

# CURRICULUM VITAE

Marco Abate

## 1. General information

- August 29, 1962: date of birth, in Milano, Italy.
- June 13, 1985: undergraduate degree in Mathematics, received by the University of Pisa, with a grade of 110/110 *cum laude*; advisor Prof. E. Vesentini.
- July 1985: undergraduate degree in Mathematics of the Scuola Normale Superiore of Pisa.
- June 1986: Fellowship awarded by the Mathematics Committee of the Italian Consiglio Nazionale delle Ricerche.
- September 1986–December 1986: period spent visiting the University of Southern California, Los Angeles, supported by the previously mentioned fellowship.
- January 1987–June 1987: period spent visiting the University of California, Berkeley, supported by the previously mentioned fellowship.
- October 1987: Research fellowship awarded by the Istituto Nazionale di Alta Matematica Francesco Severi, to work at the Scuola Normale Superiore of Pisa, renewed for the academical year 1988/89.
- October 22, 1988: Ph.D. degree in Mathematics at the Scuola Normale Superiore of Pisa, advisors Proff. S. Kobayashi, E. Vesentini e J.-P. Vigué, with a grade of 70/70 *cum laude*.
- June 1, 1989–October 31, 1992: assistant professor in the Department of Mathematics of the University of Roma “Tor Vergata”, Italy.
- April 1990: period spent visiting the Washington University, St. Louis.
- April 1991: period spent visiting the Ruhr-Universität, Bochum.
- November 1, 1992–October 31, 1993: associate professor of Geometry in the Department of Mathematics of the University of Roma “Tor Vergata”.
- November 1, 1993–October 31, 1994: associate professor of Geometry in the Institute of Applied Mathematics of the University of Pisa.
- November 1, 1994–October 31, 1997: full professor of Geometry in the Department of Mathematics of the University of Ancona.
- March 1996–May 1996: period spent as Visiting Professor at the University of California, Berkeley.
- November 1, 1997–October 31, 2001: full professor of Geometry in the Department of Mathematics of the University of Roma “Tor Vergata”.
- Since November 1, 2001: full professor of Geometry in the Department of Mathematics of the University of Pisa.
- May 2008–June 2008: period spent at the *Institut Mittag-Leffler*, Stockholm, Sweden.

## 2. Organizational activities

- May 1999: organizer of the congress *Intensive week on holomorphic dynamics*, Scuola Normale Superiore, Pisa, May 10–14, 1999.
- October 1998–October 2002: leading scientist of the local unit at the University of Roma “Tor Vergata” of the MURST project of relevant national interest *Geometric properties of real and complex manifolds*.
- October 2002–October 2005: director of undergraduate studies in Mathematics, University of Pisa.
- February 2003–October 2006: leading scientist of the local unit at the University of Pisa of the FIRB project funded by the Italian MIUR *Dynamics and group actions on complex domains and manifolds*.
- June 2003: organizer of the congress *Dynamics in Italy*, Scuola Normale Superiore, Pisa, June 25–27, 2003.
- January 2006–December 2007: Principal investigator for the INdAM project *Local discrete dynamics in one, several, and infinitely many variables*.

- January 2007: organizer of the workshop *Local Holomorphic Dynamics*, Centro di Ricerca Matematica “Ennio de Giorgi”, January 22-26, 2007.
- June 2007: organizer of the special session on *Complex Analysis and Holomorphic Dynamics* in the congress *Joint Meeting UMI-DMV*, Università di Perugia, June 18–22, 2007.
- Since January 2008: member of the scientific council and of the executive committee of CIME.
- Since April 2008: national coordinator of the Italian degree courses in Mathematics.
- Since July 2009: member elected of the Scientific Committee of the Unione Matematica Italiana.
- Since July 2009: *associated editor* of the *Journal of Geometric Analysis*.
- Since November 2009: *editor* of the journal *Bollettino dell’Unione Matematica Italiana*.
- Since November 2010: head of the Department of Mathematics of the University of Pisa.
- Since January 2011: member of the Council of the Centro di Ricerca Matematica “Ennio de Giorgi”, Pisa.

### 3. Awards

- January 1986: award *Benedetto Sciarra* for the year 1985, awarded by the Scuola Normale Superiore.
- May 1989: award of the Fondazione Francesco Severi, Arezzo, for the year 1989.
- May 1991: award Giuseppe Bartolozzi 1989, awarded by the Unione Matematica Italiana.

### 4. Main research interests

- *Dynamical systems*: holomorphic dynamics on taut complex manifolds, local dynamics of holomorphic self-maps in several complex variables, general index theorems for holomorphic self-maps and foliations, meromorphic connections and homogeneous vector fields.
- *Geometric function theory*: boundary behavior of holomorphic maps, Lindelöf principles and Julia-Wolff-Carathéodory theorems in several complex variables, interplay between the geometrical properties of invariant metrics and analytic properties of holomorphic functions.
- *Complex differential geometry*: hermitian symmetric spaces, complex Finsler metrics, Finsler manifolds of constant holomorphic sectional curvature.

## PUBLICATIONS

Marco Abate

### 1. Research papers

- [1] *Automorphism groups of the classical domains, I.* Rend. Acc. Naz. Lincei **79** (1985), 25–30.
- [2] *Automorphism groups of the classical domains, II.* Rend. Acc. Naz. Lincei **79** (1985), 127–131.
- [3] *Boundary behavior of invariant distances and complex geodesics.* Rend. Acc. Naz. Lincei **80** (1986), 100–106.
- [4] *Orbit structure of the non-compact hermitian symmetric spaces.* Rend. Circ. Mat. Palermo **36** (1987), 241–280.
- [5] *Annular bundles.* Pac. J. Math. **134** (1988), 1–26.
- [6] *Horospheres and iterates of holomorphic maps.* Math. Z. **198** (1988), 225–238.
- [7] *Converging semigroups of holomorphic maps.* Rend. Acc. Naz. Lincei **82** (1988), 223–227.
- [9] *Common fixed points of commuting holomorphic maps.* Math. Ann. **283** (1989), 645–655.
- [12] *The Lindelöf principle and the angular derivative in strongly convex domains.* J. Anal. Math. **154** (1990), 189–228.
- [13] With J.-P. Vigué: *Common fixed points in hyperbolic Riemann surfaces and convex domains.* Proc. Am. Math. Soc. **112** (1991), 503–512.
- [14] *The infinitesimal generator of semigroups of holomorphic maps.* Ann. Mat. Pura Appl. **161** (1992), 167–180.
- [16] *Iteration theory, compactly divergent sequences and commuting holomorphic maps.* Ann. Scuola Norm. Sup. Pisa **18** (1991), 167–191.
- [17] *A characterization of hyperbolic manifolds.* Proc. Am. Math. Soc. **117** (1993), 789–793.
- [18] With G. Patrizio: *Uniqueness of complex geodesics and characterization of circular domains.* Man. Math. **74** (1992), 277–297.
- [20] With L. Geatti: *Cohomogeneity 2 hyperbolic acyclic Stein manifolds.* Int. J. Math. **3** (1992), 591–608.
- [21] With P. Heinzner: *Holomorphic actions on contractible domains without fixed points.* Math. Z. **211** (1992), 547–555.
- [23] With G. Patrizio: *Holomorphic curvature of Finsler metrics and complex geodesics.* J. Geom. Anal. **6** (1998), 341–364.
- [25] With G. Patrizio: *Complex Finsler metrics.* In **Geometry and analysis on complex manifolds**, edited by T. Mabuchi, J. Noguchi and T. Ochiai, World Scientific Publications, Singapore, 1994, pp. 1–38.
- [26] *Iteration of holomorphic families.* Rend. Ist. Mat. Trieste **26** (1994), 141–150.
- [28] With G. Patrizio: *Kähler Finsler metrics with constant holomorphic curvature.* Int. J. Math. **8** (1997), 169–186.
- [33] *When is a linear operator diagonalizable?.* Amer. Math. Monthly **104** (1997), 824–830.
- [34] *A characterization of the Chern and the Berwald connections.* Houston J. Math. **22** (1996), 701–717.
- [35] With G. Patrizio: *Isometries of the Teichmüller metric.* Ann. Sc. Norm. Sup. Pisa **26** (1998), 437–452.
- [36] *The Julia-Wolff-Carathéodory theorem in polydisks.* J. Analyse Math. **74** (1998), 275–306.
- [37] With R. Tauraso: *The Julia-Wolff-Carathéodory theorem(s).* Contemp. Math. **222** (1999), 161–172.
- [38] With G. Patrizio: *Convex-like properties of the Teichmüller metric.* Contemp. Math. **222** (1999), 149–159.
- [39] *Diagonalization of non-diagonalizable discrete holomorphic dynamical systems.* Amer. J. Math. **122** (2000), 757–781.

- [41] *The residual index and the dynamics of holomorphic maps tangent to the identity*. Duke Math. J. **107** (2001), 173–207.
- [42] *Basins of attraction in quadratic dynamical systems with a Jordan fixed point*. Nonlinear Anal. **51** (2002), 271–282.
- [44] With R. Tauraso: *The Lindelöf principle and angular derivatives in convex domains of finite type*. J. Austr. Math. Soc. **73** (2002), 221–250.
- [46] With F. Tovena: *Parabolic curves in  $\mathbf{C}^3$* . Abstr. Appl. Anal. **2003** (2003), 275–294.
- [48] With F. Bracci e F. Tovena: *Index theorems for holomorphic self-maps*. Ann. of Math. **159** (2004), 819–864.
- [49] *Angular derivatives in several complex variables*. In **Real methods in complex and CR geometry**, Eds. D. Zaitsev, G. Zampieri, Lect. Notes in Math. 1848, Springer, Berlin, 2004, pp. 1–47.
- [53] With F. Bracci: *Ritt’s theorem and the Heins map in hyperbolic complex manifolds*. Science in China, Ser. A **48 Suppl.** (2005), 238–243.
- [54] With F. Bracci e F. Tovena: *Index theorems for holomorphic maps and foliations*. Indiana Univ. Math. J. **57** (2008), 2999–3048.
- [62] *Sistemi dinamici ologomorfi discreti locali*. Matem. Soc. Cult. **1** (2008), 409–441.
- [66] With F. Bracci and F. Tovena: *Embeddings of submanifolds and normal bundles*. Adv. Math. **220** (2009), 620–656.
- [67] With J.-P. Vigué: *Isometries for the Carathéodory metric*. Proc. Amer. Math. Soc. **136** (2008), 3905–3909.
- [74] *Discrete holomorphic local dynamical systems*. In **Holomorphic dynamical systems**, G. Gentili, J. Guénot, G. Patrizio eds., Lect. Notes in Math. 1998, Springer, Berlin 2010, pp. 1–55.
- [75] With F. Tovena: *Poincaré-Bendixson theorems for meromorphic connections and homogeneous vector fields*. J. Diff. Eq. **251** (2011), 2612–2684.
- [76] With A. Saracco: *Carleson measures and uniformly discrete sequences in strongly pseudoconvex domains*. J. London Math. Soc. **83** (2011), 587–605.
- [80] With F. Bracci, T. Suwa and F. Tovena: *Localization of Atiyah classes*. To appear in Rev. Mat. Iberoam. Preprint, arXiv:1005.1482, 2010.
- [81] With F. Bracci, Manuel D. Contreras, S. Díaz-Madrigal: *The evolution of Loewner’s differential equations*. Newsletter Eur. Math. Soc., 78 2010 31-38.
- [82] With J. Raissy: *Formal Poincaré-Dulac renormalization for holomorphic germs*. Preprint, arXiv:1008.0272, 2010.
- [84] With A. Abbondandolo and P. Majer: *Stable manifolds for holomorphic automorphisms*. Preprint, arXiv: 1104.4561, 2011.
- [85] With J. Raissy: *Backward iteration in strongly convex domains*. Adv. Math. **228** (2011), 2837–2854.
- [89] *Open problems in local discrete holomorphic dynamics*. To appear in Anal. Math. Phys. Preprint, arXiv: 1107.4876, 2011.

## 2. Proceedings

- [8] *Iterates and semigroups on taut manifolds*. In **Atti delle Giornate di Geometria Analitica e Analisi Complessa, Rocca di Papa, 1988**, Editel, Cosenza, 1990, pp. 3–13.
- [10] *Iteration theory on weakly convex domains*. In **Seminar in complex analysis and geometry 1988**, Editel, Cosenza, 1990, pp. 3–16.
- [15] *Angular derivatives in strongly pseudoconvex domains*. Proc. Symp. Pure Math. **52**, Part 2 (1991), 23–40.
- [19] *The complex geodesics of non-compact hermitian symmetric spaces*. In **Seminari di Geometria 1991–1993**, Università di Bologna, 1994, pp. 1–18.
- [22] With G. Patrizio: *A characterization of convex circular domains*. In **Proceedings of Complex Analysis and Applications, 1991**, Bulgarian Academy of Sciences, Sofia, 1994, pp. 1–7.
- [24] With G. Patrizio: *Complex geodesics and Finsler metrics*. In **Topics in Complex Analysis**, Banach Center Publications, Warszawa, 1995, pp. 11–25.
- [29] With G. Patrizio: *Finsler metrics of constant curvature and the characterization of tube domains*. In **Finsler Geometry**, Contemp. Math. 196, American Mathematical Society, Providence, 1996, pp. 101–107.
- [31] With G. Patrizio: *Equazione di Monge-Ampère omogenea complessa e metriche di Finsler*. In **Seminari di Geometria 1994–1995**, Università di Bologna, 1996, pp. 1–25.
- [32] With T. Aikou and G. Patrizio: *Preface for Complex Finsler Geometry*. In **Finsler Geometry**, Contemp. Math. 196, American Mathematical Society, Providence, 1996, pp. 97–100.
- [50] *Discrete local holomorphic dynamics*. In **Proceedings of 13th. Seminar on Analysis and Its Applications, Isfahan 2003**, Eds. S. Azam et al., University of Isfahan, Iran, 2005, pp. 1–32.
- [51] *Holomorphic classification of 2-dimensional quadratic maps tangent to the identity*. Sūrikaiseikikenkyūsho Kōkyūroku **1447** (2005), 1–14.
- [52] With F. Tovena: *Formal classification of holomorphic maps tangent to the identity*. Disc. Cont. Dyn. Sys., Suppl. 2005 1–10.
- [69] *A general approach to Camacho-Sad-like index theorems*. Proceedings of the 6th Congress of Romanian Mathematicians, Publishing House of the Romanian Academy, Bucarest, 2007, pp. 83–92.
- [70] *An introduction to local discrete holomorphic dynamics*. In **Advanced courses of mathematical analysis III**, Eds. J.M. Delgado Sánchez and T.D. Benavides, World Scientific, Honk Kong, 2008, pp. 1–27.
- [77] *Homogeneous vector fields and meromorphic connections*. In **Progress in analysis and its applications**, M. Ruzhansky, J. Wirth eds, World Scientific, Hong Kong, 2010, pp. 523–529.
- [87] *Index theorems for meromorphic self-maps of the projective space*. To appear in **Frontiers in complex dynamics**. Preprint, arXiv: 1106.2394, 2011.

## 3. Research books

- [11] **Iteration theory of holomorphic maps on taut manifolds**. Mediterranean Press, Cosenza, 1989.
- [27] With G. Patrizio: **Finsler metrics — A global approach**. Lecture Notes in Mathematics 1591, Springer, Berlin, 1994.
- [47] **An introduction to hyperbolic dynamical systems**. I.E.P.I. Pisa, 2001.

#### 4. Textbooks

- [28] **Geometria**. McGraw-Hill Libri Italia, Milano, 1996.
- [40] With C. de Fabritiis: **Esercizi di Geometria**. McGraw-Hill Libri Italia, Milano, 1999.
- [43] **Algebra lineare**. McGraw-Hill Libri Italia, Milano, 2000.
- [45] With G.F. Simmons: **Calcolo differenziale e integrale, con elementi di algebra lineare**. McGraw-Hill Libri Italia, Milano, 2000.
- [60] With C. de Fabritiis: **Geometria analitica con elementi di algebra lineare**. McGraw-Hill Libri Italia, Milano, 2006, Second Edition 2010.
- [61] With F. Tovena: **Curve e superfici**. Springer Italia, Milano, 2006.
- [72] **Matematica e statistica**. McGraw-Hill Libri Italia, Milano, 2009.
- [86] With F. Tovena: **Geometria differenziale**. Springer Italia, Milano, 2011.
- [88] With F. Tovena: **Curves and surfaces**. Springer, Berlin, 2011.

#### 5. Popularizing papers

- [55] *Narrare matematica nel fumetto*. Int. J. Sci. Comm. **7** (2003), 1–10.
- [56] *Scrivere Matematica nel fumetto*. In **Matematica e cultura 2004**, Ed. M. Emmer, Springer Italia, Milano, 2004, pp. 19–29.
- [57] *Dinamicamente parlando*. Sapere **70** (2004), 18–27.
- [58] *Come salvare vite e comprarsi le Seychelles usando la teoria della misura*. In **Lezioni sotto la torre**, Ed. M. Stampacchia et al., ETS, Pisa, 2006, pp. 145–151.
- [59] *Évariste et Héloïse*. In **Matematica e cultura 2006**, Ed. M. Emmer, Springer Italia, Milano, 2006, pp. 145–156.
- [63] *Nostra (poco affidabile) comunicazione scientifica*. Doc Toscana **19** (2006), 21–22.
- [64] *La divulgazione scientifica: scenari e prospettive*. In *Speciale Pisa Book Festival*, Edizioni Plus, Pisa, 2006, p. 4.
- [65] *Il girasole di Fibonacci*. In **Matematica e cultura 2007**, Ed. M. Emmer, Springer Italia, Milano, 2007, pp. 227–240.
- [68] *L'autobiografia riluttante di G.H. Hardy*. In **Matematica e cultura 2008**, Ed. M. Emmer, Springer Italia, Milano, 2008, pp. 37–48.
- [71] *Sistemi dinamici e sistemi caotici*. In **XXI Secolo: L'universo fisico**, Istituto dell'Enciclopedia Treccani, Roma, 2010, pp. 133–142.
- [78] *Prezzi nel caos*. In **Matematica e cultura 2010**, Ed. M. Emmer, Springer Italia, Milano, 2010, pp. 197–207.
- [83] *Quando il cielo ci cade sulla testa*. In **Matematica e cultura 2011**, Ed. M. Emmer, Springer Italia, Milano, 2011, pp. 97–109.
- [90] *The many faces of Lorenz knots*. To appear in **Matematica e cultura 2012**, Ed. M. Emmer, Springer Italia, Milano, 2012.

#### 6. Editing of books

- [73] **Perché Nobel?**. Ed. M. Abate, Springer Italia, Milano, 2008.
- [79] **Local dynamics of singular holomorphic foliations**. Ed. M. Abate, ETS, Pisa, 2010.