

GIULIO GALISE

Curriculum vitae et studiorum

PERSONAL INFORMATIONS

Surname	Galise
Name	Giulio
Date and place of birth	February 26, 1984 in Pompei (NA)
Citizenship	Italian
Academic Affiliation	Dipartimento di Matematica “Guido Castelnuovo” Sapienza Università di Roma
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ACADEMIC POSITIONS

Associate professor Since November 2nd, 2023

*Department of Mathematics Guido Castelnuovo
University of Rome Sapienza*

- **ASN-National Italian license as Full Professor
Sector 01/A3** (From 28/11/2023 to 28/11/2034)

Assistant professor with tenure track (Rtd-B) November 2nd, 2020 - November 1th, 2023

*Department of Mathematics Guido Castelnuovo
University of Rome Sapienza*

- **ASN-National Italian license as Associate Professor
Sector 01/A3** (From 30/06/2020 al 30/06/2031)

Assistant professor (Rtd-A) October 1st, 2018 - November 1th, 2020

*Department of Mathematics Guido Castelnuovo
University of Rome Sapienza*

- Research programm: *Mathematical analysis and its applications*

Postdoctoral research fellow March 2018 - September 30th, 2018

*Department of Mathematics “Federigo Enriques”
University of Milano Statale*

- Research project: *Critical phenomena and degeneration
in nonlinear PDE: analytic and geometric aspects*
- Supervisor: Prof. Kevin Ray Payne

Postdoctoral research fellow February 2017 - January 2018

*Department of Mathematics Guido Castelnuovo
University of Rome Sapienza*

- Research project: *Nonlinear elliptic equations*
- Supervisor: Prof. Emanuele Caglioti

Postdoctoral research fellow

January 2016 - December 2016

*Department of Mathematics Guido Castelnuovo
University of Rome Sapienza*

- Research project: *Nonlinear differential problems*
- Supervisor: Prof.ssa Filomena Pacella

Postdoctoral research fellow

January 2014 - January 2015

*Department of Mathematics
University of Salerno*

- Research project: *Elliptic PDE and applications*
- Supervisor: Prof.ssa Maria Transirico

EDUCATION

Ph.D. in Mathematical Analysis (with grant)

February 2010 - March 2013

University of Salerno

- Thesis: Maximum principles, entire solutions and removable singularities of fully nonlinear second order equations. Ph.D. Defense: March 22, 2013
- Advisors: Prof. Maria Transirico and Prof. Antonio Vitolo

Master's degree in Mathematics

February 2007 - July 2009

University of Salerno

- Thesis: On some properties of the fundamental frequency of the Laplacian.
- Advisor: Prof. Maria Transirico
- Grade: 110/110 cum Laude

Bachelor's degree in Mathematics

September 2003 - February 2007

University of Salerno

- Thesis: Laplace's equation.
- Advisor: Prof.ssa Maria Transirico
- Grade: 110/110 cum Laude

OTHER TITLES

TFA-Habilitation as high school Professor in Mathematics

University of Salerno (July 2013)

- Sector A047

SCIENTIFIC INTERESTS

Fully nonlinear (local and nonlocal) elliptic equations, qualitative properties of viscosity solutions, degenerate ellipticity, maximum principles, principal eigenvalues, critical exponents, concentration phenomena, Hamilton-Jacobi equations, homogenization.

RESEARCH VISITS

- Jan. 26. - Feb. 3, 2023 *Tsuda University (Tokyo).*
Scientific collaboration with Prof. Hitoshi Ishii
- Jul. 10 - Aug. 10, 2017 *Tohoku University (Sendai, JP), Waseda University (Tokyo).*
Research fellowship to attend the thematic program
“Nonlinear Partial Differential Equations for Future Applications”
Scientific collaboration with Prof. Shigeaki Koike and Prof. Hitoshi Ishii
- Jan. 13 - Feb. 13, 2014 *Université Paris-Est Créteil, École des Ponts ParisTech.*
Scientific collaboration with Prof. Cyril Imbert and Prof. Régis Monneau

PUBLICATIONS

1. I. Birindelli, G. Galise, H. Ishii, *Propagation of minima for nonlocal operators*, to appear on Proc. A Royal Soc. Edinburgh
2. I. Birindelli, G. Galise, D. Schiera, *Maximum principles and related problems for a class of nonlocal extremal operators*, Ann. Mat. Pura Appl. 201: 2371-2412 (2022)
3. I. Birindelli, G. Galise, E. Topp, *Fractional truncated Laplacians: Representation formula, fundamental solutions and applications*, Nonlinear Differ. Equ. Appl. 29, 26, 1-49 (2022)
4. F. Ferrari, G. Galise, *A regularity result for a class of non-uniformly elliptic operators*, Arch. Math. 118, 539-548 (2022)
5. I. Birindelli, G. Galise, A. Rodríguez, *Existence issues for a large class of degenerate elliptic equations with nonlinear Hamiltonians*, J. Convex Anal. 28, No. 2, 329-352 (2021)
6. I. Birindelli, G. Galise, H. Ishii, *Existence through convexity for the truncated Laplacians*, Mathematische Annalen, 379, 909-950 (2021)
7. I. Birindelli, G. Galise, H. Ishii, *Positivity sets of supersolutions of degenerate elliptic equations and the strong maximum principle*, Trans. Amer. Math. Soc., 374 (1), 539-564 (2021)
8. G. Galise, A. Iacopetti, F. Leoni, F. Pacella, *New concentration phenomena for a class of radial fully nonlinear equations*, Ann. Inst. Henri Poincaré, Anal. Non Linéaire, 37, 1109-1141 (2020)
9. I. Birindelli, G. Galise, *Allen-Cahn equation for the truncated Laplacian: unusual phenomena*, Mathematics in Engineering, 2(4): 722-733 (2020)
10. G. Galise, A. Iacopetti, F. Leoni, *Liouville-type results in exterior domains for radial solutions of fully nonlinear equations*, J. Differential Equations 269, 5034-5061 (2020)
11. I. Birindelli, G. Galise, H. Ishii, *Towards a reversed Faber-Krahn inequality for the truncated Laplacian*, Rev. Mat. Iberoam., Volume 36, Issue 3, pp. 723-740, (2020)
12. I. Birindelli, G. Galise, *The Dirichlet problem for fully nonlinear degenerate elliptic equations with a singular nonlinearity*, Calc. Var. Partial Differential Equations 58, no. 5, Art. 180 (2019)
13. G. Galise, *On positive solutions of fully nonlinear degenerate Lane-Emden type equations*, J. Differential Equations, 266, 1675-1697 (2019)
14. I. Birindelli, G. Galise, F. Leoni, F. Pacella, *Concentration and energy invariance for a class of fully nonlinear elliptic equations*, Calc. Var. Partial Differential Equations 57, no. 6, Art. 158 (2018)
15. I. Birindelli, G. Galise, H. Ishii, *A family of degenerate elliptic operators: Maximum principle and its consequences*, Ann. Inst. Henri Poincaré, Anal. Non Linéaire, 35, 417-441 (2018)

16. I. Birindelli, G. Galise, F. Leoni, *Liouville theorems for a family of very degenerate elliptic nonlinear operators*, Nonlinear Analysis, 161, 198-211 (2017)
17. G. Galise, F. Leoni, F. Pacella, *Existence results for fully nonlinear equations in radial domains*, Commun. Partial Differential Equations, 42:5, 757-779 (2017)
18. G. Galise, A. Vitolo, *Removable singularities for degenerate elliptic Pucci operators*, Adv. Differential Equations 22 no. 1/2, 77-100 (2017)
19. G. Galise, S. Koike, O. Ley, A. Vitolo, *Entire solutions of fully nonlinear elliptic equations with a superlinear gradient term*, J. Math. Anal. Appl. 441, 194-210 (2016)
20. G. Galise, C. Imbert, R. Monneau, *A junction condition by specified homogenization and application to traffic lights*, Analysis & PDE, Vol. 8, No. 8, 1891-1929 (2015)
21. M.E. Amendola, G. Galise, A. Vitolo, *On the uniqueness of blow-up solutions of fully nonlinear elliptic equations*, Discrete and Continuous Dynamical Systems - Series S, Vol. 2013, Issue special, 771-780 (2013)
22. M.E. Amendola, G. Galise, A. Vitolo, *Riesz capacity, maximum principle and removable sets of fully nonlinear second order elliptic operators*, Differential and Integral equations, Vol. 26, 845-866 (2013)
23. G. Galise, A. Vitolo, *Viscosity Solutions of Uniformly Elliptic Equations without Boundary and Growth Conditions at Infinity*, Int. J. Differ. Equ., vol. 2011, 1-18 (2011)

PREPRINTS

1. I. Birindelli, G. Galise, Y. Sire, *Nonlocal degenerate Isaacs operators: Hölder regularity*, arXiv:2310.11111

REVIEWING ACTIVITY

Acta Applicandae Mathematica, Bruno Pini Mathematical Analysis Seminar, Communications on Pure and Applied Analysis, Discrete and Continuous Dynamical Systems (series A-S), Journal de Mathématiques Pures et Appliquées, Journal of Mathematical Analysis and Applications, Journal of the European Mathematical Society, Mathematics in Engineering, Nonlinear Analysis, Nonlinear Analysis: Real World Applications, Nonlinear Differential Equations and Applications NoDEA, Nonlinearity, Proceedings of The Royal Society of Edinburgh (section A), Vietnam Journal of Mathematics.

FUNDING INFORMATION, PROJECTS AND GROUPS

GNAMPA 2023	<i>Local and nonlocal fully nonlinear equations: from the uniformly elliptic case to strongly degenerate cases</i> Principal Investigator: Fabiana Leoni
Progetto di Ateneo 2022 (Sapienza Università di Roma)	<i>At the edge of reaction-diffusion equations: from population dynamics to geometric analysis</i> Coordinatore: Isabeau Birindelli
GNAMPA 2022	<i>Local and global regularity for fully nonlinear problems</i> Principal Investigator: Giulio Galise
Progetto di Ateneo 2021 (Sapienza Università di Roma)	<i>Nonlinear PDEs: from geometry to population dynamics</i> Principal Investigator: Francesca De Marchis
GNAMPA 2020	<i>Asymptotic problems for nonlinear PDEs and Mean Field Games</i> Principal Investigator: Andrea Davini

Progetto di Ateneo 2020 (Sapienza Università di Roma)	<i>Nonlinear PDEs: from uniformly elliptic to strongly degenerate cases</i> Coordinatore: Fabiana Leoni
Visiting Professor (B) 2019 (Sapienza Università di Roma)	<i>Highly degenerate elliptic operators: from local to nonlocal case</i> Principal Investigator: Giulio Galise, Visiting: Erwin Topp
GNAMPA 2019	<i>Differential problems for highly degenerate fully nonlinear operators</i> Principal Investigator: Giulio Galise
GNAMPA 2018	<i>Curvature problems for elliptic degenerate operators</i> Principal Investigator: Giulio Tralli
GNAMPA 2017	<i>Viscosity solution methods for fully nonlinear degenerate elliptic equations</i> Coordinatore: Kevin Ray Payne
Avvio alla ricerca 2016 (Sapienza Università di Roma)	<i>Nonlinear problems with geometrical or physical motivations</i> Coordinatore: Francesca De Marchis
GNAMPA 2016	<i>Analysis and developments for fully nonlinear equations via the Maximum Principle</i> Coordinatore: Fabiana Leoni
GNAMPA 2015	<i>Viscosity solutions of degenerate elliptic equations arising in geometric problems</i> Principal Investigator: Antonio Vitolo
Fondi di Ateneo 2015 (University of Salerno)	<i>Nonlinear elliptic equations: methods and applications</i> Principal Investigator: Antonio Vitolo
Fondi di Ateneo 2013-2014 (University of Salerno)	<i>Nonlinear elliptic equations with degeneracy</i> Nonlinear elliptic equations: Antonio Vitolo
PRIN 2012	<i>Variational and perturbation aspects of nonlinear differential problems</i> Principal Investigator: Susanna Terracini

ORGANIZATIONS OF CONFERENCES, WORKSHOPS, SEMINARS

May 30 - June 3 '22	<i>Mostly maximum principle, IV edition</i> Palazzone di Cortona. Member of the organizing committee
Sep. 12 - 14, '18	<i>From Optimal Control to Maximum Principle - on the occasion of Italo Capuzzo Dolcetta's birthday</i> , Agropoli (SA). Member of the organizing committee
Oct. 1, '18 - .	<i>P(n)/N(p) : Problemi differenziali nonlineari/Nonlinear differential problems</i> University of Rome Sapienza. Member of the organizing committee

TALKS AT WORKSHOPS OR CONFERENCES

Jun. 2, '23	<i>Maximum principles and related problems for a class of nonlocal extremal operators</i> 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications Special Session 1: Analysis of PDEs and Free Boundary Problems (invited talk) Wilmington, NC USA
Jun. 1, '23	<i>Propagation of minima for nonlocal operators</i> 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications Special Session 71: At the Edge of Ellipticity (invited talk) Wilmington, NC USA
May 18, '23	<i>On the strong maximum principle for nonlocal degenerate operators</i> Variational and PDE problems in Geometric Analysis, IV Università di Bologna (su invito)
Apr. 21, '23	<i>The generalized principal eigenvalue for nonlinear degenerate integral operators</i> Differential equations and applications seminar Università degli Studi di Padova (invited talk)
Jan. 28, '23	<i>Fractional truncated Laplacians: fundamental solutions and applications</i> Waseda University (invited talk)

- Jul. 14, '22 *Fully nonlinear integral operators with high degeneracy*
Two nonlinear days in Urbino 2022
Università degli Studi di Urbino Carlo Bo **(invited talk)**
- May 3, '22 *Nonlocal truncated Laplacians: representation formulas and Liouville results*
CMM PDE Seminar
U. de Chile **(invited talk, online)**
- Mar. 2, '22 *On the Liouville property for a class of nonlocal degenerate elliptic operators*
Seminars on Mathematical Analysis
Università degli Studi di Salerno **(invited talk)**
- Jun. 21, '21 *The Dirichlet problem for fully nonlinear degenerate elliptic equations with a singular nonlinearity*
8th European Congress of Mathematics
Minisymposium: Topics in sub-elliptic and elliptic PDEs **(invited talk, online)**
- Jun. 21, '19 *Symmetry maximizes the principal eigenvalue: the case of the truncated Laplacian*
3 days on Evolution PDEs 2019, Agropoli (Italy) **(invited talk)**
- May 31, '19 *On the Lane-Emden equation with fully nonlinear degenerate operators*
Brescia-Trento Nonlinear Day - III edition
University Trento **(invited talk)**
- May 23, '19 *Towards the critical exponents for fully nonlinear degenerate Lane-Emden type equations*
Variational and PDE problems in Geometric Analysis, II edition
University of Bologna **(invited talk)**
- Jan. 9, '19 *Positive solutions of fully nonlinear degenerate Lane-Emden type equations*
Classical and new methods in Calculus of Variations and PDEs
University of Salerno **(invited talk)**
- Sep. 11, '18 *Soluzioni positive di equazioni ellittiche degeneri*
Seminario di Dipartimento, University of Rome Sapienza
- Jan. 16, '18 *A reversed Faber-Krahn type inequality for the truncated Laplacian*
2nd Italian-Chilean Workshop in PDE's, INDAM-Roma **(invited talk)**
- Jul. 28, '17 *Non existence results of positive solutions for a class of degenerate elliptic equations*
Waseda University **(invited talk)**
- Jul. 19, '17 *Liouville theorems for a family of very degenerate elliptic nonlinear operators*
Nonlinear PDE for Future Applications-Optimal Control and PDE
Tohoku University **(invited talk)**
- Jun. 12, '17 *A family of very degenerate elliptic nonlinear operators: principal eigenvalues, unusual phenomena and Liouville theorems*
Scuola Normale Superiore, Pisa **(invited talk)**
- May 24, '17 *Existence results for fully nonlinear elliptic equations with power nonlinearities*
International Conference on Elliptic and Parabolic Problems
Minisymposium 11, Gaeta (Italy) **(invited talk)**
- Apr. 4, '17 *A class of highly degenerate elliptic operators: maximum principle and unusual phenomena*
Mostly Maximum Principle, BIRS Canada **(invited talk)**
- Mar. 16, '17 *Maximum Principle results for a class of degenerate elliptic operators*
Topics in nonlinear analysis and applications, University of Milano-Bicocca **(invited talk)**
- Sep. 1, '16 *A family of degenerate elliptic operators: maximum principle and its consequences*
First Joint Meeting Brazil - Italy in Mathematics, IMPA Rio de Janeiro **(invited talk)**
- May 31, '16 *A junction condition by specified homogenization and application to traffic lights*
Hamilton-Jacobi Equations: new trends and applications, INSA Rennes **(invited talk)**
- Dec. 17, '15 *Il principio di massimo esteso per gli operatori ellittici degeneri di Pucci*
P(n)/N(p)-Nonlinear differential problems, University of Rome Sapienza **(invited talk)**
- Sep. 17, '15 *Removable singularities for some degenerate elliptic equations*
Mostly Maximum Principle, Agropoli (Italy) **(invited talk)**
- Set. 7, '15 *Il Principio di Massimo Esteso per equazioni ellittiche completamente non lineari*
XX Congresso U.M.I., Sezione 2: Equazioni alle derivate parziali, Siena
- Jul. 8, '14 *The extended maximum principle and removable singularities of fully nonlinear second-order elliptic operators*
10th AIMS Conference on Dynamical Systems, Differential Equations and Applications
Special Session 76: Viscosity, Nonlinearity and Maximum Principle, Madrid **(invited talk)**
- Giu. 13, '12 *Viscosity solutions of elliptic equations in \mathbb{R}^n : existence and uniqueness results*
GNAMPA School "Differential equations and dynamical systems", Latina
- Set. 1, '11 *Viscosity solutions of uniformly elliptic equations without boundary and growth conditions at infinity*, CIME "Hamilton-Jacobi equations: approximations, numerical analysis and applications", Cetraro (CS)

TEACHING ACTIVITY

A.Y. '22/'23

- *Mathematics III*, Department of Statistical Sciences, University of Rome Sapienza
- *Mathematical Institutions II*, Department of Chemistry, University of Rome Sapienza

A.Y. '21/'22

- *Mathematics III*, Department of Statistical Sciences, University of Rome Sapienza
- *Mathematical Institutions II*, Department of Chemistry, University of Rome Sapienza

A.Y. '20/'21

- *Mathematical Analysis*, Department of Physics, University of Rome Sapienza

A.Y. '19/'20

- *Mathematical Analysis*, Department of Physics, University of Rome Sapienza

A.Y. '18/'19

- *Mathematical Analysis*, Department of Physics, University of Rome Sapienza

A.Y. '17/'18

- Teaching assistant for the course *Mathematical Analysis I*, 20 hours, Department of Physics, University of Salerno (Prot. N. 247763 del 15/12/2017)

A.Y. '16/'17

- Teaching assistant for the course *Mathematical Analysis I*, 34 hours, Department of Physics, University of Salerno (Prot. N. 0107794 del 19/02/2016)

A.Y. '15/'16

- Teaching assistant for the course *Mathematical Analysis I*, 50 hours, Department of Physics, University of Salerno (Prot. N. 1858 del 12/01/2016, Rep. N. 47)
- Teaching assistant for the course *Mathematics*, 31 hours, Department of Natural Sciences, University of Salerno (Prot. 60378 del 15/10/2015)

A.Y. '14/'15

- *Mathematics II*, 30 hours, Department of Civil Engineering, University of Salerno (Prot. N. 28411 del 24/04/2015, Rep. N. 1310)

A.Y. '13/'14

- Teaching assistant for the course *Mathematics*, 40 hours, Department of Science and Technology, University of Sannio (Rep. N. 145, Reg. N. 1, Fgl. N. 9 del 03/03/2014)
- Teaching assistant for the course *Mathematical Analysis II*, 14 hours, Department of Mathematics, University of Salerno
- Teaching assistant for the course *Mathematical Analysis*, 15 hours, Department of Computer Science, University of Salerno

A.Y. '12/'13

- Teaching assistant for the course *Mathematical Analysis III*, 10 hours, Department of Mathematics, University of Salerno (Prot. N. 0001026 del 01/10/2012)

- Teaching assistant for the course *Mathematicas and Logic*, 20 hours, Department of Computer Science, University of Salerno (Contratto Prot. N. 0001260 del 27/11/2012)

A.Y. '11/'12

- Teaching assistant for the course *Mathematical Analysis I-II*, 24 hours, Department of Mathematics, University of Salerno (Prot. N. 0000024 del 04/01/2012)
- Teaching assistant for the course *Mathematics I*, 12 hours, Department of Natural Sciences, University of Salerno (Prot. N. 0000025 del 04/01/2012)
- Teaching assistant for the course *Mathematics II*, 12 hours, Department of Natural Sciences, University of Salerno (Prot. N. 0000026 del 04/01/2012)

A.Y. '10/'11

- Teaching assistant for the course *Mathematical Analysis*, 20 hours, Department of Computer Science, University of Salerno (Prot. N. 0001792 del 17/12/2010)
- Teaching assistant for the course *Mathematics I-II*, 20 hours, Department of Natural Sciences, University of Salerno (Prot. N. 0001837 del 23/12/2010)
- Teaching assistant for the course *Mathematics IV*, 15 hours, Department of Civil Engineering, University of Salerno

AFFILIATION

2012-. **GNAMPA** - sezione Equazioni Differenziali e Sistemi Dinamici

Il sottoscritto Galise Giulio dichiara, sotto la propria responsabilità ai sensi degli articoli 46 e 47 del DPR 445/2000, che quanto scritto nella presente relazione corrisponde a verità, consapevole che le dichiarazioni false e mendaci sono punite ai sensi degli artt. 483, 495, 496 del codice penale e delle leggi speciali in materia.

Roma, 1 dicembre 2023

Firma