

PERSONAL INFORMATION

Name: Marco Compagnoni
Email: marco.compagnoni@polimi.it
Nationality: Italian
Date of birth: 04/25/1980

EDUCATION

Dates: 2005-2009
Title of qualification awarded: Ph.D. in Mathematical Engineering
Principal subjects: Mathematical Physics and Algebraic Geometry
Thesis title: Geometric aspects of D-Branes on noncompact varieties
Principal advisor: Dr. Sergio Luigi Cacciatori, Università dell'Insubria
Secondary advisor: Prof. Enrico Schlesinger, Politecnico di Milano
University: Politecnico di Milano, Milano - Italy

Dates: 1999-2004
Title of qualification awarded: Degree in Physics (MSc Equivalent)
Principal subjects: Theoretical Physics
Thesis title: Supersymmetric integrable models in nonanticommutative geometry (in Italian)
Principal advisor: Prof. Silvia Penati
Secondary advisors: Prof. Luciano Girardello, Dr. Laura Tamassia
Final Mark: 110/110 cum laude
University: Università degli studi di Milano Bicocca, Milano - Italy

JOB POSITIONS

Dates: 2013-
Position: PostDoc
Principal subject: Applied Mathematics - MAT/03
Project title: Engineering of an automatic classifier of cheratinic fibers (CLASH).
Head: Prof. Alessandra Cherubini
Name of organization: Dipartimento di Matematica del Politecnico di Milano, Milano - Italia

Dates: 2012-
Position: Adjunct Professor
Course: Linear Algebra and Geometry
Name of organization: Politecnico di Milano, Milano - Italia

Dates: 2011-2013
Position: PostDoc
Principal subject: Applied Mathematics - MAT/02
Project title: Study of an automatic classifier of cheratinic fibers (CLASH).
Head: Prof. Alessandra Cherubini
Name of organization: Dipartimento di Matematica del Politecnico di Milano, Milano - Italia

Dates: 2005-
Position: Teaching Assistant
Courses: Precalculus, Mathematical Analysis, Linear Algebra and Geometry, Theoretical Mechanics
Name of organization: Politecnico di Milano, Milano - Italia

PERSONAL SKILLS, COMPETENCES, QUALIFICATIONS

Mother tongue: Italian
Other languages: English written C1, spoken B2. French A2.

Computer skills: Operating System: Windows, Linux, Mac OS X
Programming Languages: C, Fortran, Java
Scientific Programs: Mathematica, Matlab, Singular.
In particular, I have advanced skills in the processing of digital images.
Qualifications awarded: Qualification aux maîtres de conférences in Mathematics, 2014–2018
Qualification as Adjunct Professor of the Mathematics Department of
Politecnico di Milano, 2012–

RESEARCH COLLABORATIONS

MATHEMATICAL METHODS FOR SPACE–TIME SIGNAL PROCESSING

Roberto Notari - GAIA, Dipartimento di Matematica, Politecnico di Milano
Alessia Pini - MOX, Dipartimento di Matematica, Politecnico di Milano
Fabio Antonacci, Augusto Sarti, Stefano Tubaro - ISPG, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano

IMAGE PROCESSING AND PATTERN RECOGNITION

Alessandra Cherubini - GAIA, Dipartimento di Matematica, Politecnico di Milano
Simone Vantini - MOX, Dipartimento di Matematica, Politecnico di Milano
Marco Marcon - ISPG, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano
Mario Arrigoni Neri - Dipartimento di Ingegneria dell'Informazione e Metodi Matematici, Università degli studi di Bergamo
Alessandro Berlin - IMAX s.r.l., MaxMara Fashion Group.

LOCAL MIRROR SYMMETRY

Sergio Luigi Cacciatori - Dipartimento di Scienza e Alta Tecnologia, Università dell'Insubria
Stefano Guerra - Department of Mathematics, Oregon State University.

PARTICIPATION IN RESEARCH PROJECT

Dates: 2011-

Project: CLASH "Studio di un classificatore automatico di fibre cheratiniche"
(Study of an automatic classifier of keratinic fibers)

Financial support: IMAX s.r.l. - MaxMara Fashion Group
Regione Lombardia

Dates: 2012-

Project: PRIN 2010/2011 "Automati e Linguaggi Formali: aspetti matematici e applicativi"
(Automata and Formal Languages: mathematical and applied aspects)

Financial support: MIUR - Italian Ministry for University and Research

Dates: 2010-2012

Project: collaboration to SCENIC "Self Configuring ENvironment-aware Intelligent aCoustic sensing"

Financial support: Seventh Framework Program of the European Community in the ICT area

MASTER AND DOCTORAL THESIS SUPERVISION

Dates: 2013-2014

Role: Co–advisor with Alessandra Cherubini and Mario Arrigoni Neri

University: Politecnico di Milano - Dipartimento di Matematica

Student: Silvia Gentili - Master student in Mathematical Engineering

Thesis title: Procedura di feature selection per classificatori neurali e sua applicazione in campo tessile

Dates: 2013-2014

Role: Co–advisor with Roberto Notari

University: Politecnico di Milano - Dipartimento di Matematica

Student: Andrea Ruggiu - Master student in Mathematical Engineering

Thesis title: The geometry of trilateration and the TOA map

Dates: 2012-2013

Role: Co–advisor with Simone Vantini

University: Politecnico di Milano - Dipartimento di Matematica

Student: Marina Riabiz - Master student in Mathematical Engineering

Thesis title: Data driven Sobolev metrics for functional data analysis: an application to natural fibers

Dates: 2011-2012

Role: Advisor for the minor doctoral theme

University: Politecnico di Milano - Dipartimento di Elettronica, Informazione e Bioingegneria

Student: Paolo Bestagini - Graduate student in Information Engineering

Thesis title: Localization of Acoustic Sources through the Fitting of Propagation Cones using Multiple Independent Arrays

SEMINARS, CONFERENCES AND SCHOOLS

Dates: August 2015

Conference: SIAM Conference on Applied Algebraic Geometry

Held at: National Institute for Mathematical Sciences, Daejeon - South Korea

Seminar: The Algebro-Geometric Study of TOA-based Localization Problems

Dates: June 2015

Conference: Algebraic Statistics 2015

Held at: Università degli studi di Genova, Genoa - Italy

Seminar: The geometry of the statistical model for range–based localization

Dates: January 2014

Conference: 3rd Carlo Alberto Stochastics Workshop

Held at: Collegio Carlo Alberto, Moncalieri - Italy

Poster: The geometry of the TDOA based localization and its statistical inference

Dates: August 2013

Conference: SIAM Conference on Applied Algebraic Geometry

Held at: Colorado State University, Fort Collins - USA

Seminar: The geometry of the TDOA based localization

Dates: June 2013

Conference: Effective Methods in Algebraic Geometry MEGA2013

Held at: Goethe Universität, Frankfurt - Germany

Poster: The geometry of the TDOA based localization

Dates: May 2013

Conference: Meeting on Discrete Tomography and Applications

Held at: Politecnico di Milano, Milan - Italy

Seminar: A geometric model for radiant source localization based on TDOA

Dates: March 2013

Conference: G.T.M. Seminar

Held at: Università degli studi di Genova, Genoa - Italy

Seminar: A geometric model for radiant source localization based on TDOA

Dates: April 2011

Conference: Meeting on Discrete Tomography and Applications of Convexity

Held at: Politecnico di Milano, Milan - Italy

Seminar: Localization of Acoustic Sources through the Fitting of Propagation Cones

Dates: June 2008

School: Aspects of moduli theory

Held at: Scuola Normale Superiore, Pisa - Italy

Dates: March 2008

School: Holomorphic symplectic manifolds and derived categories

Held at: Palazzo Feltrinelli, Gargnano del Garda - Italy

Dates: June 2007

Conference: Derived categories in mathematics and physics
Held at: Snowbird conference center, Snowbird (Utah) - USA
Dates: June 2007
School: Derived categories minicourse
Held at: University of Utah, Salt Lake City - USA
Dates: August 2005
School: Scuola Matematica Interuniversitaria
Held at: Università di Perugia, Perugia - Italy

PUBLICATIONS AND RESEARCH PRODUCTS

MATHEMATICAL METHODS FOR SPACETIME SIGNAL PROCESSING

- [1] F. Antonacci, A. Canclini, P. Bestagini, M. Compagnoni, A. Sarti, S. Tubaro,
A Robust and Low-Complexity Source Localization Algorithm for Asynchronous Distributed Microphone Networks,
IEEE Transactions on Audio, Speech, and Language Processing, Volume 23 (2015), Issue 10, 1563-1575.
- [2] M. Compagnoni, R. Notari, F. Antonacci, A. Sarti,
A comprehensive analysis of the geometry of TDOA maps in localisation problems,
Inverse Problems, Vol. 30 (2014), Number 3, Pages 035004.
- [3] M. Compagnoni, R. Notari,
TDOA-based localization in two dimension: the bifurcation curve,
Fundamenta Informaticae XXI (2014) 1001–1012.
- [4] P. Bestagini, M. Compagnoni, F. Antonacci, A. Sarti, S. Tubaro,
TDOA-Based Acoustic Source Localization in the Space-Range Reference Frame,
Journal on Multi-Dimensional Systems and Signal Processing, (2014) 25:337-359.
- [5] A. Contini, A. Canclini, F. Antonacci, M. Compagnoni, A. Sarti, S. Tubaro,
Self-calibration of microphone arrays from measurement of Times Of Arrival of acoustic signals,
5th INTERNATIONAL SYMPOSIUM ON COMMUNICATIONS, CONTROL, AND SIGNAL PROCESSING (ISCCSP 2012), Pages 1-6.
- [6] M. Compagnoni, P. Bestagini, F. Antonacci, A. Sarti, S. Tubaro,
Localization of Acoustic Sources Through the Fitting of Propagation Cones Using Multiple Independent Arrays,
IEEE Transactions on Audio, Speech, and Language Processing, Volume 20 (2012), Issue 7, 1964-1975.

Preprints and works in preparation

- [7] M. Compagnoni, R. Notari, A. Ruggiu, A. Sarti,
The Algebro–Geometric study of Range Maps,
submitted to Journal of Nonlinear Science.
- [8] M. Compagnoni, A. Canclini, P. Bestagini, F. Antonacci, A. Sarti, S. Tubaro,
TDOA denoising for acoustic source localization,
arXiv 1509.02380, submitted to Journal on Multi-Dimensional Systems and Signal Processing.
- [9] M. Compagnoni, R. Notari, F. Antonacci, A. Sarti,
The statistical model of the TDOA–based localization
in preparation.
- [10] M. Compagnoni, A. Pini, A. Canclini, P. Bestagini, F. Antonacci, A. Sarti, S. Tubaro,
Outliers removal in TDOA data,
in preparation.

Software

- [11] F. Antonacci, P. Bestagini, A. Canclini, M. Compagnoni, A. Sarti,
Error propagation toolbox
within the SCENIC project, <http://www.thescenicproject.eu/resources/software/EPT.zip>.

LOCAL MIRROR SYMMETRY

- [12] S.L. Cacciatori, M. Compagnoni, S. Guerra,
The physical mirror equivalence for the local \mathbb{P}^2 ,
Communications in Mathematical Physics, 333, 367-388 (2015).
- [13] S.L. Cacciatori, M. Compagnoni,
Supersymmetric standard model, branes and Del Pezzo Surfaces,
New Developments in the Standard Model (2012), 131-184, Nova Science Publishers.
- [14] S.L. Cacciatori, M. Compagnoni,
On the geometry of \mathbb{C}^3/Δ_{27} and Del Pezzo surfaces,
Journal of High Energy Physics, Volume 2010, Issue 5, 1-27.
- [15] S.L. Cacciatori, M. Compagnoni,
D-Branes on \mathbb{C}_6^3 . Part I. Prepotential and GW-invariants,
Advances in Theoretical and Mathematical Physics, Volume 13 (2009), Issue 5, 1371-1443.

REFEREE ACTIVITIES

Mathematical Review 2011-, Zentralblatt MATH 2014-, Signal Processing 2014-, IEEE Journal on Selected Areas in Communications 2014-, IEEE Transactions on Audio, Speech, and Language Processing 2015-, Journal of Selected Topics in Signal Processing 2015-.

TEACHING ACTIVITIES

Since 2005, I have taught several mathematical courses for various undergraduate engineering classes at the Politecnico di Milano, both as Professor, Teaching Assistant and Tutor.

Adjunct Professor

Dates: 2015-2016

Course: Linear Algebra and Geometry, Information Engineering, 80 hours

Dates: 2014-2015

Course: Linear Algebra and Geometry, Information Engineering, 80 hours

Dates: 2013-2014

Course: Linear Algebra and Geometry, Information Engineering, 80 hours

Dates: 2012-2013

Course: Linear Algebra and Geometry, Information Engineering, 80 hours

Teaching Assistant

Dates: 2014-2015

Course: Mathematical Analysis and Geometry I, Industrial Engineering, Prof. Fabio Cipriani, 48 hours

Dates: 2013-2014

Course: Mathematical Analysis and Geometry I, Industrial Engineering, Prof. Fabio Cipriani, 48 hours

Dates: 2012-2013

Course: Mathematical Analysis and Geometry I, Industrial Engineering, Prof. Fabio Cipriani, 48 hours

Dates: 2011-2012

Courses: Mathematical Analysis and Geometry I, Industrial Engineering, Prof. Fabio Cipriani, 48 hours

Linear Algebra and Geometry, Information Engineering, Prof. Alessandra Cherubini, 30 hours

Theoretical Mechanics, Civil Engineering, Dr. Silvia Lorenzani, 30 hours

Dates: 2010-2011

Courses: Mathematical Analysis and Geometry I, Industrial Engineering, Prof. Fabio Cipriani, 48 hours
Theoretical Mechanics, Civil Engineering, Prof. Giancarlo Spinelli, 40 hours
Theoretical Mechanics, Civil Engineering, Dr. Paolo Barbante, 30 hours
Theoretical Mechanics, Civil Engineering, Dr. Silvia Lorenzani, 30 hours

Dates: 2009-2010

Courses: Mathematical Analysis and Geometry II, Industrial Engineering, Prof. Fabio Cipriani, 96 hours
Theoretical Mechanics, Materials Engineering, Prof. Paolo Biscari, 20 hours
Mathematical Analysis and Geometry I, Industrial Engineering, Dr. Gianluca Mola, 48 hours
Mathematical Analysis II, Information Engineering, Prof. Luisa Rossi Costa, 20 hours
Theoretical Mechanics, Civil Engineering, Prof. Giancarlo Spinelli, 40 hours
Theoretical Mechanics, Civil Engineering, Dr. Paolo Barbante, 30 hours

Dates: 2008-2009

Courses: Mathematical Analysis and Geometry II, Industrial Engineering, Dr. Marco Boella, 48 hours
Theoretical Mechanics, Materials Engineering, Prof. Paolo Biscari, 20 hours
Theoretical Mechanics, Civil Engineering, Prof. Giancarlo Spinelli, 40 hours
Theoretical Mechanics, Biomedical Engineering, Prof. Lorenzo Valdetaro, 40 hours

Dates: 2007-2008

Courses: Theoretical Mechanics, Civil Engineering, Prof. Giancarlo Spinelli, 40 hours
Theoretical Mechanics, Materials Engineering, Prof. Lorenzo Valdetaro, 20 hours

Date: 2006-2007

Course: Theoretical Mechanics, Civil Engineering, Prof. Giancarlo Spinelli, 40 hours

Dates: 2005-2006

Course: Theoretical Mechanics, Civil Engineering, Prof. Giancarlo Spinelli, 40 hours

Tutor

Dates: 2010-2011

Course: Precalculus, 48 hours

Dates: 2009-2010

Courses: Mathematical Analysis II, Materials Engineering, 20 hours
Precalculus, 48 hours

Moreover, in 2008-2009 I was involved as a tutor in the project *Progettiamo con la matematica* (projecting with mathematics) of the Politecnico di Milano, devoted to high school students. I supported a group of students in the realization of the projects *A Green Lighting Plant using Automata*, which was later presented at interscholastic scientific contests.