

CURRICULUM VITAE

Adrian Ștefan CÂRSTEA

Professor (Researcher grd. I)

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Education:

1. 1998 October: Ph. D. degree in Theoretical Physics at the University of Bucharest and National Institute of Physics and Nuclear Engineering, Department of Theoretical Physics with thesis "*Weakly localised structures in nonlinear systems*".
2. 1995 June: Master in Physics degree, Theoretical Physics, University of Bucharest, Department of Physics, thesis title "*Rational solutions for Toda lattice*".
3. 1994 June: Bachelor Thesis, Theoretical Physics, University of Bucharest, Department of Physics. title "*Perturbed NLS equation and renormalization of multisoliton solution*"

Positions held:

1. 2003-onwards, Professor (Scientific Researcher grade I) National Institute of Physics and Nuclear Engineering, Department of Theoretical Physics, Bucharest, Romania
2. 2003-2007, Associate Professor (Scientific Researcher grd.II) National Institute of Physics and Nuclear Engineering, Department of Theoretical Physics, Bucharest, Romania
3. January 2003-July 2003, postdoctoral fellow at the Department of Theoretical Physics (CPT), Ecole Polytechnique, CNRS, Palaiseau, France.
4. January 2001-July 2001 postdoctoral fellow at the Department of Theoretical Physics (CPT), Ecole Polytechnique, CNRS, Palaiseau, France.
5. 1994-2000 researcher at the National Institute of Physics and Nuclear Engineering, Department of Theoretical Physics, Bucharest, Romania

Visiting positions:

1. March 2004, Invited Professor at University Paris VII (Ramani-Grammaticos group)
2. November 2004, Invited Professor, University of Tokyo, Dept. of Mathematical Sciences, Satsuma laboratory.
3. February 2005, Invited Professor, University of Tokyo, Dept. of Mathematical Sciences, Satsuma laboratory.

4. June 2005, Invited Professor, at University Paris VII, (Ramani-Grammaticos group)
5. May 2007 Invited Professor, at University Paris VII, (Ramani-Grammaticos group)
6. May 2009 Invited Professor, at group University Paris VII, (Ramani-Grammaticos group)

Research interests:

Nonlinear discrete dynamical systems (singularity analysis, algebraic geometric approaches, lattice solitons, supersymmetric soliton equations), deterministic and stochastic nonlinear evolution equations and applications in fluids (weak turbulence, dynamics of various coherent structures etc.) and biological phenomena (gene regulatory networks, virus dynamics etc.).

Selected publications (*see also the full list of publications below*):

- *Super-QRT and 4D-mappings reduced from the lattice super-KdV equation*, **A. S. Carstea**, T. Takenawa, Journal of Mathematical Physics, Vol 60, Article Nr. 093503 (2019)
- *Bilinear approach to Kuperschmidt super-KdV type equations*, C. N. Babalic, **A. S. Carstea**, Journal of Physics A: Mathematical and Theoretical, Vol. 51, Issue 22, Article Nr. 225204 (2018)
- *Constructing soliton solutions and super-bilinear form of lattice supersymmetric KdV equation*, **A. S. Carstea**, Journal of Physics A: Mathematical and Theoretical, Vol. 48, Issue 28, Article Nr: 285201 (2015)
- *A classification of two dimensional integrable mappings and rational elliptic surfaces*, **A. S. Carstea**, T. Takenawa, J. Phys. A: Math.Theor. 45, 155206, (2012)
- *Deautonomizing integrable non-QRT mappings* **A. S. Carstea**, B. Grammaticos, A. Ramani, J. Phys. A: Math. Theor , 42 Issue: 48 Article Number: 485207 (2009)
- *On the non-autonomous form of the $Q(4)$ mapping and its relation to elliptic Painleve equations*, A. Ramani, **A. S. Carstea**, B. Grammaticos, J. Physics A: Math. Theor. 42, Issue: 32 Article Number: 322003 (2009)
- *Do integrable cellular automata have the confinement property?*, B. Grammaticos, A. Ramani, K. M. Tamizhmani, T. Tamizhmani, **A. S. Carstea**, J. Phys A: Math. Theor. 40, F725, (2007)
- *On the dynamics of a gene regulatory network* , B. Grammaticos, **A. S. Carstea**, A. Ramani, Journal of Physics A: Math. Gen, 39, 2965-2971, (2006)
- *Epidemic models; discrete time and cellular automaton approaches*, R. Willox, B. Grammaticos, **A. S. Carstea**, A. Ramani, Physica A, 328, 13-22, (2003)
- *On the autonomous limit of discrete Painlevé equations*, A. Ramani, **A. S. Carstea**, B. Grammaticos, Y. Ohta, Physica A, 305, 437-444, (2002).
- *Fermionic extension of the Painlevé equations*, A. Ramani, **A. S. Carstea**, B. Grammaticos, Physics Letters A, 292, 115-119, (2001).
- *Bilinearisation and soliton solution of the $N=1$ supersymmetric Sine-Gordon equation*, B. Grammaticos, A. Ramani, **A. S. Carstea**, Journal of Physics A: Mathematical and General, 34, 4881-4886, (2001).
- *Construction of the soliton solution for the $N=1$ supersymmetric KdV hierarchy*, **A. S. Carstea**, A. Ramani, B. Grammaticos, Nonlinearity, 14, 1419-1423, (2001).

- *Extension of the bilinear formalism to supersymmetric KdV-type equations*, **A. S. Carstea**, Nonlinearity, 13, 1645-1656, (2000)

Teaching courses:

September 2008 – June 2009, Classical Mechanics, Technical University of Construction Bucharest

Awards:

Romanian Academy Prize (November 1998)

Grants won by competition

Three Projects IDEAS financed by the Romanian Ministry of research in the program PN-II-ID-PCE, during the periods: 2004-2007, 2007-2010, 2011-2014, on the subject of integrable systems and various applications.

Miscellaneous:

Referee at the following journals: Journal of Physics A: Mathematical and Theoretical, Physics Letters A, Inverse Problems, Chaos, Solitons and Fractals, Journal of Mathematical Physics

Publications:

(<http://www.nipne.ro/research/publications/449-publications.html#articles>)

1. *Space of initial conditions and geometry of two 4-dimensional discrete Painleve equations*, **A. S. Carstea**, T. Takenawa, Journal of Physics A: Mathematical and Theoretical, Vol. 52, Issue 27, (2019)
2. *Super-QRT and 4D-mappings reduced from the lattice super-KdV equation*, **A. S. Carstea**, T. Takenawa, Journal of Mathematical Physics Vol 60, Article Nr. 093503 (2019)
3. *Bilinear approach to Kuperschmidt super-KdV type equations*, C. N. Babalic, **A. S. Carstea**, Journal of Physics A: Mathematical and Theoretical, Vol. 51, Issue 22, Article Nr. 225204 (2018)
4. *Coupled Ablowitz-Ladik equations with branched dispersion*, C. N. Babalic, **A. S. Carstea**, Journal of Physics A: Mathematical and Theoretical, Vol. 50, Issue 41, Article Nr. 415201 (2017)
5. *Fiber-dependent deautonomization of integrable 2D mappings and discrete Painleve equations*, **A. S. Carstea**, T. Takenawa, A. Dzhamay, Journal of Physics A: Mathematical and Theoretical, Vol. 50, Issue 40, Article Nr. 405202 (2017)
6. *Bilinear approach to the supersymmetric Gardner equation*, C. N. Babalic, **A. S. Carstea**, Theoretical and Mathematical Physics 188 (2016) 1172-1180
7. *Statistical approach of modulation instability in the class of NLS equations*, D. Grecu, **A. S. Carstea**, A. T. Grecu, A. Visinescu, Journal of Physics A: Mathematical and Theoretical 61 (2016) 124-134

8. *Constructing soliton solutions and super-bilinear form of lattice supersymmetric KdV equation*, **A. S. Carstea**, Journal of Physics A: Mathematical and Theoretical, Vol. 48, Issue 28, Article Nr: 285201 (2015)
9. *Coupled discrete KdV equations and modular genetic networks*, **A. S. Carstea**, T. Tokihiro, Journal of Physics A: Mathematical and Theoretical, Vol. 48, Issue 5, Article Nr: 055205 (2015)
10. *On some new forms of lattice integrable equations*, C. N. Babalic, **A. S. Carstea**, CENT. EUR. J. PHYS. 12 (2014), 36-41.
11. *On the stochastic modulational instability for intermediate nonlinear Schrodinger equation*, **A. S. Carstea**, A. Ludu, preprint (2013)
12. *On various discretizations of a general Volterra system*, N. C. Babalic, **A. S. Carstea** submitted to J. Phys. A: Math. Theor. (2013)
13. *A note un minimization of elliptic surfaces from birational dynamics*, **A. S. Carstea**, T. Takenawa, to appear J. Nonlinear Math. Phys. (2013)
14. *On the geometry of $Q(4)$ mapping*, **A. S. Carstea**, to appear in Contemporary Mathematics (2013)
15. *A classification of two dimensional integrable mappings and rational elliptic surfaces*, **A. S. Carstea**, T. Takenawa, J. Phys. A: Math.Theor. 45, 155206, (2012)
16. *Bilinear approach to delay-Painleve equations*, **A. S. Carstea** J. Phys. A: Math.Theor. 44, Issue 10, article number: 105202, (2011)
17. *Proteomic signals in modular transcriptional cascades. A discrete time and cellular automaton approach*, **A. S. Carstea**, A. T. Grecu, D. Grecu, Physica D, 239, 12, 967, (2010)
18. *Deautonomizing integrable non-QRT mappings* **A. S. Carstea**, B. Grammaticos, A. Ramani, J. Phys. A: Math. Theor , 42 Issue: 48 Article Number: 485207 (2009)
19. *On the non-autonomous form of the $Q(4)$ mapping and its relation to elliptic Painleve equations*, A. Ramani, **A. S. Carstea**, B. Grammaticos
20. J. Physics A: Math. Theor., 42 Issue: 32 Article Number: 322003 (2009)
21. *Proteomic kinks in simple transcriptional regulators*, **A. S. Carstea**, B. Grammaticos, A. Ramani, K. M. Tamizhmani, CHAOS SOLITONS & FRACTALS, 41, 1823, (2009)
22. *Proteomic waves in networks of transcriptional regulators*, **A. S. Carstea**, Math.Comp. Sim. 80, 66, (2009)
23. *Integrable systems related to Su-Schrieffer-Heeger lattices*, **A. S. Carstea**, CHAOS SOLITONS & FRACTALS, 42 , 923 (2009)
24. *Do all integrable equations satisfy integrability criteria?* B. Grammaticos, A. Ramani, K.M. Tamizhmani, T. Tamizhmani, **A. S. Carstea** Advances in Difference Equations Article Number: 317520 Published: 2008
25. *Do integrable cellular automata have the confinement property?* ,B. Grammaticos, A. Ramani, K. M. Tamizhmani, T. Tamizhmani, **A. S. Carstea**, J. Phys A: Math. Theor. 40, F725, (2007)

26. *Continuos, discrete and ultradiscrete models of inflammatory response*, **A. S. Carstea**, A. Ramani, J. satsuma, R. Willox, B. Grammaticos *Physica A*,364, 276, (2006)
27. *On the dynamics of a gene regulatory network* , B. Grammaticos, **A. S. Carstea**, A. Ramani , *Journal of Physics A: Math. Gen.*, 39, 2965-2971, (2006)
28. *Special solutions for Ricci flow equations in 2D using the linearisation approach*, **A. S. Carstea**, M. Visinescu, *Modern Physics Letters A* 20, 1-10, (2005)
29. *Modelling AIDS epidemic dynamics and treatment with difference equations*, K. M. Tamizhmani, A. Ramani, B. Grammaticos, **A. S. Carstea**, *Advances in Difference Equations*, 3, 183-193, (2004)
30. *The q -discrete Painleve IV equations and their properties*, K. M. Tamizhmani, B. Grammaticos, **A. S. Carstea**, A. Ramani, *Regular and Chaotic Dynamics*, 9, 13-20, (2004)
31. *Integrable third order mappings and their growth properties*, S. Lafortune, **A. S. Carstea**, A. Ramani, B. Grammaticos, Y. Ohta, *Regular and Chaotic Dynamics*, 6, 443-448, (2001).
32. *Limits and degeneracies of discrete Painleve equations: a sequel*, A. Ramani, R. Willox, B. Grammaticos, **A. S. Carstea**, J. Satsuma, *Physica A*, 347, 1-16, (2005)
33. *Reductions of integrable lattices* B. Grammaticos, A. Ramani, J. Satsuma, R. Willox, **A. S. Carstea** *Journal of Nonlinear Mathematical Physics (Supplement)*, 12, 363-371, (2005)
34. *Localised and nonlocalised structures in nonlinear lattices with fermions*, **A. S. Carstea**, D. Grecu, A. Visinescu, *Europhysics Letters*, 67, 531-537, (2004)
35. *Extending the SIR epidemic model*, J. Satsuma, B. Grammaticos, A. Ramani, R. Willox, **A. S. Carstea**, *Physica A*, 336, 369-375, (2004).
36. *Oscillating epidemics; a discrete time model*, A. Ramani, **A. S. Carstea**, R. Willox, B. Grammaticos, *Physica A* 333, 278-292, (2004).
37. *Epidemic models; discrete time and cellular automaton approaches*, R. Willox, B. Grammaticos, **A. S. Carstea**, A. Ramani, *Physica A*, 328, 13-22, (2003)
38. *Discrete Painlevé II equations, Miura and auto-Bäcklund transformations*, **A. S. Carstea**, A. Ramani, R. Willox, B. Grammaticos, *Journal of Physics A: Mathematical General* 36, 8419-8431, (2003)
39. *On the autonomous limit of discrete Painlevé equations*, A. Ramani, **A. S. Carstea**, B. Grammaticos, Y. Ohta, *Physica A*, 305, 437-444, (2002).
40. *Bilinear approach to the discrete Painlevé I equations*, B. Grammaticos, T. Tamizhmani, A. Ramani, **A. S. Carstea**, K. M. Tamizhmani, *Journal of Physical Society of Japan* 71, 443-447, (2002).
41. *Linearisable supersymmetric equations*, *Chaos, Solitons and Fractals*, **A. S. Carstea**, A. Ramani, B. Grammaticos, 14, 155-158, (2002).
42. *Bilinear approach to supersymmetric KdV equation*, **A. S. Carstea**, *Journal of Nonlinear*

Mathematical Physics Supplement 8, 48-52, (2001)

43. *Beyond nonlinear Schrodinger equation approximation for an anharmonic chain with long range interaction potentials*, D. Grecu, **A. S. Carstea**, A. Visinescu Journal of Nonlinear Mathematical Physics, 8, 139-144, (2001)
44. *Fermionic extension of the Painlevé equations*, A. Ramani, **A. S. Carstea**, B. Grammaticos, Physics Letters A, 292, 115-119, (2001).
45. *Bilinearisation and soliton solution of the $N=1$ supersymmetric Sine-Gordon equation*, B. Grammaticos, A. Ramani, **A. S. Carstea**, Journal of Physics A: Mathematical and General, 34, 4881-4886, (2001).
46. *Construction of the soliton solution for the $N=1$ supersymmetric KdV hierarchy*, **A. S. Carstea**, A. Ramani, B. Grammaticos, Nonlinearity, 14, 1419-1423, (2001).
47. *Extension of the bilinear formalism to supersymmetric KdV-type equations*, **A. S. Carstea**, Nonlinearity, 13, 1645-1656, (2000).
48. *Exact solutions of $KdV+mKdV+ Benjamin-Ono$ equation*, **A. S. Carstea**, D. Grecu, A. Visinescu, Physics Letters A, 296, 82-86, (1998).
49. *On the dynamics of rational solutions for 1D Volterra systems*, **A.S.Carstea**, Physics Letters A 233, 378-382, (1997).
50. *On a class of rational and mixed rational-soliton solutions for Toda lattice*, **A. S. Carstea**, D. Grecu, Progress of Theoretical Physics, 96, 29-36 (1996).

Talks and Presentations:

(<http://www.nipne.ro/research/publications/449-publications.html#conferences>)

1. International Conference on Scientific Computation and Differential Equations, SCICADE 2019, Innsbruck, 22-26 iulie 2019, A. S. Carstea, “*Birational dynamics on non-relatively minimal elliptic surfaces for discrete Nahm-type equations*”.
2. The Joint Meeting on Quantum Fields and Nonlinear Phenomena, Sinaia, Roamania, 18-22 april 2018, A. S. Carstea, “*Bilinear approach to lattice super-KdV equation and super-QRT mappings*”.
3. The Joint Meeting on Quantum Fields and Nonlinear Phenomena, Sinaia, Roamania, 18-22 april 2018, C. N. Babalic, A. S. Carstea, Bilinear form and soliton solutions for Kuperschmidt super - KdV equation
4. The Joint Meeting on Quantum Fields and Nonlinear Phenomena, 9-13 March 2016, Sinaia, Romania, A. S. Carstea, “*Lattice supersymmetric KdV equation and super-QRT mappings*” and “*Discrete dynamical systems: how to construct invariants and symmetries.*”
5. Discrete Integrable Systems, Workshop 2016, Sanya, China, 11-15 april 2016, A. S. Carstea, “*Lattice supersymmetric KdV equation and super-QRT mappings*”.
6. Conference on Nonlinear Mathematical Physics: Twenty years of JNMP, Nordfjordeit, Norway,

June 4-14, 2013, A. S. Carstea, “*Minimal rational surfaces and discrete Nahm equations*”.

7. Invited talk at JOINT MATHEMATICS MEETING, Boston USA (4-6 jan.2012), A. S. Carstea, “*Q4-elliptic Painleve equation and rational elliptic surfaces*” at the section: Algebraic and Geometric aspects of Integrable Systems and Random Matrices.
8. Invited talk at Lorentz Center Workshop on Discrete Integrable Systems (Leiden 18-22, july 2011), A. S. Carstea, “*Invariants of non-QRT mappings and rational surfaces with higher index*”.
9. Contributed talk “*On the integrability of some HKY-type mappings*”, A. S. Carstea, T. Takenawa talk at IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena; Computation and Theory, University of Georgia, Athens USA, 16-19 april 2009.
10. Contributed talk “*Proteomic signals in gene regulatory networks*”, A. S. Carstea, talk at IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena; Computation and Theory, University of Georgia, Athens USA, 16-19 april 2007.
11. Invited Seminar Department of Physics University of British Columbia Vancouver Canada, *On the dynamics of proteomic signals in genetic transcriptional regulators*, A. S. Carstea, 13 april 2007, Prof. Steve Plotkin group.
12. Invited talk “*On the dynamics of proteomic signals in genetic transcriptional regulators*”, A. S. Carstea, International Conference “Recent advances and applications in nonlinear sciences” Tokyo Japan, 16-19 oct. 2006.
13. Invited talk “*Localised and nonlocalised structures in nonlinear lattices with fermions*”, A. S. Carstea, invited talk at the “International Conference on Nonlinear Integrable Systems and their world applications” dedicated to Prof. Martin Kruskal 80-th anniversary and Prof. M. Toda 88-th anniversary, Tokyo Japan 14-18 feb. 2005.
14. Contributed talk “*Crossover behaviour between KdV and mKdV equations in Cold Plasma with Negative Ions*”, D. Grecu, A. Visinescu, A. S. Carstea, Global Analysis and Applied Mathematics, 729, 332-338, American Institute of Physics, (2004), Proceedings of International Workshop on Global Analysis, Ankara, Turkey, 15-17 April, (2004).
15. “*Supersymmetric Soliton Equations*”, A. Ramani, A. S. Carstea, B. Grammaticos, Proceedings of the Symposium "Theory and Application on Nonlinear Wave Phenomena" Kasuga, Fukuoka, Japan, Nov. 14-16, 2001, Reports of RIAM No. 13ME-S4 (2002) 36-42.
16. Contributed talk “*Rational Solutions of a Mixed KdV+mKdV+BO*” equation, A. S. Carstea, D. Grecu, A. Visinescu, Proceedings of the Workshop on "Nonlinearity, Integrability and all that: Twenty years after NEEDS'79, Lecce, Italy, 1-10 july, 1999, Editors M. Boiti et al. World Scientific, 82-88, (2000).
17. Contributed talk “*Bilinear Formalism of Supersymmetric KdV type Equations*”, A. S. Carstea, Proceedings of the Workshop on "Nonlinearity, Integrability and all that: Twenty years after NEEDS'79, Lecce, Italy, 1-10 july, 1999, Editors M. Boiti et al. World Scientific, 75-81, (2000).
18. Contributed talk “*Long range interaction corrections on the quantum vibronic soliton*”, D. Grecu, A. S. Carstea, A. Visinescu, Proceedings of the Sixth International Conference on "Path Integrals from peV to TeV" 50 years after Feynman's paper, Florence, Italy, 25-29 august 1998, Editors, R. Casalbuoni et al. World Scientific, 399-402, (1999).

19. Invited talk "*On the dynamics of Rational Solutions for 1-D Volterra System*", A. S. Carstea, Centre de Recherche Mathematiques, Montreal, CRM, 25, 65-72, (2000) Proceedings al Conferintei Internationale, "Symmetries and Integrability of Difference Equations" Sabaudia, Italy, 16-22 May, (1998).
20. Poster presentation "*Rational and Mixed rational-soliton solutions of Toda lattice*", A. S. Carstea, D. Grecu, International Conference on Nonlinear Dynamics, Chaotic and Complex Systems, Zakopane, Poland, 7-11 Nov. 1995.