

VINCENZO FIORENTINI – FULL CV

(partial update : jan 2012)

A – GENERAL

Born: Padova, Italy, on 5 Aprile 1960.

Citizenship and nationality: Italian.

Civil status: married. Two daughters (Isabella, 15½; Beatrice, 13), a son (Giovanni, 4½).

Current position:

Associate Professor, Italian scientific sector FIS-03–Physics of Matter, at the Facoltà di Scienze Matematiche, Fisiche, e Naturali of Università degli Studi di Cagliari.

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B – BRIEF SCIENTIFIC AND MANAGEMENT PROFILE

VF's activity is centered on the realistic theoretical description of the structural, electronic, vibrational, magnetic, dielectric, and polarization properties of solid-state systems. Typical topics have been: defects and impurities in semiconductors and oxides; dielectric and vibrational properties of oxides; low-dimensional nanostructures and interfaces; polarization and piezoelectricity applied to devices; fundamental processes (stress, reconstruction, adsorption and growth) at surfaces; correlation, magnetism, ferroelectricity, and phase transitions in oxides. Methodological developments included the density-functional stress density, a method to compute dielectric tensors with polarization theory, self-energy corrections to density-functional theory, and recently self-interaction-free density functional approaches. The main techniques used by VF are first-principles methods based on density-functional theory, and recently on post-DFT treatments for correlated systems. His activity is characterized by the prediction of observable quantities and effects, by continued comparison with experiment, and suggestions on the planning of specific experiments.

The main results of VF's research have been reported to date in 99 publications on major refereed journals (12 PRL, 11 APL, 48 PRB) and about 26 –mostly refereed– invited or contributed papers on proceedings or books. His scientific papers have been cited over 4200 times; he has 1, 3, 12, 19, 32, and 41 "significant" papers with, respectively, more than 1000, 200, 100, 50, 30, and 20 citation hits. The Hirsch indexes [J. Hirsch, PNAS **102** 16569 (2005), Scientometrics **85**, 741 (2010)] of VF's scientific production (1989-today) are $h=\bar{h}=31$ (WebOfScience 2011). Remarkably, the new Hirsch index \bar{h} is the same as h (Hirsch opines that "*A vanishing $h-\bar{h}$ gap in the advanced stages of a scientists career is a hallmark of scientific leaders*"). VF is also included in the list

of Top Italian scientists of V.I.A. Academy, Manchester. A full publication list is available at <http://www.dsfi.unica.it/~fiore/pub.pdf>. VF also edited several books and journal special issues as proceedings of a major workshop series he has been co-organizing for 12 years. VF has held 44 invited talks or lectures at international conferences and schools.

VF has been active in a number of conference program and steering committees, as well as consulting and hiring committees of several organizations, as detailed below. Between Jan. 2004 and Jan. 2009 he headed the Sardinian Laboratory for Computational materials Science of CNR/INFM, a 20-researcher organization among the top performers in computational materials physics in Italy. He has steadily managed his own research group (of size 3 to 6 people on average) and research grants/funding in the last 19 years, tutoring and directing the work of about 30-40 students and post-docs, and receiving research funding from various national and international institutions for a gross total of roughly 2 MEuro. He has spent sabbaticals abroad (about 18 months overall) as a Humboldt fellow and a Philips MC fellow.

C – STUDIUM

7/1979 Maturità classica (high school license) at Liceo Classico “J. Stellini”, Udine, Italy (final mark: 48/60).

7/1987 Laurea in Physics at Università degli Studi di Trieste, final mark 100/110. Thesis advisor: prof. A. Baldereschi.

10/1991 Completion of PhD thesis at Dipartimento di Fisica Teorica, Università degli Studi di Trieste. Tutore: prof. A. Baldereschi.

10/1992 Final PhD exam at Ministry of Research, Rome. Final mark: ‘excellent’

D – EMPLOYMENT

D.1 – in Italy

2/1982-2/1983 Civil service at Vigili del Fuoco (Fire Guard), Udine

1/1989-10/1991 PhD student at Dipartimento di Fisica Teorica, Università degli Studi di Trieste, at the International center for Theoretical Physics.

12/1991-3/1992 Guest scientist, Dipartimento di Scienze Fisiche, Università degli Studi di Cagliari.

2/1993-4/2001 Ricercatore (lecturer, assistant professor) in the sector Condensed matter physics at Facoltà di Scienze, Università degli Studi di Cagliari.

from 4/2001 Associate University Professor, sector Physics of Matter, at Facoltà di Scienze MFN, Università degli Studi di Cagliari.

D.2 – abroad

11/1987-12/1988 Consultant scientist at Fraunhofer-Institut für Angewandte Festkörperphysik, Abt. Materialforschung, Freiburg i.B. (Germany), funded by a Fraunhofer Stipendium.

7/1990 Guest scientist at Fraunhofer-Institut für Angewandte Festkörperphysik, Abt. Materialforschung, Freiburg i.B. (Germany).

4/1992-10/1993 Temporary staff member of Fritz-Haber-Institut der Max-Planck-Gesellschaft, Abt. Theorie, Berlin (Germany), funded by a Max-Planck Stipendium.

Jul-Ott 1998, Jun-Jul 1999, Oct-Dec 2000 Alexander-von-Humboldt guest scholar at Walter Schottky Institut, Technische Universität München, Abt. Theoretische Halbleiterphysik, Garching (Germany), funded by an Alexander von Humboldt–Stiftung scholarship.

Dec 2005-Feb 2006, Nov 2006-Jan 2007 Marie Curie invited professor at Philips Research Leuven

E – TEACHING

As university lecturer and professor at Università di Cagliari:

1993-2000 Lectures on Condensed matter physics for Physicists.

1993-94 Lectures on Analytical Mechanics for Physicists.

1995-2003 Full course on Computational methods of physics, for Physicists.

1996-97 Full course on Mathematics, Diploma in Economy.

1997-2003 Full course on Solid state physics, Diploma in Materials Science.

1998-2003 Full course on Surface Physics, for Physicists.

2001-2002, 2009-2011 Full course on Foundations of computational physics, for Physicists.

1998-99 Lectures of Semiconductor Physics, for Physicists.

2002-2003 Full course of Semiconductor Physics, for Physicists.

2002-2010 Full course on Computational physics, for Physicists.

2003-2008 Full course on Computational condensed matter physics, for Physicists.

2004-2010 Full course on Solid state physics, for Physicists.

2010 Full course on Advanced quantum mechanics for Physicists.

2010 to date Full course on Condensed matter physics for Physicists.

Since 1993 Advisor or co-advisor of over 25 laurea (Diplom-like) theses and about 10 PhD theses.

Also :

1995 Invited lectures on “Pseudopotentials in electronic structure applications”, Workshop on Computational Methods in Material Science and Engineering, ICTP Trieste.

2000 Invited lectures on “Spontaneous and piezoelectric polarization in semiconductors: conceptual aspects and applications”, International School of Semiconductor Physics, Jaszowiec (Polonia).

2010 Invited lecture on “Ab initio description of correlation-induced transitions in solids”, CNR-UCSB Workshop “Aquila Initiative for Ferroics”, L’Aquila (Italy).

2011 Invited lectures on “Topics in the ab initio theory of oxides”, ”Workshop on Advanced Oxide Interfaces” at International Center for Theoretical Physics, Trieste.

F – RESEARCH MANAGEMENT AND ORGANIZATION

F.1 – Management of projects and personnel

- 2004-2009** Director of SLACS, Sardinian Laboratory for Computational Materials Science.
- 1993 to date** Scientific advisor of post-doc researchers for approximately 60 man-years within approximately 15 different projects.
- 2002 to date** Responsible of a MIUR “Ritorno dei Cervelli” contract at Università di Cagliari.
- 2006 to date** Recipient of a Fondazione Banco di Sardegna grant on “Correlated multiferroics”.
- 2008 to date** Recipient of a Fondazione Banco di Sardegna grant on “Spintronic devices based on manganites”.
- 2009 to date** Scientific responsible at CNR IOM-SLACS Cagliari for the Research Project “NEWD-FESCM: New density functionals for the electronic structure of complex materials.”, funded by the Italian Institute of Technology.
- 2008 to date** Scientific responsible at CNR SLACS for the EU-NPM Research Project “ATHENA: Advanced theories for functional oxides: new routes to handle the devices of the future”, funded by the EU 7 FP.
- 2008 to date** Scientific responsible at CNR SLACS for the EU-SMP Research Project “OxIDE: Oxide interface design”, funded by the EU 7 FP.
- 2009 to date** Scientific responsible at CNR SLACS for the Research Project “New density functionals for correlated materials”, funded by the Italian Institute of Technology.
- 1993-96** Scientific responsible at Università di Cagliari for the Focused Fundamental Research Project “LASBE” on III-V nitrides and their nanostructures, funded by the EU Brite-EURAM II program.
- 1997-1999** Scientific responsible of the advanced project (PAIS) “Theory of metallic contacts on nitrides and oxides” funded by the Semiconductors division of National Institute for the Physics of Matter (INFM).
- 1999-2001** Local scientific responsible in the national research project funded by Ministry of research (MIUR-Cofin 1999) “Fisica e tecnologia di eterostrutture a nitruri”.
- 2000-2002** Local scientific responsible in the national research project funded by Ministry of research (MIUR-Cofin 2000) “Diffusione di non-equilibrio in nanostrutture a base silicio”.
- 2001-2003** Local scientific responsible in the national research project funded by Ministry of research (MIUR-Cofin 2001) “Caratterizzazione ottica e strutturale e trattamenti post-crescita di eterostrutture InGaAsN / GaAs”.
- 2002-2004** Local scientific responsible in the national research project funded by Ministry of research (MIUR-Cofin 2002) “Diffusione e clustering di droganti in silicio cristallino”.
- 2005-2007** National and local scientific responsible in the national research project funded by Ministry of research (MIUR-Cofin 2005) “Coexistence of magnetism and metallicity in oxide superconductors”.
- 2001-2004** Responsible for theoretical activity within INFM-MDM Lab in the project INVEST on the epitaxy of high- κ oxides on Si, funded by the EU.

2001-2005 Scientific responsible for the project Fondo Integrativo Ricerca di Base (FIRB) "Basi microscopiche della morfologia di film metallici epitassiali".

2003-2004 Scientific responsible of the advanced project (PAIS) "Rare-earth high-k oxides for Si microelectronics" funded by the Semiconductors division of National Institute for the Physics of Matter (INFM).

1999 to date Responsible for INFM supercomputing projects (on average 2-3 yearly)

F.2 – Conference organization

1994 to date Co-organizer of the Computational Materials Science Workshop, Cagliari.

1995-98 Member of Program committee of the series European Gallium Nitride Workshops.

1997-2000 Member of Program committee of International Conference on Nitride Semiconductors.

1999 Program chair of symposium "Nitride semiconductors" at INFM-Meeting (Catania, Italy)

1999-2003 Member of Program and Advisory Committee of International Symposium on Blue Light Emitting Devices.

1999 Member of Program and Advisory Committee of International Conference on Ternary and Multinary Compounds.

F.3 – Scientific evaluation committees

passim Member of selection committees for grants, post-doc positions, admission to PhD school, final PhD examinations, etc.

1998 Member of the committee for the hiring of the head of a junior independent group at Fritz-Haber-Institut, Berlin.

1996-97 Project referee for the Schwerpunktprogramm *Gruppe III-Nitride und ihre Heterostrukturen* of the Deutsche Forschungsgemeinschaft.

1997-2002 Member of the committee for local funding of physics research at Università degli Studi di Cagliari.

2002 Consultant referee for the Swiss National Science Foundation.

2005-2008 Consultant to the Ministry of Industry.

2005 Consultant referee for the Steering Committee on Research of the Ministry of University and Research.

2007 Member of the committee for the hiring of an assistant professor at University of Padova.

2008 Consultant referee for the Estonian National Science Foundation.

2011 Consultant referee for the Romanian National Science Foundation.

2010 Consultant to Veneto Innovazione (regional funding agency).

2011 Consultant to Ministry of University and research (industrial project evaluation)

F.4 – Other management and service activities

1992 to date Referee for Nature, Physical Review Letters, Physical Review B, Applied Physics Letters, Europhysics Letters, Surface Science, Journal of Applied Physics, physics status solidi, Computational Materials Science, European Physical Journal B.

1995-2007 Coordinator of ERASMUS/SOCRATES activities for physics at Università di Cagliari.

2000-2003 Elected member of the Executive Committee of the Semiconductors division of INFM.

2001-2006 Editorial Board member of International Journal of Theoretical and Computational Chemistry.

G – INVITED TALKS AT INTERNATIONAL CONFERENCES

G.1 – Complete list

Besides several tens of contributed talks or posters at national and international congresses and several invited seminars at various institutions, I held over 40 invited talks to date at international conferences or schools. Many further invited talks have been held by coauthors of the relevant works. The invited talks I have given in person are:

1991 II Italian-Swiss Workshop on Computational Condensed Matter Physics, S. Margherita di Pula (CA) (invited talk).

1992 III Italian-Swiss Workshop on Computational Condensed Matter Physics, S. Margherita di Pula (CA) (invited talk).

1993 Convegno GNSM “Fisica Teorica e Struttura della Materia”, Fai della Paganella (TN) (invited talk).

1994 Miniworkshop on Total Energy and Force Methods, Copenhagen (invited participant and speaker).

1994 Frühjahrstagung der Deutsche Physikalische Gesellschaft, Münster (invited talk).

1994 Workshop on Computational Material Science, Brindisi (invited talk).

1995 Workshop on Computational Methods in Material Science and Engineering, ICTP Trieste (invited lectures).

1995 Workshop on Computer Simulation of Crystal and Overlayer Growth, Lyon (invited participant and speaker).

1996 MRS Fall Meeting, Boston (invited talk)

1997 Congresso Nazionale INFM, Chia (CA) (invited talk).

1997 Workshop on First-principles Theory of Ferroelectricity, CECAM Lyon (invited participant and speaker).

1997 Workshop on Simulation of Silica Glasses, CECAM Lyon (invited participant and speaker).

1998 Max-Planck Symposium on Surface Morphology, Interfaces, and Growth of III-V Nitrides, Ringberg, Germany (invited talk).

1998 Congresso Nazionale INFM, Rimini (invited talk).

- 1999** Workshop on Computational Materials Science at the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (invited talk).
- 1999** Convegno GNSM “Fisica Teorica e Struttura della Materia”, Fai della Paganella (TN) (invited talk).
- 1999** International Conference on the Formation of Semiconductor Interfaces, Göteborg, Sweden (invited talk).
- 1999** Solid State Devices and Materials Conference, Tokio, Japan (invited talk).
- 2000** International Conference on Ternary and Multinary Semiconductors, Hsin-Chu, Taiwan (invited talk).
- 2000** International School of Semiconductor Physics, Jasowiec, Poland (invited lecture).
- 2000** Workshop on Growth, morphology and magnetic properties of epitaxial metallic systems, CECAM Lyon (invited participant and speaker).
- 2000** PSI-K2000 - Ab initio (from Electronic Structure) Calculations of Complex Processes in Materials, Schwäbisch Gmünd, Germany (invited talk).
- 2001** MURI-ONR Polaris project review, Cornell University, USA (invited talk).
- 2001** E-MRS - European Materials Research Society Meeting, Strasbourg, Francia (invited talk).
- 2001** Max-Planck Symposium and Heraeus Seminar on Electronic origin of magnetoelastic anisotropy and stress in atomic layers, Ringberg, Germany (invited talk).
- 2002** International Symposium on Blue-Light-Emitting Devices (ISBLED-2), Cordoba, Spagna (invited talk).
- 2002** International Conference on Extended Defects in Semiconductors, Bologna, Italy (invited talk).
- 2002** Italian Physical Society General Congress, Alghero, Italy (invited talk).
- 2002** ChIPPS 2002 - Challenges in Predictive Process Simulation, Prague, Chzokia (invited talk).
- 2003** ESF Workshop on Submicron gate oxides in Si technology, Zürich, Svizzera (invited talk).
- 2004** CECAM workshop on Atomic processes at Si/oxide interfaces, Lyon, Francia (invited participant and speaker).
- 2005** ESF Workshop on Rare-earth oxides, S. Remo, Italy (invited participant and speaker).
- 2005** NATO Workshop on Defects in High-k oxides, S. Petersburg, Russia (invited talk).
- 2005** Italian Physical Society General Congress, Catania, Italy (invited talk).
- 2006** E-MRS Spring Meeting, Nice (invited talk).
- 2006** ElectroChemical Society of America, Gate Stacks Symposium, Cancun, Mexico (invited talk).
- 2006** Workshop “Modeling at the nanoscale”, Palau, Italy (invited talk).
- 2008** e-science conference 2008, Naples, Italy (invited talk).

- 2010** AQUIFER - Aquila initiative on ferroics, L'Aquila, Italy (invited lecturer; resident tutoring scientist).
- 2010** Workshop “Emergent trends in advanced correlated materials”, Capri, Italy (invited talk).
- 2011** Thomas Young Center Soirée “Correlated materials with DFT ?”, London, UK (invited speaker)
- 2011** Workshop on Advanced Oxide Interfaces, International Center for Theoretical Physics, Trieste, Italy (invited lecturer)
- 2011** Workshop “Frontiers in fundamental physics”, Università di Udine, Udine, Italy (invited speaker)

G.2 – A selection of invited talks

MRS Fall Meeting 1996
 Max-Planck Symposium 1998
 “Total-Energy” Workshop 1999
 Psi-k Conference 2000
 CHIPPS 2002
 ESF workshop on rare-earth oxides 2005
 SIF 2005
 E-MRS 2006
 AQUIFER 2010
 ETACM 2010

H – AWARDS AND GRANTS

- 2005-2006** Marie Curie invited professor at Philips Research Leuven
- 1998-2000** Alexander von Humboldt Research Fellowship
- 2006** Fondazione Banco di Sardegna grant in research
- 2008** Fondazione Banco di Sardegna grant in research
- 2010** Fondazione Banco di Sardegna grant in research
- 2009** EU NMP Research Grant on perovskite oxides
- 2008** EU NMP Research Grant on perovskite oxides
- 2008** IIT Research Grant on new density functionals
- 1994-96** EEC Brite-EURAM Research Grant on III-V Nitrides
- 1999-2000** MURST-Cofin grant on nitride nanostructures
- 2000-2001** MURST-Cofin grant on impurities in Si
- 2001-2003** MIUR-PRIN grant on GaAsN alloys
- 2002-2004** MIUR-PRIN grant on impurities in Si

2005-2007 MIUR-PRIN grant on oxide superconductors

1997-99 PAIS-INFM grant on metal-nitride contacts

2003-2004 PAIS-INFM grant on rare-earth oxides

2002-2005 MIUR-FIRB grant on the epitaxial growth of metals

2001-2004 EU grant on high- κ oxides on Si

1997-99 Regione Sardegna grant on III-V nitrides

1999-2001 Regione Sardegna grant on parallel computing

1999-2003 Università di Cagliari personnel grant on III-V nitrides

2003-2007 Scientific responsible of MIUR-“Cervelli per la ricerca” grant

1993 to date Supercomputing grants

I – MEMBERSHIP IN SCIENTIFIC SOCIETIES

1989-2003 Deutsche Physikalische Gesellschaft.

1990-2005 INFN

2005-onward CNR (“associato”)

2005-onward American Physical Society