

Curriculum Vitae

Name : Artur Avila Cordeiro de Melo.

Born : June 29, 1979 - Rio de Janeiro - RJ - Brazil.

Parents : Raimundo Nonato Cordeiro de Melo, Lenir Letiere de Avila Cordeiro de Melo.

Citizenship : Brazilian.

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Present position : Chargé de recherche de deuxième classe, CNRS UMR 7599 (10/2003-).

Past positions :

Maître de Conférence Associé au Collège de France (09/2001-08/2003).

Degrees

Bacharel em Matemática. Universidade Federal do Rio de Janeiro, 04/2001.

Mestre em Matemática. Instituto Nacional de Matemática Pura e Aplicada (IMPA), 04/2001.

Doutor em Ciências. Instituto Nacional de Matemática Pura e Aplicada (IMPA), 04/2001. (Doctorate in mathematics.)

Advisor : Wellington de Melo (IMPA).

Thesis : Bifurcations of unimodal maps : the topological and metric picture.

Committee : W. de Melo, M. Viana, J. Palis, J.-C. Yoccoz, J. Milnor.

Fellowships

Iniciação científica (CNPq), 08/1995-02/1997.

Mestrado (CNPq), 03/1997-02/1998.

Doutorado (CNPq), 03/1998-04/2000. (Doctorate.)

Doutorado 'Bolsa Nota Dez' (FAPERJ), 05/2000-04/2001. (Doctorate.)

Prizes and honors

Gold medal at the International Mathematical Olympiad. Canada, 1995.

Cours Peccot au Collège de France, 2005.

Participations in conferences as invited speaker

- (1) Meeting of the American Mathematical Society, Washington DC, 01/2000.
- (2) International Conference on Dynamical Systems, Porto, 05/2000.
- (3) International Conference on Dynamical Systems, Rio de Janeiro, 07/2000.
- (4) First Latin American Congress of Mathematics, Rio de Janeiro, 08/2000.
- (5) Special Session on Complex Dynamics and Ergodic Theory, Warwick, 01/2001.
- (6) Dynamical Odyssey, Luminy, 02/2001.
- (7) Recent Trends in Dynamics II, Porto, 05/2001.
- (8) School and Workshop on Dynamical Systems, Trieste, 08/2001.
- (9) Research Trimester on Dynamical Systems, Pisa, 04/2002.
- (10) Recent Trends in Dynamics III, Porto, 05/2002.
- (11) New Directions in Dynamical Systems (ICM satellite conference), Kyoto, 08/2002.
- (12) Dynamical methods in differential equations, Medina del Campo, 09/2002.

- (13) Congrès franco-brésilien en l'honneur d'Harold Rosenberg : Géométrie, feuilletages et systèmes dynamiques, Abbaye de La Bussière, 09/2002.
- (14) Real and Complex One-dimensional Dynamics, Warwick, 12/2002.
- (15) Geometría compleja y sistemas dinámicos (Alberto Fest), Cuernavaca, 01/2003.
- (16) Holomorphic Dynamics, Warwick, 04/2003.
- (17) Recent Trends in Dynamics 2003, Porto, 07/2003.
- (18) Dynamische Systeme, Oberwolfach, 07/2003.
- (19) Geometric Aspects of Dynamical Systems, Warwick, 07/2003.
- (20) Combinatorial Methods in Complex Dynamics, Warwick, 04/2004.
- (21) Multidimensional non-uniformly hyperbolic dynamical systems, CIRM, Luminy, 05/2004.
- (22) Dynamical Systems : from Algebraic to Topological Dynamics, MPIM, Bonn, 07/2004.
- (23) Premier congrès Canada-France des sciences mathématiques, Toulouse, 07/2004.
- (24) Summer School and Conference on Dynamical Systems, ICTP, Trieste, 07/2004.
- (25) Qmath 9, Giens, 09/2004.
- (26) Nonlinear Dynamics, Ergodic Theory and Renormalization, Lorentz center, Leiden, 09/2004.
- (27) Conformal Dynamics, Hyperbolic Geometry, and Continued Fractions, Luminy, 06/2005.
- (28) Colloquium in Dynamical Systems and Smooth Ergodic Theory, Bordeaux, 06/2005.
- (29) 25 Colóquio Brasileiro de Matemática (sessão de sistemas dinâmicos), Rio de Janeiro, 07/2005.
- (30) International Conference on Dynamical Systems, Angra dos Reis, 08/2005.
- (31) Renormalization in dynamical systems workshop, Fields institute, Toronto.
- (32) Partially hyperbolic dynamics, laminations, and Teichmüller flow Workshop, Fields institute, Toronto.

Short visits

- (1) State University of New York at Stony Brook, 04/1999.
- (2) State University of New York at Stony Brook, 01/2000-02/2000.
- (3) State University of New York at Stony Brook, 11/2000.
- (4) Royal Institute of Technology (KTH), Stockholm, 09/2001.
- (5) State University of New York at Stony Brook, 11/2001-12/2001.
- (6) University of Toronto, 01/2003-02/2003.
- (7) Caltech, 03/2004.
- (8) University of Toronto, 10/2004.
- (9) Scuola Normale Superiore, Pisa, 01/2005-02/2005.
- (10) IMPA, Rio de Janeiro, 08/2005.
- (11) Fields institute, Toronto, 12/2005.

Research papers

Published

- (1) On the dynamics of the renormalization operator.
A. Avila, M. Martens, W. de Melo. In "Global Analysis of Dynamical Systems : Festschrift dedicated to Floris Takens for his 60th birthday", Ed. H.Broer, B. Krauskopf, G. Vegter, Institute of Physics Publishing, Bristol and Philadelphia, 2001, pp. 449–460.

- (2) Bifurcations d'applications unimodales.
A. Avila. C. R. Acad. Sci. Paris, Ser. I 334 (2002), 483-488.
 - (3) Infinitesimal perturbations of rational maps.
A. Avila. Nonlinearity 15 (2002), 695-704.
 - (4) A formula with applications to the theory of Lyapunov exponents.
A. Avila, J. Bochi. Israel Journal of Mathematics 131 (2002), 125-137.
 - (5) Statistical properties of unimodal maps : smooth families with negative Schwarzian derivative.
A. Avila, C. G. Moreira. Astérisque 286 (2003), 81-118.
 - (6) Regular or stochastic dynamics in real analytic families of unimodal maps.
A. Avila, M. Lyubich, W. de Melo. Inventiones Mathematicae 154 (2003), 451-550.
 - (7) Robust transitivity and topological mixing for C^1 -flows.
F. Abdenur, A. Avila, J. Bochi. Proceedings of the AMS 132 (2004), 699-705.
 - (8) Bifurcations of unimodal maps.
A. Avila, C. G. Moreira. In Dynamical Systems. Part II : Topological Geometrical and Ergodic Properties of Dynamics. Pubblicazioni della Classe di Scienze, Scuola Normale Superiore, Pisa. Centro di Ricerca Matematica "Ennio De Giorgi" : Proceedings, 2003, pp. 1-22.
 - (9) Convergence of an exact quantization scheme.
A. Avila. Communications in Mathematical Physics 249 (2004), 305-318.
 - (10) Quasisymmetric robustness of the Collet-Eckmann condition in the quadratic family.
A. Avila, C. G. Moreira. Bulletin of the Brazilian Mathematical Society 35 (2004), 291-331.
 - (11) Siegel disks with smooth boundaries.
A. Avila, X. Buff, A. Chéritat. Acta Mathematica 193 (2004), 1-30.
 - (12) Statistical properties of unimodal maps : the quadratic family.
A. Avila, C. G. Moreira. Annals of Mathematics 161 (2005), 831-881.
 - (13) Statistical properties of unimodal maps : physical measures, periodic orbits and pathological laminations.
A. Avila, C. G. Moreira. Pub. Math. IHES 101 (2005), 1-67.
 - (14) Generic singular spectrum for ergodic Schrödinger operators.
A. Avila, D. Damanik.
Duke Mathematical Journal 130 (2005), 393-400.
 - (15) Phase-Parameter relation and sharp statistical properties for general families of unimodal maps.
A. Avila, C. G. Moreira. Contemporary Mathematics 389 (2005), 1-42.
 - (16) Dynamics in the moduli space of Abelian differentials.
A. Avila, M. Viana. Portugaliae Mathematica 62 (2005), 531-547.
 - (17) Smoothness of solenoidal attractors.
A. Avila, S. Göuezal, M. Tsujii. Discrete and Continuous Dynamical Systems 15 (2006), 21-35.
 - (18) Examples of Feigenbaum Julias sets with small Hausdorff dimension.
A. Avila, M. Lyubich. In "Dynamics on the Riemann Sphere. A Bodil Branner Festschrift", Ed. Poul G. Hjorth, Carsten Lunde Petersen, European Mathematical Society (EMS), Zürich, pp. 71-87, 2006.
- Accepted for publication**
- (19) Reducibility or non-uniform hyperbolicity for quasiperiodic Schrödinger cocycles.
A. Avila, R. Krikorian. To appear in : Annals of Mathematics.
Preprint (www.arXiv.org).

- (20) Weak mixing for interval exchange transformations and translation flows.
A. Avila, G. Forni. To appear in : *Annals of Mathematics*.
Preprint (www.arXiv.org).
- (21) Solving the ten martini problem.
A. Avila, S. Jitomirskaya. To appear in : *Lecture Notes in Physics 690 (2006)*.
Preprint (www.arXiv.org).

Submitted for publication

- (22) Hausdorff dimension and conformal measures of Feigenbaum Julia sets.
A. Avila, M. Lyubich. Preprint IMS Stony Brook 2004/5.
- (23) The ten martini problem.
A. Avila, S. Jitomirskaya. Preprint (www.arXiv.org).
- (24) Combinatorial rigidity for unicritical polynomials.
A. Avila, J. Kahn, M. Lyubich, W. Shen. Preprint IMS Stony Brook 2005/5.
- (25) Simplicity of Lyapunov spectra : proof of the Zorich-Kontsevich conjecture.
A. Avila, M. Viana. Preprint (<http://www.arXiv.org>).
- (26) Exponential mixing for the Teichmüller flow.
A. Avila, S. Gouëzel, J.-C. Yoccoz. Preprint (www.arXiv.org).
- (27) Absolute continuity of the integrated density of states for the almost Mathieu operator with non-critical coupling.
A. Avila, D. Damanik.

Preprints

- (28) Smooth Siegel disks via semicontinuity : a remark on a proof of Buff and Cheritat.
A. Avila. Preprint (www.arXiv.org).
- (29) Density of positive Lyapunov exponents for quasiperiodic $SL(2, \mathbb{R})$ cocycles in arbitrary dimension.
A. Avila. Preprint (<http://www.proba.jussieu.fr/pageperso/artur/>).
- (30) On rigidity of critical circle maps.
A. Avila. Preprint (<http://www.proba.jussieu.fr/pageperso/artur/>).