

Curriculum Vitae DIEGO BERTI

Information

Full name: Diego Berti.
Date and place of writing the CV: June 28th, 2023, Firenze, Italy.
Citizenship: Italian.

Academic positions

since April 2023 Researcher Fellow (Ricercatore Tempo Determinato tipo A, legge 240/2010) s.s.d. MAT/05, **Università di Torino**, Department of Mathematics “Giuseppe Peano”, Turin, Italy. PNRR: *NODES.SPOKE 1: INDUSTRY 4.0 FOR SUSTAINABLE MOBILITY & AEROSPACE. CUP n. E13B22000020001*.

October, 2022 – March, 2023 Post-doc, **Università di Pisa**, Department of Mathematics, Pisa, Italy. **Project**: Qualitative study of Dispersive and Hamiltonian Equations, under *PRIN 2020 Prot. 2020XB3EFL “Hamiltonian and dispersive PDEs”*. **Director**: Nicola Visciglia (Università di Pisa).

October, 2021 – September, 2022 Post-doc, **Università di Firenze**, Department of Mathematics and Informatics “Ulisse Dini”, Firenze, Italy. **Project**: Partial differential equations analysis for fluid dynamics. **Director**: Luca Bisconti (Università di Firenze).

January – September, 2021 Post-doc, **Università di Modena e Reggio Emilia**, Department of Sciences and Methods for Engineering, Reggio Emilia, Italy. **Project**: Quantitative models for the study of collective movements: crowd dynamics and vehicular traffic. **Director**: Luisa Malaguti (Università di Modena e Reggio Emilia).

January – December, 2020 Post-doc, **Università di Modena e Reggio Emilia**, Department of Sciences and Methods for Engineering, Reggio Emilia, Italy. **Project**: Macroscopic models for the analysis of crowd dynamics. **Director**: Luisa Malaguti (Università di Modena e Reggio Emilia).

April – December, 2019 Post-doc, under *Programa de Excelencia Severo Ochoa (SEV-2015-0554)*, Consejo Superior de Investigaciones Científica (CSIC), **Instituto de Ciencias Matemáticas (ICMAT)**, Madrid, Spain. **Principal researcher**: Diego Cordoba (ICMAT).

Education

November, 2015 – February, 2019 **Ph.D. in Mathematics**, Dottorato di Ricerca in Matematica, Informatica e Statistica, Curriculum in Matematica, Ciclo XXXI, **Università di Firenze**, Firenze, Italy.
Date of thesis defense: 18/02/2019. **Thesis title**: Asymptotic analysis of solutions related to the game-theoretic p -laplacian. **Advisor**: Rolando Magnanini (Università di Firenze).

September, 2012 – October, 2015 **Laurea Magistrale in Matematica (Master’s Degree in Mathematics)**, Università di Firenze, Firenze, Italy.
Date of thesis defense: 14/10/2015. **Final grade**: 110/110 cum laude. **Thesis title (in italian)**: Comportamento asintotico delle soluzioni di certi problemi al bordo per il p -Laplaciano normalizzato. **Advisor**: Rolando Magnanini (Università di Firenze).

September, 2008 – April, 2012 **Laurea Triennale in Matematica (3-year Bachelor’s Degree in Mathematics)**, Università di Firenze, Firenze, Italy.
Date of thesis defense: 18/04/2012. **Thesis title (in italian)**: Computazione di Gruppi di Omologia. **Advisor**: Marco Maggesi (Università di Firenze).

1999 – 2004 **Upper Secondary School Diploma in Electronic and Telecommunications**. ITIS “Antonio Meucci”, Firenze, Italy.

Publications

- [1] Dynamics of complex bodies with memory and vector-valued microstructure: existence and uniqueness, (with L. Bisconti and P. M. Mariano), *Physica D: Nonlinear Phenomena*, 446, Article no. 133683, 2023.
[DOI: 10.1016/j.physd.2023.133683](https://doi.org/10.1016/j.physd.2023.133683)

- [2] Global attractor for the three-dimensional Bardina Tropical Climate Model, (with L. Bisconti and D. Catania), accepted by *Applicable Analysis*, 9 pp., 2023, available in its online version.
DOI: [10.1080/00036811.2023.2166494](https://doi.org/10.1080/00036811.2023.2166494)
- [3] A regularity criterion for a 3D tropical climate model with damping, (with L. Bisconti and D. Catania), *J. Math. Anal. Appl.*, 518 (2023) 126685, available online 14 September 2022.
DOI: [10.1016/j.jmaa.2022.126685](https://doi.org/10.1016/j.jmaa.2022.126685)
- [4] Energy decay in the dynamics of complex bodies with spreading microstructures represented by 3D vectors, (with L. Bisconti and P. M. Mariano), *J. Elasticity*, 2022.
DOI: [10.1007/s10659-022-09921-4](https://doi.org/10.1007/s10659-022-09921-4)
- [5] Diffusion–convection reaction equations with sign-changing diffusivity and bistable reaction term, (with A. Corli and L. Malaguti), *Nonlinear Anal. Real World Appl.*, 2022, 103579.
DOI: [10.1016/j.nonrwa.2022.103579](https://doi.org/10.1016/j.nonrwa.2022.103579)
- [6] Wavefronts for degenerate diffusion-convection reaction equations with sign-changing diffusivity, (with A. Corli and L. Malaguti), *Discrete Contin. Dyn. Syst.*, **41**(12):6023–6046, 2021.
DOI: [10.3934/dcds.2021105](https://doi.org/10.3934/dcds.2021105)
- [7] Uniqueness and nonuniqueness of fronts for degenerate diffusion-convection-reaction equations, (with A. Corli and L. Malaguti), *Electron. J. Qual. Theory Differ. Equ.*, 2020, No.66, 1-34.
DOI: [10.14232/ejqtde.2020.1.66](https://doi.org/10.14232/ejqtde.2020.1.66)
- [8] Small diffusion and short-time asymptotics for Pucci operators, (with R. Magnanini), *Appl. Anal.*, **101**(10):3716–3732, 2022
DOI: [10.1080/00036811.2020.1750602](https://doi.org/10.1080/00036811.2020.1750602)
- [9] Asymptotic analysis of solutions related to the game-theoretic p -laplacian, Ph.D. Thesis, Università di Firenze (2019). (Online on arXiv:1902.10346.)
- [10] Asymptotics for the resolvent equation associated to the game-theoretic p -laplacian, (with R. Magnanini), *Appl. Anal.*, **98**:1827–1842, 2019.
DOI: [10.1080/00036811.2018.1466283](https://doi.org/10.1080/00036811.2018.1466283)
- [11] Short-time behaviour for game-theoretic p -caloric functions, (with R. Magnanini), *J. Math. Pures Appl.*, **126**:249–272, 2019.
DOI: [10.1016/j.matpur.2018.06.020](https://doi.org/10.1016/j.matpur.2018.06.020)
- [12] Berti, D. (Conference paper) *Short-Time Asymptotics for Game-Theoretic p -Laplacian and Pucci Operators*. In: Cerejeiras, P., Reissig, M., Sabadini, I., Toft, J. (eds) *Current Trends in Analysis, its Applications and Computation. Trends in Mathematics*. Birkhäuser, Cham. 2022.
DOI: [10.1007/978-3-030-87502-2_42](https://doi.org/10.1007/978-3-030-87502-2_42)
- [13] D. Berti, A. Corli, L. Malaguti. (Conference paper) *Wavefronts in forward-backward parabolic equations and applications to biased movements*, (with A. Corli and L. Malaguti), to appear in 13th ISAAC Congress, 2022.

Reviewer activity

- Reviewer for *Mathematical Methods in the Applied Sciences, Journal of Mathematical Analysis and Applications*.

Teaching experiences

- 2022 Elementi di Matematica (A-K) 2022-2023 (part of the course; other parts of the course held by E. Pacifici (Firenze)), Corso di Laurea in Biotecnologie, [Università di Firenze](https://www.unifi.it), Italy; *24 hours*, 3 CFU, (September – December, 2022).
- 2022 Esercitazioni - Analisi Matematica A (L-Z) 2022-2023 (theory held by V. Taddei (Modena and Reggio Emilia)), Corso di Laurea in Ingegneria Meccatronica, [Università di Modena e Reggio Emilia](https://www.unimore.it), Italy; *27 hours*, 3 CFU, (September – December, 2022).
- 2022 Analisi Matematica II 2021-2022 (part of the course; other parts held by S. Vessella (Firenze)), Corso di Laurea in Ingegneria Biomedica, [Università di Firenze](https://www.unifi.it), Italy; *18 hours*, 2 CFU, (March – May, 2022).
- 2021 Elementi di Matematica (L-Z) 2021-2022 (part of the course; other parts of the course held by M. Focardi (Firenze)), Corso di Laurea in Biotecnologie, [Università di Firenze](https://www.unifi.it), Italy; *24 hours*, 3 CFU, (October – December, 2021).

- 2021 Elementi di Matematica (A-K) 2021-2022 (part of the course; other parts of the course held by G. Villari (Firenze)), Corso di Laurea in Biotecnologie, [Università di Firenze](#), Italy; *24 hours*, 3 CFU, (October – December, 2021).
- 2021 Esercitazioni - Analisi Matematica A (L-Z) 2021-2022 (theory held by V. Taddei (Modena and Reggio Emilia)), Corso di Laurea in Ingegneria Meccatronica, [Università di Modena e Reggio Emilia](#), Italy; *27 hours*, 3 CFU, (September – December, 2021).
- 2020 Esercitazioni - Analisi Matematica A (L-Z) 2020-2021 (theory held by E. Rossi (Modena and Reggio Emilia)), Corso di Laurea in Ingegneria Meccatronica, [Università di Modena e Reggio Emilia](#), Italy; *27 hours*, 3 CFU, (September – December, 2020).
- 2019 *Corso di Recupero OFA in Matematica - (Preliminary course in basic Mathematics) 2019-2020*, Dipartimento di Scienze e Tecnologie Agrarie, Alimentari e Forestali, Scuola di Agraria, [Università di Firenze](#), Firenze, Italy; *24 hours*, (January – February, 2019).
- 2016 – 2017 Tutor of the course *Matematica e Esercitazioni*, Corso di Laurea in Scienze Geologiche, Scuola di Scienze Matematiche, Fisiche e Naturali, [Università di Firenze](#), Firenze, Italy. (In-person tutoring activity to 1st-year students for the Mathematics 1st-year course.) (September, 2016 – September, 2017).

Invited talks & seminars

- 2022 A regularity criterion for a 3D tropical climate model with damping, *Seminari di Analisi - Firenze*, Dipartimento di Matematica e Informatica “Ulisse Dini”, Firenze, Italy. (May, 27th.)
- 2021 Multiplicity of traveling waves to bistable problems with negative diffusivity, *Two days workshop in nonlinear analysis 2021*, GNAMPA INdAM Metodi topologici per problemi al contorno associati a certe classi di equazioni alle derivate parziali, online. (September, 3rd.)
- 2021 Wavefronts for degenerate diffusion-convection reaction equations with sign-changing diffusivity, *Methods of Non-linear Analysis in Differential and Integral Equations*, Department of Nonlinear Analysis, Rzeszow University of Technology, Poland, online. (May, 16th.)
- 2021 Wavefronts for degenerate diffusion-convection reaction equations, *Seminari di Analisi @ Unife*, Ferrara (online). (April, 29th.)
- 2019 Short-time asymptotics for solutions of the evolutionary game-theoretic p -laplacian and Pucci operators, *XXI Congresso dell'Unione Matematica Italiana - Equazioni differenziali alle derivate parziali*, Università di Pavia, Italy. (September, 4th.)
- 2019 Short-time asymptotics for solutions of the evolutionary game-theoretic p -laplacian and Pucci operators, *12th ISAAC Congress - Geometric & Regularity Properties of Solutions to Elliptic and Parabolic PDEs*, University of Aveiro, Portugal. (July, 30th.)
- 2018 Asymptotic analysis and symmetry results of solutions related to the game-theoretic p -laplacian, *Joint Firenze-Tohoku Research Workshop on Nonlinear PDEs*, Dipartimento di Matematica e Informatica “Ulisse Dini”, Firenze, Italy. (October, 22nd.)
- 2018 Short-time behaviour for game-theoretic p -caloric functions, *15th Aoba-yama seminar: PDEs and Inverse Problems*, GSIS center, Tohoku University, Sendai, Japan. (February, 22nd.)
- 2016 Asymptotic behaviour of solutions for certain boundary problems for the normalized p -laplacian, *PDEs-Calculus of Variations seminars*, Dipartimento di Matematica e Informatica “Ulisse Dini”, Firenze, Italy. (April, 1st.)
- 2016 Asymptotic behaviour of solutions for certain boundary problems for the normalized p -laplacian, *Firenze-Sendai seminars*, GSIS center, Tohoku University, Sendai, Japan. (January, 28th.)

Posters at conferences

- 2022 On regularized three-dimensional tropical climate models, *International Workshop on Nonlinear Differential Problems*, Giardini Naxos (Messina), Italy (September, 21st.)
- 2018 Asymptotic analysis of solutions of boundary problems for the game-theoretic p -laplacian, *Sobolev spaces and partial differential equations. In honour of Vladimir Maz'ya, on the occasion of his 80th birthday*, Accademia dei Lincei, Palazzo Corsini, Roma, Italy. (May, 17th.)
- 2017 Short-time behaviour for game-theoretic p -caloric functions, *Geometry of PDE's and related problems*, Cetraro (Cosenza), Italy. (http://php.math.unifi.it/users/cbianchini/doc_cetraro/posterBerti.pdf). (June, 22nd.)
- 2016 Asymptotic behaviour of solutions for certain boundary problems for the normalized p -laplacian, *Geometric aspects of PDE's and functional inequalities*, Palazzone di Cortona, Cortona (Arezzo), Italy. (April, 29th.)

Visiting periods

- February 2019 *Research Center for Pure and Applied Mathematics Graduate School of Information Sciences (GSIS)*, Tohoku University, Sendai, Japan. Visitor of Shigeru Sakaguchi.
- February 2018 *Research Center for Pure and Applied Mathematics Graduate School of Information Sciences (GSIS)*, Tohoku University, Sendai, Japan. Visitor of Shigeru Sakaguchi.
- January 2016 *Research Center for Pure and Applied Mathematics Graduate School of Information Sciences (GSIS)*, Tohoku University, Sendai, Japan. Visitor of Shigeru Sakaguchi.

Affiliations, memberships and Research Projects

- April, 2023 – up to now Dipartimento di Matematica “Giuseppe Peano”, Torino, Italy.
- October, 2022 – March 2023 Dipartimento di Matematica, Università di Pisa, Pisa, Italy.
- October, 2021 – September, 2022 Dipartimento di Matematica e Informatica “Ulisse Dini”, Università di Firenze, Firenze, Italy.
- 2020 – 2021 Dipartimento di Scienze e Metodi dell’Ingegneria, Università di Modena e Reggio Emilia, Reggio Emilia, Italy.
- April – December, 2019 Instituto de Ciencias Matemáticas (ICMAT), Consejo Superior de Investigaciones Científicas (CSIC), Campus de Cantoblanco, UAM Madrid, Spain.
- 2019 UMI (Unione Matematica Italiana), membership.
- November 2015 – February 2019 Dipartimento di Matematica e Informatica “Ulisse Dini”, Università di Firenze, Firenze, Italy.
- 2016 – up to now GNAMPA of INdAM (Istituto Nazionale di Alta Matematica), membership.
- 2023 GNAMPA Research Project 2023. Tecniche Analitiche per Modelli di Biologia, Dinamica dei Fluidi e Traffico Veicolare.
- 2018 GNAMPA Research Project 2018. Problemi inversi per equazioni alle derivate parziali.
- 2017 GNAMPA Research Project 2017. Esistenza, molteplicità e proprietà qualitative delle soluzioni di problemi differenziali non lineari.
- 2016 GNAMPA Research Project 2016. Proprietà quantitative e qualitative di soluzioni di equazioni ellittiche e paraboliche.

Other academic merits

- 2017 Collaboration for the Lecture notes from the CIME Summer School held on 19–23.06.2017:
X. Cabré, A. Henrot, D. Peralta-Salas, W. Reichel, H. Shahgholian, *Geometry of PDEs and related problems. Cetraro, Italy 2017*. Edited by Chiara Bianchini, Antoine Henrot and Rolando Magnanini. Lecture Notes in Mathematics, 2220. Fondazione CIME/CIME Foundation Subseries. Springer, Cham; Fondazione C.I.M.E., Florence, 2018. xi+196 pp.

Awards, prizes and honours

- 2017 *Premio di Laurea in Matematica*, Dipartimento di Matematica e Informatica Ulisse Dini, Corso di Laurea Magistrale in Matematica, Firenze, Italy. (Local award for Master thesis and curriculum.)