

# Roberto Natalini – CV

(updated to July 2019)

## PRESENT POSITION

Dirigente di Ricerca del CNR, Istituto per le Applicazioni del Calcolo “M Picone”, Roma

Direttore ff di CNR-Istituto per le Applicazioni del Calcolo “M Picone”, Roma

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## EDUCATION

1986, PhD in Mathematics, Univ. Bordeaux I, France.

1984, D.E.A. in Applied Mathematics, Univ. Bordeaux I, France.

1983, Laurea in matematica, Univ. Roma "La Sapienza",

## PROFESSIONAL APPOINTMENTS

2018 - present Direttore ff di CNR-Istituto per le Applicazioni del Calcolo “M Picone”, Roma

1999-present Dirigente di Ricerca, IAC-CNR

2014-2018 Director of the Istituto per le Applicazioni del Calcolo “M. Picone” of CNR (IAC-CNR)

1998-99 Associated Professor, Dipartimento di Matematica “G. Castelnuovo”, Univ. Roma "La Sapienza".

1989-1998 Teaching activities: Univ. L'Aquila, Univ. Roma III.

1988-98 Researcher, IAC-CNR.

## INSTITUTIONAL RESPONSIBILITIES

2018 – to date Delegate for CNR in the Steering Committee of the Regional District for Cultural Heritage in Latium (Italy)

2017 – 2018 Delegate for CNR in the Memorandum of Understanding Board for the Regional District for Cultural Heritage in Latium (Italy)

2016 SIMAI delegate to the General Assembly of the European Mathematical Union

2015 – 2017 Scientific Advisor of the French Agency for Collaborations of Mathematics and Industries

2015 – to date Chair of the Public Awareness Committee of the European Mathematical Union

2015 – 2018 Member of the Scientific Committee of the Italian Mathematical Union (Unione Matematica Italiana)

2012 – to date Scientific Head of the Mathematical Desk for Italian Industry

2009 – 2016 Treasurer and member of the Executive Board of the Italian Society of Industrial and Applied Mathematics

2011 – to date Member of the Board of the PhD School in Mathematics at the "Tor Vergata" University of Rome, Italy

2001 – 2011 Member of the Board of the PhD School in SBAI Department, Sapienza University of Rome, Italy

2009 – to date Main coordinator of the greatest Italian outreach site MaddMaths!, supported by SIMAI, UMI and AIRO societies

## RESEARCH INTERESTS

Analytical and numerical investigations about evolutionary partial differential equations, modeling and simulation of complex phenomena in physics, chemistry, biology and social sciences, like hydrodynamic semiconductor models, shock waves and gas dynamics, incompressible fluid and mixture theory, singular perturbation approximations of fluid dynamical models, numerical approximation of models in finance, movement and aggregation of stem cells in bounded regions and on polymeric networks, car traffic flows on networks, intracellular dynamics, propagation of signals inside of the cell, immunological based cancer therapies, models of selection and mutation in biological populations, diffusion problems in porous media and interactions with damage, chemical damage on stone and copper surfaces, growth of biofilm and bio-damage, pedagogy of mathematics.

## PUBLICATIONS

A total of 122 papers in international ISI journals. More than 30 papers in popular science and outreach activities. 27 publications in proceedings of international congress. Author of one book about pedagogy of mathematics.

Citation records (ISI, July 2019):

Total Citation Count: 2078

H-index: 24

## Journals

1. Gabriella Bretti, Luigi Campanella, Maurizio Ceseri, Roberto Natalini, Filippo Notarnicola, Rita Reale, Maria Pia Sammartino, Giovanni Visco, A Mathematical Model of Iron Rings Formation in Porous Stones, *Journal of Cultural Heritage*, 39 (2019), 158-166, doi: <https://doi.org/10.1016/j.culher.2019.01.012> (a preliminary version can be found here : [arXiv:1810.11825](https://arxiv.org/abs/1810.11825))
2. Elena Bonetti, Cecilia Cavaterra, Francesco Freddi, Maurizio Grasselli, Roberto Natalini, A nonlinear model for marble sulphation including surface rugosity: theoretical and numerical results, *Communications on Pure & Applied Analysis* 2019, 18 (2): 977-998, doi:[10.3934/cpaa.2019048](https://doi.org/10.3934/cpaa.2019048) (a preliminary version can be found here: [arXiv:1710.01225](https://arxiv.org/abs/1710.01225))
3. Roberta Bianchini, Roberto Natalini, Convergence of a vector-BGK approximation for the incompressible Navier-Stokes equations, *Kinet. Relat. Models*, 12(1) (2019), 133-158. doi: [10.3934/krm.2019006](https://doi.org/10.3934/krm.2019006)
4. R. Bianchini, R. Natalini, The paradifferential approach to the local well-posedness of some problems in mixture theory in two space dimensions, *Communications in Partial Differential Equations* , 43 (7) 2018 Pages: 1051-1072, doi:

- [10.1080/03605302.2018.1499775](https://doi.org/10.1080/03605302.2018.1499775) (a preliminary version can be found here: <https://arxiv.org/abs/1610.03956>).
5. Manon Deville; Roberto Natalini; Clair Poignard, A continuum mechanics model of enzyme-based tissue degradation in cancer therapies, in *Bulletin of Mathematical Biology*, 80(12) (2018), 3184–3226 <https://doi.org/10.1007/s11538-018-0515-2> (a preliminary version can be found here: <https://hal.inria.fr/hal-01469180v2>)
  6. Francois Bouchut, Yann Jobic, Roberto Natalini, René Ocelli, Vincent Pavan, Second-order entropy satisfying BGK-FVS schemes for incompressible Navier-Stokes equations, *SMAI-Journal of computational mathematics*, 4 (2018), 1-56.
  7. Gabriella Bretti, Roberto Natalini, On modeling Maze solving ability of slime mold via a hyperbolic model of chemotaxis, *J. Comput. Methods Sci. Eng.* 18, no. 1, (2018), 85-115, 2018, DOI:10.3233/JCM-170773
  8. Ezio Di Costanzo, Alessandro Giacomello, Elisa Messina, Roberto Natalini, Giuseppe Pontrelli, Fabrizio Rossi, Robert Smits, Monika Twarogowska, A discrete in continuous mathematical model of cardiac progenitor cells formation and growth as spheroid clusters (Cardiospheres), *Mathematical Medicine And Biology: A Journal of the Ima*, 35 (2018), 121-144, Published online on January 2017 . doi: <https://doi.org/10.1093/imammb/dqw022>
  9. A. L. Amadori, R. Natalini, D. Palmigiani, A rare mutation model in heterogeneous environment with simulations for the hawk and dove game, *Ecological Complexity*, 34, (2018), 188-197. doi: <https://doi.org/10.1016/j.ecocom.2017.10.003>
  10. Roberta Bianchini, Roberto Natalini, Well-posedness of a model of nonhomogeneous compressible-incompressible fluids, *J. Hyperbolic Differ. Equ.* 14 (2017), no. 3, 487-516. doi: <https://doi.org/10.1142/S0219891617500163>
  11. M.P. Bracciale, G. Bretti, A. Broggi, M. Ceseri, A. Marrocchi, R. Natalini, C. Russo, Crystallization Inhibitors: Explaining Experimental Data through Mathematical Models. *Applied Mathematical Modelling*, Volume 48, August 2017, Pages 21-38. doi: <https://doi.org/10.1016/j.apm.2016.11.026>
  12. M. Leguèbe, R. Natalini, M.G. Notarangelo, C. Poignard, M. Twarogowska, Mathematical model for transport of DNA plasmids from the external medium up to the nucleus by electroporation, *Math. Biosci.* Volume 285, March 2017, Pages 1-13. doi: <https://doi.org/10.1016/j.mbs.2016.11.015>
  13. Di Costanzo E, Ingangi V, Angelini C, Carfora MF, Carriero MV, Natalini R, A Macroscopic Mathematical Model for Cell Migration Assays Using a Real-Time Cell Analysis. *PLoS ONE* 11(9) (2016): e0162553. doi:10.1371/journal.pone.0162553
  14. Fabrizio Clarelli, Cristiana Di Russo, Roberto Natalini, Magali Ribot, A fluid dynamics multidimensional model of biofilm growth: stability, influence of environment and sensitivity, *Mathematical Medicine and Biology*, Volume 33, Issue 4, 1 December 2016, Pages 371–395, <https://doi.org/10.1093/imammb/dqv024>
  15. Denise Aregba-Driollet, Maya Briani, and Roberto Natalini, Time Asymptotic High Order Schemes for Dissipative BGK Hyperbolic Systems. *Numer. Math.* (2016) 132:399-431, DOI 10.1007/s00211-015-0720-y

- 16.A. L. Amadori, M. Briani, R. Natalini, A non-local rare mutations model for quasispecies and prisoner's dilemma: Numerical assessment of qualitative behaviour. *European J. Appl. Math.* **27** (2016), no. 1, 87—110. DOI: 10.1017/S0956792515000352.
- 17.R. Bianchini, R. Natalini, Global existence and asymptotic stability of smooth solutions to a fluid dynamics model of biofilms in one space dimension, *Journal of Mathematical Analysis and Applications*, 434 (2) (2016) , 1909-1923.
- 18.F.R. Guarguaglini, R. Natalini, Global smooth solutions for a hyperbolic chemotaxis model on a network, *SIAM J. Math. Anal.* 47-6 (2015), 4652-4671. <http://dx.doi.org/10.1137/140997099>
- 19.Anna Lisa Amadori, Antonella Calzolari, Roberto Natalini, Barbara Torti, Rare mutations in evolutionary dynamics, *Journal of Differential Equations*, 259 (11), 6191-6214. <http://dx.doi.org/10.1016/j.jde.2015.07.021>.
- 20.R. Natalini, M. Ribot, M. Twarogowska; A numerical comparison between degenerate parabolic and quasilinear hyperbolic models of cell movements under chemotaxis. *Journal of Scientific Computing*, Volume 63 (3) (2015), 654-677. DOI: 10.1007/s10915-014-9909-y
- 21.E. Di Costanzo, R. Natalini, L. Preziosi, A hybrid mathematical model for self-organizing cell migration in the zebrafish lateral line, *J. Math. Bio.* Volume 71, Issue 1 (2015), 171-214. DOI: 10.1007/s00285-014-0812-9
- 22.G. Alì, R. Natalini, I. Torcicollo, Global existence for a 1D parabolic-elliptic model for chemical aggression in permeable materials, *Nonlinear Analysis: Real World Applications*, Volume 21 (2015), 1–12, DOI: 10.1016/j.nonrwa.2014.05.006.
- 23.Notarangelo M. G., Natalini R., Signori E., Gene therapy: the role of cytoskeleton in gene transfer studies based on biology and mathematics. *Curr Gene Ther.* (2014) ;14(2) :121-7.
- 24.Clarelli, F.; De Filippo, B.; Natalini, R., A mathematical model of copper corrosion, *Appl. Math. Mod.* Volume: 38 (2014) 4804-4816.
- 25.J. Elias, L. Dimitrio, J. Clairambault, R. Natalini, Dynamics of p53 in single cells: physiologically based ODE and reaction-diffusion PDE models, *Phys. Biol.* 11 (2014), 045001. doi:10.1088/1478-3975/11/4/045001
- 26.Ján Elias; Luna Dimitrio; Jean Clairambault; Roberto Natalini, The p53 protein and its molecular network: modelling a missing link between DNA damage and cell fate, *Biochimica et Biophysica Acta - Proteins and Proteomics*, Volume:1844, Issue: 1, Special Issue: SI, Pages: 232-247, Part: B, (2014).
- 27.G. Bretti, R. Natalini, M. Ribot, A hyperbolic model of chemotaxis on a network: a numerical study, *ESAIM: Mathematical Modelling and Numerical Analysis*, Volume: 48, Issue: 1, Pages: 231-25, DOI:10.1051/m2an/2013098.
- 28.R. Natalini, M. Ribot, M. Twarogowska.; A well-balanced numerical scheme for a one dimensional quasilinear hyperbolic model of chemotaxis, *Comm. Math. Sci.* 12 (2014), 13-29.

- 29.M. Briani, G. Germani, E. Iannone. M. Moroni, R. Natalini; Design and Optimization of Reaction Chamber and Detection System in Dynamic Labs-on-Chip for Proteins Detection, *IEEE Transactions on Biomedical Engineering*, 60 (2013), 2161–2166.
- 30.Luna Dimitrio, Jean Clairambault, Roberto Natalini; A spatial physiological model for p53 intracellular dynamics, *J. Theor. Bio.* v. 316, (2013), 9–24.
- 31.F. Clarelli, C. Di Russo, R. Natalini and M. Ribot, A fluid dynamics model of the growth of phototrophic biofilms, *J. Math. Biol.* 66 (2013), no. 7, 1387—1408.
- 32.R. Natalini, M. Ribot. Asymptotic High Order Mass-Preserving Schemes for a Hyperbolic Model of Chemotaxis, *SIAM Journal on Numerical Analysis* 50 (2012), pp. 883-905.
- 33.A. Amadori, B. Boccabella, R. Natalini. A hyperbolic model of spatial evolutionary game theory. *Comm. Pure Appl. Analysis* 11, (2012), 981 – 1002. doi: 10.3934/cpaa.2012.11.981
- 34.Boccabella, Astridh; Natalini, Roberto; Pareschi, Lorenzo. On a continuous mixed strategies model for evolutionary game theory. *Kinet. Relat. Models* 4 (2011), no. 1, 187--213.
- 35.A. Cangiani, R. Natalini, A spatial model of cellular molecular trafficking including active transport along microtubules. *Journal of Theoretical Biology*, 267; (2010) p. 614-625, ISSN: 0022-5193, doi: 10.1016/j.jtbi.2010.08.017.
- 36.F. Clarelli, R. Natalini, A pressure model of immune response to mycobacterium tuberculosis infection in several space dimensions, *Mathematical Biosciences and Engineering*, Volume: 7 Issue: 2 Pages: 277-300 Published: APR 2010
- 37.Anna Lisa Amadori, Astridh Boccabella, Roberto Natalini, A One Dimensional Hyperbolic Model for Evolutionary Game Theory: Numerical Approximations and Simulations, *Communications in Applied and Industrial Mathematics*, 1, 1, (2010) 1–21.
- 38.Cristiana Di Russo, Roberto Natalini, Magali Ribot, Global existence of smooth solutions to a two-dimensional hyperbolic model of chemotaxis, *Communications in Applied and Industrial Mathematics*, 1, 1, (2010) 92–109.
- 39.C. Mascia, R. Natalini, On Relaxation Hyperbolic Systems violating the Shizuta--Kawashima condition, *Archive for Rational Mechanics and Analysis*, Volume 195, Number 3 / March, 2010, DOI 10.1007/s00205-009-0225-x, Pages 729-762.
- 40.F. Guarguaglini, C. Mascia, R. Natalini, M. Ribot, Global stability of constant states and qualitative behavior of solutions to a one dimensional hyperbolic model of chemotaxis, *Discrete and Continuous Dynamical Systems - Series B*, 12, 2009, 39-76.
- 41.Davide Vergni, Filippo Castiglione, Maya Briani, Silvia Middei, Elena Alberdi, Klaus G. Reymann, Roberto Natalini, Cinzia Volonté, Carlos Matute, Fabio Cavaliere, A Model of Ischemia-Induced Neuroblast Activation in the Adult Subventricular Zone, *PLoS ONE*, 4 (4) 2009, art. no. e5278.
- 42.Carbou, G.; Hanouzet, B.; Natalini, R. Semilinear behavior for totally linearly degenerate hyperbolic systems with relaxation. *J. Differential Equations* 246 (2009), no. 1, 291–319.

43. Aregba-Driollet, Denise; Bretti, Gabriella; Natalini, Roberto. Numerical schemes for the Barenblatt model of non-equilibrium two-phase flow in porous media. *Quart. Appl. Math.* 66 (2008), no. 2, 201–231.
44. Carfora, Maria Francesca; Natalini, Roberto A discrete kinetic approximation for the incompressible Navier-Stokes equations. *M2AN Math. Model. Numer. Anal.* 42 (2008), no. 1, 93–112.
45. Clarelli, Fabrizio; Fasano, Antonio; Natalini, Roberto Mathematics and monument conservation: free boundary models of marble sulfation. *SIAM J. Appl. Math.* 69 (2008), no. 1, 149–168.
46. Giavarini C, Santarelli ML, Natalini R., Freddi F (2008). A non-linear model of sulphation of porous stones: Numerical simulations and preliminary laboratory assessments. *Journal of Cultural Heritage*, vol. 9; p. 14-22, ISSN: 1296-2074.
47. Aregba-Driollet, Denise; Briani, Maya; Natalini, Roberto Asymptotic high-order schemes for  $2 \times 2$  dissipative hyperbolic systems. *SIAM J. Numer. Anal.* 46 (2008), no. 2, 869–894.
48. Bianchini, Stefano; Hanouzet, Bernard; Natalini, Roberto Asymptotic behavior of smooth solutions for partially dissipative hyperbolic systems with a convex entropy. *Comm. Pure Appl. Math.* 60 (2007), no. 11, 1559–1622.
49. G. Bretti, R. Natalini, B. Piccoli, A Fluid-Dynamic Traffic Model on Road Networks, *Archives of Computational Methods in Engineering* 14 (2007), 139-172; available at [springerlink](#).
50. M. Briani, R. Natalini, G. Russo, Implicit-Explicit Numerical Schemes for Jump-Diffusion Processes; *Calcolo* 44 (2007), 33-57.
51. F. R. Guarguaglini and R. Natalini, Fast reaction limit and large time behavior of solutions to a nonlinear model of sulphation phenomena, *Commun. Partial Differ. Equations* 32 (2007), 163-189.
52. F.R. Guarguaglini, R. Natalini Nonlinear transmission problems for quasilinear parabolic systems, *Networks and Heterogeneous Media* 2, n.2 (2007), 359- 381.
53. F. R. Guarguaglini, R. Natalini, Global existence and uniqueness of solutions for multidimensional weakly parabolic systems arising in chemistry and biology, (CPAA) Volume 6, Number: 1 (2007), 287-309.
54. M. Garavello, R. Natalini, B. Piccoli and A. Terracina, Conservation laws with discontinuous, *Networks and Heterogeneous Media* 2, n.1 (2007), 159 – 179.
55. G. Alì, V. Furuholt, R. Natalini, and I. Torcicollo, A mathematical model of sulphite chemical aggression of limestones with high permeability. Part I. Modeling and qualitative analysis, *Transport in Porous Media*, Volume 69, Number 1 (2007), 109-122.
56. G. Alì, V. Furuholt, R. Natalini, and I. Torcicollo, A mathematical model of sulphite chemical aggression of limestones with high permeability. Part II: Numerical approximation, *Transport in Porous Media*, Volume 69, Number 2 (2007), 175-188.
57. Briani, Maya; Natalini, Roberto. Asymptotic high-order schemes for integro-differential problems arising in markets with jumps. *Commun. Math. Sci.* 4 (2006), no. 1, 81-96.
58. Natalini, R.; Rousset, F. Convergence of a singular Euler-Poisson approximation of the incompressible Navier-Stokes equations. *Proc. Am. Math. Soc.* 134, No.8, 2251-2258 (2006).

59. G. Bretti, R. Natalini, B. Piccoli, Numerical Approximations of a Traffic Flow Model on Networks, *Networks and Heterogeneous Media* 1, No.1, 57-84 (2006).
60. Bretti, Gabriella; Natalini, Roberto; Piccoli, Benedetto. Fast algorithms for the approximation of a traffic flow model on networks. *Discrete Contin. Dyn. Syst. Ser. B* 6 (2006), no. 3, 427—448.
61. F. R. Guarguaglini and R. Natalini, Global existence of solutions to a nonlinear model of sulphation phenomena in calcium carbonate stones, *Nonlinear Analysis: Real World Applications*, Volume 6, Issue 3 (2005), Pages 477-494.
62. D. Aregba-Driollet, F. Diele, and R. Natalini. A Mathematical Model for the SO<sub>2</sub> Aggression to Calcium Carbonate Stones: Numerical Approximation and Asymptotic Analysis, *SIAM J. APPL. MATH.* (2004) 64, No. 5, pp. 1636-1667.
63. M. Briani, C. La Chioma, R. Natalini Convergence of numerical schemes for viscosity solutions to integro-differential degenerate parabolic problems arising in financial theory, *Numer. Math.* 98 (2004), no. 4, 607—646.
64. Y. Brenier, R. Natalini, and M. Puel On a relaxation approximation of the incompressible Navier-Stokes equations; *Proc. Am. Math. Soc.* 132, No.4, 1021-1028 (2004).
65. D. Aregba-Driollet, R. Natalini, S.Q. Tang , Diffusive kinetic explicit schemes for nonlinear degenerate parabolic systems, *Math. Comp.* 73 (2004) 63-94.
66. B. Hanouzet, R. Natalini. Global existence of smooth solutions for partially dissipative hyperbolic systems with a convex entropy, *Arch. Ration. Mech. Anal.* 169 (2003), 89-117.
67. R. Natalini, C. Nitsch, G. Pontrelli, S. Sbaraglia. A numerical study of a nonlocal model of damage propagation under chemical aggression, *European Journal of Applied Mathematics* Volume 14, Issue 4, (2003) p. 447-464.
68. A. L. Amadori, R. Natalini, Entropy solutions to a strongly degenerate anisotropic convection-diffusion equation, with application to the backward-forward stochastic differential utility, *J. Math. Anal. Appl.* 284/2 (2003), 511-531.
69. Lattanzio, Corrado; Natalini, Roberto. Convergence of diffusive BGK approximations for nonlinear strongly parabolic systems. *Proc. Roy. Soc. Edinburgh Sect. A* 132 (2002), no. 2, 341--358.
70. Natalini, Roberto; Terracina, Andrea. Convergence of a relaxation approximation to a boundary value problem for conservation laws. *Comm. Partial Differential Equations* 26 (2001), no. 7-8, 1235--1252.
71. H. Liu and R. Natalini, Long-Time Diffusive Behavior of Solutions to a Hyperbolic Relaxation System, *Asymptot. Anal.* 25 (2001), no. 1, 21--38.
72. F. Bouchut, F.R. Guarguaglini and R. Natalini, Diffusive BGK Approximations for Nonlinear Multidimensional Parabolic Equations, *Indiana Univ. Math. J.* 49 (2000), 723-749.
73. R. Natalini and S. Tang, Discrete Kinetic Models for Dynamical Phase Transitions, *Commun. Appl. Nonlinear Anal.* 7 (2000), 12-32.
74. Denise Aregba-Driollet and Roberto Natalini, Discrete Kinetic Schemes for Multidimensional Conservation Laws, *SIAM J. Num. Anal.* 37 (2000), 1973-2004.
75. Gilding, Brian H.; Natalini, Roberto; Tesei, Alberto, How parabolic free boundaries approximate hyperbolic fronts. *Trans. Amer. Math. Soc.* 352 (2000), no. 4, 1797--1824.

76. Tao Luo, Roberto Natalini and Tong Yang, Global BV solutions to a p-system with relaxation, *Quaderno IAC* 12/1998; *J. Differential Equations* 162 (2000), no. 1, 174--198.
77. Roberto Natalini and Alberto Tesei, On the Barenblatt Model for Non-Equilibrium Two Phase Flow in Porous Media, *Arch. Ration. Mech. Anal.* 150 (1999), no. 4, 349--367.
78. Gasser, Ingenuin; Natalini, Roberto The energy transport and the drift diffusion equations as relaxation limits of the hydrodynamic model for semiconductors. *Quart. Appl. Math.* 57 (1999), no. 2, 269--282.
79. LeFloch, Philippe G.; Natalini, Roberto Conservation laws with vanishing nonlinear diffusion and dispersion. *Nonlinear Anal.* 36 (1999), no. 2, Ser. A: Theory Methods, 213--230.
80. Brenier, Yann; Corrias, Lucilla; Natalini, Roberto, Relaxation limits for a class of balance laws with kinetic formulation. *Advances in nonlinear partial differential equations and related areas (Beijing, 1997)*, 2--14, World Sci. Publishing, River Edge, NJ, 1998.
81. Luo, Tao; Natalini, Roberto; Xin, Zhouping Large time behavior of the solutions to a hydrodynamic model for semiconductors. *SIAM J. Appl. Math.* 59 (1998), no. 3, 810—830.
82. Luo, Tao; Natalini, Roberto BV solutions and relaxation limit for a model in viscoelasticity. *Proc. Roy. Soc. Edinburgh Sect. A* 128 (1998), no. 4, 775--795.
83. Natalini, Roberto A discrete kinetic approximation of entropy solutions to multidimensional scalar conservation laws. *J. Differential Equations* 148 (1998), no. 2, 292--317.
84. Hanouzet, Bernard; Natalini, Roberto; Tesei, Alberto On the Chapman-Jouguet limit for a combustion model. *SIAM J. Math. Anal.* 29 (1998), no. 3, 619--636.
85. Marcati, Pierangelo; Natalini, Roberto Global weak entropy solutions to quasilinear wave equations of Klein-Gordon and sine-Gordon type. *J. Math. Soc. Japan* 50 (1998), no. 2, 433--449.
86. Natalini, R.; Sinestrari, C.; Tesei, A. Incomplete blowup of solutions of quasilinear hyperbolic balance laws. *Arch. Rational Mech. Anal.* 135 (1996), no. 3, 259--296.
87. Mascia, Corrado; Natalini, Roberto  $L^1$  nonlinear stability of traveling waves for a hyperbolic system with relaxation. *J. Differential Equations* 132 (1996), no. 2, 275--292.
88. Natalini, Roberto; Hanouzet, Bernard Weakly coupled systems of quasilinear hyperbolic equations. *Differential Integral Equations* 9 (1996), no. 6, 1279--1292.
89. Aregba-Driollet, Denise; Natalini, Roberto Convergence of relaxation schemes for conservation laws. *Appl. Anal.* 61 (1996), no. 1-2, 163--193.
90. Natalini, Roberto Convergence to equilibrium for the relaxation approximations of conservation laws. *Comm. Pure Appl. Math.* 49 (1996), no. 8, 795--823.
91. Natalini, Roberto; Rubino, Bruno A discrete approximation for hyperbolic systems with quadratic interaction term. *Comm. Appl. Nonlinear Anal.* 3 (1996), no. 2, 1--21.
92. Natalini, R. The bipolar hydrodynamic model for semiconductors and the drift-diffusion equations. *J. Math. Anal. Appl.* 198 (1996), no. 1, 262--281.
93. Kersner, R.; Natalini, R.; Tesei, A. Shocks and free boundaries: the local behaviour. *Asymptotic Anal.* 10 (1995), no. 1, 77--93.

94. Marcati, Pierangelo; Natalini, Roberto Weak solutions to a hydrodynamic model for semiconductors and relaxation to the drift-diffusion equation. Arch. Rational Mech. Anal. 129 (1995), no. 2, 129--145.
95. Corrias, L.; Falcone, M.; Natalini, R. Numerical schemes for conservation laws via Hamilton-Jacobi equations. Math. Comp. 64 (1995), no. 210, 555--580.
96. Marcati, Pierangelo; Natalini, Roberto Weak solutions to a hydrodynamic model for semiconductors: the Cauchy problem. Proc. Roy. Soc. Edinburgh Sect. A 125 (1995), no. 1, 115--131.
97. Claudi, S.; Natalini, R.; Tesei, A. Large time behaviour of a diffusion equation with strong convection. Ann. Scuola Norm. Sup. Pisa Cl. Sci. (4) 21 (1994), no. 3, 445--474.
98. Marcati, Pierangelo; Natalini, Roberto Convergence of the pseudo-viscosity approximation for conservation laws. Nonlinear Anal. 23 (1994), no. 5, 621--628.
99. Natalini, R.; Tesei, A. Blow-up of solutions for a class of balance laws. Comm. Partial Differential Equations 19 (1994), no. 3-4, 417--453.
100. Natalini, Roberto; Tesei, Alberto Blow-up of solutions of first order quasilinear hyperbolic equations. Appl. Anal. 51 (1993), no. 1-4, 81--114.
101. Natalini, R. Unbounded solutions for conservation laws with source. Nonlinear Anal. 21 (1993), no. 5, 349--362.
102. Natalini, R.; Tesei, A. On a class of perturbed conservation laws. Adv. in Appl. Math. 13 (1992), no. 4, 429--453.
103. Arosio, Alberto; Natalini, Roberto; Paoli, Maria Gabriella. Fourth order quasilinear evolution equations of hyperbolic type. J. Math. Soc. Japan 44 (1992), no. 4, 619--630.
104. Natalini, Roberto Multiplication de distributions avec conditions de compatibilité. Ann. Fac. Sci. Toulouse Math. (5) 10 (1989), no. 1, 75--91.

## 2. Books (author and editor)

1. Roberto Natalini, Anna Baccaglioni-Frank, Pietro Di Martino, Giuseppe Rosolini, [Didattica della Matematica](#), Mondadori Università, 2018, ISBN: 9788861845503.
2. Gosse, Laurent, Natalini, Roberto (Eds.), Innovative Algorithms and Analysis, [Springer INdAM Series](#), Series Volume 16, 2017, Springer International Publishing, eBook ISBN 978-3-319-49262-9, DOI: 10.1007/978-3-319-49262-9, Hardcover ISBN 978-3-319-49261-2, Series ISSN, 2281-518X, Number of Pages XVIII, 351
3. P A Marcati, P A Markowich, Roberto Natalini (Eds.), Mathematical Problems in Semiconductor Physics, December 15, 1995 by Chapman and Hall/CRC, 224 Pages ISBN 9780582287044 - CAT# LM8704 Series: [Chapman & Hall/CRC Research Notes in Mathematics Series](#)

## 3. Lecture Notes

1. R. Natalini, Introduzione ai metodi numerici alle differenze finite per equazioni di evoluzione, Appunti del corso tenuto nel quadro della XVIII SCUOLA DI MATEMATICA COMPUTAZIONALE organizzata dall'Istituto per le Applicazioni della Matematica di Napoli, Vico Equense, 11-16 Settembre 2000. (In Italian);

2. Natalini, Roberto Recent results on hyperbolic relaxation problems. Analysis of systems of conservation laws (Aachen, 1997), 128--198, Chapman & Hall/CRC Monogr. Surv. Pure Appl. Math., 99, Chapman & Hall/CRC, Boca Raton, FL, 1999. 35L65 (35B35 76N15);

#### 4. Some proceedings e short refereed papers

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