

ANDREA GIACOMO MARRANI

Curriculum Vitae

General Information

Full Name	Andrea Giacomo Marrani
Spoken Languages	Italian; English

Education

Type	Year	Institution	Notes (Degree, Experience,...)
University graduation	2004	Università di Roma La Sapienza	Laurea in Chimica Industriale, ordinamento quinquennale, durata legale 5 anni, voto finale 110/110 e lode
PhD	2007	Università di Roma La Sapienza	Dottorato in Scienza dei Materiali

Academic Appointments

Start	End	Institution	Position
11/2019		Università di Roma La Sapienza – Dipartimento di Chimica	Professore Associato (II fascia) SC 03/B1 (Fondamenti delle Scienze Chimiche e sistemi inorganici)
04/2017	04/2023	MIUR	Abilitazione Scientifica Nazionale 03/B1 (Fondamenti delle Scienze Chimiche e sistemi inorganici) – seconda fascia
11/2013	11/2019	Università di Roma La Sapienza – Dipartimento di Chimica	Ricercatore a tempo indeterminato confermato – SD CHIM/03
11/2010	11/2013	Università di Roma La Sapienza – Dipartimento di Chimica	Ricercatore a tempo indeterminato non confermato – SD CHIM/03
02/2008	10/2008	Università di Roma La Sapienza – Dipartimento di Chimica	Assegno di ricerca

Society memberships, Awards and Honors

Year	Title
2008	Premio “Aldo La Ginestra” conferito da Ordine dei Chimici-Luam e Società Chimica Italiana per il miglior poster – Terzo Convegno Giovani Chimici, Università di Roma La Sapienza
2005	Premio “Amel” per la miglior tesi in Elettrochimica, conferito dalla Divisione Elettrochimica della Società Chimica Italiana (SCI) al Congresso GEI 2005, Spoleto
2004-2019	Membro della Società Chimica Italiana (SCI)
2019	Membro dell’American Chemical Society (ACS)

Teaching experience

A.A.	Sem.	Corso	CdS	Dip.	Fac.	CFU	SSD
11/12	I	Chimica Generale ed Inorganica con Elementi di Organica	Scienze Geologiche	Scienze della Terra	SMFN	12	Chim/03
12/13	I	Chimica Generale ed Inorganica con Elementi di Organica	Scienze Geologiche	Scienze della Terra	SMFN	12	Chim/03
13/14	II	Chim. Inorganica 2	Chimica	Chimica	SMFN	9	Chim/03
14/15	II	Chim. Inorganica 2	Chimica	Chimica	SMFN	9	Chim/03
15/16	II	Chim. Inorganica 2	Chimica	Chimica	SMFN	9	Chim/03
16/17	II	Chim. Inorganica 2	Chimica	Chimica	SMFN	9	Chim/03
17/18	II	Chim. Inorganica 2	Chimica	Chimica	SMFN	9	Chim/03
18/19	II	Chim. Inorganica 2	Chimica	Chimica	SMFN	9	Chim/03
18/19	II	Chim. Inorganica 1	Chimica	Chimica	SMFN	6	Chim/03

Other Appointments – Professional experiences characterized by research activities

Start	End	Appointment
10/2008	11/2010	Ricercatore presso Centro Ricerche "Giulio Natta" presso azienda Basell Poliolefine Italia s.r.l., Polo Petrolchimico di Ferrara, IT. Posizione: Structure-Properties Relationships Scientist.

Research Activities

Keywords	Brief Description
Surface science, inorganic/organic hybrids, nanostructured surfaces, covalent immobilization, silicon functionalization, molecular electronics, electrochemical surface science, photoemission, photoabsorption	His scientific interests, shared with other collaborators in the international field, mainly concern the reactivity of metallic and semiconductor surfaces towards the anchoring and immobilization of functional molecules, and the study of the electrical and electronic properties of advanced inorganic-organic hybrid interfaces. In particular, several years have been spent in the field of wet-chemical functionalization of crystalline Si(100) and Si(111) surfaces with organic and organometallic molecules, such as ferrocene derivatives, porphyrins and fullerenes, as well as supramolecularly bound gold nanoparticles, with the aim at investigating model systems for molecular memories and charge storage devices. The study of these systems has been dealt with by means of photoemission (XPS and UPS) and photo-absorption (NEXAFS) spectroscopy, both with conventional and synchrotron sources, with probe microscopies (AFM / STM) and electrochemical methods. These studies resulted in the publication of 19 articles.
Surface science, self-assembled monolayers (SAM), inorganic/organic hybrids, covalent immobilization, corrosion inhibition, electrochemical surface science, photoemission	Regarding the interaction of metallic surfaces with molecules, he has studied model interfaces resulting from the wet-chemical adsorption of thiols on polycrystalline copper for applications in corrosion inhibition. The study of these systems has been dealt with by means of photoemission spectroscopy (XPS) and electrochemical methods. These studies resulted in the publication of 2 articles.

Surface science, electrochemical surface science, photoemission, electrified interfaces, dye adsorption, metal oxides, nanoporous materials, dye sensitized solar cells, adsorption	Another field of research regards the study of electrified interfaces used in electrochemical devices for the energy conversion, in particular dye-sensitized solar cells. In collaboration with other researchers, he has focused on the comprehension of the phenomena at the semiconductor/dye/electrolyte interface when the semiconductor is NiO, TiO ₂ or ZnO. Such interfaces were studied upon application of different electrochemical conditions and with photoemission spectroscopy. These studies resulted in the publication of 6 articles.
Surface science, electrochemical surface science, photoemission, electrified interfaces, Li-O ₂ batteries, degradation phenomena	Recently, he has been focusing his research to the study of the phenomena and chemical/electrochemical reactions occurring at the triple electrode/electrolyte/oxygen interphase taking part of Li-O ₂ cell devices. Such phenomena were studied on real devices with a multi-technique approach including photoemission (XPS and UPS) and photo-absorption (NEXAFS) spectroscopy, both with conventional and synchrotron sources, vibrational spectroscopies (FTIR, Raman), electron microscopies (SEM/TEM), electrochemical methods and theoretical methods. These studies resulted in the publication of 6 articles.
Surface science, electrochemical surface science, photoemission, nanostructured surfaces, 2D-materials, graphene	Recently, he has focused on the preparation and investigation of supported graphene materials, exploring the features of reduced graphene oxide with modulated C/O ratios by means of photoemission (XPS) and electrochemical methods. The supports investigated are crystalline silicon, Au, carbon, and flexible ITO-PET. Such study is relevant in fields like nanoelectronics, sensors, biomedicine and drug-delivery. These studies resulted in the publication of 2 articles.

Organization or participation as a speaker at scientific conferences in Italy or abroad

Conference	Place & date	Title	Role
Graphene 2019 International Conference	Rome, 25-28/06/2019	An in-depth study of the formation of graphene/Si(111) interface from the electrochemical reduction of graphene oxide nanosheets	Speaker
XXVI Congresso Nazionale della Società Chimica Italiana (SCI)	Paestum (SA), 10-14/9/2017	Unravelling the surface degradation mechanisms in ether electrolyte based Li-O ₂ cells	Speaker
XLIII Congresso Nazionale di Chimica Inorganica della SCI	Camerino (MC), 9-12/9/2015	Surface reactivity of carbonaceous cathodes in Li-O ₂ batteries: an ex-situ XPS investigation	Speaker
XXV Congresso Nazionale della Società Chimica Italiana	Rende (CS), 7-12/9/2014	The effects of electronic delocalization and metal-metal coupling on the core levels of tetraferrocenylporphyrins	Speaker
XLI Congresso	Parma, 3-6/09/2013	Formation of oxyhydroxide species	Speaker

Nazionale di Chimica Inorganica della SCI		at the surface of electrochemically treated NiO thin films for solar cells applications: spectral signatures in XPS	
XL Congresso Nazionale di Chimica Inorganica della SCI	Sestri Levante (GE), 9-13/09/2012	Adsorption behavior of N719 dye onto electrodeposited ZnO porous films for solar cells as studied by X-ray photoelectron spectroscopy	Speaker
Quinto Convegno Giovani Chimici	Università di Roma "La Sapienza", Roma, 12-13/6/2012	Redox-active monolayers on silicon as prototypical hybrid materials for molecular memories	Speaker
XXIV Congresso Nazionale della Società Chimica Italiana della SCI	Lecce, 11-16/9/2011	Probing the role of related ring substituents over the electronic structure of ferrocene via synchrotron radiation photoabsorption and photoemission	Speaker
14th European Conference on Applications of Surface and Interface Analysis (ECASIA)	Cardiff (UK), 4-9/9/2011	Hydrocarbon-monosubstituted ferrocenes as model molecules for silicon-based charge storage molecular devices: a synchrotron radiation photoabsorption and photoemission study	Speaker
2nd EuCheMS Chemistry Congress	Torino, 16-20/09/2008	"Click" chemistry as a novel route to electroactive molecular monolayers covalently attached to Si(100)	Speaker
Second International Conference on Nanostructures Self-Assembly (NanoSeA)	Villa Mondragone, Monteporzio Catone, Roma, 7-10/07/2008	Chemical routes to fine tuning the redox potential of self-assembled monolayers covalently attached on H-Si(100)	Speaker
17th International Vacuum Congress	Stoccolma, Svezia, 2-6/07/2007	Gas-phase photoemission study of ferrocene derivatives: insight into electronic structure for applications in Si-based hybrid materials for molecular electronics	Speaker
XXII Congresso Nazionale della Società Chimica Italiana	Firenze, 14/09/2006	Redox-active hybrids for molecular electronics: ferrocene derivatives anchored on silicon (100)	Speaker
Secondo Convegno Giovani Chimici	Università di Roma "La Sapienza", Dipartimento di Chimica, 07-06-2006	Monostrati redox-attivi per l'elettronica molecolare, ovvero dialoghi tra silicio e ferrocene	Speaker

Participation in Scientific Boards of Conferences

Conference	Place & date	Role
25th International Symposium On Metastable, Amorphous And Nanostructured Materials (ISMANAM)	Roma, 2-6/7/ 2018	Membro del Comitato Scientifico (National Advisory Committee), chairman e valutatore sessione poster.

Editorial reviewing activity

He is regularly involved as a Reviewer for international Journals such as *Journal of Physical Chemistry (ACS)*, *ACS Applied Materials & Interfaces (ACS)*, *Inorganic Chemistry (ACS)*, *Chemical Physics Letters (Elsevier)*, *Electrochimica Acta (Elsevier)*, *Small (Wiley)*, and other journals from MDPI Publishing.

Funding Information [grants as PI-principal investigator]

Year	Title	Program	Grant value (euro)
2015	Studio della reattività superficiale di catodi per celle Li-ossigeno mediante tecniche spettro/microscopiche	Finanziamento Ateneo 2015 n° C26A152T5M	5000 - PI
2016	Studio sulla preparazione e caratterizzazione di ossido di grafene ridotto elettrochimicamente (erGO) su superfici di Si(100) e sua funzionalizzazione covalente con molecole organiche	Finanziamento Ateneo 2016 n° RP116154CAAC0238	4000 - PI
2017	Studio della reattività elettrochimica e chimica in batterie Li-O ₂ con catodo "carbon-free" a base di cobaltiti di nichel.	Finanziamento Ateneo 2016 n° AR11715C62B8607E Avvio alla Ricerca	1000 - Tutor di riferimento (Titolare Dr.ssa D. Giacco)
2017		Finanziamento alla ricerca di base riservato ai ricercatori universitari e professori associati universitari - FFARB – MIUR	3000 - PI

Other assignments as PI

Year	Title	Institution/Project	Assignment
2017	Investigation on the surface reactivity of Mn ⁺ -doped NiCo ₂ O ₄ @Ni (Mn ⁺ = Cr ³⁺ , Zn ²⁺) foam cathodes in a Li-O ₂ cell	Materials Science beamline – Elettra synchrotron radiation facility project number 20170077	Beamtime dal 27/11/2017 al 3/12/2017

Summary of Scientific Achievements

Product type	Number	Data Base	Start	End
Papers [international]	40	Scopus	2005	2019
Papers in the last 10 years	30	Scopus	2009	2019
Conference Proceedings	2	Scopus	2008	2009
Errata	1	Scopus	2008	2008
Duplicates	1	Scopus	2008	2008

Total Impact factor *	155,174
Average impact factor per Product**	3,979
Total Citations	839
Average Citations per Product	20
Hirsch (H) index	15
Hirsch (H) index -15***	15
N° papers as corresponding author	14
N° papers as first author	12
N° papers as last author	5

* Impact factor values according to the Journal of Citation Reports (Clarivate Analytics). Values are referred to the year of publication. For articles published in 2019 IF value has been set to the last published value (2018).

** Average impact factor per product was determined from the Total impact factor, dividing it by the number of all the products with an IF, excluding errata and duplicates. In this case, 39 products (the latest article is on a journal with no IF yet).

***H index of the last 15 years.

Fonte: Scopus 27/11/2019

Participation in the activities of a research group characterized by collaborations at national or international level (with reference projects/publications)

- Participation in scientific activities in collaboration with University of Montevideo, Uruguay, Prof. E. Dalchiele - electrochemical properties of Si-ferrocene and Si-graphene hybrids
Research project Ateneo Sapienza 2016 n° RP116154CAAC0238
Marrani, A.G., Zandoni, R., Schreiber, R., Dalchiele, E.A.
Toward graphene/silicon interface via controlled electrochemical reduction of graphene oxide (2017) Journal of Physical Chemistry C, 121, 5675–5683
DOI: 10.1021/acs.jpcc.7b00749
Zandoni, R., Cattaruzza, F., Coluzza, C., Dalchiele, E.A., Decker, F., Di Santo, G., Flamini, A., Funari, L., Marrani, A.G.
An AFM, XPS and electrochemical study of molecular electroactive monolayers formed by wet chemistry functionalization of H-terminated Si(1 0 0) with vinylferrocene (2005) Surface Science, 575 (3), pp. 260-272.
DOI: 10.1016/j.susc.2004.11.023
- Participation in scientific activities in collaboration with University of Piemonte Orientale,

Prof. M. Cossi - DFT study of the redox potential of Si-ferrocene adducts and the theoretical study of the electronic structure of ferrocene derivatives.

Boccia, A., Marrani, A.G., Stranges, S., Zanoni, R., Alagia, M., Cossi, M., Iozzi, M.F.

Symmetry breaking effect in the ferrocene electronic structure by hydrocarbon-monomer substitution: An experimental and theoretical study

(2008) Journal of Chemical Physics, 128 (15), art. no. 154315

DOI: 10.1063/1.2898498

- Participation in scientific activities in collaboration with University of Trieste, Prof. M. Prato - functionalization of Si (100) by means of "click chemistry" and with fullerene-ferrocene dyads
Marrani, A.G., Dalchiele, E.A., Zanoni, R., Decker, F., Cattaruzza, F., Bonifazi, D., Prato, M.
Functionalization of Si(1 0 0) with ferrocene derivatives via "click" chemistry
(2008) Electrochimica Acta, 53 (11), pp. 3903-3909.
DOI: 10.1016/j.electacta.2007.10.051
- Participation in scientific activities in collaboration with University of Duluth, Minnesota, Prof. V. Nemykin - study of the electronic structure of neutral and mixed valence tetraferrocenylporphyrins.
Nemykin, V.N., Rohde, G.T., Barrett, C.D., Hadt, R.G., Bizzarri, C., Galloni, P., Floris, B., Nowik, I., Herber, R.H., Marrani, A.G., Zanoni, R., Loim, N.M.
Electron-transfer processes in metal-free tetraferrocenylporphyrin. Understanding internal interactions to access mixed-valence states potentially useful for quantum cellular automata
(2009) Journal of the American Chemical Society, 131 (41), pp. 14969-14978.
DOI: 10.1021/ja905310h
- Participation in scientific activities in collaboration with University of Parma, Prof. Andrea Secchi - Study on the preparation and surface characterization of Silicon/Au and Ag nanoparticles hybrids.
Boccia, A., D'Orazi, F., Carabelli, E., Bussolati, R., Arduini, A., Secchi, A., Marrani, A.G., Zanoni, R.
Assembly of Gold Nanoparticles on Functionalized Si(100) Surfaces through Pseudorotaxane Formation
(2013) Chemistry – A European Journal, 19, pp. 7999–8006.
DOI: 10.1002/chem.201204318
- Participation in scientific activities in collaboration with University of Basilicata, Potenza, Dr. Sergio Brutti – Study on the surface characterization of cathodes for Li-O₂ cells.
Research project Ateneo Sapienza 2015 prot. C26A152T5M
Carboni, M., Brutti, S., Marrani, A. G.
Surface Reactivity of a Carbonaceous Cathode in a Lithium Triflate/Ether Electrolyte-based Li–O₂ Cell
(2015) ACS Applied Materials & Interfaces, 7 (39), pp 21751–21762
DOI: 10.1021/acsami.5b05202
- Participation in scientific activities in collaboration with University College of Dublin, School Of Mechanical & Materials Eng., Prof. Denis Dowling - Study on the surface electronic features of NiO electrodes for DSSCs.
Marrani, A.G., Novelli, V., Sheehan, S., Dowling, D., Dini, D.
Probing the redox states at the surface of electroactive nanoporous NiO thin films
(2014) ACS Applied Materials & Interfaces, 6, pp. 143-152.
DOI: 10.1021/am403671h
- Participation in scientific activities in collaboration with University of Rome “La Sapienza”, Dip-Chimica – Prof. D. Dini - Study on the surface electronic features of materials for DSSCs.
Bonomo, M., Dini, D., Marrani, A. G.
Adsorption behavior of I³⁻ and I⁻ ions at a nanoporous NiO/acetonitrile interface studied by X-ray photoelectron spectroscopy
(2016) Langmuir, 32, pp. 11540-11550
DOI: 10.1021/acs.langmuir.6b03695
- Participation in scientific activities in collaboration with Catholic University of Sacred Heart, Rome, Prof. M. Papi – Development and characterization of graphene-oxide based materials for biomedical applications.
Palmieri, V., Dalchiele, E.A., Perini, G., Motta, A., De Spirito, M., Zanoni, R., Marrani, A.G.,* Papi, M.
Biocompatible: N -acetyl cysteine reduces graphene oxide and persists at the surface as a green radical scavenger
(2019) Chemical Communications, 55, 4186-4189

DOI: 10.1039/c9cc00429g

Roma, 27/11/2019

f.to Andrea Giacomo Marrani

A handwritten signature in black ink, appearing to read "Andrea Giacomo Marrani". The signature is written in a cursive, flowing style with some loops and flourishes.