BIRINDELLI Isabella
POSITION
Since March 2007 : Professore ordinario (Full professor) Università di Roma "La Sapienza"
1998-2007: Associate professor

Publications bibliometrics
according to Math Review Citation Database: 54 publications. Cited 576 times by 326 authors
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INVITED SPEAKER IN CONFERENCES THE LAST THREE YEARS
•2017 September, Workshop on Nonlinear Diff. Eq., Brasilia
•2017 September, 4th Conference on Recent Trends in Nonlinear Phenomena, Messina
•2017 July, Viscosity sol. approach to asymptotic problems in front propagation, dynamical sys. and related topics, RIMS, Kyoto
• 2017: March, Seminario Matematica e Fisico, Univ. di Milano
• 2017: January, James SERRIN: from His legacy to the new frontiers, Perugia
• 2016: September, A PDE day with Nirenberg, Haifa, Israel
• May 2016, 9th European Conference on Elliptic and Parabolic Problems, Gaeta
• April 2016, Recent Trends in Nonlinear Evolution Equations, CIRM, Marseille, France
• Febbraio 2016, Nonlinear PDE, Padova
• August 2015, Current trends in Analysis and PDE, IMPA, Rio de Janeiro, Brazil
• March 2015, Non linear PDE at the end of the world, Punta Arenas, Chile
• February 2015, Spectral theory and shape optimization problems for elliptic PDEs, Milano Bicocca

OTHER RECENT RESEARCH-RELATED ACTIVITIES

1-ORGANIZATION OF CONFERENCES:
From 2010, with A. Vitolo, F. Leoni and I. Capuzzo Dolcetta, I have created and organised a cycle of conferences , the idea being to gather a small but highly qualified group of researchers interested in the study of elliptic equations via the Maximum Principle. The conferences have proved to be a success and are becoming a reference in the field:
The first was "Positivity: a key to fully-nonlinear equations" in Vietri, May 2010. Followed by "Mostly maximum Principle" in Rome, September 2012 and "Mostly maximum Principle" in Agropoli, September 2015. The success of these conferences has lead us to apply for a bigger event, and it has taken place at the Banff International Research Station in April 2017 with over 40 participants.
-January 2017, with A. Pistoia and M. Musso, organization of the 2nd Italian-Chilean Workshop in PDE's

2-Member of the scientific panel of Gruppo Nazionale Analisi Matematica, Probabilità e Applicazioni, INDAM that evaluates the funding of Mathematical analysis and probability in Italy
3-Member of the Panel for the funding of Mathematical research in Portugal for FCT, 2012 and 2013.
4- Invited professor in many important universities among others: Cergy-Pontoise, Paris X, University of Chile, Stanford University, Rutgers University, U. C. Berkeley
5- Member of the editorial Board of DCDS- series A.

6- Referee for many journals including "Inventiones Matematicae", "Journal IHP", "Analyse non

linéaire", "Communication in Partial Differential Equations", "Journal of European Mathematical Society", " Proceedings of the Royal Society of Edinburgh", "Pacific Journal", "Annali di Pisa", "Non Linear Differential equations and applications", "Nonlinearity"

7-PI of many research grants from Sapienza University, CNR and GNAMPA

EDUCATION
1993 Ph.D. in Mathematics, Courant Institute of Mathematical Sciences, N.Y.U.
Thesis: Second order elliptic equations in general domains: Hopf's lemma and Anti maximum principle . Advisor: Louis Nirenberg.
1988 Laureata con lode, Sapienza, relatore: Prof. U. Mosco

RESEARCH FIELD
Fully non linear elliptic PDE, spectral properties, maximum principle, regularity. Elliptic, degenerate elliptic and systems of pPDE, with pattention to qualitative properties, regularity, existence and non-existence theorems in the semi-linear, quasi-linear and linear cases.

SOME OF THE MAIN RESULTS OBTAINED
I -Fully nonlinear equations

I.1 Truncated laplacian. Recently I have started an investigation concerning a class of fully nonlinear degenerate elliptic operators so called "truncated laplacian", precisely, the operators P_k^+ (D^2u) indicate the some of the k largest eigenvalues of the Hessian matrix D^2u and P_k^- (D^2u)indicate the some of the k smallest eigenvalues of the Hessian matrix D^2u. Many unusual and interesting phenomena occurs concerning the validity of the Maximum principle, the regularity of solutions, the existence of solutions.

For a class of fully nonlinear operators which are either degenerate or singular when the gradient is null:
I.2 Spectral properties when the equation is homogenous in the Hessian, the gradient and the function itself
 -Existence of principal eigenvalues also called demi-eigenvalues
The existence is done through the maximum principle and the definition of principal eigenvalue à la Berestycki Nirenberg Varadhan in different contests Dirichlet problem [B.D.], unbounded domains [B.D.], Neuman problem [B.P.]
-Simplicity of the principal eigenvalues [B.D.]
-Evaluation of the eigenvalue and the eigenfunction: in special domains with explicit computations [B.L.] and through numerical schemes with a pointwise sup inf characterisation of the eigenvalue [B.C.CD.]
-Qualitative properties of eigenfunctions corresponding to higher eigenvalues.[B.L.P.]
-In the linear case, we prove that above the principal eigenvalue the anti-maximum principle holds [B]
I.3 Regularity of solutions.
-Harnack's inequality [B.D.]
- Holder regularity of the gradient of the solutions local and global [B.D.]. The proof uses an improvement of flatness lemma and known regularity results.
-Global Holder regularity of the solution for singular unbounded domains through ABP estimates [B.CD.V]
I. 4 Qualitative properties.
-Characterization of domains with overdetermined non trivial solutions of equations involving the Pucci operators [B.D]
-Connection between symmetry and other qualitative properties of the solutions and the sign of

some principal eigenvalue of the operator [B.L.P.]
-Liouville type results for semi/fully nonlinear equations [B.D.]
II Elliptic non linear PDE in other geometries:
II.1 The Heisenberg group and other Carnot groups
-Liouville type results [B.CD.C.]
-qualitative properties via the moving planes method [B.P.]
-Allen Cahn equations , stable solutions, monotone solutions. Classifications of symmetric solutions
[B.P., B.L.]. Geometric features of the stable solutions and some non existence results [B.F.V.]
II.2 Hyperbolic space
-Study the symmetry of solutions with respect to their behaviour at infinity in the hyperbolic state.
[BM]

Pubblications

-preprints with G. Galise, F. Leoni, F. Pacella arXiv1802.03218, with F. Demengel, F. Leoni arXiv
1712.02671

2. with G. Galise, F. Leoni, Nonlinear Analysis (2017).
3. with G. Galise, H. Ishii, A family of degenerate elliptic operators: maximum principle and its
consequences, to appear in Ann. I.H.P.
4. with F. Leoni, F. Pacella on Jour. de Math. Pures et Appl. (2017).
5. with F. Camilli, I. Capuzzo Dolcetta, Communications in Mathematical Sciences ,1 (2017).
6. with F. Demengel ,Journal of Elliptic and Parabolic Equations, (2016).
7. with F. Demengel NoDEA(2016)
8. with I. Capuzzo Dolcetta, A. Vitolo, Communications in Contemporary Mathematics (2016).
9. with F. Leoni, Mathematical Research Letters (2014).
10. with F. Demengel, COCV (2014)
11. with F. Demengel , Comm. Partial Differential Equations 38 (2013), no. 4, 608-628.
12. with F. Demengel , Nonlinear Anal. 75 (2012), no. 17, 6237-6249.
13. with R. Cedrone, Modern geometry versus modern architecture. Imagine math,Springer, 2012
14. with E. Valdinoci, Discrete Contin. Dyn. Syst. 29 (2011), no. 3, 823-838.
15. with F. Demengel, Symmetry for elliptic PDEs, 115, Contemp. Math., 528, Amer. Math. Soc.,
Providence, RI, 2010
16. with S. Patrizi, Discrete and Continous Dynamical Systems, volume speciale (2010) special
volume for L. Nirenberg.
17. with F. Demengel , Nonlinear Diff. Equations. and Appl. (2010)
18. with F. Demengel, Journal of Differential Equations (2010)
19. with F. Demengel , Zeitschrift fur Analysis und Ihre Anwendungen, vol. 29, (2010)
20. with F. Ferrari, E. Valdinoci Nonlinear Analysis vol. 72 (2010)
21. with F. Demengel , Journal of mathematical Analysis and its applications, vol. 352 (2009)
22. with R. Mazzeo, Indiana University Mathematical Journal, vol 58 (2009).
23. with E. Valdinoci Communications in Contemporary Mathematics (2009).
24. with F. Demengel, Discrete Contin. Dyn. Syst. 2007, Dynamical Systems and Differential
Equations. Proceedings of the 6th AIMS International Conference, suppl.,
25. with B. Stroffolini, Lect. Notes Semin. Interdiscip. Mat., 6, Semin. Interdiscip. Mat. (S.I.M.),
Potenza, 2007.
26. with F. Demengel, Commun. Pure Appl. Anal. 6 (2007)
27. with F. Demengel, Adv. Differential Equations 11 (2006)
28. with F. Demengel, Annales de Toulouses (2004)
29. with J. Wigniolle, Comm. in Pure and Applied Analysis (2003)
30. with F. Demengel, Calculus of Variation (2004)
31. with F. Demengel , C. R. Math. Acad. Sci. Paris 336 (2003)
32. with E. Lanconelli Calculus of Variation.(2005)

33. with F. Demengel, Calculus of Variation (2004).

34. with F. Demengel, Proceedings of the 2001 Luminy Conference on Quasilinear Elliptic and Parabolic Equations and System, 35–46 (electronic), Electron. J. Differ. Equ. Conf., 8.

35. with F. Demengel, Differential and Integral Equations 15 (2002), no. 7, 823–837.

36. with E. Lanconelli, Atti Accad. Naz. Lincei Cl. Sci. Fis. Mat. Natur. Rend. Lincei (9) Mat. Appl. 13 (2002), no. 1, 17–22.

31. NoDEA Nonlinear Differential Equations Appl. 10 (2003), no. 2, 171–185.

37. with J. Prajapat Annali della Scuola Normale Superiore di Pisa, (2001)

38. with E. Lanconelli, to appear Rendiconti Accademia Nazionale Lincei.

39. with J. Prajapat, Pacific Jour- nal. Pacific J. Math. 204 (2002), no. 1, 1–17

40. with J. Giacomoni, Topological Methods in Nonlinear Analysis (2000)

41. with I. Capuzzo Dolcetta, Contributions in honor of the memory of Ennio De Giorgi (Italian). Ricerche Mat. 49 (2000), suppl., 1–15.

42. with J. Prajapat, Comm. Partial Differential Equations (1999)

43. with S. Finzi Vita, No DEA(1998).

44. with E. Mitidieri e G. Sweers, Differential Equations-Differentil'nye Uravnenija (1998)

45. with E. Mitidieri, Proceedings of the Royal Society of Edinburgh, vol 128A (1998)

45. with I. Capuzzo Dolcetta e A. Cutrì, Communications in Partial Differential Equations, 23, (1998).

46. Proceedings of the Meeting Reaction Diffusion Systems, Lecture Notes in Pure and Applied Mathematics, Marcel Dekker Inc.(1997)

47. with I. Capuzzo Dolcetta and A. Cutrì, Annales de l'Institut Henri Poincaré-Analyse non linéaire,vol 14, 3 (1997).

48. Nonlinear Analysis Vol 27 (1996).

49. with A. Cutrì, Rendiconti del Seminario dell'Universit`a di Padova Vol. , (1996).

50. Journal of Differential Equations, Vol. 119, (1995).

51. with M.A. Vivaldi, Rendiconti di Matematica, Serie VII Vol. 14 , (1994).

52. Ph.D. thesis at the Courant Institute: Second order elliptic equations in general domains:Hopf's lemma and Anti maximum principle (1992)

53. Integral and differential equations, Vol 8, (1992).