Michele Griffa
Curriculum Vitae et Studiorum

Personal information

Name/Surname	**Michele Griffa**
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Personal web site	www.calcolodistr.altervista.org
Birth date	05/11/1079
Nationality	Italian
Civil state	unmarried
National Service	Released from due to expired call-up time according to art. 1, comma 2 and 5, of Italian law n° 504 30/12/1997
Temporary affiliations	• Dept. of Physics, Polytechnic of Torino
	• Bioindustry Park of Canavese, Bioinformatics and High Performance Computing Lab

Education and learning

• Date (since - to) • Name and type of education/formation activity • Issues, subjects of learning	January 7th 2004 – December 31st 2006 **Ph.D.** in **Physics**, Ph.D. School, Polytechnic of Torino

- Ph.D. Thesis title: *Mathematical Models and Numerical Simulations for the study of ultrasonic wave propagation in heterogeneous non-linear materials.*
- Disciplines of interest: Continuum Mechanics (Elasticity Theory, Physics of materials), Applied Mathematics, *Scientific Computing*, Parallel Computing, Inverse Problems Theory, Ultrasonic Imaging for the Non-Destructive Evaluation of materials, Ultrasonic Signal Processing; hysteretic systems mathematical modeling.
- Issues and acquired knowledge: non-linear elastic behaviour of mesoscopic granular materials, like concrete; elastic hysteresis; Preisach-Mayergoyz's models of hysteretic systems; finite differences methods for numerical simulations in Elastodynamics; Time Reversal Acoustics imaging methods and non-destructive evaluation of solid materials; development of computational codes for distributed-memory multi-processors supercomputers, such as Beowulf-like clusters of PCs, by MPI libraries.
- Secondary scientific research activities: study of biomechanical and biophysical processes involved in tumor growth by mathematical models and numerical simulations.

- Till now, I'm author of 9 scientific papers published on international *peer reviewed* journals, author of 4 contributions to Proceedings of International Conferences and author of 2 chapters in a book published by an international publisher (have a look at the web page http://www.calcolodistr.altervista.org/work/work_mg.html#scie_pubs for a complete list).
- I have participated to several national and international conferences with both oral and poster contributions (a complete list can be found at the web site http://www.calcolodistr.altervista.org/work/oral_pres.html).

• Eligible Title	• **Ph.D.** in **Physics**

• Date (since - to)	June 16th – 23rd 2006
• Name and type of education/formation activity	**Course** *Management of Innovation*, organized by Torino Industry Association, Fiat Research Centre, Politecnico di Torino, dedicated to PhD students of Politecnico di Torino.
• Issues, subjects of learning	The organization of the enterprise and the control of its results. Open Innovation. Technologies Scouting. Public funding of scientific/technological Research in Italy: methods and procedures. Business Development and Planning. Project Management of Innovation. Risk Management. Technology Transfer. The role of the core competences in Innovation and Product Development. Knowledge Management for the Product Development Process. Intellectual Property and its role in Innovation. How to evaluate the Intangible Capital.
• Type of certificate	Attendance certificate

• Date (since - to)	November 22nd – 25th 2005
• Name and type of education/formation activity	**Course** *XML for the elaboration and presentation of data*, attended at CILEA (Lombardia Inter-University Consortium for Automatic Elaboration), Segrate (Milano)
• Issues, subjects of learning	Markup meta-language XML. DTD and XML Schema. Development of markup meta-languages by XML. XML for the Semantic WWW . Scientific databases and XML. XML for the processing, storing and communication of scientific data.
• Type of certificate	Attendance certificate

• Date (since - to)	July 5th - 16th 2004
• Name and type of education/formation activity	*XIIIth* **Summer School** *on Parallel Computing*, CINECA (Inter-University Consortium for High Performance Computing and Data Elaboration), Bologna (Italy)
• Issues, subjects of learning	Parallel computers architectures. Parallel programming models (Message Passing and Data Parallel). Distributed-memory systems programming by MPI libraries. Shared-memory systems programming by OpenMP. Parallel debugging and tuning. Code optimization for Intel CPU architectures. Scientific Computing parallel libraries.
• Type of certificate	Attendance certificate

• Date (since - to)	September 1998 – April 2003
• Name and type of education/formation activity	**Master** of **Science** (**MS**.) in **Physics**
• Issues, subjects of learning	• Specialization fields: **Electronics** and **Cybernetics** • Specialization courses: **Microelectronics**, **Computational Physics**, **Cybernetics**, **Biological Physics** • Thesis Degree Title: *The Role of Mechanical Stress, Cellular Adhesion and Apoptosis in the Growth of Multicellular Tumor Spheroids: mathematical models and numerical simulations* • Fields of Research: <u>Biophysics</u>, <u>Biomathematics</u>, <u>*Scientific Computing*</u>, <u>Mathematical Modeling</u>, Tumor Biology, Cellular Biology • Place of Thesis work: Dept. of Physics, Polytechnic of Torino and Research Unit of Torino-Polytecnic of the National Institute for Condensed Matter Physics (ex INFM-CNISM)
• Title	**MS.** (**Master** of **Science**, Italian "Laurea specialistica") in **Physics**
• Evaluation degree	**110**/**110** *cum laude*
• Date (since - to)	September 1993 – July 1998
• Name and type of education/formation activity	**Scientific** *Liceum* "Norberto Bobbio", Carignano (Torino, Italy)
• Title	Scientific High School Diploma
• Evaluation degree	**60/60**

Job experiences

• Date (since - to)	January – December 2004
• Employer/Institution	National Institute for Condensed Matter Physics (ex INFM-CNISM), Research Unit of Torino-Polytecnic
• Type of job	Scientific Research
• Type of contract	**Scientific Research Consultant**
• Main duties and responsibilities	Development of a computational code for the simulation of elastic wave propagation throughout specimens with an extended surface damaged area of structural/architectural/hystorical interest.
• Date (since - to)	April 15th 2003 – January 6th 2004
• Employer/Institution	National Institute for Condensed Matter Physics (ex INFM-CNISM), Research Unit of Torino-Polytecnic
• Type of job	Scientific Research
• Type of contract	**Scientific Research Fellow**
• Main duties and responsibilities	Project title: *Mathematical modeling and numerical simulations as support tools in the study of tumor growth*. Research activity in collaboration with Nose and Throat Division of *Umberto I* Hospital (Torino) and Dept. of Genetics, Medical Chemistry and Biology, Medical Sciences Faculty, University of Torino.

Scientific/technical skills

- **Computational and Condensed Matter Physics**: Continuum Mechanics, especially Elasticity Theory, Computational Elastodynamics (numerical simulation of elastic (acoustic or ultrasonic) wave propagation throughout heterogeneous materials); Condensed Matter Quantum Theory; Monte Carlo methods in Materials Science.

- **Scientific Computing**: Finite Differences methods; Finite Elements methods; Parallel Computing on PC clusters (Beowulf-like clusters); optimization of both parallel and sequential scientific computing codes; Soft Computing methods (Artificial Neural Networks, Genetic Algorithms, Neuro-Fuzzy methods, Bayesian methods); methods for numerical processing of signals for Imaging purposes; development of GUIs (Graphical User Interfaces) to simulation codes for post-processing of output data.

- **Mathematical Modeling**: for three years I have been involved in the development of mathematical models and subsequent numerical simulation codes and platforms for the study of complex adaptive artificial and natural systems. For example, I have developed mathematical models and codes for the investigation of processes involved in the growth of multicellular tumor spheroids (aggregate populations of cancer cells used *in vitro* as models of solid micro-tumors) in different micro-environmental conditions.

- **Inverse Problems and Imaging**: ultrasound imaging for materials non-destructive characterization, probabilistic methods (Monte Carlo) for the solution of Inverse Problems, use of Genetic Algorithms in the solution of Inverse Problems.

- Basic skills in **Microelectronics** and **Physics** of **Electronic Devices** (**6 months** of experience in a **Microelectronics Lab**): bipolar logic devices (ECL, CMOS); combinatorial logic devices; sequential logic devices; PLCs; micro-controllers, micro-processors and DSPs; VLSI circuits; OPAmp; A/D and D/A converters; Assembly language for 68K architectures.

- **Cybernetics** and **Systems Theory**: dynamical systems characterization and analysis; Stochastic Processes Theory for signal processing and analysis.

- **Web** and **Networking Technologies**: TCP/IP protocols, client-server architectures, static and dynamic HTML Web pages development, technologies based upon XML, database technologies (SQL language, server MySQL, development of graphical user interfaces to R-DBMS).

- **e-Science**: scientific databases and Web platforms social networking; bibliographic databases; Grid Computing for the management of distributed heterogeneous databases.

- **Systems Administration** experience (since 2002): PC GNU/Linux, Beowulf-like PC clusters for parallel scientific computing.

- Experience in the financial/burocratic/logistic management of several national and international scientific Research projects (have a look at the list of expired projects and at the list of ongoing ones I have been involved in).

- Experience as a Technical Delegate of the Italian Red Cross Society.

Information and Communication Technologies skills

- **"High level" programming languages**
    - **C** (since 2000)
    - **C++** (since 2002)
    - **Pascal** (basic level)
- **"Low-level" languages**
    - Assembler Motorola 6800 (basic experience)
- **Networking technologies**
    - TCP/IP protocols
    - basic experience in the management of PC networks (LAN)
- **Markup languages/Web technologies**
    - **TeX/LaTeX**
    - **HTML**

- ➢ **XML**
- **Relational databases**
  - ➢ **SQL** language
  - ➢ experience in the use of the R-DBMS **MySQL** and in the development of R-databases
- **OSs**
  - ➢ GNU/Linux OSs, especially Fedora, SuSE, Mandrake (since 2005, Mandriva) distributions
  - ➢ MS Windows (NT, 2K, XP) OSs
- **High Performance Computing/Parallel Computing**
  - ➢ Parallel programming of GNU/Linux clusters (Beowulf clusters) with the use of MPI (MPICH) (distributed-memory parallel systems)
  - ➢ Source sequential code optimization on GNU/Linux PC with Intel CPU, Pentium (i486, i586) architectures, with the use of Intel optimized compilator
  - ➢ GNU/Linux cluster of PCs and Computing Grids administration (OpenPBS, LSF)
- **Integrated Development Environment**
  - ➢ KDevelop
  - ➢ Eclipse
  - ➢ MS Visual Studio
- **Scientific Computing tools**
  - ➢ Matlab (also development of GUIs)
  - ➢ Scilab

Linguistic skills

- **Italian** (mother language)
- **English**
  - ➢ **PET** certificate ("**Pass with Merit**" level), **University of Cambridge**
  - ➢ Kenilworth Language Institute certificate (Dublin, Ireland), General English Program, course attended from August 21st to September 18th 2004 by UGAF (Union of Fiat Group retired workers) type B fellowship (for the study of English language)
  - ➢ Language Centre of Ireland certificate, Advanced 2 level, type "English as a Foreign Language" course, July 25th – August 5th 2005, Dublin (Ireland)
- **French**: High School knowledge

Management and relational skills/Spare time activities/Licences

- **Italian Red Cross Society volunteer** (since February 2003)

- **Medical First Aid** (**paramedic**) **volunteer** at the **Piemonte Emergency Administration** (**118 Service**)

- **Local technical responsible** of the **Italian Red Cross Society**: **Public Relations**, **Press**, and **ICTs infrastructures** (since 2005)

- During my Ph.D. in Physics I have been collaborating with different Research groups all around the world (look at the Web page http://www.calcolodistr.altervista.org/work/work_mg.html#collabs for the complete list of collaborations), I have visited different Research institutions abroad (have a look at the subsequent list of projects I have been involved in). I have been doing my Ph.D. in a Research group made of 6 people, where I take care of Research activities on specific subjects in collaboration with people working on other subjects, having developed a strong habit to integrate individual-conducted work within the framework of a team.

- I have had several experiences in the management of scientific Research projects, both national and international, taking care of burocratic, logistic, relational, financial and scientific aspects (look at the Web page http://www.calcolodistr.altervista.org/work/work_mg.html for a complete list of projects I

have been involved in or below) and acquiring a significant knowledge of procedures and methods in proposals writing/organizing within the European Research framework.

- I have been collaborating with the [Bioindustry Park of Canavese](#) in the promotion and organization of meetings, workshops and activities in the fields of **Computational Biology**, **Bioinformatics** and **Systems Biology** (have a look at the Web pages http://www.calcolodistr.altervista.org/work/bioinfo_syst_biol.html and http://www.piemontelifesciences.org/documents.htm).

- European car driving license (Italian type B).

- Italian driving license of type B-E (ambulances, basic and advanced emergency vehicles).
- Safe driving certificate for ambulances, Piemonte Region (2005).

Participation in Scientific Research Projects/Collaborations

• Date (since - to)	March 2004 - nowadays
• Title of the project	**AERONEWS** (Non-linear Elastic Wave Spectroscopy for Health Monitoring of Aircraft Components)
• Type of Project/Funding	Specific Targeted Research Project (STREP): FP6-502927/ FP6 (VI European Union Research Framework)
• Roles, duties in the project/knowledge acquired	Development of mathematical models and numerical simulation codes for the implementation of Imaging techniques based upon *Time Reversal Acoustics*, in order to investigate new methods of identification and non-destructive characterization of non-linear defects in materials and specimens of interest for aircraft components

• Date (since - to)	April 2004 - nowadays
• Title of the project	**CViT** (**C**enter for the development of a **Vi**rtual **T**umor)
• Type of Project/Funding	**ICBP** (**I**ntegrative **C**ancer **B**iology **P**rogram), National Cancer Institute-National Institutes of Health (**NCI**-**NIH**), USA
• Roles, duties in the project/knowledge acquired	Participation in the development of a Web platform (http://www.cvit.org/) for the *social networking* and for the creation of a modular software toolkit in order to support the study of tumor growth by the use of mathematical models and computational codes.

• Date (since - to)	January 2004 - nowadays
• Title of the project	Collaboration with the **Bioindustry Park** of **Canavese** (http://www.bioindustrypark.it/)
• Type of Project/Funding	Collaboration
• Roles, duties in the project/knowledge acquired	Development of a Bioinformatics and High Performance Computing Lab based on a Beowulf-like cluster of Linux PCs for supporting activities in Computational Biology and Bioinformatics (have a look at the Web page http://www.calcolodistr.altervista.org/work/bioinfo_syst_biol .html). Management of the collaboration between Bioindustry Park of Canavese and the Dept. of Physics, Polytechnic of Torino. Collaboration with **Aethia S.r.l.** (http://www.aethia.com/), on the use of the cluster.

• Date (since - to)	January 2004 – August 2005
• Title of the project	**NATEMIS** (**N**onlinear **A**coustics **TE**chniques for **MI**cro-**S**cale damage diagnostics) (http://www2.polito.it/ricerca/natemis/)
• Type of Project/Funding	Researchers Mobility, development of a Research network / ESF (European Science Foundation)
• Roles, duties in the project/knowledge acquired	I have been involved in the implementation of numerical Imaging techniques by numerical simulations and processing of ultrasound signals (visit to the Fraunhofer Institute for Non-Destructive Testing, Dresden branch, Dresden, Germany). I have participated in the development of software tools for the resolution of Inverse Problems by Genetic Algorithms (visit to the Institute of Thermomechanics, Czech Academy of Sciences, Prague, Czech Republic).

• Date (since - to)	January 2004 - nowadays
• Title of the project	Use of parallel super-computers for the simulation of elastic wave propagation through heterogeneous non-linear media
• Type of Project/Funding	Grant for the use of parallel super-computers / **CINECA** (Inter-University Consortium for High Performance Computing and Data Elaboration), Casalecchio di Reno (Bologna, Italy)
• Roles, duties in the project/knowledge acquired	Systems administrator for the use of computation time, development of parallel elastodynamic simulation codes, code debugging and tuning, participation in the management of the project for the years 2004, 2005 and 2006

• Date (since - to)	January 2003 – December 2005
• Title of the project	From Molecular Dynamics to Continuum Mechanics: a multi-scale description of mechanical properties of solids
• Type of Project/Funding	PRIN, 2002 call / MIUR (Italian Ministery of University and Research)
• Roles, duties in the project/knowledge acquired	Development of mathematical models and numerical codes for the simulation of ultrasonic wave propagation throughout materials with mesoscopic grains (hundreds of microns), such as polycrystalline rocks. Involved also in the burocratic and financial management of the project

Fellowship Grants

- UGAF (Union of Fiat Group retired workers) type A fellowships, years 1999, 2000, 2001 e 2002, for grades obtained during High School and University studies.
- UGAF (Union of Fiat Group retired workers) type B fellowship for the study of English as a foreign language, (Ireland, Dublin, August-September 2004)
- INFM-CNISM fellowship, Research Unit of Torino-Polytechnic, for the execution of the MS thesis, within the framework of the project *Mesoscopic simulations for bridging between the microscopic and macroscopic scales in Physics and Biophysics*, May 1st 2002 – January 31st 2003.
- First classified, fellowship for attending I level Master in Bioinformatics, Academic Year 2004, University of Torino, Mathematical, Physical and Natural Sciences Faculty.
- Winner of a fellowship for attending the XIII Summer School of Parallel Computing at CINECA, July 2004.

Note: I authorize the use of the provided information in accordance to the Italian Privacy Protection Law 675/96