

Maria Grazia BETTI
Curriculum Vitae ai fini della pubblicazione

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Part II – Education

	<i>Year</i>	<i>Institution</i>	<i>Thesis and Marks</i>
Graduation	29 March 1985	Univ. Roma La Sapienza	Physics Proprietà elettroniche e strutturali dei siliciuri di nichel da misure di perdita di energia degli elettroni 110 cum laude
PhD	1989	Univ. Parma-Modena	Physics High Resolution electron energy loss spectroscopy on semiconductor surfaces

Part III – Appointments

IIIA – Professional Appointments

<i>Start</i>	<i>End</i>	<i>Institution</i>	<i>Position</i>
2018			Abilitazione Nazionale Professore I Fascia 02/B1
2012			Abilitazione Nazionale Professore I Fascia 02/B1
1.11.1999		University La Sapienza	Associate Professor 02/B1 FIS01
1.11.1992	31.10.1999	University of Modena and Reggio Emilia	Researcher FIS03
30-12-1988	31.10.1992	CNR- Istituto di Struttura della Materia Frascati (Roma)	Researcher (ex art. 36)
1-11-1988	30-04-1989*	SISSA – Scuola Superiore di Studi Avanzati (Trieste)	Visiting Professor

*leaving on 29-12-1989 to CNR-ISM Frascati (Roma)

IIIB – Temporary Appointments and visiting positions

	<i>Institution</i>	<i>Position</i>
1.2.1998-31.10. 1998	CNRS- Université Pierre et Marie Curie, Paris (France)	Fixed term research contract (CNRS- Postes rouges)
1 June- 30 Sept 1992	Synchrotron Radiation Laboratory LURE, Orsay (France)	Visiting researcher
1 Jul-31 Aug 1991	Synchrotron Radiation Laboratory BESSY, Berlin (Germany)	Visiting researcher
1Apr-31Aug 1988	Montana State University, Bozeman (USA)	Visiting researcher
Sept 1988	University of California, Irvine California (USA)	Visiting researcher

Several short term projects in synchrotron radiation facilities:

ESRF- Grenoble-France,
Soleil- Paris-France,
Elettra (Trieste)-Italy,
Bessy (Berlin-Germany))

IIIC – Appointments for international research organizations

In recent years, I have held many positions in national and international research institutes both of scientific review and auditor for funding agencies. Among these positions I was scientific member and Italian representative in the Scientific Advisory Committee (SAC) of the European Synchrotron Radiation Facility (ESRF) Grenoble for two terms (2012-2014 and 2015-2017). During this period, the new upgrade project EBS (Extremely Brilliant Source) at ESRF was approved by SAC and eventually launched. I participated to the search committee of the SAC with the task to select the new six innovative beamlines for the future upgrade of ESRF. I participate to the review panels of several beamlines to audit the scientific activity and the performance of the beamlines, as SAC observer.

In the past, I held appointments in international synchrotron radiation facilities where I have a longstanding collaboration with several research lines. See for example the participation to the review panel for “*Electronic and Magnetic properties of solids*” in the Proposal Review Committee of the National French Synchrotron Radiation Facility SOLEIL Saint-Aubin (France).

I am/was referee of several research funding agencies in Italy and abroad, among them: Agence National de Recherche - France, Austrian Science Fund (FWF) Austria, MIUR- Italy, CNR – Italy.

In the following a detailed list of my appointments.

2016-today	Expert reviewer for the European Science Foundation (ESF)
2015-2017	National delegate of Scientific Advisory Committee (SAC) of the European Synchrotron Radiation Facility (ESRF) Grenoble (France)
2015-2017	Expert reviewer for the Proposal Review Committee at the European Synchrotron Radiation Facility (ESRF) Grenoble (France)
2012-2014	National delegate of Scientific Advisory Committee (SAC) of the European Synchrotron Radiation Facility (ESRF) Grenoble
2009-2015	Expert Reviewer for the Agence National de la Recherche (France)
2006-2014	Expert reviewer for <i>Electronic and Magnetic properties of solids</i> in the Proposal Review Committee of the National French Synchrotron Radiation Facility SOLEIL Saint-Aubin (France)
2004-2007	Member of the Committee of the Surface Science Division Electoral College of International Union for Vacuum Science, Technique and Applications (IUVSTA)
2001-2004	Alternate Councilor Executive Council International Union for Vacuum Science, Technique, and Applications (IUVSTA) http://iuvsta.org/flipbook/files/assets/basic-html/page-24.html
1999-2002	Elected member of the User Committee LURE National French Synchrotron Laboratory
1998-2001	Alternate Councilor Executive Council International Union for Vacuum Science, Technique, and Applications (IUVSTA)
1998-2004	Elected member Executive Council Associazione Italiana Vuoto

IIID –Academic Appointments at the University

I have held several academic appointments at the University La Sapienza and now I am member of the college board of the PHD in Physics and of the Steering Committee of the Amaldi research Center (“dipartimento di eccellenza” MIUR). From 2013 to 2016 I was elected representative of the associate professors for the Macro-Area A (science and engineering/technological sectors) in the SENATO ACCADEMICO, where I participated in many panels and executive committees, including the “Commissione chiamate dirette”, to encourage the call of candidates with excellent academic

positions abroad or winners of European projects of excellence. During my tenure, 11 excellent candidates were hired in the Physics Department under the program “chiamate dirette”.

2018	today	Member of the steering committee of the Amaldi Research Center (MIUR-Dipartimento di Eccellenza)	University La Sapienza
2018	today	Member of the College board of PhD School in Physics (Collegio dei Docenti - PhD Fisica)	University La Sapienza
2016	today	Member Commissione Paritetica Laurea Magistrale in Fisica	University La Sapienza
2015	today	Member <i>Commissione Paritetica Laurea Triennale in Biologia</i>	University La Sapienza
2013	today	Member Premio Tomassoni Committee	University La Sapienza
2013	2016	Elected member of Academic Senate (Senato Accademico)	University La Sapienza
2008	2011	Elected member of the SMFN School board (Giunta di Facoltà)	University La Sapienza
2006	2012	Member of the College board of PhD School in Physics (Collegio dei Docenti - PhD Fisica)	University La Sapienza
2007	2012	Member of executive board and scientific council of Nanotechnology Inter-departmental Center CNIS	University La Sapienza
2003	2008	Member of board of Master Degree Program (Giunta Consiglio Area Didattica) in Physics	University La Sapienza
2000	2006	Member of the College board of PhD School in Materials Science (Collegio dei Docenti - PhD Scienza dei Materiali)	University La Sapienza
2004	2006	Member Premio Tomassoni Committee	University La Sapienza
2002	Today	Responsible ERASMUS agreement Sapienza-Université Pierre et Marie Curie- Paris (France)	University La Sapienza
2002	2006	Member of <i>Giunta del Consiglio di Area didattica in Fisica</i>	University La Sapienza
2002	2006	Member Teaching Committee in Biology	University La Sapienza
1995	1999	Elected researcher representative at SMFN School Council (Assemblea di Facoltà)	University Modena e Reggio Emilia
1992	1996	Member of board (Giunta) of the Department of Physics	University Modena e Reggio Emilia

III E –Appointments: Commissions of trust abroad

2018	Expert Reviewer panel at ESRF 6-7 November 2018 Grenoble (France)
2018	Expert Reviewer European Project CERIC 28-29 May 2018 Praha and Trieste
2015	Thesis committee PHD committee Universidad Donostia-San Sebastian
2015	Chairperson of the review panel at SOLEIL Synchrotron radiation national laboratory Saint-Aubin (France); 20-21 April 2015:
2015	Expert reviewer panel at ESRF Grenoble (France) 26-27 May 2015
2014	Expert for Scientific Evaluation Panel of the European Science Foundation for the

	GRAPHENE FLAGSHIP Amsterdam (The Netherlands) 14-15 May 2014
2014	Expert Review panel at ESRF May 2014 Grenoble (France) 20-21 May 2014
2012	Member of selection board for the recruitment of beamline responsible at SOLEIL Synchrotron Radiation Laboratory (France)
2005	Member of selection board CNRS- Université Pierre et Marie Curie Paris VI "habilitation a diriger les recherches"
2002	Member of the Italian Delegation of the 1 st bilateral Italy-US Frontiers of Material Science and Nanoscale Science & Nanotechnology, Washington, Washington DC (USA), March 14- 15, 2002
2001	Thesis committee (Jury) PHD in Physics Pierre et Marie Curie-Paris VI -France

IIIF– Selection boards in Italy

Member of several selection boards for recruitment of scientists in Italy.

In the following a list of those of selection boards for permanent positions

2016	Member of selection board for researcher position at CNR	CNR 366.19 DSFTM TEC
2015	Member of selection board for researcher RTDA position at Politecnico di Milano	Politecnico di Milano
2012	Member of selection board for researcher position at CNR-IPCF	CNR 364.117
2004	Member of selection board for Associate Professor Politecnico di Milano	Politecnico di Milano
2004	Member Selection board for a researcher position Istituto B. Kessler	Istituto B. Kessler, Trento
2003	Member of selection board CNR researcher position Montelibretti (Rome)	CNR
2000-2004	Member of the selection board of permanent researcher positions (12) at INFM and several tenure tracks positions	INFM

Referees of several international journals like Physical Review and Physical Review Letters, Journal of the American Chemical Society, Journal Physical Chemistry Letters etc

IIIG – Organization of Conferences and Congresses

Organizer and member of the Program Committee of several conferences, congresses and workshops.

A list of the main conferences (more than 1000 Participants)

Year **Conference**

2008	Program Committee CMD-22 EPS Surface Division Rome
2008	Organizing Committee CMD 22 EPS
2006	Program Committee International Conference on Surface Science (ICSS-13) Stockholm
2004	Organizing Committee International Vacuum Congress IVC16
2004	Program Committee International Conference on Solid Surface ICSS-12 Venezia
1991	Program Committee International Conference of Semiconductor and Interfaces (ICFSI)

III H – Invited talks

I presented oral contributions in more than 50 international conferences and I was invited in several workshops, schools and seminars in international research institutions. A list of invited talks in international conferences is reported below

<i>Year</i>	<i>Conference</i>
2018	3 rd Joint AIC-SILS Conference Rome 25-28 June 2018 “Topology and functions of porous 3D graphene architectures”
2017	COST- EUSPEC WG2-WG5 COST Workshop “Recent Advances in Spectroscopy: Experiment and Theory” Krakow (Poland) 4-5 April 2017, Tuning the magnetic properties of self-assembled molecules on Co intercalated graphene http://www.euspec.eu/dates/82-electron-and-absorption-spectroscopies
2016	Spintronic Meeting- EMN- Las Vegas Meeting 11-14 October 2016 Las Vegas (USA)
2013	FISMAT 9-13 September 2013 Milan (Italy) Organometallics architectures on surfaces
2013	3 rd Joint Summer Workshop on Nanotechnology 5-9 September 2013 Adsorption of 2D molecular structures on surfaces
2010	Nanoscience&Nanotechnology N&N 2010 Frascati 20-23 September 2010 Organic chains on surfaces
2006	XCII SIF Congress 18-23 September 2006 Mixing electronic states of organic molecules at surfaces
2004	XC Congresso SIF Congress 20-25 September 2004 Self assembling organic molecules on surfaces
2002	Workshop of the National Science Foundation “Frontiers in Material Research in Nanoscience and Nanotechnology” Washington (USA) 14-15 March 2002 Alkali chains on semiconductor surfaces
2001	International conference on surfaces and Nanostructures Minsk (Belarus) 22-25 May 2001 Self assembling alkali nanowires at semiconductor surfaces
2000	LURE User Meeting Orsay 10-12 December 2000 2D electron gas at surfaces
1999	IUVSTA Conference on Quantum devices and nanostructures Cortona 2-5 July 1999 Space charge layers at semiconductor surfaces
1998	INFM Meeting Rimini 25-30 June 1998 Two dimensional electron gas at semiconductor surfaces
1995	2 nd International Conference of “Physics of Low Dimensional Structure” Dubna 18-22 September 1995 “Structural and electronic properties of 2D systems

Part IV – Teaching Experience

IV A - Courses

Year	Institution	Lecture/Course
2018/19	Univ Sapienza CdS Fisica LM	Physics of surfaces and nanostructures (6ECTS)
2018/19	Univ Sapienza CdS Biologia	Fisica (9ECTS)
2017/18	Univ Sapienza CdS Fisica LM	Fisica delle superfici e nanostrutture (6ECTS)
2017/18	Univ Sapienza CdS Biologia	Fisica (9ECTS)
2016/17	Univ Sapienza CdS Fisica LM	Fisica delle superfici e nanostrutture (6ECTS)
2016/17	Univ Sapienza CdS Biologia	Fisica (9ECTS)
2015/16	Univ Sapienza CdS Fisica LM	Fisica delle superfici e nanostrutture (6ECTS)
2015/16	Univ Sapienza CdS Biologia	Fisica (9ECTS)
2014/15	Univ Sapienza CdS Fisica LM	Lab per Materia Condensata (12 ECTS)
2013/14	Univ Sapienza CdS Fisica LM	Lab per Materia Condensata (12 ECTS)
2012/13	Univ Sapienza CdS Fisica LM	Lab per Materia Condensata (12 ECTS)
2011/12	Univ Sapienza CdS Fisica	Meccanica (12 ECTS)
2010/11	Univ Sapienza CdS Fisica	Meccanica (12 ECTS)
2009/10	Univ Sapienza CdS Fisica	Meccanica (12 ECTS)
2008/09	Univ Sapienza CdS Fisica	Termodinamica e laboratorio (9 ECTS)
2007/08	Univ Sapienza CdS Fisica	Termodinamica e laboratorio (9 ECTS)
2006/07	Univ Sapienza CdS Fisica	Fisica dei sistemi a bassa dimensionalità (6 ECTS)
2006/07	Univ Sapienza CdS Fisica	Termodinamica (6 ECTS)
2006/07	Univ Sapienza CdS Fisica	Lab di Termodinamica (9 ECTS)
2005/06	Univ Sapienza CdS Fisica	Lab di Termodinamica (9 ECTS)
2004/05	Univ Sapienza CdS Fisica	Lab di Termodinamica (9 ECTS)
2003/04	Univ Sapienza CdS Fisica	Lab di Termodinamica (9 ECTS)
2002/03	Univ Sapienza CdS Biologia	Laboratorio di Analisi dati e misure
2001/02	Univ Sapienza CdS Biologia	Laboratorio di Analisi dati e misure
2000/01	Univ Sapienza CdS Biologia	Laboratorio di Fisica
1999/00	Univ Sapienza CdS Biologia	Laboratorio di Fisica
1998/99	University of Modena- Reggio Emilia	Fisica per il CdS Biotecnologie
1998/99	University of Modena- Reggio Emilia	Fisica dei Semiconduttori per il CdS Fisica
1997/98	University of Modena- Reggio Emilia	Fisica per il CdS Biotecnologie
1996/97	University of Modena- Reggio Emilia	Fisica per il CdS Biotecnologie
1995/96	University of Modena- Reggio Emilia	Fisica per il CdS Biotecnologie
1994/95	University of Modena- Reggio Emilia	Esercitazioni Fisica per Cds Biotecnologie
1994/95	University of Modena- Reggio Emilia	Esercitazioni di Struttura della Materia per CdS Ingegneria
1993/94	University of Modena- Reggio Emilia	Esercitazioni Fisica per Cds Biotecnologie
1993/94	University of Modena- Reggio Emilia	Esercitazioni di Struttura della Materia per CdS Ingegneria
1992/93	University of Modena- Reggio Emilia	Esercitazioni Fisica per Cds Biotecnologie
1992/93	University of Modena- Reggio Emilia	Esercitazioni di Struttura della Materia per CdS Ingegneria

IVB – Teaching experience: Supervisor PHD students

GIULIA AVVISATI	XXXI ciclo FISICA Università Sapienza now Post-doc Sapienza
SIMONE LISI	XXVII ciclo FISICA Università Sapienza now post-doc Université Grenoble
PIERLUIGI GARGIANI	XXV ciclo FISICA Università Sapienza now Beamline scientist synchrotron radiation ALBA (Barcelona)
CHIARA BALDACCHINI	XVIII ciclo FISICA Università Sapienza now CNR Researcher- Viterbo
SANDRA GARDONIO	XVI ciclo Scienza dei Materiali Università Sapienza now Assistant Professor University Nova Goritzza
VALDIS CORRADINI	PHD- Université Pierre et Marie Curie now CNR researcher- Modena

IVC – Tutor Master students

Università Roma La Sapienza	18 Master Thesis , and tens of first level thesis (dissertazioni)
Università Modena e Reggio Emilia	6 Master Thesis

IVD– PHD students duties

From 2018	Member of PHD Council (Collegio dei docenti) Physics
2015	Thesis committee PHD in Physics San Sebastian-Donostia Spain
2014	Thesis committee PHD in Physics University L'Aquila
2010	Thesis committee PHD in Physics University of Cosenza
2007-2013	Member of PHD Council (Collegio dei docenti) Physics
2003	Selection board for PHD students for Physics University La Sapienza
2001	Thesis committee (Jury) PHD in Physics Pierre et Marie Curie-Paris VI -France
2000-2006	Member of PHD Council (Collegio dei docenti) Material Science
2000	Selection board for PHD students for Material Science University La Sapienza

IVE–Scientific dissemination and equal opportunities and science policy issues

Since my PHD, I have been dedicated to scientific dissemination and I am interested in promoting the debate on science policy issues. Recently I was the promoter of the agreement between Città della Scienza in Naples and University La Sapienza in Rome, supporting several exhibitions, and conferences. I have promoted several projects to support gender equality and the career of women in science and I was member of the Italian delegation at the 1st International Conference of Women in Physics, with 67 national delegation and now I am active in the Department and in the Faculty where an observatory on gender and diversity is active. In the following a list of the main activities:

Gender and diversity and equal opportunity

2019	Organizing Committee of the <i>International Day of Women and Girls in Science</i> at Department of Physics Rome La Sapienza 11 February 2019
since 2018	Co-proposer of the observatory <i>Gender and diversity in Physics at Sapienza (GIPSI)</i>
2006	Invited speaker at the 2nd National Conference “Women and Science” Padova, 21-23 september 2006 http://www.donnescienza.it/2-convegno-nazionale-donne-e-scienza-2006/
2002	Member of the Italian delegation at the 1st International Conference of Women in Physics , with 67 National Delegations (Paris, UNESCO Headquarters, March 2002; American Inst of Physics Conference Proceedings 628 E. Molinari, M. G. Betti , A. Bonfiglio, A. G. Magnani, M. L. Paciello “Women in Physics in Italy: the leaky pipeline”, in “Women in Physics” Ed. By Beverly K. Hartline and Dongqi Li (2003). AIP Conf. Proc. 628, 181 (2002)),
2002	Invited talk “ <i>Le statistiche di genere: Istituto di Fisica della Materia</i> ” Conference “Equal opportunities in the Italian research institutions” Roma, 4 June 2002 web.infn.it/CUG/images/alfresco/CPO/Sito_CPO/pubbl/CPO2002/INFM_Betti.pdf

Scientific dissemination and science policy issues

since 2015	Appointed in the management committee of the convention between Città della Scienza (Naples) – Università La Sapienza . Several activities already promoted: cycle of conferences, exhibitions and workshops
2015	Organizing Committee SESAME: un supermicroscopio in Medio Oriente Città della Scienza , Napoli 7 May 2015 – Science for Peace: SESAME Università La Sapienza 6 May 2015
2015	Organizing Committee Exhibition: La Scienza illumina Città della Scienza-Università La Sapienza http://193.206.84.63/it/news-3/news-uffcom/1655-la-mostra-scienza-illumina-a-citta-della-scienza
2012	Organizing Committee conference “ Dialoghi Scienze e Società ” University La Sapienza 1-2 March 2012 https://agenda.infn.it/event/4592/
2007	Publication “Scienza e Società 2007”; vol. 1, pag. 129 Edizioni Università Bocconi Le nanotecnologie vanno alla guerra
2005	Conference: “ Le corporazioni nel mondo globale: i rapporti con la scienza ” 20-4-2005 “Viaggio al centro dell’impero” http://www.circoloculturalemontesacro.it/politica/estera/politica_estera.html
2005	Dissemination http://www.treccani.it/scuola/tesine/relativita/3.html

	Enciclopedia Treccani, Italia, maggio 2005 , “ <i>Le frontiere degli studi sulla struttura della materia</i> ”
2004	Invited talk “La scienza e la guerra fredda” Workshop “ <i>Movimenti, dissensi, guerre: gli Stati Uniti ieri e oggi</i> ” Università della Calabria 13-14 gennaio 2004 www.women.unical.it/app/download/5788051730/Locandina_Movimenti%2C+dissenso+e+guerre.pdf
2003	Invited talk Workshop “ Scienza e Pace: Paradigmi e Pratiche a confronto ” World Science Day for Peace and Development Università di Modena 10 Novembre 2003
2003	Publication “ Ricerca e democrazia in Italia ” Democrazia e diritto, 2003; 41(1) Franco Angeli Editore 259-269 ISSN:04169565 https://www.francoangeli.it/riviste/Scheda_Rivista.aspx?IDArticolo=20161&iDRivista=116
1998	Organizing Committee “ Imparagiocando ” INFM - Foro Boario-Modena

Part V - Funding Information
grants as PI-principal investigator or I-investigator

Year	Title	Program	Grant value
2018	Strain-driven patterning of two-dimensional materials	I Ricerca Progetti Grandi Sapienza RG11816436AA49A7	63.800 Euro
2017	Carbon Nanotubes for Dark Matter directional searches.	I Ricerca Progetti Grandi Sapienza RG11715C818AAC8F	53750 Euro
2016	Superconductivity in Li-decorated nanoporous Graphene	I Ricerca Progetti Grandi Sapienza RG116154BE254CF7	63000 Euro
2016	FATA: Facility di test e sviluppo di tecnologie avanzate	I Progetto di ricerca Regione Lazio	50.000 Euro
2015	Research frontiers on graphene: alkali metal functionalisation	PI Ateneo La Sapienza	10.000 Euro
2014	Improving light emission efficiency in semiconductor nanowires by hydrogen-assisted surface and hetero-interface passivation	I Project AWARDS La Sapienza	63000 Euro
2014	Manipulator at variable temperature (from low temperature to 1300 K) for graphene growth in UHV condition	PI <u>C26G14TBW4</u> Grandi Attrezzature Università La Sapienza	42.000 Euro
2013	Low-dimensional systems based on Graphene: growth and electronic properties	PI <u>C26A13CN2Y</u> PI Ateneo La Sapienza	15.000 Euro
2012	Frontiere nelle ricerca sul grafene: funzionalizzazione e controllo delle proprietà elettroniche	PI <u>C26A12S9ME</u> Progetto Ateneo	34.946 Euro
2010-2011	GRAF Frontiere nelle ricerca sul grafene: funzionalizzazione e controllo delle proprietà elettroniche	PI PRIN-MIUR Unit Coordinator	215.000 Euro
2010	Nanostrutture in semiconduttori organici ed inorganici	PI <u>C26A12S9ME</u> Progetto Ateneo La Sapienza	15.000 Euro
2009	Nanostrutture magnetiche su superfici	PI C26F092JX4 Progetto AST	38.000 Euro
2009	REALIST (SEED): Project "Rechargeable, Advanced, Nano Structured Lithium Batteries with High Energy Storage"	I SEED- IIT	50.000 Euro
2008	Controllare la struttura e le funzioni di nanostrutture organiche su superfici	PI National Coordinator PRIN-MIUR	268.000 Euro
2008	Nanostrutture organiche su superfici	PI C26F08JW33 Progetto AST La Sapienza	31.000 Euro
2007	Nanostrutture di carbonio: dalla topografia molecolare alle proprietà elettroniche e di trasporto	PI C26A0792HP Progetto Università La Sapienza	45.000 Euro

2006	Photoemission spectroscopy of organic and inorganic nanostructures on surfaces	PI <u>C26G06MBA3</u> Grandi Attrezzature Università La Sapienza	100.000 Euro
2005	Studio sperimentale di nanostrutture organiche: dalla topografia alle proprietà elettroniche	PI C26A0057194 Università La Sapienza	24.000 Euro
2004	Aggregazione di strutture molecolari a bassa dimensionalità:	PI National Coordinator PRIN-MIUR	268.000 Euro
2003	Studio sperimentale e teorico di self-assembling di nanostrutture	PI C26A031947 Ateneo La Sapienza	43.000 Euro
2001	NOMADE: Nano-molecular devices	I MIUR-FIRB NOMADE	120.000 Euro
2000	Self assembling of organic molecules on metallic surfaces: growth morphology and atomic geometry	PI INFM-PURS01	15.000.000 Lire
1999	"Studio di proprietà elettroniche di sistemi bidimensionali ordinati"	I INFM-PAIS Responsabile unità di Modena	125.000.000 Lire
1999	Sistemi confinati in 1D e 2D: densità spettrale ed eccitazioni elettroniche	I PRIN-MIUR Responsabile di unità (1999)	251.500.000 Lire
1998	Studio delle eccitazioni elettroniche delle superfici di semiconduttori e metalli	PI Progetto finalizzato CNR 99.01289.CT02	40.000.000 Lire
1996	LOw temperature UltraViolet Spectroscopy (LOTUS)	I INFM-PRA	940.000.000 Lire
1996	Cresita e caratterizzazione di sistemi a bassa dimensionalità: superfici, interfacce, multistrati	I PRIN-MIUR	
1995	Fotoemissione ad alta risoluzione su sistemi bidimensionali ordinati	PI Università di Modena	45.000.000 Lire

Part VI – Research Activities

Research activities keywords: Experimental nanoscience: surfaces and nanostructures. Magnetic nanostructures. Graphene and 2D materials. Molecular assembly on surfaces.

I am responsible of a surface and nano-science laboratory at Department of Physics La Sapienza with an experimental activity focused on nanostructures at surfaces. Since the PHD, I am expert in a large variety of experimental techniques from state-of-the-art high energy resolution electron spectroscopies and photoemission in laboratory on campus, and advanced photoemission and absorption spectroscopies in synchrotron radiation facilities.

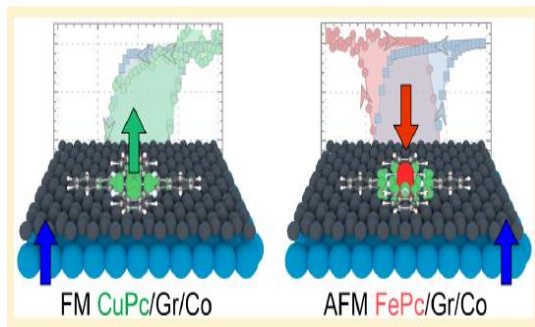
During my whole experience, I have designed and realized several experimental facilities on campus. During my PHD thesis, (i) I participated to the construction of the **first experimental apparatus for high resolution electron energy loss spectroscopy** in Italy, then (ii) I personally contributed to the **creation of the LOTUS (Low Temperature Ultraviolet Spectroscopy) laboratory at the University of Modena (laboratory moved to Rome in 2003)** with high-energy (less than 4 meV) and angle (less than 0.01°) resolved photoemission spectroscopy. In November 1999 I moved to the Department of Physics La Sapienza where a surface science/nanoscience experimental activity was missing. I have **designed realized a complete ultra-high-vacuum (UHV) system for core level photoemission (XPS), Auger and thermal desorption spectroscopies** with all ancillary facilities to deposit organic and organometallic molecules with high controlled molecular beam sources.

Now, a new perspective is open with the realization of a **spectro-microscopy laboratory financed by MIUR-Dipartimento di eccellenza**. I have designed a **UHV apparatus for micro-Raman and luminescence and for spatially-resolved X-ray photoemission at low temperature (below 20 K) all in UHV**, in collaboration with a working group, collecting different expertise of our department. A third chamber, connected with the spectro-microscopy stages, will be dedicated to the in-situ growth of 2D materials, and nanostructures on surfaces. This spectro-microscopy apparatus is strategic to study and functionalize 2D materials. The project on gravitational waves financed by MIUR can exploit this expertise of spectro-microscopies to characterize, optimize and discover new materials/solutions for the coating of the mirrors of VIRGO/LIGO projects.

Recent research activity

Since 2010, my research activity is focused on graphene and 2D materials and magnetic low dimensional systems, with three main items described in detail below: **(i) magnetic nanostructures; (ii) 3D nanoporous and microporous graphene; (iii) molecular precursors for 2D materials**. A summary of the highlights of my previous activity (1985-2010) is summarized in the following.

MAGNETIC NANOSTRUCTURES

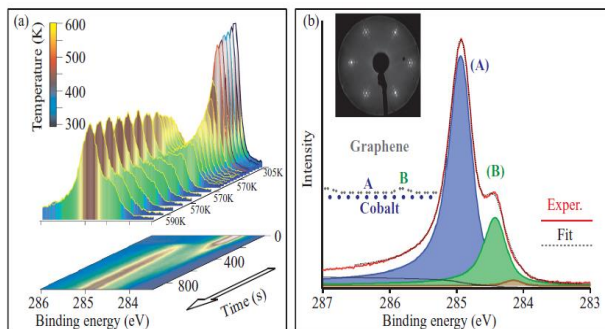


Ferromagnetic and anti-ferromagnetic coupling of spin molecular interfaces with high thermal stability

Magnetic remanence at room temperature of molecular spin interfaces opens the possibility to produce single-bit operational spintronic devices. A significant contribution to this field has been given by realizing highly ordered **molecular spin networks with robust ferromagnetic or anti-ferromagnetic response**, up to device working temperature. These advanced organic spin-interface

architectures are constituted by metal phthalocyanine molecules magnetically coupled with 3d metallic ferromagnetic layer(s), mediated by graphene. The **robust anti-ferromagnetic coupling** is stabilized by a **super-exchange interaction**, driven by the molecular orbitals responsible of the magnetic ground state and electronically decoupled from the underlying metal **via the graphene layer**, as confirmed by theoretical predictions. **Changing the central metal atom, i.e. the orbital configuration, the coupling switches from ferromagnetic to anti-ferromagnetic [1,2]**. In perspective, the magnetic remanence at RT of these archetypal spin interfaces, once paired with a tunable magnetic substrate, opens the possibility to produce future operational spintronic devices.

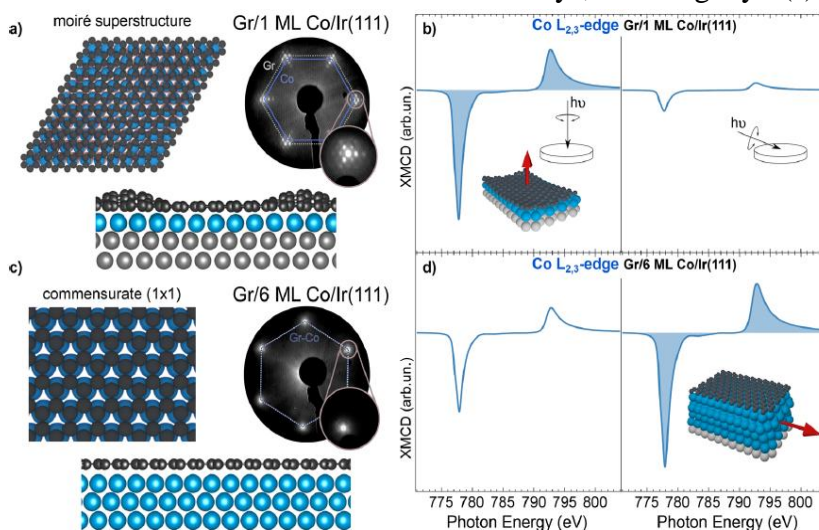
1- 2- G. Avisati, C. Cardoso, A. Ferretti, D. Varsano, P. Gargiani, and M. G. Betti Ferromagnetic and anti-ferromagnetic coupling of spin molecular interfaces with high thermal stability *Nano letters*, 18 (4), pp 2268–2273 (2018)



Tuning the magnetic response of 3d metals intercalated under graphene. Magnetic nanostructures can be promising candidates for high-density magnetic storage and spintronic devices when their ground-state has high magnetic moment and high spin flip energy to obtain stable magnetic configurations against thermal fluctuations.

I succeeded to exploit dimension and symmetry reduction in transition metal / alloys, realizing layer(s)

with unprecedented spin moments and magnetic anisotropy. Kinetically controlled growth and intercalation of Fe and Co beneath Gr is the strategic and viable route to obtain the highest spin and orbital moment among all 3d transition elements. These strong ferromagnetic interfaces with a homogeneous, smooth equiatomic FeCo layers intercalated under graphene, present an out of plane easy magnetization axis, that switches by only increasing the number of layers. This is a

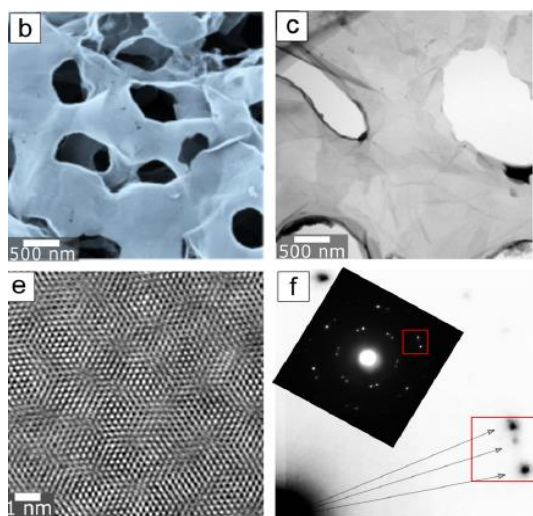


significant breakthrough towards the control at the atomic scale of magnetic response of low dimensional magnetic systems, with tunable easy-magnetization direction, enhanced spin moments and magnetic anisotropy, in an inert and protect spin architecture thanks to the 2D graphene cover [1,2].

1-D. Pacile, S. Lisi, I. Di Bernardo, M. Papagno, L. Ferrari, M. Pissarra, M. Caputo, S. K. Mahatha, P. M. Sheverdaya, P. Moras, P. Lacovig, S. Lizzit, A. Baraldi, M. G. Betti, C. Carbone, *Electronic structure of the Graphene/Co interface Physical Review B* B 90 (19), 195446 (2014)

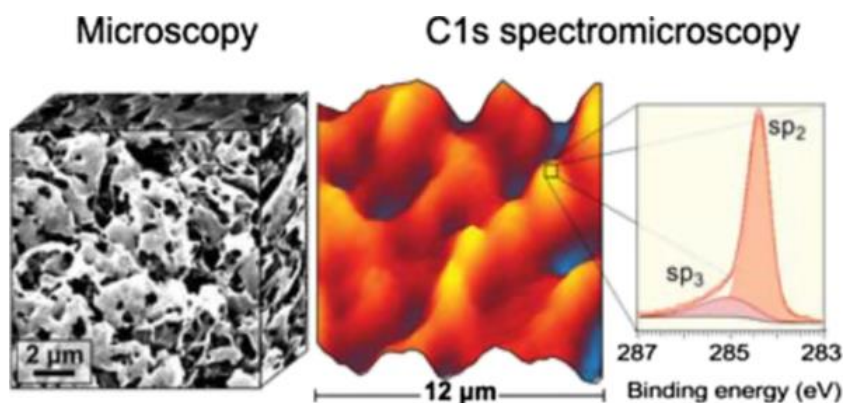
2-G. Avvisati, P. Gargiani, D. Lizzit, M. Valvidares, P. Lacovig, F. Sacchetti, C. Petrillo, Maria Grazia Betti Strong ferromagnetic coupling and tuned magnetic axes of FeCo layers intercalated under graphene *submitted to Physical Review Materials* (2019)

NANOPOROUS and MCROPOROUS GRAPHENE FOR ADVANCED DEVICES



The employment of a single graphene sheet in 3D devices is not straightforward, and a strong research effort is oriented toward the design of 3D structures, preserving the remarkable electronic, optical, and transport properties of suspended 2D sheets. The design challenges of **3D nanoporous graphene (NPG)** structures are focused on enhancing the surface active areas and on ensuring a topological structure with highly connected layers and negligible density of lattice and edge defects. An **advanced state of the art nano-photoemission and micro-Raman study has unveiled that the electronic and vibrational 2D graphene properties** are preserved in highly interconnected 3D NPG, fabricated in the University of Tohoku (Japan) [1,2]

Functionalized (doped) graphene in this 3D form opens new routes for a wide range of applications in 3D devices for example in Li batteries. Micrometer-size



graphene flakes have been already exploited in an electrochemical cell, however, Li ions adsorb on the borders and defects of the graphene flakes, thus Li cycling is reduced [3]. NPG thanks to its continuous 2D structure, with extremely low defect density, may constitute an ideal scaffold for Li up-take and possibly cycling. In our preliminary results, we have demonstrated that **there is a much higher absorption content of**

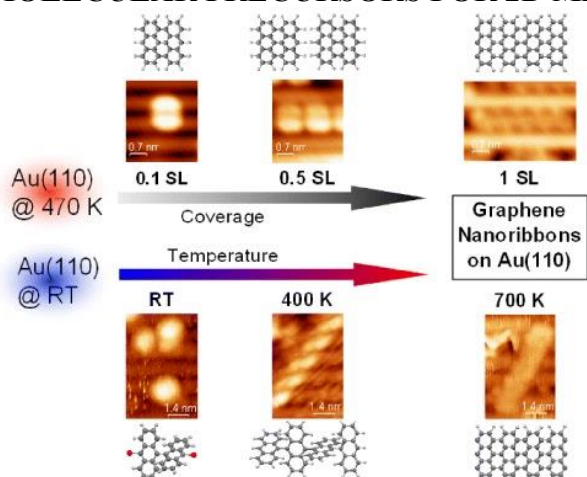
NPG (47% higher than for graphite) thanks to the porous structure a now we are looking forward to realize a prototype of Li cell battery in a tight collaboration with electrochemistry experts.

1- I. Di Bernardo, N. Motta, C. Chen, J. Avila, M. C. Asensio, Y. Ito, M. Chen, G. Avvisati, S. Lupi, C. Mariani, M. G. Betti, *Two-dimensional hallmark of highly interconnected three-dimensional nano-porous graphene ACS Omega* 2 (7), pp 3691–3697 (2018)

2- I. Di Bernardo, G. Avvisati, C. Chayou, J. Avila, M. C. Asensio, H. Kailong, Y. Ito, P. Hines, J. Lipton-Duffin, L. Rintoul, N. Motta, C. Mariani, and M. G. Betti *Topology and doping effects in three-dimensional nanoporous graphene Carbon* 131, pp. 258-265 (2018)

3- F. Bonaccorso, J. Hassoun, M. G. Betti, M. Angelucci, R. Cingolani, S. Panero, V. Pellegrini, B. Scrosati, *An advanced lithium-ion battery based on a graphene anode and a lithium iron phosphate cathode, Nano Lett.*, 2014, 14 (8), pp 4901-6

MOLECULAR PRECURSORS FOR 2D MATERIALS



Surface-assisted chemical reaction of single molecular units can be used to assemble nanostructures with desired properties. The surface-induced polymerization of molecular monomers into extended chains has been used as the seed of **graphene nanoribbon (GNR) formation, where nano-sized graphene has the advantage of a quantum-size derived energy gap.** A viable route to successfully align graphene nanoribbons on surfaces **has been proposed exploiting the reconstructed channel of a Au(110) surface** [1].

Molecular precursor can be also employed to obtain single layer of 2D material, optimizing the stoichiometry to tune the electronic properties. In this perspective, the advantage of having a 2D material, based on the graphene properties, but with an energy gap, pushes to the integration of C with h-BN layers, towards the formation of a 2D BCN compound. We recently exploited a direct and fast synthesis route to grow boron–carbon–nitrogen layers by microwave-assisted plasma enhanced chemical vapour deposition by using methylamine borane as molecular precursor, in collaboration with Prof. F. Leardini (Universidad Autonoma de Madrid). We obtained controlled and reproducible B–C–N layers onto thin Cu foils. High doping levels have been reached, inducing strong modifications of the electronic, optical and transport properties of C-rich and h-BN-rich phases. This synthesis procedure can open new routes towards the achievement of homogeneous highly mixed ternary B–C–N semiconducting phases [2].

1- L. Massimi, O. Ourdjini, L. Gavioli, E. Cavaliere, A. Ferretti, C. Cardoso, C. Mariani, M.G. Betti *Surface-Assisted Reactions toward Formation of Graphene Nanoribbons on Au(110) Surface J. Phys. Chem. C*, 2015, 119 (5), pp 2427–2437

2- F. Leardini, N. Jiménez-Arévalo, I. Jiménez Ferrer, J. Ramón Ares, P. Molina, C. Gómez Navarro, Y. Manzanares, Granados, F. J. Urbanos, F. J. García-García, A.del Campo, G. Avvisati, M. G. Betti, C. Mariani *A fast synthesis route of Boron-Carbon-Nitrogen thin layers towards highly mixed ternary B-C-N phase 2D Materials* 6, (2019) 035015

Research activity in Rome (2000-2010)

MOLECULES ASSEMBLED ON SURFACES

This line of research, financed by two PRIN 2004 (national coordinator) and PRIN 2008 (national coordinator) had to two main subjects (i) **π -conjugated molecules for molecular electronics**. (ii) **ordered magnetic molecular structures on surfaces** to enhance the magnetic anisotropy

(i) Molecular electronics devices based on π -conjugated molecular systems can be an alternative to solid-state electronics. We investigate the mechanisms driving the electronic structure and the charge layer at molecular-surface interfaces. A significant breakthrough has **been the understanding of the interaction process of π -conjugated systems on the surfaces, overcoming the physisorption or chemisorption dichotomy** and a model has been proposed in a paradigmatic system: pentacene on metal surface (1). A prerequisite to control the parameters for applications of organic molecules in new nano-devices is the **control of barrier formation at the interface** and a successful model has been proposed for **nanolayers molecular heterostructures** [2]

(i) Single magnetic atoms on surfaces, albeit showing enhanced magnetic tend to aggregate on surfaces without forming regular patterns and can present a decreased magnetic response due to the interaction with the surface. **Magnetic metal atoms embedded into the organic cage** of organic oligomers constitute an efficient method for achieving **regular networks of magnetic units at the nanoscale**, while the organic surround acts as a binding anchor to the surface. Paramagnetic molecules form highly long-range ordered magnetic molecular architectures on metallic surfaces. The individual spins in the molecules centers can interact with the underlying metal surface giving rise to a **Kondo lattice**, observed for the first time combining photoemission, scanning tunneling spectroscopy and magnetic dichroism experiments [3].

The spin and orbital configuration can be reduced by the molecular interaction with the substrate [4]. We propose to use *graphene as a buffer layer* between the magnetic molecules and the substrate with the double effect of acting as a decoupling and of **enhancing the magnetic anisotropy** of the magnetic organometallic spin network []

- 1- [A. Ferretti, C. Baldacchini, A. Calzolari, R. Di Felice, A. Ruini, E. Molinari and MG Betti, Phys. Rev Lett. 99, \(4\) 046802, 2007; 125 citations](#)
- 2- [Betti, M.G. et al. Barrier formation at organic interfaces in a Cu \(100\) -benzenethiolate-pentacene Heterostructure Phys. Rev. Lett 100 \(2\), 027601, 2008 60 citations](#)
- 3- [P. Gargiani et al. Spin and orbital configuration of metal phthalocyanine chains assembled on the Au \(110\) surface Phys. Rev B 87 \(16\), 165407 \(2013\) 40 citations](#)
- 4- [Gargiani, Pierluigi et al. Orbital Symmetry of the Kondo State in Adsorbed FePc Molecules on the Au\(110\) Metal Surface Journal of Physical Chemistry C, 120 \(50\) 28527-28532 \(2016\); ON of the](#)
- 5- [Simone Lisi et al. Graphene-Induced Magnetic Anisotropy of a Two-Dimensional Iron Phthalocyanine Network J. Phys. Chem. Lett., \(2015\), 6, 1690–1695](#)

Research activity in Modena and CNR

In the 1992 -1999 (researcher at Modena University) my research was dedicated to the electronic properties and the dynamics of semiconductor surfaces and focused on these main issues: (i) **semiconductor-metal transition in the semiconductor surfaces**, Among the results I would mention that at increasing temperature the Si dimers at the Si surfaces undergo a dynamics with symmetrical configurations (flip-flop and twist dynamics) inducing a surface metallization below the surface melting temperature [1] (ii) **2D electron gas on the semiconductor surfaces**. A self-consistent solution of the equation of Schroedinger-Poisson allowed to find the potential, the position of the energy levels of the sub-bands and the density of accumulated charge for the two-dimensional gas III-V semiconductor surfaces/interfaces at different doping levels and the results were in excellent agreement with pioneering photoemission experiments [2] The results were obtained thanks to the performance on the **new laboratory LOTUS** (Low Temperature Ultraviolet Spectroscopy) laboratory, funded by PRA-INFN. In 1996, I personally contributed to the creation of the LOTUS and I was involved in the design and construction of the angle-resolved photoemission system. and I realized a He lamp for a UV source. The LOTUS laboratory for ultraviolet photoemission spectroscopy with high energy resolution (4 meV), and angle resolution (0.1°), and low temperature (10K) was the first lab on

campus with these experimental performances in Italy.

From 1989 to 1992 I was researcher at the ISM-CNR Frascati and I was responsible of a UHV laboratory with Auger and inelastic electron scattering spectroscopies. The main object of research was **the study of two-dimensional ordered systems in the CNR-laboratory and synchrotron light laboratories in Frascati PULS and LURE Paris**. Study of electronic transitions and the gap of two-dimensional ordered systems (Bismuth and Antimony of III-V semiconductors) to discriminate the structural configurations and the metal or insulator state.

During the **PhD thesis at the University of Modena** I collaborated to the development of the first high-resolution electron energy loss spectroscopy system in Italy. Pioneering works on the anisotropy of electronic excitations in semiconductors have been published and a model to interpret the collective plasmon and phonon excitations in III-V semiconductors doped has been successfully proposed to obtain information on the evolution of the depletion/accumulation region in semiconductors. Several results are reported in textbooks, see for example F. Bechstedt “Principles of Surface Physics “, Springer 2003 and W. Kress, FW Wette “Surface Phonons” Springer 1991

- 1- Luca Gavioli, et al. *Dynamics-induced surface metallization of Si(100)*, Phys. Rev Lett. 77 (1996) 3869
- 2- Maria Grazia Betti, et al. *Density of states of a two-dimensional electron gas at semiconductor surfaces* Phys. Rev.B 63 155315 (2001)

Part VII – Summary of Scientific Achievements

Product type	Number	Data Base	Start	End
Papers [international]	163		1986	2019
Papers [international]	158*	ISI	1986	2019
Papers [international]	162**	SCOPUS	1986	2019
Papers [educational]	4			
Books [scientific]	4			

**SCOPUS ed ISI non riportano la pubblicazione 38 del 1995 perché la rivista è presente sui data base dal 1997

Summary of scientific achievements in the last 15 years (2004-2019)

	ISI	SCOPUS
Publications	82	84
Total Citations	1645	1697
Average Citations per Product	20,06	20,20
Hirsch (H) index	24	25

Summary of scientific achievements in the entire career

	ISI	SCOPUS
Publications	156	162
Total Impact factor	490 (JCR)	
Total Citations	2567	2635
Average Citations per Product	16,24	16,27
Hirsch (H) index	27	28

Part VIII– Selected Publications in the last ten years

A- *SELECTED PUBLICATIONS*

List of the publications selected for the evaluation. For each publication report title, authors, reference data, journal IF (if applicable), citations.

N	TITLE	AUTHORS	JOURNAL	DATE	CIT	IF
1	Ferromagnetic and Antiferromagnetic Coupling of Spin Molecular Interfaces with High Thermal Stability <i>SELECTED HIGHLIGHT:</i> https://www.cells.es/en/media/news/ferromagnetic-and-antiferromagnetic-coupling-of-spin-molecular-interfaces-with-high-thermal-stability	G. Avvisati, C. Cardoso, D. Varsano, A. Ferretti, P. Gargiani, and M. G. Betti	Nano Letters, 18 (4), 2268–2273	APR 2018	5	12.084
2	Topology and doping effects in three-dimensional nanoporous graphene	I. Di Bernardo, G. Avvisati, C. Chayou, J. Avila, M. C. Asensio, H. Kailong, Y. Ito, P. Hines, J. Lipton-Duffin, L. Rintoul, N. Motta, C. Mariani, and M. G. Betti	Carbon, 131 258-265	MAY 2018	7	7.082
3	FePc Adsorption on the Moire Superstructure of Graphene Intercalated with a Cobalt Layer	G. Avvisati, S. Lisi, P. Gargiani, A. Della Pia, O. De Luca, D. Pacilé, C. Cardoso, D. Varsano, D. Prezzi, A. Ferretti, and M. G. Betti	Journal of Physical Chemistry C 121(3), 1639-164	JAN 2017	11	4.484
4	Graphene-Induced Magnetic Anisotropy of a Two-Dimensional Iron Phthalocyanine Network	S. Lisi, P. Gargiani, M. Scardamaglia, N. B. Brookes, V. Sessi, C. Mariani, and M. G. Betti	Journal of Physical Chemistry Letters 6 (9), 1690-1695	MAY 2015	18	8.539
5	Surface-Assisted Reactions toward Formation of Graphene Nanoribbons on Au(110) Surface	L. Massimi, O. Ourdjini, L. Gavioli, E. Cavaliere, A. Ferretti, C. Cardoso, C. Mariani, M.G. Betti	Journal of Physical Chemistry C 119 (5) 2427-2437	FEB 2015	27	4.509
6	Electronic structure of graphene/Co interfaces	D. Pacilé, S. Lisi, I. Di Bernardo, M. Papagno, L. Ferrari, M. Pisarra, M. Caputo, S. K. Mahatha, P. M. Sheverdyeva, P. Moras, P. Lacovig, S. Lizzit, A. Baraldi, M. G. Betti , C. Carbone	Physical Review B 90 (19), 195446	NOV 2014	27	3.736
7	An Advanced Lithium-Ion Battery Based on a Graphene Anode and a Lithium Iron Phosphate Cathode	J. Hassoun, F. Bonaccorso, M. Agostini, M. Angelucci, M. G. Betti , R. Cingolani, M. Gemmi, C. Mariani, S. Panero, V. Pellegrini, B. Scrosati	Nano Letters 14 (8), 4901-4906	AUG 2014	215	13.592
8	Energetics and Hierarchical Interactions of Metal Phthalocyanines Adsorbed on Graphene/Ir(111)	M. Scardamaglia, C. Struzzi, S. Lizzit, M. Dalmiglio, P. Lacovig, A. Baraldi, C. Mariani, and M. G. Betti	Langmuir 29 (33), 10440-10447	AUG 2013	37	4.384
9	Spin and orbital configuration of metal phthalocyanine chains assembled on the Au(110) surface	P. Gargiani, G. Rossi, R. Biagi, V. Corradini, M. Pedio, S. Fortuna, A. Calzolari, S. Fabris, J. Criginski Cezar, N. B. Brookes, and M. G. Betti	Physical Review B 87 (16), 165407	APR 2013	40	3.664

10	Graphene-Induced Substrate Decoupling and Ideal Doping of a Self-Assembled Iron-phthalocyanine Single Layer	M. Scardamaglia, S. Lisi, S. Lizzit, A. Baraldi, R. Larciprete, C. Mariani, and M. G. Betti	Journal of Physical Chemistry C 117	FEB 2013	52	4.835
11	Molecule-Driven Substrate Reconstruction in the Two-Dimensional Self-Organization of Fe-Phthalocyanines on Au(110)	S. Fortuna, P. Gargiani, M. G. Betti , C. Mariani, A. Calzolari, S. Modesti, S. Fabris	Journal of Physical Chemistry C 116, (10), 6251-6258	MAR 2012	32	4.814
12	Coexistence of Negatively and Positively Buckled Isomers on n(+)-Doped Si(111) - 2 x 1	G. Bussetti, B. Bonanni, S. Cirilli, A. Violante, M. Russo, C. Goletti, P. Chiaradia, O. Pulci, M. Palummo, R. Del Sole, P. Gargiani, M. G. Betti , C. Mariani, R. M. Feenstra, G. Meyer, K. H. Rieder	Physical Review Letters, 106 (6), 067601	FEB 2011	20	7.370
13	Localized and Dispersive Electronic States at Ordered FePc and CoPc Chains on Au(110)	M. G. Betti , P. Gargiani, R. Frisenda, R. Biagi, A. Cossaro, A. Verdini, L. Floreano, C. Mariani	Journal of Physical Chemistry C 114 (49), 21638-21644	DIC 2010	68	4.520
14	Metal-phthalocyanine chains on the Au(110) surface: Interaction states versus d-metal states occupancy	P. Gargiani, M. Angelucci, C. Mariani, and M. G. Betti	Physical Review B 81 (8), 085412	FEB 2010	73	3.813
15	Filling empty states in a CuPc single layer on the Au(110) surface via electron injection	A. Calabrese, L. Floreano, A. Verdini, C. Mariani, and M. G. Betti	Physical Review B 79 (11), 115446	2009	25	3.772
16	Structural Phases of Ordered FePc-Nanochains Self-Assembled on Au(110)	M. G. Betti , P. Gargiani, C. Mariani, R. Biagi, J. Fujii, G. Rossi, A. Resta, S. Fabris, S. Fortuna, X. Torrelles, M. Kumar, M. Pedio	Langmuir 28 (37), 13232-13240	2012	23	4.187

Publications list

works published in refereed papers:

- 163- F. Leardini, N. Jiménez-Arévalo, I. Jiménez Ferrer, J. Ramón Ares, P. Molina, C. Gómez Navarro, Y. Manzanares, Granados, F. J. Urbanos, F. J. García-García, A.del Campo, G. Avvisati, **M. G. Betti**, C. Mariani
A fast synthesis route of Boron-Carbon-Nitrogen thin layers towards highly mixed ternary B-C-N phase
2D Materials **6**, (2019) 035015 IF 7.042
- 162- **Betti, M. G.** et al.
A design for an electromagnetic filter for precision energy measurements at the tritium endpoint
Progress in particle and in nuclear physics **106**, 120-131 2019 IF 11.049
- 161- G. Avvisati, P. Gargiani, P. Mondelli, A. Baraldi, F. Presel, L. Bignardi, **M. G. Betti**
Metal phthalocyanines interaction with Co mediated by a moiré graphene superlattice
Journal of Chemical Physics **150**, 5 (2019), IF 2.843
- 160 Giulio D'Acunto; Francesca Ripanti; Paolo Postorino; **Maria Grazia Betti**; Mattia Scardamaglia; Carla Bittencourt; Carlo Mariani
Channelling and induced defects at ion-bombarded aligned multiwall carbon nanotubes
Carbon **139**, 768-775 (2018), doi10.1016/j.carbon.2018.07.032 IF 7.082
- 159 G. Avvisati, P. Mondelli, A. Baraldi, F. Presel, P. Gargiani, **M. G. Betti**
Super-exchange pathways for MnPc magnetic coupling with Co in a spin interface mediated by graphene
Physical Review B **98**, 115412 (2018) IF 3.813
- 158 M. Iacobucci, I. Di Bernardo, M. Christian, V. Morandi, F. Ripanti, P. Postorino, C. Mariani, **M.G. Betti**
Three-dimensional microporous graphene decorated with lithium
Nanotechnology **29**, (40), 405707 (2018) doi 10.1088/1361-6528/aad3f5 IF 3.404
- 157 I. Di Bernardo, G. Avvisati, C. Chayou, J. Avila, M. C. Asensio, H. Kailong, Y. Ito, P. Hines, J. Lipton-Duffin, L. Rintoul, N. Motta, C. Mariani, and **M. G. Betti**
Topology and doping effects in three-dimensional nanoporous graphene
Carbon **131**, pp. 258-265 (2018) IF 7.082
- 156 G. Avvisati, C. Cardoso, A. Ferretti, D. Varsano, P. Gargiani, **M. G. Betti**
Ferromagnetic and antiferromagnetic coupling of spin molecular interfaces with high thermal stability
Nano letters, **18** (4), pp 2268–2273 (2018) IF 12.084
- 155 G. Avvisati, P. Gargiani, P. Mondelli, **M. G. Betti**
Graphene-Mediated Interaction between FePc and Intercalated Cobalt layers
Applied Surface Science **2018**, *432 A*, p 2-6, IF 4.439
- 154- F. Leardini, E. Flores, A. Galvis, I. Jiménez Ferrer, J. R. Ares, J. F. Fernández, C. Sánchez, P. Molina, H. van der Meulen, J. M. Calleja, G. López Polin, C. Gómez Navarro, F. Jiménez, D. Granados, J. García, U. Demirci, P. Yot, F. Mastrangelo, **M. G. Betti**, C. Mariani
Chemical Vapor Deposition Growth of Borocarbonitride layers from Methylamine Borane thermolysis products
Nanotechnology **29** (2018) 025603 IF 3.404
- 153 - M. Lo Cicero, A. Della Pia, M. Riello, L. Colazzo, F. Sedona, **M. G. Betti**, M. Sambì, A. De Vita; Carlo Mariani
A long-range ordered array of copper tetrameric units embedded in an on-surface metal organic framework
The Journal of Chemical Physics **147** (21), 214706 (2017) IF 2.843
- 152 P. Gargiani, G. Avvisati, P. Mondelli, S. Lisi, S. Fatale, **M. G. Betti**
Mixing of MnPc electronic states at the MnPc/Au(110) interface
The Journal of Chemical Physics **147** (13), 134702 (2017) IF 2.843

- 151 I. Di Bernardo, N. Motta, C. Chen, J. Avila, M. C. Asensio, Y. Ito, M. Chen, G. Avvisati, S. Lupi, C. Mariani, and **M. G. Betti**,
Two-dimensional hallmark of highly interconnected three-dimensional nano-porous graphene
ACS Omega 2 (7), pp 3691–3697
- 150 P. Mondelli, B. Gupta, **M. G. Betti**, C. Mariani, J. Lipton Duffin, and N. Motta
High Quality Epitaxial Graphene by hydrogen etching of 3C-SiC(111) thin film on Si(111)
Nanotechnology, 2017 28, (11) 115601 IF 3.404
- 149 G. Avvisati, S. Lisi, D. Pacile, C. Cardoso, D. Prezzi, D. Varsano, A. Ferretti, **M.G. Betti**
FePc adsorption on the moirè superstructure of graphene intercalated with a Co layer
Journal of Physical Chemistry C 2017, 121 (3), pp 1639–1647 IF 4.484
- 146- Gargiani, Pierluigi; **Betti, Maria Grazia**; Ibrahimi, Amina Taleb; Patrick Le Fèvre, Silvio Modesti,
Orbital Symmetry of the Kondo State in Adsorbed FePc Molecules on the Au(110) Metal Surface
Journal of Physical Chemistry C, 120 (50) 28527-28532 (2016); IF 4.536
- 145- Lorenzo Massimi, **Maria Grazia Betti**, Simone Caramazza, Paolo Postorino, Carlo Mariani, Alessandro Latini and Fabrice Leardini,
In-vacuum thermolysis of ethane 1,2-diamineborane for the synthesis of ternary borocarbonitrides
Nanotechnology 27 43 435601 (2016) IF 3.440
- 144- Ada Della Pia, Giulia Avvisati, Oualid Ourdjini, Claudia Cardoso, Daniele Varsano, Deborah Prezzi, Andrea Ferretti, Carlo Mariani, and **Maria Grazia Betti**,
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