Piermarco Cannarsa — Curriculum Vitae

Contact Information

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Academic Appointments

Professore Ordinario (Full Professor) November 1990 to present
Department of Mathematics, University of Rome "Tor Vergata" (Italy)

Professore Associato (Associate Professor) November 1987 to October 1990
Department of Mathematics, University of Pisa (Italy)

Ricercatore Universitario (Researcher) November 1986 to October 1987
Department of Mathematics, University of Rome "Tor Vergata" (Italy)

Assistente di Ruolo (Assistant Professor) November 1982 to October 1986
Naval Academy, Livorno (Italy)

Degrees

University of Pisa, Pisa (Italy)

Laurea in Mathematics (1979)

- Thesis Topic: *Interior regularity for solutions of nonlinear elliptic systems*
- Advisor: Professor Sergio Campanato

Scuola Normale Superiore, Pisa (Italy)

Diploma di Licenza in Mathematics (1979)

Research Interests (last 10 years)

1. Regularity of solutions to **Hamilton-Jacobi equations**.
2. Irreversibility in Hamilton-Jacobi dynamics: propagation of **singularities** and **compactness** estimates.
3. Sensitivity analysis and necessary conditions in **optimal control**.
4. Analysis and control of **degenerate parabolic equations**.
5. **Stabilization** of evolution equations.
6. Domain invariance for **diffusion** processes.

Bibliometry (MathSciNet)

Citations 1470
H index 20

Publications (MathSciNet)

Synthetic view

Journal Articles 114

Proceedings 29

Books 2

including *Semiconcave functions, Hamilton-Jacobi equations, and optimal control* (with C. Sinestrari), Birkhäuser, Boston, 2004

Edited Volumes 3

including the CIME lecture notes *Control of partial differential equations* (with J.-M. Coron), Lecture Notes in Mathematics 2048, Springer, Berlin, 2012

Selected Publications

[1] F. ANCONA, P. CANNARSA & K.T. NGUYEN, Quantitative compactness estimates for Hamilton-Jacobi equations, *Arch. Rational Mech. Anal.* (2015), DOI 10.1007/s00205-015-0907-5.

[2] P. CANNARSA, W. CHENG & Q. ZHANG, Propagation of singularities for weak KAM solutions and barrier functions, *Comm. Math. Phys.* 331 (2014), no. 1, 1-20.

[3] K. BEAUCHARD, P. CANNARSA & R. GUGLIELMI, Null controllability of Grushin-type operators in dimension two, *J. Eur. Math. Soc.* 16 (2014), No. 1, 67-101.

[4] P. CANNARSA & P. CARDALIAGUET, Hölder estimates in space-time for viscosity solutions of Hamilton-Jacobi equations, *Comm. Pure Appl. Math.* 63 (2010), 590-629.

[5] P. CANNARSA, G. DA PRATO & H. FRANKOWSKA, Invariant measures associated to degenerate elliptic operators, *Indiana Univ. Math. J.* 59 (2010), 53-78.

[6] P. CANNARSA & Y. YU, Singular dynamics for semiconcave functions, *J. Eur. Math. Soc.* 11 (2009), 999-1024.

[7] P. CANNARSA, P. MARTINEZ & J. VANCOSTENOBLE, Carleman estimates for a class of degenerate parabolic operators, *SIAM J. Control Optim.* 47 (2008), no. 1, 1-19.

[8] F. ALABAU-BOUSSOUIRA, P. CANNARSA & D. SFORZA, Decay estimates for second order evolution equations with memory, *J. Funct. Anal.* 254 (2008), no. 5, 1342-1372.

[9] P. CANNARSA & H. FRANKOWSKA, Interior sphere property of attainable sets and time optimal control problems, *ESAIM Control Optim. Cal. Var.* 12 (2006), 350-370.

[10] P. CANNARSA & P. CARDALIAGUET, Representation of equilibrium solutions to the table problem for growing sandpiles, *J. Eur. Math. Soc.* 6 (2004), 435-464.

[11] F. ALABAU, P. CANNARSA & V. KOMORNIK, Indirect internal stabilization of weakly coupled systems of evolution equations, *J.evol.equ.* 2 (2002), 127-150.

[12] P. ALBANO & P. CANNARSA, Structural properties of singularities of semiconcave functions, *Ann.Scuola Norm.Sup. Pisa Cl.Sci.* 28 (1999), 719-740.

[13] P. CANNARSA, A. MENNUCCI & C. SINESTRARI, Regularity results for solutions of a class of Hamilton-Jacobi equations, *Arch. Rational Mech. Anal.* 140 (1997), 197–223.

[14] P. CANNARSA & C. SINESTRARI, Convexity properties of the minimum time function, *Calc. Var.* 3 (1995), 273-298.

[15] P. CANNARSA & G. DA PRATO, On a functional analysis approach to parabolic equations in infinite dimensions, *J. Funct. Anal.* 118 (1993), pp.22-42.

[16] G. ALBERTI, L. AMBROSIO & P. CANNARSA, On singularities of convex functions, *Manuscripta Math.* 76 (1992), 421-435.

[17] P. CANNARSA & H. FRANKOWSKA, Some characterizations of optimal trajectories in control theory, *SIAM J. Control Optim.* 29 (1991), 1322-1347.

[18] P. CANNARSA & V. VESPRI, Generation of analytic semigroups by elliptic operators with unbounded coefficients, *SIAM J. Math. Anal.* 18 (1987), 857-872.

[19] P. CANNARSA & H. M. SONER, On the singularities of viscosity solutions to Hamilton-Jacobi-Bellman equations, *Indiana Univ. Math. J.* 36 (1987), 501-524.

[20] S. CAMPANATO & P. CANNARSA, Differentiability and partial Hölder continuity of the solutions of non–linear elliptic systems of order $2m$ with quadratic growth, *Ann. Scuola Norm. Sup. Pisa* 8 (1981), 285-309.

Editorial Boards

Present

Mathematical Control and Related Fields (AIMS)
Nonlinear Differential Equations and Applications (Birkhäuser)
Springer INdAM Series

Past

Journal of Mathematical Systems, Estimation, and Control
SIAM Journal on Control and Optimization

Visiting Positions

Long Term

2014	CARMIN senior position at IHP/IHES (Paris, France)	six months
2010	Institut Henri Poincaré (Paris, France)	three months
1987	University of Maryland (College Park MD, USA)	five months
1986	Lehigh University (Bethlehem PA, USA)	five months
1985	Brown University (Providence RI, USA)	six months

Short Term (Last 2 Years)

Université Paris-Dauphine (Paris 9), Université Pierre et Marie Curie (Paris 6), Universitè de Bretagne Occidentale (Brest), Universitè de Paris 1 (La Sorbonne), Universitè de Toulouse III, Nanjing University, University of Tokyo

Conference Organizing (Last 3 Years)

Mathematical Paradigms of Climate Science (Rome, 2013)
First Joint International Meeting RSME-SCM-SEMA-SIMAI-UMI (Bilbao, 2014)
SIAM Conference on Analysis of Partial Differential Equations (Scottsdale, 2015)

Plenary Talks

2015	SIAM Conference on Control and Its Applications	Paris (France)
2015	13^{th} Viennese Workshop on Optimal Control and Dynamic Games	Vienna (Austria)
2014	SADCO Conference New trends in optimal control	Tours (France)
2014	Mathématiques de l'Optimisation et de la Décision	INSA de Rennes (France)
2013	Mathematical Control in Trieste	SISSA (Italy)
2013	French-German-Polish Conference on Optimization	Krakow (Poland)
2012	PICOF 2012 (Inverse Problems, Control, Shape Optimization)	Paris (France)
2012	DIMACOS'12 (Discrete Mathematics and Comp. Science)	Beirut (Lebanon)
2007	Congress of the Spanish Society of Applied Mathematics	Sevilla (Spain)
2005	IFIP Conference on Systems Modeling and Optimization	Torino (Italy)
2003	Congress of the Italian Mathematical Society	Milano (Italy)
1998	SIAM Conference on Control and Its Applications	Jacksonville (USA)

National and International Responsibilities

Italian Delegate to the ICIAM Board Meeting in Beijing (China) (August 15, 2015)

Italian Delegate to the IMU General Assembly in Gyeongju (Korea) (August 10-11, 2014)

Member of the Scientific Committee of the Unione Matematica Italiana (June 2012 to May 2015)

Member of the Scientific Committee of the Istituto Nazionale di Alta Matematica (June 1999 to May 2007 [Vice-President] and September 2011 to August 2015)

Member of the Group of Experts in Evaluation (GEV) of the Italian Ministry of Research, for the *Evaluation of Quality in Research* (VQR) for the years 2004-2010 and 2011-2014 [coordinator of the SUBGEV for Mathematical Analysis and Probability].

Administrative Responsibilities in Rome

Chairman of the **Undergraduate and Master Program in Mathematics** November 2005 to October 2010

Chairman of the **Doctoral School in Mathematics** November 1996 to October 2003

Fellowship Program Director within the National Project *Lauree Scientifiche* with a budget of **1.6 million euros** (2006 to 2009)

Grants

Coordinator, for the Italian part, of the **European Research Group (GDRE)** on **Control of Partial Differential Equations** (**CONEDP**) between the French *Centre National de la Recherche Scientifique* and the Italian *Istituto Nazionale di Alta Matematica* – **Issued in 2010 for four years and renewed up to 2017**, this GDRE has a guaranteed budget of **50 000 euros per year**.

2014/2015: Joint Chair Award University of Rome Tor Vergata – Université Pierre et Marie Curie (Paris 6), **11 000 euros**

2000 to 2009: Principal Investigator of the department team on *Differential equations*, University of Rome Tor Vergata, **25 000 euros per year**

1997 to 1999: Principal Investigator of the Roma Tor Vergata team in the national reasearch project *Differential equations and calculus of variations*, Italian Ministry of Research, **10 000 euros per year**

Doctoral and Post-Doctoral Advising

Since 1990, I have been the advisor of **fourteen Ph. D. students** and **four Post-docs** including:

Elisabetta Tessitore	Assistant Professor, University of Rome Tor Vergata
Carlo Sinestrari	Full Professor, University of Rome Tor Vergata
Paolo Albano	Associate Professor, University of Bologna
Cristina Pignotti	Associate Professor, University of L'Aquila
Francesco Marino	Junior Researcher, A3R s.r.l. `www.a3r.it`
Marco Mazzola	Assistant Professor, Université Pierre et Marie Curie – Paris 6
Roberto Guglielmi	post-doc, RADON Instutute (Austria) (awarded the 2013 **prize of the Rendiconti di Matematica** for his Ph. D. thesis)
Teresa Scarinci	post-doc, Vienna University of Technology