

# Curriculum Vitae et Studiorum

Autorizzo il trattamento dei miei dati personali ai sensi dell'art. 13 Decreto Legislativo 196/03 e dell'art. 13 GDPR 679/16.

## Personal details

First name and Surname **Francesca Anna Scaramuzzo**  
Place and date of birth Cosenza, 10th March 1983  
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## Employment history

Dates	04th May 2020 – currently
Position held	Fixed-term Assistant Professor (RTD-A, according to Italian Law n. 240/2010)
Employer	Department of Basic and Applied Sciences for Engineering (SBAI), <i>Sapienza</i> University of Rome - Via A. Scarpa, 14/16 - 00161 Rome (Italy)
Main activities and responsibilities	Research and teaching within the fields of materials chemistry and technologies for energy and molecular recognition
Dates	01/03/2019 – 29/02/2020;
Position held	Post-doctoral Fellow (Italian Law n. 240/2010)
Employer	SBAI Department, <i>Sapienza</i> University of Rome (PI Prof. Marco Rossi)
Main activities and responsibilities	Synthesis and characterization of nanostructured materials for energy and sensing
Dates	01/06/2013 – 31/05/2014, 01/10/2015 – 30/09/2016, 01/05/2017 - 31/10/2017; 01/02/2018 -31/01/2019;
Position held	Post-doctoral Fellow (Italian Law n. 240/2010)
Employer	SBAI Department, <i>Sapienza</i> University of Rome (PI Prof. Mauro Pasquali)
Main activities and responsibilities	Synthesis and characterization of oxide-based nanostructured materials for applications in energy, optical and sensing fields
Dates	01/06/2014 – 31/05/2015
Position held	Post-doctoral Fellow
Employer	“Guido Donegani” Foundation - Accademia Nazionale dei Lincei – Via della Lungara, 10 – Rome
Main activities and responsibilities	Synthesis of a library of pyrylium-based compounds to be used as DNA intercalating agents
Dates	01/05/2010 – 30/04/2013
Position held	Post-doctoral Fellow
Employer	Dipartimento di Scienze Chimiche, Università di Padova – Via Marzolo, 1 – 35131 Padova (PI Prof. Giulia Licini and Cristiano Zonta)
Main activities and responsibilities	Hybrid self-assembling molecular materials for advanced catalysis and molecular recognition
Dates	02/05/2012 – 29/05/2012
Position held	Post-doctoral visiting fellow
Employer	Department of Chemistry – Nanoscience Center – University of Jyväskylä – Jyväskylä (Finland)
Main activities and responsibilities	Multidentate Ligands for Catalysis and molecular Recognition: X-Ray Characterization. Short Term Scientific Mission granted by the COST Action Number CM1005 (Supramolecular Chemistry in Water).

## Professional Qualifications

Date	23/12/2016
Qualification awarded	Eligible in the public selection as staff-member Researcher in the field of Advanced Materials at the Italian National Research Council (CNR)
Date	11/2007
Qualification awarded	Italian Professional Qualification to practice as a Chemist

## Education history

Dates	08/07/2010 and 21/12/2009
Qualification awarded	PhD
Thesis topic	Functionalization of Inorganic Surfaces: from the Synthesis of New Monolayers to the Immobilization of Biological Material
Supervisors	Prof. Jurriaan Huskens, Prof. Mario Barteri
Institutions	University of Twente - Enschede (The Netherlands), <i>Sapienza</i> University of Rome <i>Joint research doctoral thesis project, with independent final defences in both the Institutions; 15 months spent in The Netherlands</i>

Date	27/10/2006
Qualification awarded, final mark	MS graduation in Chemistry - 110 / 110, cum laude
Thesis topic	Synthesis and characterization of new linker molecules for Au and Si surface functionalization for biosensor applications
Supervisors	Prof. Mario Barteri, Prof. Giancarlo Doddi
Institution	Sapienza University of Rome
Date	15/07/2004
Qualification awarded, final mark	BS graduation in Chemistry - 110 / 110, cum laude
Thesis topic	Study of $\alpha$ -lactalbumin conformational variations in hydro-alcoholic solutions via circular dichroism and fluorescence spectroscopy
Institution	Sapienza University of Rome
Date	07/2001
Qualification awarded, final mark	High school leaving qualification – 100 / 100
Institutions	Liceo Scientifico G.B. Scorza – Cosenza (Italy)

## Publication record

Author of **36** publications on peer-reviewed journals indexed on Scopus database:

- 31 research papers (8 as first author, 3 of which also as corresponding author)
- 1 review
- 2 conference papers (1 as first author and corresponding author)
- 2 editorials (1 as first author)

Author of:

- 2 book chapters (1 as first author, 1 just accepted for publication)
- 1 manuscript submitted to peer-reviewed journals and currently under review
- 1 patent submitted to the Italian Patent and Trademark Office and currently under review

Active participant to 35 national and international Congresses and training schools:

- 14 oral communications (2 invited)
- 12 poster presentations (2 of which selected for flash presentation)
- 17 co-authored oral or poster communications presented by co-workers

Citations: **359**; H-index: **10** (Scopus)

## Research Interests

My research interests deal with different materials chemistry topics, going from the synthesis of inorganic materials (either bulk or nanostructured) for energy, to the functionalization of inorganic surfaces for biomedical application, to coordination compounds chemistry for molecular recognition. All these interests grew up working in different Italian and international groups and they have always been developed with a well-defined personal imprint.

At the moment, I work on materials chemistry for energy. In detail, I am interested in the electrochemical synthesis of TiO<sub>2</sub> nanotube and nanowire arrays in polar organic solvents. The optimized reaction conditions (e.g. cell geometry, anodic bath composition, potential applied, post-synthetic thermal treatment) allow to obtain the perfect control of morphology and crystal structure (*J. Phys. Chem. C* **2017**, *121*, 24871). I successfully used these materials for water splitting (*Chem. Eng. Trans.* **2014**, *41*, 223; *J. Appl. Electrochem.* **2015**, *45*, 727) and developed an innovative method to obtain multilayers of nanotubes with different diameter on Ti and ITO (*AIP Conf. Proc.* **2015**, 1667, 020005). Moreover, I work on the development of electrode nanomaterials for lithium-ion and lithium-sulfur batteries (*Materials* **2018**, *11*, 56; *Appl. Sci.* **2019**, *9*, 1913; *J. Electroanal. Chem.* **2020**, *870*, 114239), even derived from waste materials (*Solid State Ionics* **2018**, *324*, 20), with the goal of optimizing the production on kilo-scale.

During my PhD, I studied and applied the main techniques for functionalization of inorganic surfaces. In detail, I successfully functionalized Au surfaces with organic molecules, biological macromolecules and cells (*J. Phys. Chem. B* **2009**, *113*, 15895; *J. Biomed. Mat. Res. A* **2009**, *91*, 370). Moreover, I synthesized organic molecules for functionalization of monolayers on silica, performing click reactions in order to obtain a reactive platform for amines (*Chem. Commun.* **2010**, 46, 4193). More recently, I moved from functionalization of surfaces to synthesis, functionalization and characterization of core-shell nanoparticles for theragnostic applications (*Biomatter* **2014**, *4*, e29507; *Clin. Nucl. Med.* **2015**, *40*, e-104; *AIP Conf. Proc.* **2016**, 1749, 020006; *Int. J. Nanotechnol.* **2016**, *13*, 659; *Nanoscale* **2017**, *9*, 5671; *J. Magn. Magn. Mater.* **2020**, *516*, 167299). Within long-standing collaborations, I also characterize functionalized inorganic surfaces, metallic and polymeric nanoparticles via atomic force microscopy, both in air and in fluid, for energy and molecular recognition (*Materials* **2017**, *10*, 258; *Colloids Surf. A* **2017**, *532*, 125; *Microchem. J.* **2018**, *138*, 430; *Appl. Surf. Sci.* **2018**, *445*, 404; *Int. J. Biol. Macromol.* **2020**, *146*, 790; *Mater. Sci. Eng. C*, **2020**, *117*, 111337; *ACS Appl. Nano Mater.* **2021**, *4*, 2930; *Coll. Surf. B* **2021**, *203*, 111727).

Finally, especially during my post-doc at the University of Padova, I worked on Zn(II) and Co(II) organometallic complexes based on tris(2-pyridylmethyl)amine ligands in order to obtain self-assembling and cage-like structures for molecular recognition and hydrogen production (*Dalton Trans.* **2016**, *45*, 14764;

*J. Am. Chem. Soc.* **2017**, 139, 6456; *RSC Adv.*, **2018**, 8, 19494; *Dalton Trans.* **2020**, 49, 10011). In this field, besides developing abilities concerning organic synthesis, I studied induced chirality via circular dichroism spectroscopy and rationalized the obtained results using multivariate statistical analysis techniques (*Chem. Eur. J.* **2013**, 19, 16809; *Eur. J. Org. Chem.* **2017**, 1438; *Chirality* **2019**, 31, 375).

## Fellowships

1. May 2017: Fellowship for participation to the First National Italian School on Chemical Sensors, offered by *Electrochemistry Group (Divisione di Elettrochimica)* of the *Italian Chemical Society*.
2. June 2014 – May 2015: Post-doctoral Fellowship offered by *Guido Donegani's Foundation* for Researches within the field of Organic Chemistry for 2014.
3. April 2008: Fellowship for PhD Students performing joint research doctoral thesis projects offered by *Sapienza University of Rome*.
4. September 2001 – July 2006: Fellowship offered by *Federazione Nazionale dei Cavalieri del Lavoro* to live in *Collegio Universitario Lamaro-Pozzani* ([www.collegiocavalieri.it](http://www.collegiocavalieri.it)).

## Awards

1. June 2008: *Alessandro D'Aprano Award* offered by *Ordine dei Chimici LUAM*, 3rd Young Chemists Congress, Department of Chemistry, *Sapienza University of Rome*, for best Poster presentation.
2. September 2001: *Premio Alfieri del Lavoro* offered by *Federazione Nazionale dei Cavalieri del Lavoro* and personally given by the past President of the Italian Republic Carlo Azeglio Ciampi.

## Acquisition record

1. Participant as researcher to the project *A preliminary Study Towards A circular Green-use of Eco-friendly barrier masks for SARS-CoV-2 protection: production, use, decontamination, reuse and recycling (STAGES)*, Protocol number RM120172B479E2E8, PI Dr D. Passeri, funded as University Project by *Sapienza University of Rome*, **2020**;
2. Participant as researcher to the proposal to acquire new facilities *Advanced Platform for nanoscale Electrochemical Synthesis and Characterizations based on Atomic Force Microscopy (PESCA)* as tool of visualization at high spatial resolution, Protocol number GA120173054F048C, PI Prof. D. Dini, funded by *Sapienza University of Rome*, **2020**;
3. Participant as post-doc fellow to the research project *Development and Characterization of new electrodes for lithium-air batteries*, Protocol number RM11715C58A1093A, PI Dr A. Dell'Era, funded as University Project by *Sapienza University of Rome*, **2017**;
4. PI of the project *Synthesis of a library of pyrylium-based compounds to be used as DNA intercalating agents*, funded as a post-doctoral fellowship for researches within the field of Organic Chemistry by *Guido Donegani's Foundation*, *Accademia Nazionale dei Lincei*, Protocol number 38/2014/A, **2014**;
5. Participant as post-doc fellow to the research project *Supramolecular Technologies to manage chemical information: advanced molecular materials and devices (InfoChem)*, Protocol number 2010CX2TLM\_002, PI Prof. G.M. Licini, funded by Italian Minister of University, **PRIN 2010-2011**.

## Editorial and Organizing Activities

1. *Lead Guest Editor* for the Special Issue "*Cutting Edge Technologies by Silicon- and Silicon Oxide-Based Nanostructures*" of *Journal of Nanomaterials*
2. *Guest Editor* for the Special Issue "*Exploitation of Multifunctional Nanomaterials for Biological Applications*" of *Molecules*
3. *Guest Editor* for number 2257 "*Nanoinnovation 2019*" of *AIP Conference Proceedings*
4. *Referee* for the international, peer reviewed journals *Appl. Phys. A*, *J. App. Electrochem.*, *AIP Conf. Proc.*, *Colloids and Surfaces A*, *IEEE Trans. Nanotechnol.*, *Materials*
5. Member of the local Scientific Committee of *Eurasia Conference on Chemical Sciences (EuAsC2S-15)*, Rome, 5-8 September 2018.

## Teaching

1. *Chemistry for Nanotechnology* (SSD CHIM-07, 9 CFU), Master Degree in Nanotechnology Engineering, *Sapienza University of Rome*, a.y. 2019/2020 - currently;
2. *Chemistry for Nanotechnology / Advanced Chemistry*, (SSD CHIM-07, 3 CFU), Master Degree in Nanotechnology Engineering, *Sapienza University of Rome*, a.y. 2017/2018 and 2018/2019;
3. *Chemistry* (SSD CHIM-07, 3 + 3 CFU), Bachelor Degree in Mechanical Engineering, *Sapienza University of Rome*, a.y. 2017/2018 and 2018/2019;
4. *Chemistry and Biochemistry for Biomedical Technologies* (SSD CHIM-07, 3 CFU), Master Degree in Biomedical Engineering, *Sapienza University of Rome*, a.y. 2017/2018;
5. Tutorship activity for *Chemistry* class, Bachelor Degree in Clinical Engineering, *Sapienza University of Rome*, 48 hours, a.y. 2016/2017;
6. Tutorship activity for *Inorganic Synthesis and Reactivity* class, Master Degree in Industrial Chemistry, *University of Padova*, 25 hours, a.y. 2012/2013;
7. Tutorship activity for *Organic Chemistry* class, Bachelor Degree in Chemistry, Industrial Chemistry, Materials Science, *University of Padova*, 49 hours, a.y. 2011/2012.

## Other Activities related to Teaching

1. Invited lecture on the topic: *Atomic Force Microscopy: a versatile tool for characterization at the nanoscale*, *Nanoinnovation 2021 – School of Nanomedicine* co-organized with *Istituto Superiore di Sanità*, 24/09/2021

### Third Mission

2. Invited lecture on the topic: *Le nanotecnologie nell'industria tessile: dagli smart wearables alla sensoristica integrate*, NanolInnovation 2021 and NanolInnovation 2020 – *Corso di aggiornamento professionale dell'Ordine degli Ingegneri di Roma*, 23/09/2021 and 16/09/2020;
  3. Member of Doctoral Degree Examining Board Committee (PhD Candidate Sandra Giraldo Clemente, title of the thesis: *Monocapes autoassemblades electroactives: interaccions  $\pi$ -donador/  $\pi$ -acceptor per a induir transport en superficie*), Universitat de Barcelona, Spain, 26/02/2021;
  4. Member of Graduation Examining Board Committee, Master's degree in Nanotechnology Engineering, University of Rome "La Sapienza", Rome, Italy, 26/03/2021; 30/10/2020;
  5. Member of Exam Committees of *Chemistry* classes, Bachelor Degree in Mechanical Engineering and Chemical Engineering, *Sapienza* University of Rome, a.y. 2015/2016-currently;
  6. Member of the Committee for communication and students orienteering (*Commissione per la gestione della comunicazione e per l'orientamento*, CCOM), Master's degree in Nanotechnology Engineering, University of Rome "La Sapienza", Rome, Italy, a.y. 2020/2021-currently;
  7. Member of the Committee for study plans and evaluation of admission requirements (*Commissione per i percorsi formativi degli studenti e per la valutazione dei requisiti di accesso*, CFOR), Master's degree in Nanotechnology Engineering, University of Rome "La Sapienza", Rome, Italy, a.y. 2020/2021-currently.
1. Patent: P. Atanasio, F.A. Scaramuzzo, A. Capasso, M. Rossi, M. Pasquali, Elettrodi ibridi carbonio/materiale attivo per accumulatori agli ioni di litio (Hybrid Carbon/active material electrodes for lithium-ion accumulators), submitted to the Italian Patent and Trademark Office on 29<sup>th</sup> June 2021, n. 102021000017024, *under review*.
  2. 09/06/2021: Interview to *Sportello Italia* (a radio broadcast by the Italian National radio Radio 1) concerning private-public partnership;
  3. 20/06/2019 – 04/05/2020: President of *NanoShare srl*;
  4. 2020: Consultant for PROGES srl: Bibliographic research and technical analysis for the development of the Training Case for a workshop concerning the quality of water within the project "EBM-DSS Caraibi Olandesi (Applied training for the application of the EBM-DSS methodology and the use of the ISP software developed by PROGES)".

Rome, 14/10/2021

Francesca Anna Scaramuzzo

