

## Curriculum Vitae of Carlo Sinestrari (short)

- Born in Roma (Italy), 13–8–1970.
- Laurea (Master degree) in mathematics, July 1992, University of Rome “La Sapienza”.
- Ph. D. Mathematics, July 1997, University of Rome “Tor Vergata”.
- Associate professor in Mathematical Analysis from November 1998 to October 2001 at the University of Rome “Tor Vergata”.
- Full professor in Mathematical Analysis at the University of Rome “Tor Vergata” since November 2001 (current position).

### Talks at conferences and workshops

I have given a talk at the following conferences and workshops (selection):

- “Systems of Conservation Laws”, Oslo (Norway), August 1993.
- “Fifth International Conference on Hyperbolic Problems”, Stony Brook (U.S.A.), June 1994.
- “PDE Methods in Control Problems, Shape Optimization and Stochastic Problems”, Pisa, December 1994.
- “Fifth International Conference in Industrial and Applied Mathematics”, Hamburg (Germany), July 1995.
- “Hyperbolic Conservation Laws and Numerical Analysis”, Anogia (Greece), August 1995.
- “Hyperbolic Systems of Conservation Laws”, Oberwolfach (Germany), aprile 1996.
- “Viability and Control”, Levico Terme, Italy, June 1997.
- “Analysis of Systems of Conservation Laws”, Aachen (Germany), August 1997.
- “Seventh International Conference on Hyperbolic Problems”, Zürich (Switzerland), February 1998.
- “Fourth SIAM Conference on Control”, Jacksonville (U.S.A.), May 1998.
- “Models of Continuum Mechanics in Analysis and Engineering”, Darmstadt (Germany), October 1998.
- “Equadiff 99”, Berlin (Germany), August 1999.
- “Eighth International Conference on Hyperbolic Problems”, Magdeburg (Germany), February 2000.
- “Viscosity Solutions and applications”, Palma (Spagna), March 2001.
- “A.M.S.–U.M.I. Conference”, Pisa, June 2002.

- “Nonlinear evolution problems”, Oberwolfach (Germany), May 2003
- “Geometric flows: theory and computation”, IPAM - UCLA, Los Angeles (U.S.A.), February 2004
- “Differential equations and control”, Toulouse (France), July 2004
- “Geometric evolution equations”, Banff (Canada), July 2004
- “Mean curvature flow and related topics”, Leipzig (Germany), March 2005
- “Aspects of Ricci flow”, Oberwolfach (Germany), May 2005.

### **Visits to universities and institutes in Italy and abroad**

In the academic year 1995/96 I have visited the Institute of Mathematics of the University of Tübingen (Germany). In addition I have spent shorter periods (one week to three months) visiting the following institutions:

- Center of Nonlinear Analysis, Carnegie Mellon University (Pittsburgh, U.S.A.).
- Lefschetz Center for Dynamical Systems, Brown University (Providence, U.S.A.)
- University of Padova
- S.I.S.S.A. (Trieste).
- University of Princeton (U.S.A).
- Isaac Newton Institute, Cambridge (UK).
- University of California at S. Barbara (U.S.A.),
- Australian National University at Canberra (Australia)
- Max Planck Institut, Potsdam (Germany).
- Centro De Giorgi, Scuola Normale Superiore, Pisa.
- CRM, Barcelona, (Spain).

### **List of publications**

#### Papers appeared in journals

- [1] Semiconcavity of solutions of stationary Hamilton-Jacobi equations, *Nonlinear Analysis TMA* **24**, 1321–1326 (1995).
- [2] Large time behaviour of solutions of balance laws with periodic initial data, *Nonlinear Differential Equations and Applications* **2**, 111–131 (1995).
- [3] (with P. Cannarsa) Convexity properties of the minimum time function, *Calculus of Variations and Partial Differential Equations* **3**, 273–298 (1995).

- [4] (with P. Cannarsa) On a class of nonlinear time optimal control problems, *Discrete and Continuous Dynamical Systems* **1**, 285–300 (1995).
- [5] Asymptotic profile of solutions of conservation laws with source, *Differential and Integral Equations* **9**, 499–525 (1996).
- [6] (with R. Natalini and A. Tesei) Incomplete blowup of solutions of quasilinear hyperbolic balance laws, *Archive for Rational Mechanics and Analysis* **135**, 259–296 (1996).
- [7] The Riemann problem for an inhomogeneous conservation law without convexity, *SIAM Journal for Mathematical Analysis* **28**, 109–135 (1997).
- [8] Instability of discontinuous traveling waves for hyperbolic balance laws, *Journal of Differential Equations* **134**, 269–285 (1997).
- [9] (with C. Mascia) The perturbed Riemann problem for a balance law, *Advances in Differential Equations* **2**, 779–810 (1997).
- [10] (with P. Cannarsa and A. Mennucci) Regularity results for solutions of a class of Hamilton–Jacobi equations, *Archive for Rational Mechanics and Analysis* **140**, 197–223 (1997).
- [11] (with E. Barron, P. Cannarsa and R. Jensen) Regularity of Hamilton–Jacobi equations when forward is backward, *Indiana University Mathematics Journal* **48**, 385–409 (1999).
- [12] (with G. Huisken) Mean curvature flow singularities for mean convex surfaces, *Calculus of Variations and Partial Differential Equations* **8**, 1–11 (1999).
- [13] Layering methods for Hamilton–Jacobi equations with nonconvex hamiltonian, *Nonlinear Analysis TMA* **38**, 137–149 (1999).
- [14] (with H. K. Jenssen) Blowup asymptotics for scalar conservation laws with a source, *Communications in Partial Differential Equations* **24**, 2237–2261 (1999).
- [15] (with G. Huisken) Convexity estimates for mean curvature flow and singularities of mean convex surfaces, *Acta Mathematica* **183**, 45–70 (1999).
- [16] (with P. Cannarsa and H. Frankowska) Optimality conditions and synthesis for the minimum time problem, *Set-Valued Analysis* **8**, 127–148 (2000).
- [17] (with P. Albano e P. Cannarsa) Regularity results for the minimum time function of a class of semilinear evolution equations of parabolic type, *SIAM Journal on Control and Optimization* **38**, 916–946 (2000).
- [18] (with P. Cannarsa and C. Pignotti) Semiconcavity for optimal control problem with exit time, *Discrete and Continuous Dynamical Systems* **6**, 975–997 (2000).
- [19] (with H. K. Jenssen) On the spreading of characteristics for nonconvex conservation laws, *Proceedings of the Royal Society of Edinburgh* **131**, 909–925 (2001).
- [20] Regularity along optimal trajectories of the value function of a Mayer problem. *ESAIM Control, Optimisation and Calculus of Variations* **10**, 666–676.

- [21] Semiconcavity of the value function for exit time problems with nonsmooth target *Communications in Pure and Applied Analysis* **3**, 757-774.

Conference proceedings

- [1] Local regularity properties of the minimum time function, in *PDE Methods in Control Problems, Shape Optimization and Stochastic Problems (Pisa, 1994)*, Marcel Dekker, Lecture Notes in Pure and Applied Mathematics **188** (1997).
- [2] (with P. Cannarsa) An infinite dimensional time optimal control problem, in *Optimization Methods in Partial Differential Equations (M. Holyoke, USA, 1996)*, A.M.S. Contemporary Mathematics **209** (1997).
- [3] (with H. K. Jenssen) Blowup for hyperbolic equations, in *Seventh International Conference on Hyperbolic Problems, (ETH Zürich, 1998)*, Birkhäuser, ISNM **129** (1999).
- [4] Convexity estimates for mean curvature flow of mean convex hypersurfaces, in *International conference on Differential Equations "Equadiff99" (Berlin, 1999)*, World Scientific (2000).
- [5] Formazione di singolarità nel moto per curvatura media, in *XVI Congresso U.M.I (Napoli, 1999)*, Unione Matematica Italiana, (2001).

Books

- [1] (with P. Cannarsa) Semiconcave functions, Hamilton–Jacobi equations, and optimal control, (Progress in Nonlinear Differential Equations and Their Applications, 58) Birkhäuser Boston, (2004).