinator: Prof. Dario P. Bambusi  
Role: participant

## Supervised Students

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- Guglielmo Moroni, M.Sc. in Theoretical Physics, Università degli Studi di Milano, Physics Department  
Thesis: “*Scalar Casimir effect on a line in presence of delta-interaction*”  
Dissertation date: 2 April 2020  
Co-supervised with Prof. Livio Pizzocchero

## Teaching activity

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- Teaching assistant for “Meccanica Analitica” (Analytical Mechanics) for the B.Sc. degree in Physics, Università degli Studi di Milano, academic year 2019/2020 (20 hours of teaching activity).
- Teaching assistant for “Meccanica Analitica” (Analytical Mechanics) for the B.Sc. degree in Physics, Università degli Studi di Milano, academic year 2018/2019 (20 hours of teaching activity).
- Teaching assistant for “Meccanica Analitica” (Analytical Mechanics) for the B.Sc. degree in Physics, Università degli Studi di Milano, academic year 2017/2018 (20 hours of teaching activity).
- Teaching assistant for “Matematica del continuo”, mathematics course for the B.Sc. degree in Computer Science, Università degli Studi di Milano, academic year 2015/2016 (48 hours of teaching activity, 20 hours of support for exams).
- Teaching assistant for “Matematica del continuo”, mathematics course for the B.Sc. degree in Computer Science, Università degli Studi di Milano, academic year 2014/2015 (48 hours of teaching activity, 20 hours of support for exams).
- Teaching assistant for “Istituzioni di matematica”, mathematics course for the B.Sc. degree in Computer Science, Università degli Studi di Milano, academic year 2013/2014 (48 hours of teaching activity, 20 hours of support for exams).
- Freshmen tutor for “Corsi di azzeramento”, mathematics pre-introductory course for the B.Sc. degree in Biological Sciences, Università degli Studi di Milano, September 2014 (24 hours of teaching activity).

## Administration Posts

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- Representative of postdoc researchers at the Department Council (“Consiglio di Dipartimento”) of the Department of Mathematics, Università degli Studi di Milano, academic years 2017/2018, 2018/2019, 2019/2020.
- Member of the Didactic Board (“Collegio Didattico”) of the Department of Physics, Università degli Studi di Milano, academic years 2017/2018, 2018/2019, 2019/2020.

## Affiliations

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- Member of the “*Unione Matematica Italiana*” (UMI) since 2019.
- Member of the “*International Association of Mathematical Physics*” (IAMP) since 2017.
- Member of the “*Istituto Nazionale di Fisica Nucleare*” (INFN, Italian National Institute for Nuclear Physics) from March 2017 to March 2020.
- Member of the “*Gruppo Nazionale per la Fisica Matematica*” (INdAM-GNFM, Italian National Group for Mathematical Physics), Section *Relatività e Teoria dei Campi* since 2015.

## Research Interests

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- Schrödinger operators with Aharonov-Bohm potentials; anyonic systems and fractional statistics.
- Schrödinger operators with singular potentials; perturbations of self-adjoint operators and self-adjoint extensions of symmetric operators; scattering theory for non-relativistic quantum particles; semi-classical limit; quantum graphs.
- Mathematical aspects of relativistic quantum field theories (axiomatic QFT); zeta-regularization and its applications to the renormalization of vacuum expectation values; Casimir effect for a scalar field in presence of external potentials or classical boundaries.
- Exotic solutions of Einstein’s field equations; violations of the classical positive energy conditions; non-standard causal structures with closed timelike curves; scalar field models for early-stage inflation in cosmology.

## Citation Metrics

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	Scopus	Web of Science	Google Scholar
Number of citations	40	31	76
H-index	5	4	7

## Attended Schools and Meetings

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- 2020 “*Applications of Bogoliubov Theory, Mathematical Physics of Quantum Many-Body Systems - Online Summer School*”, <http://nielsbenedikter.de/conference/conference.html>, 19-22 June 2020.
- 2020 “*One World IAMP Mathematical Physics Seminar Series*”, [http://www.iamp.org/page.php?page=page\\_seminar](http://www.iamp.org/page.php?page=page_seminar), May-June 2020.
- 2020 “*Munich-Aarhus-Santiago Seminar in Mathematical Physics*”, <https://math.au.dk/en/projects/sqm/mas-mp-seminar/>, April-June 2020.
- 2019 “*From semi-classical to quantum many body through normal forms*”, workshop at Dipartimento di Matematica, Università degli Studi di Milano, 17-20 December 2019.
- 2019 “*Meccanica quantistica e dintorni*”, workshop at “Sapienza” Università di Roma, 7–8 November 2019.
- 2019 “*Quantum graphs and quantum random walks*”, Lake Como School of Advanced Studies at Villa del Grumello, Como, 5–9 August 2019.
- 2019 “*Foundations and Constructive Aspects of QFT*”, 43rd workshop of the LQP series at Galileo Galilei Institute, Firenze, 20–22 February 2019.
- 2018 “*Mathematical Challenges of Zero Range Physics: rigorous results and open problems*”, INdAM workshop at “Sapienza” Università di Roma, 9–13 July 2018.
- 2018 “*Trails in Quantum Mechanics and Surroundings*”, workshop at SISSA Trieste, 29–30 January 2018.
- 2017 “*Spectral and scattering theory: from selfadjoint operators to boundary value problems - Insubria Summer School in Mathematical Physics*”, workshop at Department of Science, Università degli Studi dell’Insubria (Como), 18–22 September 2017.
- 2017 “*Fundamental problems of quantum physics*”, workshop INFN BELL 2017 at Dipartimento di Fisica, Università degli Studi di Milano, 16 June 2017.
- 2017 “*Linear and Nonlinear Dirac Equation: advances and open problems*”, workshop at Dipartimento di Scienza e Alta Tecnologia, Università degli Studi dell’Insubria (Como), 08–10 February 2017.
- 2016 “*EMS – IAMP Summer School in Mathematical Physics. Universality, Scaling Limits and Effective Theories*”, “Sapienza” Università di Roma, 11–15 July 2016.
- 2016 “*Contemporary Trends in the Mathematics of Quantum Mechanics*”, INdAM workshop at “Sapienza” Università di Roma, 04–08 July 2016.
- 2016 “*Operator Algebras and Quantum Field Theory*”, workshop at Frascati INFN-LNF, 27–29 June 2016.
- 2016 “*Mathematical Challenges in Quantum Mechanics*”, workshop at Bressanone, 8–13 February 2016.
- 2016 “*Geometric and Analytic Theory of Hamiltonian Systems in Finite and Infinite Dimensions*”, workshop at SISSA (Trieste), 18–21 January 2016.
- 2015 “*Assemblea Scientifica GNFM*”, workshop at Montecatini, 22–24 October 2015.
- 2015 “*New Trends in Algebraic Quantum Field Theory (AQFT2015)*”, workshop at Frascati INFN-LNF, 11–13 February 2015.
- 2014 “*Operator and Geometric Analysis on Quantum Theory*”, workshop at Levico Terme (Trento), 15–19 September 2014.
- 2014 “*Algebraic Quantum Field Theory: its status and its future*”, workshop at ESI Wien, 19–23 May 2014.
- 2013 “*Finite and Infinite Dimensional Hamiltonian Systems*”, workshop at Dipartimento di Matematica, Università di Roma Tre, 24–25 October 2013.
- 2013 “*Recent Advances in Partial Differential Equations and Applications*”, International School at Dipartimento di Matematica, Università degli studi di Milano, 17–21 June 2013.
- 2013 “*Analytical Aspects of Mathematical Physics*”, workshop at ETH Zürich, 27–31 May 2013.
- 2012 “*La geometria degli atomi e delle molecole. La Meccanica negli studi di Carlo Cercignani*”, workshop at Istituto Lombardo, Accademia di Scienze e Lettere, 22 November 2012.

Last update: Milano, July 6, 2020