

# Ciprian Preda

## Curriculum Vitae

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   Timișoara, 300086, Romania                      e-mail: [preda@math.cornell.edu](mailto:preda@math.cornell.edu)

EDUCATION                      2004 – Ph.D. in Mathematics, Department of Mathematics, West University of Timisoara

   Thesis Title *“The stability and the dichotomy of differential systems on infinite-dimensional Banach spaces”*

   Thesis Advisor: Prof. Dr. Stefan Balint

*Thesis received the maximum degree and a special Cum Laude distinction*

2000 – M.S. in Mathematics (Mathematical Models and Optimization in Economics Processes), Department of Mathematics, West University of Timisoara

   with the maximum GPA

   Thesis Title: *“A model to construct an optimum portofolio”*,

   Thesis Advisor: Prof. Dr. C. Chilarescu.

1998 – B.S. in Mathematics, Department of Mathematics, West University of Timisoara

   Thesis Title: *“Techniques of characterizing the stability of strongly continuous semigroups”*

   Thesis Advisor: Prof. Dr. V. Radu

EMPLOYMENT                      January 2011 – June 2011    Visiting Associate Professor, Cornell University

   July 2008 – present    Associate Professor, West University of Timisoara

   July 2006-July 2008    Assistant Adjunct Professor, Department of Mathematics, University of California at Los Angeles (UCLA)

   January 2005 – July 2006    Lecturer, Department of Mathematics, University of California at Los Angeles (UCLA)

   October 2004 -July 2006    PostDoctoral Scholar, NASA-UCLA Flight Systems Research Center, Department of Electrical Engineering , University of California at Los Angeles (UCLA)

   2003 - 2008    Assistant Professor, West University of Timisoara

   1998 - 2003    Teaching Assistant, West University of Timisoara.

TEACHING                      Undergraduate Courses taught:  
EXPERIENCE                      -Theory of Probability and Statistics (West University of Timisoara)  
   -Mathematics Applied in Economics including Differential Vector Calculus, Integral Vector Calculus Ordinary differential equations (West University of Timisoara)  
   -Linear Algebra (UCLA)  
   -Optimization (UCLA)  
   -Game Theory (UCLA)

- Integration and Infinite Series (UCLA)
- Calculus of Several Variables (UCLA)
- Nonlinear Dynamics and Chaos (UCLA)
- Calculus for Life Sciences Students (UCLA)
- Real Analysis (Cornell)
- Mathematics and Politics (Cornell)

## AWARDS, HONORS

1. 2006 *Robert Sorgensfrey* Teaching Award, Department of Mathematics, UCLA.
2. Elected in the *Top Ten UCLA Professors* (2006, 2007, 2008) (which includes professors from all UCLA departments) in the ranking made by the students on the official UCLA students web site (<http://bruinwalk.com>).
3. Member in the Editorial Board of *Australian Journal of Mathematical Analysis and Applications* (starting with March 2009)
4. Reviewer for Mathematical Reviews.
5. Referee for *International Journal of Evolution Equations*, *Journal of Difference Equations and Applications*, *Journal of Mathematical Analysis and Applications*, *Chaos, Solitons and Fractals*, *Physics Letters*, *Systems and Control Letters*, etc.
6. February 1999-May 1999: Erasmus Fellowship awarded by University of Orleans, France.
7. 1994-1998 Honors Fellowship (West University of Timisoara, Romania).
8. Prizes at international, Balkan and national mathematical contests.

## ARTICLES

1. On the exponential decay of an orbit of a vector under  $C_0$ -semigroups, *Houston Journal of Mathematics*, vol. 40, no. 2, (2014), to appear.
2. On the asymptotic behavior of the solutions of semilinear nonautonomous equations, (with Nguyen Van Minh, Gaston M. N'Guerekata), *Semigroup Forum*, vol. 87, no. 1, (2013), 18-34.
3. An extension of a theorem of O. Perron for nonautonomous semilinear evolution equations (with Nguyen Van Minh and R. O. Mosincat), submitted.
4. Semigroup approach to aeroelastic systems, (with A. V. Balakrishnan), submitted.
5. An ergodic theorem in the qualitative behavior of (non)linear semiflows, (with P. Preda), *Nonlinear Analysis*, vol. 75, no. 14 (2012), 5393-5400.
6. Lyapunov operator inequalities for exponential stability of Banach space semigroups of operators, (with Petre Preda), *Applied Mathematics Letters*, vol. 25, no. 3 (2012), 401-403.
7. On the asymptotic behavior of the solutions of autonomous equations without unstable invariant manifolds, (with Petre Preda), *Computer and Mathematics with Applications*, vol. 64, no. 1 (2012), 35-47.
8. An extension of some theorems of L. Barreira and C. Valls for the nonuniform exponential dichotomous evolution operators, (with Petre Preda and Cristina Prata), *Journal of Mathematical Analysis and Applications*, vol. 388, no. 2, (2012), 1090-1106.
9. On a class of backward stochastic differential equations, (with R. Negrea), *Dynamics of Continuous, Discrete and Impulsive Systems*, vol. 18, no. 4, (2011), 485-499.
10. Dichotomies with no invariant unstable manifolds for autonomous equations, (with R. O. Mosincat and P. Preda), *Journal of Function Spaces and Applications*, vol. 2012 (2012), article ID 527647, 23 pages, doi:10.1155/2012/527647.
11. Averaging theorems for the large-time behavior of the solutions of nonautonomous systems, (with R. O. Mosincat and P. Preda), *Systems & Control Letters*, 60 (12), 2011, 994-999.
12. A version of a theorem of R. Datko for nonuniform exponential contractions, (with P. Preda and A. Craciunescu), *Journal of Mathematical Analysis and Applications*, vol. 385, (2012), 572-581.

13. Some results on the qualitative theory of semiflows, (with P. Preda) *Bulletin of the Belgian Mathematical Society-Simon Stevin*, vol. 18, no. 1, (2011), 173-186.
14. On the uniform exponential stability of linear skew-product three-parameter semiflows, (with P. Preda and A. Petre), *Bull. Math. Soc. Sci. Math. Roumanie*, Tome 54(102), No. 3, (2011), 269-279.
15. On the dichotomy of the evolution families: A discrete argument approach (with C. Sipos), *Canadian Mathematical Bulletin*, vol. 54, no. 3, (2011), 527-537.
16. A new version of a theorem of Minh-Räbiger-Schnaubelt regarding nonautonomous evolution equations (with Razvan O. Mosincat and Petre Preda), *Applicable Analysis*, vol. 90, no. 9, (2011), 1405-1418.
17. Lyapunov theorems for unstable evolution families on half-line, (with P. Preda), *Canadian Mathematical Bulletin*, 54 (2011), 364-369.
18. An extension of a theorem of Barbashin to the dichotomy of abstract evolution operators, (with P. Preda) *Bulletin of the Belgian Mathematical Society-Simon Stevin*, vol. 17, no. 4, (2010), 705-715.
19. A criterion on discrete-time scale in the qualitative theory of semilinear systems, (with R.O. Mosincat and P. Preda) *J. Knowl. Commun. Comput. Technol* 2, no. 2, (2010), 59-65.
20.  $(L^p(R_+, X), L^q(R_+, X))$ -admissibility and exponential dichotomies of cocycles, *Journal of Differential Equations*, 249 (2010) 578-598.
21. Criteria for detecting the existence of the exponential dichotomies in the asymptotic behavior of the solutions of variational equations, *Journal of Functional Analysis*, vol. 258, no. 3, (2010), 729-757.
22. A discrete-time Lyapunov theorem for the exponential instability of  $C_0$ -semigroups, *Dynamics of Continuous, Discrete and Impulsive Systems*, vol. 17, no. 1, (2010), 107-114.
23. A new proof of a theorem of Datko and Pazy, (with P. Preda), *Dynamics of Continuous, Discrete and Impulsive Systems*, vol. 17, no. 3, (2010), 445-452.
24. An extension of a theorem of R. Datko for a class of semilinear evolution equations (with Bogdan Dima and Marilen Pirtea), Recent Advances in Applied Mathematics, Proceedings of the American Conference on Applied Mathematics, Harvard University, Cambridge, USA, January 27-29, 2010, ISSN 1790-2769, p. 386-389.
25. Remarks on the time-scale invariance property on the financial markets (with Bogdan Dima and Marilen Pirtea), Annals of DAAAM for 2009 & Proceedings of the 20th DAAAM symposium "Intelligent Manufacturing and Automation: Focus on theory, practice and education", 25-28 November, 2009, Vienna, Austria, ISSN 1726-9679, p. 0179-0182.
26. On the asymptotic behaviour of individual elements under one-parameter semigroups, *Houston Journal of Mathematics*, vol. 35, no. 2, (2009), 619-626.
27. On the asymptotic behavior of an exponentially bounded, strongly continuous cocycle over a semiflow, (with P. Preda and A. Petre), *Communications on Pure and Applied Analysis*, vol. 8, no. 5, (2009), 1637-1645.
28. An extension of the admissibility-type conditions for the exponential dichotomy of  $C_0$ -semigroups, (with P. Preda), *Integral Equations and Operator Theory*, vol. 63, no. 2, (2009), 249-261.
29. The Lyapunov operator equation for the exponential dichotomy of one-parameter semigroups, (with P. Preda), *Systems and Control Letters*, 58, 2009, 259-262.
30. Discrete-time theorems for the dichotomy of one-parameter semigroups, *Communications on Pure and Applied Analysis*, vol. 7, no. 2, (2008), 457-463.

31. Integral characterizations for the dichotomy of evolution families, (with P. Preda), *Bulletin of the Belgian Mathematical Society - Simon Stevin*, vol. **15**, 2, (2008), 203-215.
32. A discrete-time approach for the asymptotic behaviour of one-parameter semigroups, *Advances in mathematical problems in engineering aerospace and sciences*, Math. Probl. Eng. Aerosp. Sci., 2, Camb. Sci. Publ., Cambridge, (2008), 235-253
33. A discrete Perron-Ta Li type theorem for the dichotomy of evolution operators, *Journal of Mathematical Analysis and Applications*, vol. 332, no. 1, (2007), 727-734.
34. Admissibility and non-uniform dichotomy for differential systems, (with Sever S. Dragomir), *Differential equations and applications*, Vol. 5, Nova Sci. Publ., New York, (2007), 113-119.
35. A generalized solution of the Black-Scholes partial differential equation, (with C. Chilarescu and A. Pogan), *Differential equations and applications*, Vol. 5, Nova Sci. Publ., New York, (2007), 29-37.
36. On the remainder estimate in the generalised Taylor formula (with Sever S. Dragomir), *Inequality theory and applications*, Vol. 4, Nova Sci. Publ., New York, (2007), 65-69.
37. Input-output techniques for the stability of evolution families on the half-line. *Rendiconti di Matematica e delle sue Applicazioni, Serie VII*, 27, no. 1, (2007), 89-100.
38. An operatorial approach of Black-Scholes partial differential equation, (with C. Chilarescu and A. Pogan), *Nonlinear Studies*, 13, no. 4, (2006), 321-326.
39. A Lyapunov-type equation for exponential stability of evolution families, (with C. Chilarescu and A. Pogan), *Ital. J. Pure Appl. Math.*, No. 20, (2006), 97-102.
40. A note on the unstable solutions of a class of difference equations, *Nonlinear Studies*, 13, no. 2, (2006), 103-112.
41. Schaffer spaces and exponential dichotomy for evolutionary processes, (with A. Pogan and P. Preda), *Journal of Differential Equations*, vol. 230, no.1., 2006, 378-391.
42. On the uniform exponential stability of linear skew-product semiflow, *Journal of Function Spaces and Applications*, vol. 4, no. 2, (2006), 145-161.
43. On the uniform exponential stability of evolution families in terms of the admissibility of an Orlicz sequence space, (with Sever. S. Dragomir and C. Chilarescu), *J. Concr. Appl. Math.*, 4, no. 3, (2006), 253-265.
44. Individual stability for evolutionary processes, (with A. Pogan and P. Preda), *Dynamics of Continuous, Discrete and Impulsive Systems, series A: Mathematical Analysis*, vol. 13, no. 5, (2006), 525-536.
45. Functionals on function and sequence spaces connected with the exponential stability of evolutionary processes, (with A. Pogan and P. Preda), *Czechoslovak Mathematical Journal*, 56, (131), 2006, 425-435.
46. Schaffer spaces and uniform exponential stability of linear skew-product semiflows, (with A. Pogan and P. Preda), *Journal of Differential Equations*, vol. 212, no. 1, (2005), 191-207.
47. Discrete admissibility and exponential dichotomy for evolution families, (with A. Pogan and P. Preda), *Dynamics of Continuous, Discrete and Impulsive Systems, serie A: Mathematical Analysis*, vol. 12, no. 5, (2005), 621-633.
48. An operatorial approach of Black-Scholes partial differential equation, (with C. Chilarescu and A. Pogan), *Fifth International Conference on Mathematical Problems in Engineering and Aerospace Sciences*, Camb. Sci. Publ., Cambridge, (2005), 215-220.

49. Functionals on sequence spaces connected with the exponential stability of evolutionary processes, (with A. Pogan and P. Preda), *Acta Math. Univ. Comenian.* (N.S.), 74, no. 2, (2005), 211-218.
50. A discrete Lyapunov theorem for the exponential stability of evolution families, (with A. Pogan and P. Preda), *New York J. Math.*, 11, (2005), 457-463.
51. A characterization of the exponential stability of evolutionary processes in terms of the admissibility of Orlicz spaces, (with C. Chilarescu and A. Pogan), *Rend. Sem. Mat. Univ. Politec. Torino*, 63, no. 2, (2005), 169-178.
52. Some Landau type inequalities for functions whose derivatives are Hölder continuous, (with Sever S. Dragomir), *Nonlinear Anal. Forum*, 9, no. 1, (2004), 25-31.
53. On the connection between the exponential stability of  $C_0$ -semigroups and the admissibility of a certain Sobolev space, (with C. Chilarescu and A. Pogan), *Systems Control Letters*, vol. 53, 3-4, (2004), 299-302.
54. On (a,b)-Dichotomy for evolutionary processes on a half-line, (with A. Pogan and P. Preda), *Glasgow Math. J.*, 46, (2004), 217-225.
55. The Perron problem for  $C$ -semigroups, (with A. Pogan and P. Preda), *Math. J. Okayama Univ.*, 46, (2004), 141-151.
56.  $(L^p, L^q)$ -Admissibility and Exponential Dichotomy of Evolutionary Processes on the Half-line, (with A. Pogan and P. Preda), *Integral Equations and Operator Theory*, vol. 49, no.3, 2004, 405-418.
57. Admissibility and exponential dichotomy of evolutionary processes on half-line, (with A. Pogan and P. Preda), *Rend. Sem. Mat. Univ. Politec. Torino*, 61, no. 4, (2004), 461-473.
58. On nonuniform exponential dichotomy for evolutionary processes, (with P. Preda), *Ricerche Mat.*, 52, no. 2, (2004), 203-216.
59. Discrete characterizations of exponential dichotomy for evolution families, (with A. Pogan and P. Preda), *Irish Math. Soc. Bull.*, No. 52 (2003), 19-30.
60. On the Perron problem for the exponential dichotomy of  $C_0$ -semigroups, (with A. Pogan and P. Preda), *Acta Math. Univ. Comenian.*, (N.S.), 72, no. 2, (2003), 207-212.
61. A class of exponentially stable semigroups on Banach spaces, (with C. Buse, G. Cainiceanu), *Int. J. Differ. Equ. Appl.*, 7, no. 1, (2003), 41-46.
62. On uniform and nonuniform exponential stability for evolutionary processes, (with D. R. Latcu and P. Preda), *An. Univ. Timisoara Ser. Mat.-Inform.*, 40, no. 2, (2002), 127-140.
63. Exponential stability for solutions of linear differential equations with periodic coefficients, (with C. Buse and O. Jitianu), *Int. J. Differ. Equ. Appl.*, 5, no. 1, (2002), 45-54.

#### WORK IN PROGRESS

1. Superstability and finite time extinction for  $C_0$ -semigroups (with D. Creutz and M. Mazo).
2. On the dichotomy of evolution families on the half-line: a Lyapunov-type approach (with Robert Sacker).
3. Ergodic theorems for the large-time behavior of the solutions of nonautonomous systems (with Razvan O. Mosincat and P. Preda).
4. Discrete-time theorems for global and pointwise continuous-time dichotomies with no unstable invariant manifolds. The case of variational equations (with Razvan O. Mosincat and P. Preda).

5. On the roughness of quasinilpotency property of one-parameter semigroups (with Razvan O. Mosincat).
6. On the exponential decay of an orbit of a vector under  $C_0$ -semigroups (with Razvan O. Mosincat).
7. Relatively bounded perturbations of generators of  $C_0$ -semigroups and uniform exponential stability (with Razvan O. Mosincat).

#### CONFERENCES TALKS

1. A discrete-time approach for the asymptotic behaviour of one-parameter semigroups, *Advances in Mathematical Problems in Engineering Aerospace and Sciences* (ed S. Sivasundaram), Cambridge Scientific Publishers, 2008, 235-242.
2. "Theorems of Perron type for the exponential dichotomy of evolution equations", Horizons in Infinite Dimensional Deterministic and Stochastic Systems with Applications to Engineering, Workshop in honor of Professor A.V. Balakrishnan, UCLA, Los Angeles, U.S.A., January 30-31, 2009.
3. "Discrete-time criterions for asymptotic behavior of semilinear systems", The 1st Workshop on Knowledge and Computing Technology, 16-19 September, 2010, Orsova, Romania
4. "Some remarks on the asymptotic behavior of the solutions of semilinear evolution equations", The 23rd International Conference on Operator Theory, 29 June – 4 July, 2010, Timisoara, Romania.
5. On the asymptotic behaviour of the solutions of a class of semilinear evolution equations (with Bogdan Dima and Marilen Pirtea), Recent advances in Applied Mathematics, Proceedings of the American Conference on Applied Mathematics, Harvard University, Cambridge, USA, January 27-29, 2010.
6. Remarks on the time-scale invariance property on the financial markets (with Bogdan Dima and Marilen Pirtea), Annals of DAAAM for 2009 & Proceedings of the 20th DAAAM symposium "Intelligent Manufacturing and Automation: Focus on theory, practice and education", 25-28 November, 2009, Vienna, Austria.
7. The Tenth Riviere-Fabes Symposium on Analysis and PDE, University of Minnesota, Minneapolis, U.S.A, 20-22 April, 2007.
8. "Convolution/Evolution Equations - Representation Theory", 23rd IFIP (International Federation for Information Processing) TC 7 Conference on System Modelling and Optimization, Cracow, Poland, 23-27 July, 2007.
9. The Tenth Riviere-Fabes Symposium on Analysis and PDE, University of Minnesota, Minneapolis, U.S.A, 20-22 April, 2007.
10. "Input output conditions for the stability of evolution families" , ICNPAA Mathematical Problems in Engineering and Aerospace Sciences , Budapest, Hungary, 21-23 June, 2006.
11. "A characterization for the exponential stability of linear skew-product semiflows", Control Methods in PDE-Dynamical Systems, AMS-IMS-SIAM Joint Summer Research Conferences, Snowbird, Utah, U.S.A., 3- 7 July, 2005.
12. "On the asymptotic behaviour of nonlinear evolution operators", Analytical and Stochastic Fluid Dynamics, Mathematical Science Research Insitute, Berkeley, U.S.A, 10-14 October 2005.
13. An operatorial approach of the Black-Scholes partial differential equation, ICNPAA Mathematical Problems in Engineering and Aerospace Sciences , Timisoara, 2-5 June 2004.
14. "On the exponential stability of nonlinear evolution operators", ICNPAA Mathematical Problems in Engineering and Aerospace Sciences, Timisoara, 2-4 June 2004.

15. "Some characterizations for the exponential stability of linear skew-product semiflows", 20th International Conference on Operator Theory, Timisoara, June 30th - July 5th, 2004.
16. "A characterization of the exponential stability of evolutionary processes in terms of the admissibility of an Orlicz space", Pannonian Applied Mathematical Meetings, Balatonalmadi, Hungary, May 2004.
17. An operatorial approach of the Black-Scholes partial differential equation (I) (with C. Chilarescu and A. Pogan), Proceedings of the Fifth International Conference on Mathematical Problems in Engineering and Aerospace Sciences, Ed: S. Sivasundaram, Cambridge Scientific Publishers, 2004, 215-220.
18. On a stochastic differential equation of Ito-type and its applications to the option pricing, *Proc. of the 6-th Int. Conf. of Economics Informatics*, Bucharest, 2003, 617-621.
19. On the geometry of Black-Scholes partial differential equations, *Proc. of the 13-th Int. Symp.*, Brasov, 2003, 204-210.
20. "Linear differential delay equation applied to portofolio theory", 7-th Int. Congress on insurance: Mathematics and Economics, Lyon 25-27 June, France, 2003.
21. "Some spectral characterizations for the behaviour of the solutions of the Black-Scholes partial differential equations", 7-th Int. Congress on insurance: Mathematics and Economics, Lyon 25-27 June, France, 2003.
22. "The geometry of the Black-Scholes Equation", AMAM 2003, 10-13 february, Nice, France 2003.
23. "Discrete characterizations for exponential stability of evolution families", Pannonian Applied Mathematical Meetings, Balatonalmadi, Ungaria, May 2003.
24. "Perron conditions and their connections with spectral mapping theorems for evolution semigroups and applications in integral inequality", Thirteen international colloquium on differential equations, Plovdiv, Bulgaria, 18-23 Aug., 2002.
25. "The exponential stability of the solutions of linear differential equations with periodic coefficients", International conference on Mathematical Analysis and Applications Craiova, 2-3 november 2001.
26. "An operator Lyapunov equation for the exponential dichotomy of  $C_0$ -semigroups", International conference on Mathematical Analysis and Applications Craiova, 2-3 november 2001.

#### SEMINAR TALKS

1. "Stability and admissibility for  $C_0$ -semigroups", one-hour invited talk, Department of Mathematics of State University of Washington, Pullman, U.S.A., 30 March, 2007.
2. "On the connection between the exponential stability of  $C_0$  semigroups and the admissibility of certain Sobolev space", Department of Mathematics of University of Southern California, Los Angeles, February 2005.

#### BOOKS

1. Mathematics for economists, (with M. Neamtu and E. Topuzu), Mirton Publishing House, Timisoara, 2009, ISBN 978-973-52-0722-9 (in romanian).
2. On the asymptotic behavior of evolution families, (with P. Preda), Mirton Publishing House, Timisoara, 2007, ISBN (10) 973-52-0057-0; (13) 978-973-52-0057-2 (in romanian).



3. On the stability and dichotomy of evolution families, (with P. Preda), Mirton Publishing House, Timisoara, 2005, ISBN 973-661-716-5 (in romanian).
4. Integral Calculus, (with P. Preda and A. Craciunescu), Mirton Publishing House, Timisoara 2007, ISBN 978-973-52-0230-9, (in romanian).
5. Econometry, (with C. Sipos), Mirton, Timisoara, 2006, ISBN (10) 973-661-941-9; (13) 978-973-661-941-0 (in romanian).
6. Differential Calculus, (with P. Preda and A. Craciunescu), Mirton Publishing House, Timisoara 2005, ISBN 973-661-719-X, (in romanian).
7. Statistics for economists (with Ciprian Sipos), Mirton Publishing House, Timisoara, 2004, ISBN 973-661-439-5, (in romanian).
8. Real Analysis, (with P. Preda and A. Pogan), Mirton Publishing House, Timisoara, 2003, ISBN 978-661-189-2, (in romanian).
9. Probability and Statistics (with C. Chilarescu, O. Ciorica, C. Sipos, N. Surulescu), West University of Timisoara Publishing House, Timisoara, 2002, ISBN 973-85553-3-7, (in romanian).

#### AFFILIATION

1. Member in the Editorial Board of *Australian Journal of Mathematical Analysis and Applications* (starting with March 2009).
2. Member in the Editorial Board of *Journal of Knowledge, Communications and Computing Technologies*.
3. Reviewer for Mathematical Reviews.
4. Referee for *International Journal of Evolution Equations, Journal of Difference Equations and Applications, Journal of Mathematical Analysis and Applications, Chaos, Solitons and Fractals, Physics Letters, Systems and Control Letters, Applied Mathematics Letters, Nonlinear Analysis, Applicable Analysis, Journal of Inequalities and Applications, Journal of Differential Equations, International Journal of Mathematics and Mathematical Sciences, Integral Equations and Operator Theory, Advances in Difference Equations*

#### GRANTS

1. NSF Grant : *Mathematical Theory of Aeroelasticity*, Award ID: 0400730, principal investigator: A. V. Balakrishnan.
2. CNCSIS Grant : *The study geometrical models for some dynamical systems arising in physics and economics, by numerical, geometrical and probability methods*, CNCSIS code 757/2002, principal investigator: Mircea Puta.
3. CNCSIS Grant : *The study geometrical models for some dynamical systems arising in physics and economics, by numerical, geometrical and probability methods*, CNCSIS code 253/2003, principal investigator: Mircea Puta.
4. CNCSIS Grant : *A qualitative study for some dynamical systems described by differential equations in finite and infinite-dimensional spaces with concrete applications*, (contract number 33960), CNCSIS code 250/2003, principal investigator: Stefan Balint.