

PUBLICATIONS

May 2, 2018

Papers:

- [1] A. Carati, G. Benettin, L. Galgani: *Towards a rigorous treatment of Jeans–Landau–Teller methods for the energy exchanges of harmonic oscillator*, Comm. Math. Phys. **150**, 321–336 (1992).
- [2] A. Carati, L. Galgani: *Asymptotic character of the series of the classical electrodynamics and an application to bremsstrahlung* Nonlinearity **6**, 905–914 (1993).
- [3] G. Benettin, A. Carati, P. Sempio: *On the Landau–Teller approximation for the energy exchanges with fast degrees of freedom* Journal of Statistical Physics **73**, 175–192 (1993).
- [4] A. Carati, P. Delzanno, L. Galgani, J. Sassarini: *Nonuniqueness properties of the physical solutions of the Lorentz–Dirac equation*, Nonlinearity **8**, 65–79 (1995).
- [5] G. Benettin, A. Carati, G. Gallavotti: *A rigorous implementation of the Jeans–Landau–Teller approximations for adiabatic invariants*, Nonlinearity **10**, 479–505 (1997).
- [6] G. Benettin, A. Carati, F. Fassó: *On the conservation of adiabatic invariants for a system of coupled rotators*, Physica D **104**, 253–268 (1997).

- [7] A. Carati: *Pair production in classical electrodynamics*, Foundations of Physics **28**, 843-853 (1998).
- [8] A. Carati, L. Galgani: *Nonlocality of classical electrodynamics of point particles and violation of Bell's inequalities*, Nuovo Cimento **114** B, 489–500 (1999).
- [9] A. Carati, L. Galgani: *On the specific heat of the Fermi–Pasta–Ulam systems*, Journal of Statistical Physics **94**, 859–869 (1999).
- [10] A. Carati, L. Galgani: *Analogue of Planck's formula and effective temperature in classical statistical mechanics far from equilibrium*, Phys. Rev. E **61**, 4791 (2000).
- [11] A. Carati, L. Galgani: *Planck's formula and glassy behaviour in classical nonequilibrium statistical mechanics*, Physica A **280**, 105–114 (2000).
- [12] A. Carati, L. Galgani: *Theory of dynamical systems and the relations between Classical and Quantum Mechanics*, Foundations of Physics **31**, 69–87 (2001).
- [13] A. Carati: *An extension of Eliezer's theorem on the Abraham–Lorentz–Dirac equation*, J. Phys. A: Math. Gen. **34**, 5937–5944 (2001).
- [14] D. Bambusi, A. Carati, A. Ponno: *The Nonlinear Schrödinger Equation as a resonant normal form*, Disc. and Cont. Dyn. Syst. B **2**, 109–128 (2002).
- [15] A. Carati, L. Galgani, A. Giorgilli, A. Ponno: *The Fermi-Pasta-Ulam Problem*, Nuovo Cimento **B 117**, 1017-1026 (2002).
- [16] A. Carati: *Center manifold of unstable periodic orbits of Helium atom: numerical evidence*, Disc. and Cont. Dyn. Syst. B **3**, 97–104 (2003).
- [17] A. Carati, L. Galgani, B. Pozzi: *Lévy flights in the Landau-Teller model of molecular collisions*, Phys.Rev. Lett. **90**, 010601 (2003).
- [18] A. Carati, L. Galgani: *Reply to 'Comment on Analog of Planck's formula and effective temperature in classical statistical mechanics far from equilibrium'*, Phys. Rev. E **68**, 028102 (2003).

- [19] A. Carati, L. Galgani: *Nonradiating normal modes in a classical many-body model of matter-radiation interaction*, Nuovo Cimento **B 118**, 839–851 (2003).
- [20] A. Carati, L. Galgani: *On the definition of temperature in FPU systems*, Journal of Statistical Physics **115**, 1119-1130 (2004).
- [21] A. Carati, L. Galgani: *A critical remark on Planck’s model of black-body*, Int. Journ. of Mod. Phys. **B 18**, 549-553 (2004).
- [22] A. Carati: *Thermodynamics and time-averages*, Physica A **348**, 110-120 (2005).
- [23] A. Carati, L. Galgani, A. Giorgilli: *The Fermi-Pasta-Ulam problem as a challenge for the foundations of physics*, Chaos **15**, 015107 (2005).
- [24] A. Carati: *On the existence of scattering solutions for the Abraham-Lorentz-Dirac equation*, Disc. and Cont. Dyn. Syst. B, **6**, 471-480 (2006).
- [25] A. Carati, *On the definition of temperature using time-averages*, Physica A **369**, 417-431 (2006).
- [26] A. Carati, L. Galgani: *Metastability in specific heat measurements: simulations with the FPU model*, Europhysics Letters **75**, 528-534 (2006).
- [27] A. Carati, L. Galgani, A. Giorgilli, S. Paleari: *FPU phenomenon for generic initial data*, Phys. Rev. E **76**, 022104 (2007).
- [28] M. Marino, A. Carati, L. Galgani: *Classical light dispersion theory on a regular lattice*, Annals of Physics **322**, 799-823 (2007).
- [29] A. Carati: *An averaging theorem for Hamiltonian dynamical systems in the thermodynamic limit*, Journal of Statistical physics **128**, 1057-1077 (2007).
- [30] A Carati: *On the fractal dimension of orbits compatible with the Tsallis statistics*, Physica A **387**, 1491-1503 (2008).
- [31] A. Carati, S. Cacciatori, L. Galgani *Discrete matter, far fields and dark matter*, Europhysics Letters **83**, 59002 (2008).

- [32] D. Bambusi, A. Carati, T. Penati, *Boundary effects on the dynamics of chains of coupled oscillators*, Nonlinearity **22**, 923-946 (2009).
- [33] A. Carati, L. Galgani, F. Santolini. *On the energy transfer to small scales in a discrete model of one-dimensional turbulence*, CHAOS **19**, 023123 (2009).
- [34] A. Maiocchi, A. Carati, *Relaxation times for Hamiltonian systems*, Comm. Math. Phys. **297**, 427-445 (2010).
- [35] A. Carati, F. Benfenati, L. Galgani, *Relaxation properties in classical diamagnetism*, Chaos **21**, 023134 (2011).
- [36] A. Carati, M. Zuin , A. Maiocchi , M. Marino , E. Martines , L. Galgani, *Transition from order to chaos, and density limit, in magnetized plasmas*, Chaos **22** , 033124 (2012).
- [37] A. Carati, A. Maiocchi, *Exponentially long stability times for a non-linear lattice in the thermodynamical limit*, Comm. Math. Phys. **314** , 129-161 (2012).
- [38] G. Camelio, A. Carati, L. Galgani, *Classical Helium atom with radiation reaction*, Chaos **22**, 023111 (2012).
- [39] A.M. Maiocchi, A. Carati, A. Giorgilli, *A series expansion for the time autocorrelation of dynamical variables*, J. Stat. Phys. **148**, 6, pp 1054-1071 (2012).
- [40] A. Carati, F. Benfenati , A. Maiocchi , M. Zuin and L. Galgani *Chaoticity threshold in magnetized plasmas: Numerical results in the weak coupling regime*, Chaos **24**, 013118 (2014).
- [41] A. Lerose, A. Sanzeni, A. Carati and L. Galgani, *Classical microscopic theory of polaritons in ionic crystals*, Eur. Phys. J. D **68**, 35 (2014).
- [42] A. Maiocchi, D. Bambusi, A. Carati, *An Averaging Theorem for FPU in the Thermodynamic Limit*, J. Stat. Phys. **155**, 300 (2014).
- [43] A. Carati, L. Galgani, *Classical microscopic theory of dispersion, emission and absorption of light in dielectrics*, Eur. Phys. J. D **68**, 307 (2014).

- [44] M. Marino, L. Misuri, A. Carati, D. Brogioli, *Boosting the voltage of a salinity-gradient-power electrochemical cell by means of complex-forming solutions*, Appl. Phys. Lett. **105**, 033901 (2014).
- [45] M. Marino, L. Misuri, A. Carati, D. Brogioli, *Proof of concept of a zinc-silver battery for the extraction of energy from a concentration difference*, Energies **7**, 3664-3683 (2014).
- [46] F. Gangemi, A. Carati, L. Galgani, R. Gangemi, A. Maiocchi, *Agreement of classical Kubo theory with the infrared dispersion curves $n(\omega)$ of ionic crystals*, Europhys. Lett. **110**, 47003 (2015).
- [47] A. Carati, M. Marino, D. Brogioli, *Thermodynamic study of a distiller-electrochemical cell system for energy production from low temperature heat sources*, Energy **93**, 984–993 (2015).
- [48] A. Carati, A. Maiocchi, L. Galgani, G. Amati, *The FPU system as a model for glasses*, Math. Phys. Anal. Geom. **18**, 31 (2015).
- [49] A. Carati, A. Maiocchi, *Replacement of the Lorentz law for the shape of the spectral lines in the infrared region*, J. Opt. Soc. Am. A **33**, pp. 1193–1197 (2016).
- [50] F. Gangemi, R. Gangemi, A. Carati, A. Maiocchi, L. Galgani, *Infrared optical properties of quartz by molecular dynamics simulations*, Europhys. Lett. **116**, (2016) 37001.
- [51] A. Carati, A. Maiocchi, L. Galgani, F. Gangemi e R. Gangemi, **Persistence of regular motions for nearly integrable Hamiltonian systems in the thermodynamic limit**, Regular Chaotic Dynamics **21**, 660–664 (2016).
- [52] A. Carati, A. Maiocchi, L. Galgani, *Statistical thermodynamics for metaequilibrium or metastable states*, Meccanica **52**, 1295–1307 (2017).
- [53] A. Carati, A. Ponno, *Chopping time of the FPU α -model*, Journ. Stat. Phys. **170**, 883–894 (2018).
- [54] A. Carati, L. Galgani, A. Maiocchi, F. Gangemi, R. Gangemi, *Classical infrared spectra of ionic crystals and their relevance for statistical mechanics*, Physica A **506**, 1-10 (2018).

Conference proceedings:

- [55] D. Bambusi, A. Carati, L. Galgani, A. Giorgilli, D. Noja, J. Sassarini: *On the relevance of classical electrodynamics for the foundations of physics*, in *Transport, chaos and plasma physics*, S. Benkadda, F. Doveil, Y. Elskens eds., World Scientific (Singapore, 1994).
- [56] A. Carati, L. Galgani, J. Sassarini: *An analogue of the tunnel effect in classical electrodynamics*, in C. Garola, A. Rossi eds. *The foundations of quantum mechanics*, Kluwer (Dordrecht, 1995).
- [57] A. Carati, L. Galgani, J. Sassarini, *Recent results on the Abraham–Lorentz–Dirac equation*, in *Quantum–like models and coherent effects*, R. Fedele and P.K. Shukla eds., World Scientific (Singapore, 1995).
- [58] D. Bambusi, A. Carati, L. Galgani, D. Noja, J. Sassarini: *Dynamical aspects of classical electron theory*, in *Electron theory and quantum electrodynamics*, J.P. Dowling ed., Plenum Press (New York, 1996).
- [59] A. Carati: *A Lagrangian formulation for the Abraham–Lorentz–Dirac equation*, in *Symmetry and perturbation theory*, D. Bambusi and G. Gaeta eds., Quaderno del GFNM n. 54 (1998).
- [60] A. Carati, L. Galgani: *The black body spectrum, and the theory of dynamical systems*, in *The Chaotic Universe*, V.G. Gutzwiller and R. Ruffini eds. (World Scientific, Singapore, 2000).
- [61] A. Carati, L. Galgani: *Einstein’s nonconventional conception of the photon, and the modern theory of dynamical systems*, in *Chance in physics*, Bricmont et al. eds., Lecture notes in physics 574 (Springer, Berlin, 2001).
- [62] A. Carati, L. Galgani, B. Pozzi: *The Problem of the Rate of Thermalization and the Relations between Classical and Quantum Mechanics*, in *Mathematical Models and Methods for Smart Materials*, M. Fabrizio et al. eds., Series of Advances in Mathematics n. 62, World Scientific (Singapore, 2002).

- [63] A. Carati, L. Galgani: *Stellar Dynamics and Molecular Dynamics: Possible Analogies*, in *Galaxies and Chaos*, G. Countopoulos and N. Voglis eds., Lecture Notes in Physics (Springer, Berlin, 2003).
- [64] A. Carati: *Time-averages and the heat theorem*, in *Complexity, Metastability and Nonextensivity*, C. Beck, A. Rapisarda and C. Tsallis eds., The science and Culture Series: The Physics, World Scientific (Singapore, 2005).
- [65] A. Carati: *Compatibility between dynamics and Tsallis statistics*, in *Complexity, metastability, and nonextensivity: An International Conference*, S. Abe, H. Herrmann, P. Quarati, A. Rapisarda, C. Tsallis editors, Series: AIP Conference Proceedings, Vol. 965, Springer Verlag (Berlin,2007).
- [66] A. Carati, S. Cacciatori, L. Galgani *Far fields, from electrodynamics to gravitation, and the dark matter problem*, in *Chaos in astronomy*, P. Patzis ed., Springer Verlag (Berlin, 2008).
- [67] G. Benettin, A. Carati, L. Galgani, A. Giorgilli: *The Fermi-Pasta-Ulam problem and the metastability perspective* in *The Fermi-Pasta-Ulam Problem: A Status Report*, G. Gallavotti ed., Lecture Notes in Physics, Vol. 728, Springer Verlag (Berlin,2007).
- [68] A. Carati, L. Galgani, *Faraway matter as a possible substitute for dark matter*, in *Chaos, diffusion and non integrability in Hamiltonian Systems: Applications to Astronomy*, P. M. Cincotta, C. M. Giordano & C. Efthymiopoulos eds., AAA (La Plata, 2012).
- [69] D. Bambusi, A. Carati, A. Maiocchi, A. Maspero, *Some analytic results on the FPU paradox*, Fields Institute Communications **75**, 235–254 (2015).

Contributions to encyclopedias:

- [70] A. Carati, L. Galgani, A. Giorgilli: *Dynamical Systems and Thermodynamics*, in *Encyclopedia of Mathematical Physics*, Elsevier (Oxford, 2006)

Books:

- [71] A. Carati, L. Galgani: *Appunti di Meccanica Analitica*, in preparation. See online version at: <http://users.mat.unimi.it/users/carati/#Didattica>
- [72] A. Carati, L. Galgani: *Appunti di Meccanica Analitica 2: Introduzione alla teoria dei sistemi dinamici*, in preparation. See online version at: <http://users.mat.unimi.it/users/carati/#Didattica>
- [73] A. Carati, L. Galgani: *Fondamenti della meccanica quantistica: uno studio storico-critico*, in preparation. See online version at: <http://users.mat.unimi.it/users/galgani/#Didattica>