

## Curriculum of Dario Benedetto

Born in 1966; Associate professor in Mathematical Physics (MAT/07) at Science Faculty - Mathematics Department of Sapienza Università di Roma.

### **Education and previous positions.**

- 1990 Laurea degree in Mathematics, University of L'Aquila.
- From November 1992 researcher in Mathematical Physics, Science Faculty - Mathematics Department, University of L'Aquila.
- From April 1993 to July 1994 Second Lieutenant of the Technical Corps of Army at the Data Processing Center of Military Geographic Institute of Florence (IGMI)
- From July 1995 researcher at the Science Faculty - Mathematics Department of Sapienza Universita' di Roma
- From 2004 Associate professor.

### **Research interests**

- Mathematical methods for the analysis of data sequences: compression algorithms and entropy measures, relative entropy methods for sequences classification, application to texts and biological sequences ([1], [2], [7], [6], [10], [4], [11] [17], [18], see also [5], [3]).
- Kinetic theory for quantum systems: rigorous derivation of kinetic equations with quantum cross section from the microscopic quantum dynamics ([8], [9], [12], [13], [15], [16], [35]).
- Kinetic theory from granular media: study of kinetic and hydrodynamic equations derived from inelastic microscopic dynamics ([14], [19], [21], [22], [24], [25], [28], [29], [36]).
- Fluid mechanics: study of the equation of incompressible fluids with singular initial data, such as vortex sheet, unbounded velocity fields, water bell, vельicity, rings of vorticity ([20], [23], [26], [27], [30], [31], [32], [33], [34] ).

## Publications

- [1] D. Benedetto, M. Degli Esposti, G. Maspero: *The puzzle of Basil's Epistula 38: a mathematical approach to a philological problem* Jour. Quantitative Linguistics, ISSN 0929-6174 (online: 1744-5035), to appear
- [2] G. Maspero, D. Benedetto, M. Degli Esposti: *Who wrote Basil's Epistula 38? A Possible Answer through Quantitative Analysis* in J. Leemans - M. Cassin *Gregory of Nyssa's Contra Eunomium III*. Proceedings of the Twelfth International Gregory of Nyssa Colloquium (Leuven, 14-17 September 2010), Brill, Leuven, to appear.
- [3] D. Benedetto, E. Caglioti, M. Degli Esposti: *The Unreasonable Effectiveness of Mathematics in Human Sciences: The Attribution of Texts to Antonio Gramsci* In: Michele Emmer (editor). Imagine Math - Between Culture and Mathematics. p. 143-154, Milano:Springer-Verlag Italia, ISBN: 9788847024267, doi: 10.1007/978-88-470-2427-4 (2012)
- [4] D. Benedetto, E. Caglioti, G. Cristadoro, M. Degli Esposti: *Relative entropy via non-sequential recursive pair substitution* Jour. Stat. Mech. Theory and Exp. vol. 09, p. 1-15, ISSN: 1742-5468, doi: 10.1088/1742-5468/2010/09/P09010 (2010)
- [5] C. Basile, D. Benedetto, E. Caglioti, M. degli Esposti *L'attribuzione dei testi grammatici: metodi e modelli matematici* La Matematica nella Società e nella Cultura, vol. III, p. 235-269, ISSN: 1972-7356 (2010)
- [6] C. Basile, D. Benedetto, E. Caglioti, M. Degli Esposti: *An example of mathematical authorship attribution* Jou. Math. Phys. vol. 49; p. 125211-125231, ISSN: 0022-2488 (2008)
- [7] C. Basile, D. Benedetto, E. Caglioti, G. Cristadoro, M. Degli Esposti: *A Plagiarism Detection Procedure in Three Steps: Selection, Matches and Squares* In: Uncovering Plagiarism, Authorship and Social Software Misuse and 1st International Competition on Plagiarism Detection. San Sebastian (Spain), 10 settembre 2009, AACHEN: CEUR workshop proceedings, vol. 502, p. 19-23, ISBN/ISSN: 1613-0073 (2009)
- [8] D. Benedetto, F. Castella, R. Esposito, M. Pulvirenti *From the N-body Schrödinger Equation to the Quantum Boltzmann Equation: a Term-by-Term Convergence Result in the Weak Coupling Regime*, Comm. Math. Phys. (ISSN: 0010-3616) 277, pp. 1-44 doi:10.1007/s00220-007-0347-7 (2008)
- [9] D. Benedetto, M. Pulvirenti *The Classical Limit for the Uehling-Uhlenbeck operator*, Bull. Inst. Math. Acad. Sin. (ISSN: 0304-9825) 2, No 4, pp. 907-920 (2007)
- [10] D. Benedetto, E. Caglioti, C. Cica *Compressing proteomes: the relevance of long range correlations*, Eur. Jour. Bioinf. Syst. Bio. (ISSN: 1687-4145) 1, pp. 1-8 doi:10.1155/2007/60723.
- [11] D. Benedetto, E. Caglioti, D. Gabrielli *Non-sequential recursive pair substitution: some rigorous results*, Jour. Stat. Mech. Theo. Exp. ( ISSN: 1742-5468, on line) 09, pp. 1-21 doi:10.1088/1742-5468/2006/09/P09011 (2006)
- [12] D. Benedetto, F. Castella, R. Esposito, M. Pulvirenti *Some Considerations on the Derivation of the Nonlinear Quantum Boltzmann Equation II: The Low Density Regime*, Jour. Stat. Phys. (ISSN: 0022-4715) 124, pp. 951-996 doi:10.1007/s10955-005-9010-x (2006)
- [13] D. Benedetto, F. Castella, R. Esposito, M. Pulvirenti *On the Weak-Coupling Limit for Bosons and Fermions*, Math. Mod. Meth. Appl. Sci. (ISSN: 0218-2025) 15 n. 12, pp. 1811-1843 (2005)
- [14] D. Benedetto, E. Caglioti, F. Golse, M. Pulvirenti *Hydrodynamic limits of a Vlasov-Fokker-Planck equation for granular media*, Comm. Math. Sci. (ISSN: 1539-6746) 1, pp. 121-136 (2004)
- [15] D. Benedetto, F. Castella, R. Esposito, M. Pulvirenti *Some Considerations on the Derivation of the Nonlinear Quantum Boltzmann Equation*, Jour. Stat. Phys. (ISSN: 0022-4715) 116, 1-4, pp. 381-410 (2004)
- [16] D. Benedetto, R. Esposito, M. Pulvirenti *Asymptotic analysis of quantum scattering under mesoscopic scaling*, Asym. Anal. (ISSN: 0921-7134) 2, pp. 163-187 (2004)
- [17] A. Puglisi, D. Benedetto, E. Caglioti, V. Loreto, A. Vulpiani *Data compression and learning in time sequences analysis*, Phys. D (ISSN: 0167-2789) 180, 1-2, pp. 92-107 (2003)
- [18] D. Benedetto, E. Caglioti, V. Loreto *Language Trees and Zipping*, Phys. Rev. Lett. (ISSN: 0031-9007) 88 n. 4 048702-1, 048702-4 (2002)
- [19] D. Benedetto, M. Pulvirenti *On the one-dimensional Boltzmann equation for granular flows*, Math. Mod. Num. Anal. (ISSN: 0764-583X) 35 no. 5, pp. 899-906 (2001)
- [20] D. Benedetto, E. Caglioti, C. Marchioro: *On the Motion of a Vortex Ring with a Sharply Concentrated Vorticity*, Math. Meth. Appl. Sci. (ISSN: 0170-4214) 23 n. 2, pp. 147-168 (2000)
- [21] D. Benedetto, E. Caglioti: *The Collapse Phenomenon in one dimensional inelastic point particle systems*, Phys. D (ISSN: 0167-2789) 132, pp. 457-475 (1999)
- [22] D. Benedetto, E. Caglioti, F. Golse, M. Pulvirenti *A Hydrodynamic Model Arising in the Context of Granular Media*, Comp. and Math. Appl. (ISSN: 0898-1221) 38, pp. 121-131 (1999)
- [23] D. Benedetto, E. Caglioti, R. Libero: *Non-Trapping Sets and Huygens Principle*, Math. Mod. Num. Anal. (ISSN: 0764-583X) 33 n. 3, pp. 517-530 (1999)
- [24] D. Benedetto, E. Caglioti, M. Pulvirenti, *Erratum: A kinetic equation for granular media*, Math. Mod. Num. Anal. (ISSN: 0764-583X) 33 no. 2, pp. 439-441 (1999)
- [25] D. Benedetto, E. Caglioti, J.A. Carrillo, M. Pulvirenti: *A non Maxwellian steady distribution for one-dimensional granular media*, Jour. Stat. Phys. (ISSN: 0022-4715) 91 Nos. 5-6, pp. 979-990 (1998)
- [26] D. Benedetto, E. Caglioti: *The Water Bell: an attempt to derive it*, Rend. Mat. Ser. VII (ISSN: 1120-7183) 18, pp. 529-548 (1998)
- [27] D. Benedetto, E. Caglioti: *A Stationary Action Principle for the Water Sheet*, Eur. Jour. of Mech B/Fluids, (ISSN: 0997-7546) 17 n. 5, pp. 769-772 (1998)
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- [30] D. Benedetto: *Convergence of the Velocity Blobs Method for the Euler Equation*, Math. Meth. Appl. Sci. ( ISSN: 0170-4214) 19, pp. 463-479 (1996)
- [31] D. Benedetto: *A Remark on the Hamiltonian Formalism for Incompressible Flows*, Jour. Stat. Ph. (ISSN: 0022-4715) 79 Nos. 3-4, pp. 743-747 (1995)
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- [34] D. Benedetto, M. Pulvirenti: *From Vortex Layers to Vortex Sheet*, SIAM Jour. of Appl. Math. (ISSN: 0036-1399) 4, (1992)
- [35] (Rassegna) D. Benedetto, F. Castella, R. Esposito, M. Pulvirenti *A short review on the derivation of the nonlinear quantum Boltzmann equation*, Comm. Math. Sci. (ISSN: 1539-6746) 5, pp. 55–71 (2007)
- [36] (Rassegna) D. Benedetto, E. Caglioti, M. Pulvirenti *Collective behavior of one-dimensional granular media*, in Modeling in Applied Sciences: A Kinetic Theory Approach, Editors N. Bellomo, M. Pulvirenti, Birkhäuser (Boston 2000), series of Modeling and Simulation in Science, Engineering and Technology.
- [37] (Rassegna) D. Benedetto, C. Marchioro, M. Pulvirenti: *The 2-D incompressible Euler flow for singular initial conditions*. Nonlinear variational problems and partial differential equations (Isola d'Elba, 1990), 57–74, Pitman Res. Notes Math. Ser. 320, Longman Sci. Tech., Harlow (1995)
- [38] (Libro di testo) D. Benedetto, M. Degli Esposti, C. Maffei: *Matematica per le scienze della vita* ISBN 978-88-08-18336-1, CEA Milano (2008)