

Relatório Técnico

Instituto Nacional de Ciência e Tecnologia de Matemática – INCTMat Sistemas Dinâmicos

Coordenadores: Artur Lopes, Marcio Soares, Welington de Melo
Período – 2009

Publicações

1. Avila, Artur; Kahn, Jeremy; Lyubich, Mikhail; Shen, Weixiao Combinatorial rigidity for unicritical polynomials. *Ann. of Math. (2)* 170 (2009), no. 2, 783--797.
2. Avila, Artur; Jitomirskaya, Svetlana The Ten Martini Problem. *Ann. of Math. (2)* 170 (2009), no. 1, 303--342.
3. Avila, Artur On the spectrum and Lyapunov exponent of limit periodic Schrödinger operators. *Comm. Math. Phys.* 288 (2009), no. 3, 907--918.
4. Krikorian, Raphaël Artur Avila reçoit le prix de la Société Européenne de Mathématiques pour ses travaux en systèmes dynamiques. (French) [Artur Avila, recipient of the Société Européenne de Mathématiques Prize for his work on dynamical systems] *Gaz. Math.* No. 119 (2009), 69--72.
5. Avila, Artur; Bochi, Jairo; Damanik, David Cantor spectrum for Schrödinger operators with potentials arising from generalized skew-shifts. *Duke Math. J.* 146 (2009), no. 2, 253--280.
6. Camacho, C.; Scárdua, B. Nondicritical \mathbb{C}^* -actions on two-dimensional Stein manifolds. *Manuscripta Math.* 129 (2009), no. 1, 91--98.
7. Camacho, C.; Movasati, H.; Scárdua, B. The moduli of quasi-homogeneous Stein surface singularities. *J. Geom. Anal.* 19 (2009), no. 2, 244--260.
8. Camacho, César; Scárdua, Bruno Actions of the groups \mathbb{C}^* and \mathbb{C}^{ast} on Stein varieties. *Geom. Dedicata* 139 (2009), 5--14.
9. Linares, Felipe; Matheus, Carlos Well posedness for the 1D Zakharov-Rubenchik system. *Adv. Differential Equations* 14 (2009), no. 3-4, 261--288.
10. Corcho, Adán J.; Matheus, Carlos Sharp bilinear estimates and well posedness for the 1-D Schrödinger-Debye system. *Differential Integral Equations* 22 (2009), no. 3-4, 357--391.
11. Angulo, Jaime; Matheus, Carlos; Pilod, Didier Global well-posedness and non-linear stability of periodic traveling waves for a Schrödinger-Benjamin-Ono system. *Commun. Pure Appl. Anal.* 8 (2009), no. 3, 815--844.
12. Chandramouli, V. V. M. S.; Martens, M.; de Melo, W.; Tresser, C. P. Chaotic period doubling. *Ergodic Theory Dynam. Systems* 29 (2009), no. 2, 381--418.
13. Moreira, Carlos Gustavo; Ruas, Maria Aparecida Soares The curve selection lemma and the Morse-Sard theorem. *Manuscripta Math.* 129 (2009), no. 3, 401--408.

14. Gavrilov, L.; Movasati, H.; Nakai, I. On the non-persistence of Hamiltonian identity cycles. *J. Differential Equations* 246 (2009), no. 7, 2706--2723.
15. Palis, Jacob; Yoccoz, Jean-Christophe Non-uniformly hyperbolic horseshoes arising from bifurcations of Poincaré heteroclinic cycles. *Publ. Math. Inst. Hautes Études Sci.* No. 110 (2009), 1--217.
16. Pujals, Enrique R.; Sambarino, Martín Density of hyperbolicity and tangencies in sectional dissipative regions. *Ann. Inst. H. Poincaré Anal. Non Linéaire* 26 (2009), no. 5, 1971--2000.
17. Pujals, Enrique R.; Sambarino, Martín On the dynamics of dominated splitting. *Ann. of Math. (2)* 169 (2009), no. 3, 675--739. Araujo, V.; Pacifico, M. J.; Pujals, E. R.; Viana, M. Singular-hyperbolic attractors are chaotic. *Trans. Amer. Math. Soc.* 361 (2009), no. 5, 2431--2485.
18. Pacifico, M. J.; Pujals, E. R.; Sambarino, M.; Vieitez, J. L. Robustly expansive codimension-one homoclinic classes are hyperbolic. *Ergodic Theory Dynam. Systems* 29 (2009), no. 1, 179--200.
19. Araújo, Vítor; Luzzatto, Stefano; Viana, Marcelo Invariant measures for interval maps with critical points and singularities. *Adv. Math.* 221 (2009), no. 5, 1428--1444.
20. Araujo, V.; Pacifico, M. J.; Pujals, E. R.; Viana, M. Singular-hyperbolic attractors are chaotic. *Trans. Amer. Math. Soc.* 361 (2009), no. 5, 2431--2485.
21. Bochi, Jairo; Gourmelon, Nicolas Some characterizations of domination. *Math. Z.* 263 (2009), no. 1, 221--231.
22. Bochi, Jairo; Gourmelon, Nicolas Erratum: Some characterizations of domination [Math Z. **263** (2009), no. 1, 221--231]. *Math. Z.* 262 (2009), no. 3, 713.
23. Díaz, Lorenzo J.; Gorodetski, Anton Non-hyperbolic ergodic measures for non-hyperbolic homoclinic classes. *Ergodic Theory Dynam. Systems* 29 (2009), no. 5, 1479--1513.
24. Díaz, L. J.; Horita, V.; Rios, I.; Sambarino, M. Destroying horseshoes via heterodimensional cycles: generating bifurcations inside homoclinic classes. *Ergodic Theory Dynam. Systems* 29 (2009), no. 2, 433--474.
25. Burghlea, Dan; Saldanha, Nicolau C.; Tomei, Carlos The geometry of the critical set of nonlinear periodic Sturm-Liouville operators. *J. Differential Equations* 246 (2009), no. 8, 3380--3397.
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27. Araújo, Vítor; Pacifico, Maria José Physical measures for infinite-modal maps. *Fund. Math.* 203 (2009), no. 3, 211--262.
28. Arbieto, A.; Morales, C. A λ -lemma for foliations. *Topology Appl.* 156 (2009), no. 8, 1491--1495.

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32. Scárdua, Bruno; Seade, José Codimension one foliations with Bott-Morse singularities. I. *J. Differential Geom.* 83 (2009), no. 1, 189--212.
33. Ito, Toshikazu; Scárdua, Bruno Holomorphic foliations transverse to manifolds with corners. *Discrete Contin. Dyn. Syst.* 25 (2009), no. 2, 537--544.
34. Câmara, Leonardo; Scárdua, Bruno On the integrability of holomorphic vector fields. *Discrete Contin. Dyn. Syst.* 25 (2009), no. 2, 481--493.
35. "Negative Entropy, Pressure and Zero temperature: a L.D.P. for stationary Markov Chains on $[0^*; 1^*]$ " A. Lopes, J. Mohr, R. R. Souza Ph. Thieullen, *Bull. Soc. Bras. Math.* Vol 40 n 1, (2009), 1-52
36. "Entropy and Variational principles for holonomic probabilities of IFS A, Lopes e Elismar Oliveira, *Discrete and Continuous Dynamic* *Systems* Vol 23, N 3, 937-955 (2009) Series A
37. "KMS States, Entropy and a Variational Principle for Pressure", trabalho . G. Castro and A. Lopes, *Real Analysis Exchange*, v. 34, p. 333-346, 2009
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49. Gutierrez, Carlos; Lloyd, Simon; Medvedev, Vladislav; Pires, Benito; Zhuzhoma, Evgeny Transitive circle exchange transformations with flips. *Discrete Contin. Dyn. Syst.* 26 (2010), no. 1, 251--263.
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51. Demuner, D. P.; Federson, M.; Gutierrez, C. The Poincaré-Bendixson theorem on the Klein bottle for continuous vector fields. *Discrete Contin. Dyn. Syst.* 25 (2009), no. 2, 495--509.
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53. Gutierrez, C.; Lloyd, S.; Pires, B. Affine interval exchange transformations with flips and wandering intervals. *Proc. Amer. Math. Soc.* 137 (2009), no. 4, 1439--1445.
54. Baladi, Viviane; Smiana, Daniel Analyticity of the SRB measure for holomorphic families of quadratic-like Collet-Eckmann maps. *Proc. Amer. Math. Soc.* 137 (2009), no. 4, 1431--1437.
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59. Llibre, Jaume; Teixeira, Marco Antonio Limit cycles bifurcating from a two-dimensional isochronous cylinder. *Appl. Math. Lett.* 22 (2009), no. 8, 1231--1234.
60. Llibre, Jaume; da Silva, Paulo R.; Teixeira, Marco A. Study of singularities in nonsmooth dynamical systems via singular perturbation. *SIAM J. Appl. Dyn. Syst.* 8 (2009), no. 1, 508--526.
61. Kocsard, Alejandro Cohomologically rigid vector fields: the Katok conjecture in dimension 3. *Ann. Inst. H. Poincaré Anal. Non Linéaire* 26 (2009), no. 4, 1165--1182.
62. Kocsard, Alejandro; Koropecki, Andrés A mixing-like property and inexistence of invariant foliations for minimal diffeomorphisms of the 2-torus. *Proc. Amer. Math. Soc.* 137 (2009), no. 10, 3379--3386.
63. Licanic, Sergio On boundedness of families of holomorphic foliations. *Internat. J. Math.* 20 (2009), no. 1, 15--43.
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65. Mello, Luis Fernando; Chaves, Felipe Emanuel; Fernandes, Antonio Carlos; Garcia, Braulio Augusto Stacked central configurations for the spatial six-body problem. *J. Geom. Phys.* 59 (2009), no. 9, 1216--1226.
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68. Mello, Luis Fernando; Coelho, Sinval Ferreira Degenerate Hopf bifurcations in the Lü system. *Phys. Lett. A* 373 (2009), no. 12-13, 1116--1120.
69. Llibre, Jaume; Mello, Luis Fernando New central configurations for the planar 7-body problem. *Nonlinear Anal. Real World Appl.* 10 (2009), no. 4, 2246--2255.
70. Llibre, Jaume; Pessoa, Claudio On the centers of the weight-homogeneous polynomial vector fields on the plane. *J. Math. Anal. Appl.* 359 (2009), no. 2, 722--730.
71. Pessoa, Claudio; Sotomayor, Jorge Bifurcations in a class of polycycles involving two saddle-nodes on a Möbius band. *Qual. Theory Dyn. Syst.* 7 (2009), no. 2, 317--338.
72. Lopes, A. O.; Mohr, J.; Souza, R. R.; Thieullen, Ph. Negative entropy, zero temperature and Markov chains on the interval. (English summary) *Bull. Braz. Math. Soc. (N.S.)* 40 (2009), no. 1, 1--52.

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Março 2010 em diante

Jorge Vitório Pereira

Formação de Recursos Humanos

1 Aluno de mestrado(cursando):

Diego Rodríguez Guzmán;

2 Alunos de doutorado (concluído):

- **Thiago Fassarella.** Tese: Sobre a aplicação de Gauss de Folheações Holomorfas em Espaços Projetivos
- **Hernán Maycol Falla Luza.** Tese: Global geometry of second order differential equations

1 Aluno de doutorado (cursando):

- Renan Edgard Pereira de Lima

Trabalhos Publicados

Artigos publicados

[1] Classification des tissus exceptionnels quasilinéaires complètement décomposables
Jorge Vitório Pereira e Luc Pirio
Comptes Rendus. Mathématique, v. 346, p. 1093-1098, 2008.

[2] The classification of exceptional CDQL webs on compact complex surfaces
Jorge Vitório Pereira e Luc Pirio
International Mathematics Research Notices (2010) Vol. 12, p. 2169-2282

[3] Stability of foliations induced by rational maps
Fernando Cukierman, Jorge Vitório Pereira e Israel Vainsencher
Ann. Fac. Sci. Toulouse Math. (6) 18 (2009),no. 4,685—715.

[4] Rigidity of Fibrations
Jorge Vitório Pereira e Paulo Sad
[Astérisque No. 323 \(2009\)](#), 291--299.

[5] Germs of integrable forms and varieties of minimal degree
Jorge Vitório Pereira e Carlo Perrone
[Bull. Sci. Math. 134 \(2010\), no. 1](#), 1--11.

Livro Publicado

[6] An invitation to web geometry. From Abel's addition theorem to the algebraization of codimension one webs.
Jorge Vitório Pereira e Luc Pirio
[Publicações Matemáticas do IMPA](#). 27o Colóquio Brasileiro de Matemática.
IMPA, Rio de Janeiro,2009. xii+245 pp.

Artigos aceitos para publicação

[7] [Foliations invariant by rational maps.](#)
Charles Favre e Jorge Vitório Pereira
[Mathematische Zeitschrift](#)

[8] [The characteristic variety of a generic foliation.](#)
Jorge Vitório Pereira
Journal of the European Mathematical Society

Márcio Gomes Soares

Formação de Recursos Humanos

2 Alunos de doutorado (concluído):

- Maurício Correa Jr. . Tese: Integrabilidade algébrica de folheações e o problema de Poincaré
- Luis Guillermo Maza. Tese: Sobre distribuições e folheações holomorfas de codimensão maior do que um.

1 Aluno de doutorado (cursando):

- Marianna Ravara Vago.

Trabalhos

Artigos publicados e/ou aceitos e/ou submetidos

1. Márcio G. Soares, Singularities of logarithmic foliations and connectedness of the union of logarithmic components, *Astérisque* 323 (2009) 431-439.
2. M. Correa Jr. e M. G. Soares, Counting hypersurfaces invariant by one-dimensional complex foliations, aceito, *London Math. Soc Lecture Notes Series*.
3. M. Correa Jr. e M. G. Soares, A note on Poincaré's problem for quasi-homogeneous foliations, *Proc. AMS*.
4. M. Correa Jr. e M. G. Soares, A Poincaré type inequality for multiprojective foliations, *Bull. Braz. Math. Soc.*

Alcides Lins Neto

Formação de Recursos Humanos

2 Alunos de doutorado (concluído):

- Liliana Puchuri Medina. Tese: Famílias lineares de folheações com curvatura zero numa superfície.
- Arturo Ulises Fernandez Perez. Tese: Singular Levi-flat hypersurfaces – an approach through holomorphic foliations.

Trabalhos

Artigos publicados e/ou aceitos e/ou submetidos

1. D. Cerveau, A. Lins Neto, A structural theorem for codimension one foliations on P^n , $n \geq 3$, with an application to degree three foliations, *Annals of Math.*
2. A. Lins Neto, Fibers of the Baum-Bott map for foliations of degree two in P^{2n} , *Compositio Mathematica*.
3. D. Cerveau, A. Lins Neto, Local Levi-flat hypersurfaces invariant by a codimension one holomorphic foliation, aceito, *Amer. J. of Maths*.

4. A. Lins Neto, Homogeneous commuting vector fields on C^{2n} , *Asterisque* 323 (2009), 181-195.
5. A. Lins Neto, Polynomial differential equations with many real ovals in the same complex solution, *Publications Mathematiques*.

Hossein Movasati

Formação de Recursos Humanos

Alunos de doutorado (andamento):

1. ALAN GERARDO REYES FIGUEROA
2. Younes Nikdelan
3. JOACIR LUCAS DE OLIVEIRA

Trabalhos

Artigos publicados e/ou aceitos e/ou submetidos

1. MOVASATI, Hossein ; Stefan Reiter . Painlevé VI equations with algebraic solutions and families of curves. *Experimental Mathematics* ^{JCR}, v. 19, p. 161-173, 2010.
2. MOVASATI, Hossein ; CAMACHO, C. ; Bruno Scardua . The moduli of quasi-homogeneous Stein surface singularities. *The Journal of Geometric Analysis* ^{JCR}, v. 19, p. 244-260, 2009.
3. MOVASATI, Hossein ; GAVRILOV, L. ; NAKAI, I. . On the non-persistence of Hamiltonian identity cycle. *Journal of Differential Equations* ^{JCR}, v. 246, p. 2706-2723, 2009
4. MOVASATI, Hossein ; E. Vieira . Projective limit cycles. *Moscow Mathematical Journal (Online)* ^{JCR}, v. 9, p. 855-866, 2009.

Israel Vainsencher

Formação de Recursos Humanos

Doutorados concluídos

1 - Viviana Ferrer Cuadrado.

Enumerative aspects of holomorphic foliations. 2010. Universidade Federal de Minas Gerais. 02/02/2010

2 - José Alberto Duarte Maia

Geometria Enumerativa de Variedades projetivas Contendo Retas - 19/03/2010

Mestrado orientado

Roney Rachide Nunes,

Sistemas dinâmicos discretos lineares - 04/02/2010

Trabalhos

Artigo publicado

CUKIERMAN, F. ; PEREIRA, J. V. ; Vainsencher, I. . Stability of foliations induced by rational maps. *Annales de la Faculté des Sciences de Toulouse*, v. XVIII, p. 685-715, 2009.

Artigo aceito

Ferrer, Viviana ; Vainsencher, I. . Degenerate singularities of one dimensional foliations. *Commentarii Mathematici Helvetici*.

Livro publicado

1. Ferrer, Viviana ; Vainsencher, I. . *Enumerative Aspects of Holomorphic Foliations*. 1. ed. Lima: IMCA (Instituto de matemática y Ciencias Afines), 2010. v. 1. 77 p.

Rogério Mol

Formação de recursos humanos:

Orientação de mestrado:

- Magali Aparecida Medeiros Dias. *O Problema de Poincaré para Folheações Holomorfas em P^2* . (Concluída em 2010)

Orientação de Doutorado:

- Gilberto Duarte Cuzzuol. Problema de tese: Modelos primitivos de folheações. Previsão de conclusão: junho de 2011.

Trabalhos publicados:

Artigos aceitos para publicação:

- Rogério S. Mol. *The polar curve of a foliation on P^2* . A ser publicado nos *Annales de la faculté de Sciences de Toulouse*.
- Rogério S. Mol. *Flags of holomorphic foliations*. A ser publicado nos *Anais da Academia Brasileira de Ciências*.

Artigos submetidos a publicação:

- Gilberto D. Cuzzuol & R. Mol. *Foliations on P^2 admitting a primitive model*.
- R. Mol. *Sobre feixes lineares de folheações em P^n* .

Livro publicado:

- R. Mol. *Curvas analíticas planas y el método de Newton-Puiseux*. Lima, Sociedad Matemática Peruana, 2010.

Bruno Scárdua

Trabalhos

1. ITO, Toshikazu ; Scardua, Bruno . A NON-EXISTENCE THEOREM FOR MORSE TYPE HOLOMORPHIC FOLIATIONS OF CODIMENSION ONE TRANSVERSE TO SPHERES. *International Journal of Mathematics*^{JCR}, v. 21, p. 435-452, 2010.
2. ITO, T. ; Scardua, B. ; YAMAGISHI, Y. . Transversality of complex linear distributions with spheres, contact forms and Morse type foliations. *Journal of Geometry and Physics*^{JCR}, v. 60, p. 1370-1380, 2010.
3. Santos, Fabio ; Scárdua, Bruno . Construction of vector fields and Riccati foliations associated to groups of projective automorphisms. *Conformal Geometry and Dynamics of the American Mathematical Society*^{JCR}, v. 14, p. 154-166, 2010.
4. SCÁRDUA, B. C. A. ; Seade, J. . Codimension one foliations with Bott-Morse singularities I. *Journal of Differential Geometry*^{JCR}, v. 83, p. 189-212, 2009.