

## CURRICULUM VITAE: GABRIELLA TARANTELLA

### Education:

Nov. 1978-Apr. 1982: Undergraduate studies at: University of l'Aquila, Italy, (BS Degree in Mathematics)

Sept. 1982- June 1986: Graduate studies at Courant Institute of Mathematical Sciences, New York University, N.Y. USA.

May 1984: Master of Art and Sciences in Mathematics, Courant Institute of Mathematical Sciences, New York University, N.Y. USA.

June 1986: Ph.D. (Philosophy Doctor) in Mathematics, Courant Inst. of Mathematical Sciences, New York University, N.Y. USA.

June 1986-July 1987: Visiting Member, The Institute for Advanced Study, Princeton, N.J. U.S.A.

Aug. 1987-July 1989: Visiting Assistant Professor, University of California, Berkeley, CA, U.S.A.

Aug.1989-Dec. 1992: Assistant Professor, Carnegie Mellon University, Dept. of Mathematics, Pittsburgh, PA, U.S.A.

January 1993-Oct. 1994: Associate Professor, Università di Roma 'Tor Vergata', Rome, Italy.

November 1994-Oct. 1995: Full Professor, Università della Basilicata, Potenza, Italy.

November 1995 - present: Full Professor, Università di Roma 'Tor Vergata', Rome, Italy.

Field of Research: Nonlinear Partial Differential Equations, Differential Geometry, Mathematical Physics Calculus of Variations and Gauge Field Theory.

### Visiting positions:

- Forschungsinstitute für Mathematik, E.T.H. -Zurich, Switzerland
- Université Catholique de Louvain-la-Nauve, Belgium
- Tata Institute of Fundamental Research, Bangalore, India
- Field Institute of Mathematical Sciences, Toronto Canada
- Mc Master University, Hamilton, Canada
- Max Planck Institute, Liepzig, Germany

- Max Planck Institute, Bonn, Germany
- The Chinese University of Hong-Kong,
- Peking University and the Academia Sinica, Peking China
- Honhzhou University, China;
- University of Mainz, Germany;
- Isaac Newton Institute Cambridge, UK;
- Pacific Institute for Fundamental Research Vancouver, Canada
- Courant Institute, New York University, N.Y. USA
- Seoul National University, Korea
- Rutgers University Dept. of Math. New Bronswick USA
- Bernoulli Center Lausanne Switzerland,  
CRM Universite' de Montreal, Montreal Canada
- Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Canada.
- Universite' de Paris IV, Paris France
- Universite' de Paris Dauphine CEREMADE, Paris France
- Universite' de Cergy, Paris France
- SISSA, Trieste, Italy
- Centro Ennio de Giorgi, Pisa Italy.
- Taida Institute of Mathematical Sciences (TIMS), National Taiwan University in Taipei-TAIWAN.
- CUNY, New-York, USA.
- University of Minnesota, Minneapolis USA
- NYU-Polytecnic Brooklyn, USA.
- UNIVERSITY OF NOTRE DAME, South Band Indiana USA

SYMPOSIA and CONFERENCES (2004 - present):

- Speaker at the conference: Variational Methods and the Nonlinear Schrödinger Equation, Feb. 9-13 2004, Bernoulli Center Lausanne Switzerland.
- Speaker at the International Conference on elliptic and Parabolic Problems, Recent Advances, Feb. 16-20, 2004 National Center for Theoretical Sciences, Hsinchu, Taiwan.
- Speaker at the Analysis Seminar SISSA April 2004, Trieste, Italy.
- Speaker at the Differential Equations Seminar, University of Granada May 2004, Granada, Spain.

- Organizer of the International Symposium on Variational methods and Nonlinear differential Equations, Jan. 10-14, 2005 Rome Italy.
- Speaker at the Workshop on Variational Methods in Nonlinear Analysis, April 14-22 2005, Erice Italy.
- Speaker at the Topological and Variational Methods in Partial Differential Equations, December 5-9 2005, Guanajuato Mexico.
- Speaker at the TMS and AMS joint international meeting December 14-19 2005, Tunghai University, Taiwan.
- Speaker at the Workshop on Singularities in PDE and the Calculus of Variations, July 17-21 2006, Montreal Canada.
- Speaker at the Workshop Nonlinear Differential Equations, September 11-15 2006, Como Italy.
- Speaker at the Workshop: Recent Advances in Hyperbolic Systems, Nov. 23-25 2006, Bertinoro, Italy.
- Speaker at the Workshop: Some Topics in Nonlinear Analysis and Applications to PDE, Jan.29-Feb. 1 2007, Rome Italy.
- Speaker at the CIME Summer School Geometric Analysis and PDE, June 11-16, 2007 Cetraro Italy
- Speaker at the VII Americas School in Differential Equations and Nonlinear Analysis July 23-27, 2007, Cartagena, Columbia.
- Organizer of the workshop s: Loss of compactness in nonlinear PDE: Recent trends, August 26 -31, 2007, held at Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Canada.
- Speaker at the PDE seminar in the Department of Mathematics of Rutgers University, September 4th 2008, New Brunswick, USA.
- Speaker at the Workshop: Variational Methods for Nonlinear PDE and their Applications Technion Haifa, (Israel) March 5-10, 2008.
- Speaker at the Special Session on : Isoperimetric Problems and PDE. AMS Eastern Sectional meeting, March 15-16, 2008 held at the Courant Institute in New York.
- Speaker at the Workshop: Variational and Topological Methods in Nonlinear Phenomena, Otranto, Italy May 1-5, 2008.

- Invited at the meeting: Calculus of Variation, Mathematisches Forschungsinstitut Oberwolfach, Germany; July 6-12, 2008.
- Speaker at the meeting: Lack of compactness in nonlinear problems : prospects and applications, CIRM-Luminy, Maseille France October 5-9, 2009.
- Speaker at the meeting: VIII Americas Conferente opn Differential Equations, Veracruz-Mexico Oct. 18-23, 2009.
- Speaker: Optimal Constants in the Theory of Sobolev Spaces and PDEs Mathematisches Forschungsinstitut Oberwolfach, Germany; Feb. 7-12, 2010.
- Organizer: Differential and topological problems in modern theoretical physics, SISSA Trieste Italy, April 26-30, 2010.
- Speakers: Women of Laplacian, Monopoli Italy, June 3rd-6th, 2010.
- Speaker: Variational and Topological Methods in Nonlinear Phenomena , Cortona (Italy) Sept. 20- 23, 2010.
  
- Speaker: Nonlinear Differential Equations, Verbania (Italy), Sept. 26-Oct. 1<sup>st</sup>, 2010.
  
- Organizer: Nonlinear phenomena: a view from Mathematics and Physics TIMS-National Taiwan University Taipei (Taiwan) January 10<sup>th</sup> -14<sup>th</sup> , 2011 .
  
- Speaker: Geometric and Nonlinear Analysis: meeting in Lorraine, Nancy (France), June 12-17, 2011.
- Speaker: A conferente in Honor of the 60th birthday of Chang-Shoy Lin, National Taiwan University Taipei, July 8-9, 2011.
- Speaker: International Conferente on Nonlinear Partial Differential Equations, He-fei (China) August 1-6, 2011.
- Speaker: Nonlinear PDE Days – Variatio Delectat Koln (Germany) October 4-5, 2011.
- Seminar Department of Mathematics, Granata-Spain March 27th, 2012.
- Speaker: "Fifteenth Riviere-Fabes Symposium on Analysis and PDE", Minneapolis Minnesota (USA) April 20-22, 2012.
- Speaker: 12th International Congress Mathematical Physics (section: PDE and Relativity) Aalborg, (Denmark) 6-11 August 2012.
- Speaker: Workshop Nonlinear Differential Equations, Joao Pessoa Brazil 17- 22 August 2012.

- Plenary speaker: Problèmes de limites singulières pour les équations non linéaires aux dérivées partielles, CIRM-Luminy, Marseille France November 26-30, 2012.
- Speaker: Analytical aspects of Chern-Simons theory, CUNY New York, March 14<sup>th</sup>, 2013.
- Partecipant as Member of Scientific Committee at the meeting: ANALYSIS AND PARTIAL DIFFERENTIAL EQUATIONS, a Conference in Honour of the 60th Birthday of Nassif Ghoussoub. PACIFIC INSTITUTE FOR THE MATHEMATICAL SCIENCES, UBC-Vancouver Canada, July 7th-12th, 2013.
- Speaker: PARTIAL DIFFERENTIAL EQUATIONS, Mathematisches Forschungsinstitut Oberwolfach (MFO), Germany, August 4th-10th, 2013.
- Speaker: Conference on Qualitative and Geometric aspects of elliptic PDE's. CRM Barcelona Spain, September 2nd-6th, 2013.
- Speaker: Variational Methods in Elliptic Equations and Systems, Lisbon Portugal 7th-10th January 2014.
- Seminar: Mathematisches Institut, Universität Basel, Switzerland 20/5/2014.
- Speaker: THEMATIC PROGRAM ON NONLINEAR PDES IN GEOMETRY AND PHYSIC Graduate Student and Postdoc Mini-Course, Center for Mathematics at Notre Dame University of Notre Dame, South Bend Indiana USA June 9 – June 13, 2014.
- Speaker Nonlinear PDEs in Geometry and Physics, Center for Mathematics at Notre Dame University of Notre Dame, South Bend Indiana USA June 16 – June 20, 2014.
- Plenary Speaker International Congress of Women Mathematicians Seoul Korea, August 12-14<sup>th</sup>, 2014.
- Speaker Conference Méthodes géométriques et variationnelles pour des EDPs non-linéaires, Lyon France September 1st -5th, 2014.
- Speaker Congreso de la RSME 2015 Section: Nonlinear Analysis and Elliptic PDEs Granada (Spain) 02 - 06 Febbraio, 2015.
- Speaker Conference Flowers and Friends, Frankfurt (Germany), March 2-5, 2015.
- Speaker: RISM School on Nonlinear Phenomena in Mathematics and Economics, September 14-18, 2015, Varese Italy.

-Invited Participant: Fifth Abel Conference: Celebrating the Mathematical Impact of John F. Nash Jr. and Louis Nirenberg, November 02-04, 2015, Minneapolis, USA.

- Lecturer at Winter School: [HYPERLINK](http://www.math.uzh.ch/pde16/)

"<http://www.math.uzh.ch/pde16/>"[Nonlinear Partial Differential Equations and Geometric Analysis](http://www.math.uzh.ch/pde16/), 11-5 Jan. 2016, Centro S. Franscini Ascona Switzerland.

- Speaker: Achievements and Perspectives in Nonlinear Analysis. A tribute to Donato Fortunato June 14-17, 2016 Bari Italy.

- Lecturer EWM-EMS Summer School: Geometrical and Physical Aspects of Moser-Trudinger Inequalities, Institute Mittag-Leffler, June 26-July 1, 2016.

- Speaker 3rd Conference on Recent Trends in Nonlinear Phenomena, September 28-30, 2016 Perugia, Italy.

- Co-Organizer of the meeting: Nonlinear Partial Differential

Equations and Mathematical Physics Workshop at Tsinghua Sanya International Mathematics Forum (TSIMF), December 5-9, 2016 Sanya, China.

-Speaker: International Conference on Elliptic and Parabolic Problems, May 22-27, 2017 Gaeta Italy.

-Speaker: Nonlinear Analysis in Rome at the University of Notre Dame Gateway, June 26-30, 2017 Rome, Italy.

-Speaker: Two nonlinear days in Urbino 2017, July 6-7, 2017 Urbino, Italy.

-Speaker: 4th Conference on Recent Trends in Nonlinear Phenomena, September 18-20, 2017, Messina, Italy.

Forthcoming:

-Speaker: Analysis and Dynamics: Conference in occasion of Luigi Chierchia 60's Birthday, 12-15 October 2017, Marina di San Gregorio, Lecce , Italy.

-Organizer : Workshop Physical, Geometrical and Analytical Aspects of Mean Field Systems of Liouville Type, April 1-5th Banff Station Canada.

## PH.D Students:

Roselli Paolo, Ricciardi Tonia, Bartolucci Daniele, Esposito Pierpaolo, Carosi Massimiliano, Roberto Fortini.

## List of Publications:

1. Tarantello G., Some result on the minimal period problem for nonlinear vibrating Strings and Hamiltonian systems: and on the number of solutions for semilinear elliptic equations. Ph.D. Thesis. Courant Institute of Mathematical Sciences (1986).
2. Cafagna V., Tarantello G., Multiple solutions for semilinear elliptic Equations, *Math. Ann.* 276 (1987). 643-656.
3. Tarantello G., Solutions with prescribed minimal period for non linear vibrating strings. *Comm. P.D.E.* n. 9 12 (1987), 1071-1094.
4. Michalek R., Tarantello G., Subharmonic solutions with prescribed minimal period for nonautonomous Hamiltonian systems. *J. Diff.Equ.* 72 (1988). 28-55.
5. Michalek R., Tarantello G., Subharmonics with prescribed minimal period for Hamiltonian systems. *Proc. Inter. Conf. (1986), Recent Advances in Hamiltonian Systems.* Dell'Antonio-D'Onofrio. L'Aquila, 205-211.
6. Tarantello G., Subharmonics for Hamiltonian systems via a Zp-pseudoindeix theory. *Ann. Sc. Normale Pisa Sc.Fis. Mat.* XV fasc. III (1988), 357-409.
7. Leon J.F., Tarantello G., Breaking of symmetry for a minimization problem. *Nonlinear Analysis T.M.A.* n. 13 (1989) 579-587.
8. Tarantello G., On the number of solutions for the forced Pendulum Equations. *J. Diff. Eqq* n.1 80 (1989), 79-93.
9. Tarantello G., Remarks on forced equations of the double pendulum-type. *Trans. A.M.S.* n.1 326 (1991) 441-452.
10. Tarantello G., Multiple forced oscillations for the N-pendulum equation. *Comm. Math. Physics* n.3 132 (1990) 499-517.
11. Tarantello G., Solution d'equations elliptiques avec exposant critique qui changent de signe. *C. R. Acad. Sci. Paris series I* n.7 (1991) 441-445.
12. Tarantello G. Nodal solutions of semilinear elliptic equations with

- critical exponent. *Differential and Integral Equations*, n.1 5 (1992) 25-42.
13. Tarantello G., A note on a semilinear elliptic equation. *Differential and Integral Equations* n.3 5 (1992) 561-565.
14. Tarantello G. On nonhomogeneous elliptic equations involving critical exponent, *Ann. I.H.P. Analyse Nonlineaire* n.3 9 (1992) 281-304.
15. Comte M., Tarantello G., A Neumann problem with critical exponent. *Houston J. Math.* N.2 18 (1992) 279-294.
16. Alama S., Tarantello G., On semilinear elliptic equations with indefinite nonlinearities. *Calc. of Var. and P.D.E.* n.4 1 (1993) 439-475.
17. Tarantello G., Multiplicity results for an inhomogeneous Neumann problem with critical exponent, *Manuscripta Mathematica* 81 (1993) 57-58.
18. Tarantello G., Morse index versus concentrations for elliptic problems with Sobolev exponent. *Comm. P.D.E.* 19 (1994) 1165-1169.
19. Alama S., Tarantello G., Some remarks on  $C^1$  versus  $H^1$  minimizers, *C.R. Acad.Sci. Paris t.319 SÈrie 1* (1994) 1165-1169.
20. Alama S., Tarantello G., On the solvability of a semilinear elliptic equation via an associated eigenvalue problem. *Math Zeit.* Vol 221, (1996) 467-493.
21. Alama S., Tarantello G., Elliptic problems with nonlinearities indefinite in sign. *J. Funct. Anal.* 141 n. 1 (1996) 159-215.
22. Tarantello G., Multiple condensate solutions for the Chern-Simons-Higgs theory. *J. Math. Phys.* 37 n.8 (1996) 3769-3796.
23. Tarantello G., Vortex Condensations for a non relativistic Maxwell-Chern-Simons Theory, *J. Diff. Eqs.* N.141 (1997) 295-309.
24. Struwe M., Tarantello G., On multivortex solutions in the Chern-Simons gauge Theory. *Boll. U.M.I. nuova serie* (8) 1-B (1998) 109-121.
25. Badiale M., Tarantello G., Existence and Multiplicity results for elliptic problems with critical growth and discontinuous nonlinearities, *Nonlinear Analysis T.M.A.*, vol. 29 (1997) 639-667.
26. Ricciardi T., Tarantello G., On a periodic boundary value problem with exponential nonlinearities. *Differential and Integral Equations* 11 (5) (1998) 745-753.
27. Nolasco M., Tarantello G., On a sharp Sobolev type inequality on two dimensional compact manifolds, *Arch. Rational Mech.*, 145 (1998) 161-195.
28. Nolasco M., G. Tarantello, Double vortex-condensates in the



- Chern-Simons-Higgs theory, *Calc. Var. PDE* 9 (1999) 31-94.
29. Ricciardi T., G. Tarantello, Selfdual vortices in the Maxwell-Chern-Simons-Higgs theory, *Comm. Pure Appl. Math.* 53 (2000) 811-841.
30. Nolasco M., G. Tarantello, Vortex Condensates for the SU(3) Chern-Simons theory. *Comm. Math. Physics* 213 (2000) 599-639.
31. Prajapat J., G. Tarantello, On a class of elliptic problems in  $\mathbb{R}^2$ : symmetry and uniqueness results, *Proc. Royal Soc. Edinburgh* 131A, (2001) 967-985.
32. G. Tarantello, On Chern-Simons Theory, *Nonlinear PDE's in Condensed Matter and Reactive Flows* (2002) 507-526; H. Berysticki and Y. Pomeau (eds) Kluwer Academic Publisher, Netherlands.
33. M. Badiale, G. Tarantello, A Sobolev-Hardy inequality with applications to a nonlinear elliptic equation arising in astrophysics. *Archive Rational Mech. Anal.* 163 (2002), no. 4, 259-293.
34. D. Bartolucci, G. Tarantello, Liouville type equations with singular data and their applications to periodic multivortices for the Electroweak theory. *Comm. Math. Physics* 229 (2002), 3-47.
35. D. Bartolucci, G. Tarantello, The Liouville equation with singular data: a concentration -compactness principle. *J. Diff. Eq.* 185 (2002), 161-180.
36. D. Chae, G. Tarantello, On planar selfdual Electroweak vortices. *Annales I.H.P. Analyse NonLineaire* 21 (2004) 187-207.
37. D. Bartolucci, C.C. Chen, C.S. Lin, G. Tarantello, Profile of blow-up solutions to mean field equations with singular data. *Comm. PDE* 29 n. 7-8 (2004), 1241-1265.
38. G. Tarantello, Analytical aspects of Liouville-type equations with singular sources, In *HANDBOOK OF DIFFERENTIAL EQUATIONS*, Volume 1, M. Chipot, and P. Quittner (eds) Elsevier publ. (2004), 491-592.
39. G. Tarantello, Selfdual Maxwell-Chern-Simons vortices, *Milan Journal Math.* 72 (2004), 29-80.
40. G. Tarantello, An Harnack inequality for Liouville-type equations. *Indiana Univ. Math J.* vol. 54 n.2 (2005), 599-615.
41. G. Tarantello, A quantization property for blow-up solutions of singular Liouville-type equations. *J. Func. Anal.* 219 (2005), 368-399.
42. D. Chae, G. Tarantello, Selfgravitating Electroweak Strings. *J. Diff Eq.* 213 (2005), 146-170.

43. G. Tarantello, Uniqueness of selfdual periodic Chern-Simons vortices of topological type, *Calc. of Var. and PDE* 29 (2007), 191-217.
44. G. Tarantello, *Selfdual Gauge Field Vortices: an analytical approach*. PNLDE 72, Birkhauser Boston, Inc. Boston MA 2008.
45. J. Dalbeault, M.J. Esteban, G. Tarantello: The role of Onofri type inequalities in the symmetry properties of extremals for the Caffarelli-Kohn-Nirenberg inequality in two space dimensions. *Ann. Sc. Normale Pisa* 5 vol. VII(2008), 313-341.
46. G. Tarantello On some elliptic problems in the study of selfdual Chern-Simons vortices, in *Geometric Analysis and PDE CIME-lectures*, Cetraro June 10-16, 2007; Springer Lecture Notes in Mathematics Ed. A. Ambrosetti, S.Y. Chang, A. Malchiodi 1977 (2009).
47. J. Dalbeault, M.J. Esteban, G. Tarantello: Multiplicity results for the assigned Gauss curvature problem in  $\mathbb{R}^2$ , *Non-linear Analysis* 70 (2009), 2870-2881.
48. J. Dalbeault, M.J. Esteban, M. Loss, G. Tarantello: On the symmetry of extremals for the Caffarelli-Kohn-Nirenberg inequalities, *Advances Nonlinear Studies* 9 n.4 (2009), 713-726.
49. G. Tarantello "Analytical, Geometrical and Topological aspects of mean field equations on surfaces", issue dedicated to Professor Louis Nirenberg on the occasion of his 85th birthday" part II, *Discr. Cont. Dyn. Syst. A* 28 n. 3, ( 2010), 931-973.
50. J. Dolbeault, M. Esteban, A. Tertikas, G. Tarantello "Radial symmetry and symmetry breaking for some interpolation inequalities " *Calculus of Variations and Partial Differential Equations* 42 (2011), 461-485.
51. D. Bartolucci, C.S. Lin, G. Tarantello, A Uniqueness result for a singular mean field equation on the sphere via blow-up. *Comm. Pure Appl. Math.*, 64 (2011), 1677-1730.
52. G. Tarantello Nonabelian vortices: existence, uniqueness and asymptotics, *Milan J. Math.* 79 (2011) 343-356.
53. A. Poliakovsky, G. Tarantello, On a planar Liouville-type problem in the study of self-gravitating strings, *JDE* 252 (2012) 3668-3693.
54. C.S. Lin, G. Tarantello, Y. Yang Solutions to the master Equations governing fractional vortices, *JDE* vol. 252 n.3 (2013) 1437-1463.

55. X. Han, G. Tarantello, Doubly periodic self-dual vortices for a relativistic non-abelian Chern-Simons model, *Calc. Var. PDE* vol. 39 n.3-4 (2014) p. 1149-1176.
56. R. Fortini, G. Tarantello The role of Liouville type systems in the study of non-topological Chern-Simons vortices. *Proceedings XVII-ICMP 12, Aalborg Denmark 6-11 August 2012*, A. Jensen ed. World Scientific (2014) 383-390.
57. A. Poliakovsky, G. Tarantello, On Singular Liouville Systems, *Analysis and Topology in Nonlinear Differential Equations*, Birkhauser series PNLDE, 85 (2014) p. 353-385.
58. X. Han, C.S. Lin, G. Tarantello, Y. Yang, Chern-Simons vortices in the Gudnason model, *J. Funct. Anal.* 267 (2014) p. 678-726.
59. G. Tarantello, Blow-up analysis for a Cosmic String Equation, *J. Func. Anal.* vol. 272, n.1, pp. 255-338 (2017).
60. A. Poliakovsky, G. Tarantello, On Non-Topological Solutions for Planar Liouville Systems of Toda-Type, *Comm. Math. Physics* vol. 347 n.1 (2016) 223- 270.
61. C. S. Lin, G. Tarantello, When “blow-up” does not imply “concentration”: A detour from Brézis–Merle’s result, *C. R. Acad. Sci. Paris, Ser. I* 354 (2016) 493–498.
62. X. Han, G. Tarantello, Non-topological Vortex Configurations in the ABJM Model, *Comm. Math. Phy.* vol. 352, n.1, pp. 345-385 (2017).
63. D. Bartolucci, G. Tarantello, Asymptotic Blow-up Analysis for Singular Liouville type Equations with Applications, *J. Diff. Eq. J. Diff. Eq.*, vol. 262, n.7, pp. 3887-3931 (2017).
64. G. Tarantello Analytical Issues in the Construction of Self-dual Chern–Simons Vortices, *Milan J. Math.* Vol. 84, n. 2, (2016) 269-298.
65. Y. Lee, C.S. Lin, G. Tarantello, W. Yang, Sharp estimates for solutions of mean field equations with collapsing singularities, (2017) *COMM. PDE* to appear.