

**Curriculum Vitae** (max 2 pages):  
standard academic and research record

### Scientific studies

- *Nov. 1990 / Mai 1996*: Collegio Ghislieri, Pavia. Studies in mathematics (University of Pavia).
- *June 1996*: Summer Academy at Ircam. Courses in programming languages for computer music.
- *Oct. 1996 / June 1997*: *Visiting Student* at the University of Sussex (Brighton). Courses in Coxeter groups (Prof. R. Fenn).
- *Oct. 2000/June 2001*: Master in algebraic methods, University of Paris VI (“auditor”).
- *29 May - 5 June 2005*: Summer School on Topos Theory (Haute-Bodeux) organized by F. Borceux (University of Louvain) and P. Johnstone (Cambridge University).
- *19-26 September 2006*: CNRS Thematic School on “Logics and Interaction”(Centre Culturel International de Cerisy-La-Salle) organized by J.-B. Joinet (University of Paris IV, Sorbonne).
- *Dec. 2006 / Feb. 2009*: School of Mathematics for musicians and other non-mathematicians at IRCAM (by Y. André, ENS/CNRS).

### Musical studies

- *Nov. 1990 / Mai 1996*: Studies in piano performance (Scuola Civica Vittadini, Pavia).
- *Dec. 1993 / June 1995*: Composition and Conducting (M<sup>o</sup> F. Valdambrini) at the “Laboratorio Permanente Nuova Musica” of Pergine (Trento).
- *Nov. 1994 / Mai 1995*: Electronic Music at the University of Milan (Prof. G. Haus).
- *July 1996*: Improvisation courses at the Centre Acanthes in Avignon (Martial Solal).
- *Oct. 1996 / June 1997*: *Visiting Student* at the University of Sussex (Brighton). Courses in composition (J. Johnson and D. York), aesthetics and sociology of music (Prof. D. Osmond-Smith).
- *Nov. 1997 / June 1998*: Courses in composition (A. Solbiati), electronic music (Prof. A. Vidolin) at the Civica Scuola di Musica of Milan.
- *Oct. 1998 / June 1999*: Master in 20<sup>th</sup> Century Music and Musicology (EHESS, IRCAM).
- *21-24 June 2003*: Advanced School on Transformational Theories (Mannes Institute, New York).
- *Oct. 1999 / Dec. 2003*: Doctoral studies in computational musicology (EHESS, IRCAM).

### Diplomas

- *July 1990*: Scientific Bachelor at the Liceo “Galileo Galilei” of Trento. Maximal score: 60/60.
- *May 1996*: “Laurea” (Master Level) in Mathematics at the University of Pavia. Max. score: 110/110.
- *Sept. 1998*: First Prize (10<sup>th</sup> year) in piano performance, Conservatory of Novara, Italy.
- *June 1999*: Master award in 20<sup>th</sup> Century Music and Musicology. Max. score: “très bien”.
- *Dec. 2003*: PhD award in Musicology. Max. score: “très honorable avec les félicitations du jury”.
- In preparation: HDR (“Habilitation à diriger les recherches”) in mathematics at the IRMA (Institut de Recherche Mathématique Avancée) of the University of Strasbourg (under the direction of Athanase Papadopoulos). To be defended: May 2010.

### Teaching activities and students supervisions:

#### *Invited Professorships*

2008/2009 Invited Professor for a 30 hours Course on Mathematics and Music entitled “Elementi di Geometria Superiore 2: Matematica & Musica”, University of Pisa, Department of Mathematics (organised by Prof. Fabrizio Broglia).

#### *Workshops activities*

I am regularly invited to teach Mathematics and Music within several Workshops, ranging from high school courses to presentations addressed to a general audience, as well in France as abroad. The following list presents a selection of international contributions:

- M. Andreatta and C. Agon, “A tutorial on algebraic-oriented paradigmatic music analysis and composition in *OpenMusic* visual programming language”, *Fourth Musicnetwork Open Workshop – Integration of Music in Multimedia Applications*, Barcelona, September 2004.
- C. Agon and M. Andreatta, “OpenMusic Tutorial”, Workshop at the Center for Computation and Technology, Louisiana State University, 10 November 2006.
- M. Andreatta and G. Bloch, “Tiling Space with Musical Canons”, *Seed Workshop on Art/Sciences*, Dublin, 5 mai 2007.

- M. Andreatta, “An Introduction to Algebraic Models in Computer-Aided Music Theory...”, *International Workshop in Art Communication and Technology*, CIMAT, Guanajuato, Mexico, 19-23 November 2007.

### Regular Teaching

I am responsible for the teaching unit “Music and Science after 1945” within the ATIAM scientific Master program at IRCAM, within which I also teach a course on algorithmic composition (6 hours). I am regularly invited to teach in doctoral programs. In particular, I regularly teach:

- “Mathematical models for Music Informatics”, a 12 hours course within the ATIAM Master Program (IRCAM, University of Paris VI and Telecom Paris).
- “Mathematical Methods for musical composition”, a 12 hours course given in collaboration with Carlos Agon within the Master Program of the ENST Bretagne in Brest.
- “Mathematical methods for music informatics”, a 12 hours course given in collaboration with Carlos Agon and Isabelle Viaud-Delmon within the Master Program “Arts, Science, Technology”, Institut National Polytechnique, Grenoble.

### Supervision activities<sup>1</sup>

- Master thesis by Yun-Kang Ahn entitled “Aspects théoriques et informatiques de l’analyse transformationnelle”, ATIAM Master Prog., Univ. of Paris VI, May 2005.
- “Diplôme de magistère MMMI” by Hugues Zuber entitled “Vers une arithmétique des rythmes?”, École normale supérieure of Cachan / University of Rennes 1, 2005.
- Master thesis by Vedad FamourZadeh entitled “La musique persane, Formalisation algébrique”, Mechanics and Acoustics Engineer Master Prog., Univ. of Maine, June 2005 (with Mondher Ayari).
- Master thesis by Edouard Gilbert entitled “Polynômes cyclotomiques, canons mosaïques et rythmes k-asymétriques”, ATIAM Master Prog., Univ. of Paris VI, May 2007.
- *Tesi di Laurea* (Master thesis equivalence) by Giulia Fidanza on the Fuglede Conjecture and Tiling Canons Constructions, Univ. of Pisa, April 2008 (with Francesca Acquistapace, Department of Mathematics of the University of Pisa).
- Master thesis by Julien Junod entitled “Etude combinatoire et informatique du caractère diatonique des échelles à sept notes”, ATIAM Master Prog., June 2008, Univ. of Paris VI.
- Master thesis by John Mandereau entitled “Étude des ensembles homométriques et leur application en théorie mathématique de la musique et en composition assistée par ordinateur”, ATIAM Master Prog., Univ. of Paris VI, June 2009 (with Carlos Agon).
- doctoral thesis in informatics by Yun-Kang Ahn on the implementational aspects of transformational music theory at the Univ. of Paris 6 (with Carlos Agon). The Thesis defense is fixed for the 2<sup>nd</sup> of December 2009.
- Joint doctoral thesis of the Univ. of Pisa/Univ. of Paris 6 by John Mandereau in mathematics (with Carlos Agon). The Thesis defense is expected for: October 2012.
- Doctoral thesis in logics by Carmine Emanuele Cella (Thesis defense expected for: February 2011).

### Funding ID:

Because of its new character, securing funding for research on mathematics and music via “standard grant schemes” (such as ANR or European Projects) is still quite a challenging task. I nevertheless succeeded in obtaining some financial support which allowed to me to organise many important activities in this field. In particular I am the PI of the following institutional projects aiming at exploring new frontiers of the relationships between Mathematics & Music research in their interactions with other disciplines:

- “Computer Modelling of Algebraic Structures in Music and Musicology: Cognitive, Philosophic, and Epistemological Aspects”, MISA (obtained in 2004, includes my permanent research position, funded by CNRS)
- “Mathematics/Music and Cognition”, supported by the French Society of Music Informatics, 5200 Euros. Duration: one year (2008-2009)<sup>2</sup>.
- “Geometry of Interaction and Music”, supported by CNRS within the call “Interaction Maths/ST2I”, 5000 Euros. Duration: one year (2009-2010).<sup>3</sup>

<sup>1</sup> Most of the dissertations are available at: <http://recherche.ircam.fr/equipes/repmus/mamux/documents/Dissertations.html>

<sup>2</sup> <http://recherche.ircam.fr/equipes/repmus/mamux/Cognition.html>

<sup>3</sup> <http://recherche.ircam.fr/equipes/repmus/mamux/PEPS-GdIM.html>

**Early Achievement-Track-Record** (max 2 pages)

## 1. List of publications

**i) Publications in major international peer-reviewed multi-disciplinary scientific journals (7, from which 3 as guest editor of special issue of journals)**

- M. Andreatta and C. Agon (guest editors), Special Issue of the *Journal of Mathematics and Music* on “Tiling Problems in Music”, July 2009, Vol. 3, No. 2, pp. 63-115.
- C. Alunni, M. Andreatta and F. Nicolas (guest editors), Special Issue of the *Revue de Synthèse* (Springer) on “Mathematics, Music and Philosophy” (forthcoming November 2009).
- M. Andreatta (guest editor), Special Issue of the *Journal Musicae Scientiae* on “The Generative Theory of Tonal Music by Lerdahl and Jackendoff” (forthcoming December 2009)
- M. Andreatta, “Mathématiques, Musique et Philosophie dans la tradition américaine: la filiation Babbitt/Lewin”, to appear in the Special Issue of the *Revue de Synthèse* on “Mathematics, Music and Philosophy” (forthcoming November 2009)
- G. Mazzola et M. Andreatta, “Diagrams, gestures and formulae in music”, *Journal of Mathematics and Music*, Vol. 1, No. 1, March 2007, pp. 23-46.
- G. Mazzola et M. Andreatta, “From a categorical point of view: K-nets as limit denotators”, *Perspectives of New Music*, Vol. 44, No. 2, August 2006, pp. 88-113.
- C. Agon, M. Andreatta, G. Assayag et S. Schaub, “Formal aspects of Iannis Xenakis’ Symbolic Music: a computer-aided exploration of some compositional processes”, *Journal of New Music Research*, June 2004, Vol. 33, No. 2, pp. 145-159.

**ii) Publications in leading international scientific journals (4)**

- E. Acotto et M. Andreatta, “Représentations mentales musicales et représentations mathématiques de la musique” *InCognito, Cahiers Romains de Sciences Cognitives*, Vol. 4, No. 3, Dec. 2009 (in print).
- M. Andreatta, D. Vuza et C. Agon, “On some theoretical and computational aspects of Anatol Vieru’s periodic sequences”, *Soft Computing*, September 2004, Vol. 8, No. 9, pp. 588-596.
- M. Andreatta and S. Schaub, “Une introduction à la Set Theory: les concepts à la base des théories d’Allen Forte et de David Lewin”, *Musurgia*, Vol. 10, No. 1, 2003, pp. 73-92.
- M. Andreatta, D. T. Vuza, “On some properties of periodic sequences in Anatol Vieru’s modal theory”, *Tatra Mountains Mathematical Publications*, Vol. 23, 2001, pp. 1-15.

**iii) Peer-reviewed conference proceedings (18)**

- Junod, J., Audétat, P., Agon, C., Andreatta, M., “A Generalisation of Diatonicism and the DFT...”, *Proceedings Conference MCM09*, Springer CCIS Series, Vol. 38, New Haven, 2009, pp. 166-179.
- Jedrzejewski, F., Andreatta, M., Johnson, T., “Musical experiences with Block Designs”, *Proceedings of the Proceedings Conference MCM09*, Springer CCIS Series, Vol. 38, New Haven, 2009, pp. 154-165.
- M. Andreatta and C. Agon, “Structure and Symmetry in Iannis Xenakis *Nomos Alpha* for cello solo”, *Symmetry: Art and Science*, (ISIS – Symmetry), G. Lugosi et D. Nagy (eds.), 2-4, 2007.
- E. Amiot, C. Agon and M. Andreatta, “Autosimilar melodies and their implementation in *OpenMusic*”, *Proceedings of the Sound and Music Computing Conference 07*, Lefkada, Greece.
- Y.-K. Ahn, C. Agon and M. Andreatta, “Structures Ia pour deux pianos by Boulez: towards creative analysis using *OpenMusic* and *Rubato*”, *Proceedings Conference MCM07*, Berlin, 18-20 Mai 2007, pp. 234-238.
- C. Agon et M. Andreatta, “On some musical applications of Ircam’s Mathematical School for Musicians and other Non-Mathematicians”, *Proceedings Conference MCM07*, Berlin, 18-20 Mai 2007, pp. 31-36.
- M. Andreatta and M. Chemillier, “Modèles mathématiques pour l’informatique musicale: Outils théoriques et stratégies pédagogiques”, *Proceedings JIM07*, Lyon, April 2007, pp. 113-123.
- T. Noll, M. Andreatta and C. Agon, “Computer-Aided Transformational Analysis with Tone Sieves”, *Proceedings of the Sound and Music Computing Conference 06*, Marseille, 2006.
- E. Amiot, T. Noll, M. Andreatta and C. Agon, “Fourier Oracles for Computer-Aided Improvisation”, *Proceedings International Computer Music Conference*, New Orleans, 2006.
- M. Andreatta, C. Agon, T. Noll and E. Amiot, “Towards Pedagogability of Mathematical Music Theory”, *Proceedings Bridges. Mathematical Connections in Art, Music and Science*, London, 2006, pp. 277-284.
- E. Amiot, M. Andreatta, C. Agon, “Tiling the (musical) line with polynomials: some theoretical and implementational aspects”, *Proceedings International Computer Music Conference*, Barcelona, 2005.
- M. Andreatta, C. Agon, “Algebraic Models in Music Theory, Analysis and Composition: Towards a Formalized Computational Musicology”, *Proceedings Understanding and Creating Music*, Caserta, 2005.
- M. Andreatta, C. Agon, “Implementing algebraic methods in *OpenMusic*”, *Proceedings International Computer Music Conference*, Singapore, 2003.

- M. Andreatta, C. Agon, “Formalisation algébrique des structures musicales à l'aide de la *Set-Theory*: aspects théoriques et analytiques”, *Proceedings JIM03*, Montbeillard, 2003.
- M. Andreatta, E. Amiot, C. Agon, “Tiling problems in music composition: Theory and Implementation”, *Proceedings International Computer Music Conference*, Göteborg, 2002, pp. 156-163.
- M. Andreatta, C. Agon, D. Vuza, “Analyse et implémentation de certaines techniques compositionnelles chez Anatol Vieru”, *Proceedings JIM02*, Marseille, 2002, pp. 167-176.
- T. Noll, M. Andreatta, C. Agon, G. Assayag, D. Vuza, “The Geometrical Groove: rhythmic canons between Theory, Implementation and Musical Experiments”, *Proceedings JIM01*, Bourges, 2001, pp. 93-98.
- M. Andreatta, M. Chemillier, “*OpenMusic* et le problème de la construction de canons musicaux rythmiques”, *Proceedings JIM99*, Paris 1999, pp. 179-185.

#### iv) Editor of books (2)

- M. Andreatta, J.-M. Bardez and J. Rahn (eds.), *Autour de la Set Theory. Rencontre Musicologique franco-américain*, “Music/Sciences” Series, IRCAM-Delatour France, 2007.
- M. Andreatta, J.-M. Bardez and J. Rahn (eds.), *Around Set Theory. A French-American Musicological Meeting*, “Music/Sciences” Series, IRCAM-Delatour France, 2007.

#### v) Chapters of books (7)

- M. Andreatta, “Calcul algébrique et calcul catégoriel en musique: aspects théoriques et informatiques”, *Le calcul de la musique*, L. Pottier (ed.), Publications de l'université de Saint-Etienne, 2008, pp. 429-477.
- Bancquart, M. Andreatta, and C. Agon, “Microtonal Composition”, in *The OM Composer's Book 2*, Jean Bresson, Carlos Agon and Gérard Assayag (eds.), IRCAM/Delatour France, 2008, pp. 279-302.
- C. Cazaban, M. Andreatta, C. Agon and D. T. Vuza, “Anatol Vieru: formalisation algébrique et enjeux esthétiques”, in *Penser la musique avec les mathématiques ?*, G. Assayag, F. Nicolas and G. Mazzola (eds.), IRCAM/Delatour France, 2006, pp. 81-98.
- M. Andreatta, “La bellezza della struttura”, in Luigi Verdi: *Caleidocicli Musicali*, Rugginenti, Milan, 2005
- M. Andreatta, “On group-theoretical methods applied to music: some compositional and implementational aspects”, *Perspectives in Mathematical and Computational Music Theory*, G. Mazzola, T. Noll and E. Lluís-Puebla (eds.), epOs, Osnabrück, 2004, pp. 169-193.
- M. Andreatta, “Note su alcune tendenze compositive contemporanee”, in R. Cresti (ed.), *L'arte Innocente. Le vie eccentriche della musica contemporanea italiana*, Rugginenti, Gennaio 2004, pp. 249-264.
- M. Andreatta, “Group-theoretic methods in compositions and theory”, in G. Mazzola: *Topos of Music*, Birkhäuser Verlag, 2002.

#### vi) Editor of book series (2): “Music/Sciences” (IRCAM) and “Computational Music Sciences” (Springer)

#### 3. Invited presentations to peer-reviewed, internationally established conferences and international advanced schools (7)

- M. Andreatta, C. Agon, “Structure and Symmetry in Iannis Xenakis *Nomos Alpha* for cello solo”, Symposium “Form and Symmetry”, Buenos Aires, 11-17 November 2007.
- M. Andreatta, “Introduzione alla formalizzazione algebrica delle strutture musicali”, Colloquium “Matematica e Musica: formalizzazione delle strutture musicali”, Pisa, 28 September 2007.
- M. Andreatta and C. Agon, “Implementing Xenakis’ Theoretical Concepts in OM Visual Programming Language: Probability, Sieve, Set and Group Theory”, International Symposium “The Creative and Scientific Legacies of Iannis Xenakis”, Univ. of Guelph/Fields Institute/Perimeter Institute, June 2006.
- M. Andreatta, “Approches ‘structurelles’ en musique et musicologie du XX<sup>e</sup> siècle”, Symposium at the Centre Georges Canguilhem “Les structures après le structuralisme”, Paris, 2 December 2004.
- M. Andreatta, “Modern Mathematics and the Rise of Mathematical Music Structures”, *International Computer Music Conferences*, Miami, 1-6 November 2004 (with L. Fritts, J. Rahn and G. Mazzola).
- M. Andreatta, “A Computer-aided exploration of the transformational process in Xenakis’ *Nomos Alpha*”, AMS-MAA Joint Meeting, Phoenix, Arizona, 7-10 January 2004.
- G. Assayag and M. Andreatta, “L’état de l’art des outils d’analyse”, International Symposium “Around Set Theory”, Festival Résonances, Centre G. Pompidou, 16 October 2003.

#### 4. Prizes and awards (3)

- *Academic year 2004-2005*: PhD prize of the ASTI (French Association of Sciences and Technologies of Information and Communication). Special mention for the quality of the research.
- *Academic year 2000-2001*: European Scholarship of the Marcel Bleustein-Blanchet Foundation
- *July 1995*: First Prize of the piano Competition “O. Giulotto” of Pavia (Italy)