

## Plutino Maria Rosaria

## PROFESSIONAL EXPERIENCE

- 01/01/2021– at the present **Senior researcher – II level (disciplinary scientific sector Inorganic Chem., Chim/03).**  
Institute for the Study of Nanostructured Materials (Section of Palermo) Via Ugo La Malfa 153 -90146 Palermo, based at the Messina research unit c/o Department of Inorganic Chemistry, Analytical Chemistry and Physical Chemistry, Sperone n.31-98166 Vill. S. Agata – Messina, Messina (Italy)
- 21/12/2001– 31/12/2020 **Permanent researcher position at the CNR– III level (disciplinary scientific sector Inorganic Chem., Chim/03).**  
Institute for the Study of Nanostructured Materials (Section of Palermo) Via Ugo La Malfa 153 -90146 Palermo, based at the Messina research unit c/o Department of Inorganic Chemistry, Analytical Chemistry and Physical Chemistry, Sperone n.31-98166 Vill. S. Agata – Messina, Messina (Italy)
- 01/04/1999–20/12/2001 **Researcher temporary position (art. 36, disciplinary scientific sector Inorganic Chem., Chim/03).**  
Institute of Chemistry and Technologies of Natural Products (ICTPN), section of Messina - CNR, Messina (Italy)
- 2010–2011 **Professor on contract of an integrative course of Inorganic Chemistry (S.S.D. Chim/03), I semester/II year at the Degree Course in Industrial Chemistry.**  
University of Messina, Messina (Italy)
- 2013–2014 **Professor on contract of “Nanostructured Inorganic Materials”, Degree course in Industrial Chemistry, at the Department of Electronic, Chemical and Industrial Engineering.**  
University of Messina, Messina (Italy)
- 11/2017–01/2018 **ISMN responsible of the consulting contract of Dept. of Engineering and Applied Sciences (Univ. of Bergamo, Dr. G. Rosace) for characterization tests within the Project “MULTIFUN – Announcement Smart Fashion and Design, DDUO N. 3169/2016 – CUP: E48116000160002.**
- 09/2019–01/2020 **Consultant by the Dept. of Engineering and Applied Sciences (Univ. of Bergamo) for the “Design and development of eco-sustainable products and processes for the textile supply chain” (i.e. synthesis and characterization of bio-polymeric materials, and development of eco-friendly strategies for the synthesis of**

functional coatings for textiles).

27/11/2019– present

Co-founder, Chairperson and scientific manager of “ATHENA Green Solutions Srl”, innovative start-up and spin-off (joint and not attended by CNR and Univ. of Messina)

#### OTHER

12/01/2007

Expert in the sector S.S.D. Chim/03 at the Faculty of Sciences MM. FF. NN.- Univ. of Messina. (permanent title from 09/11/2006).

15/05/2007

Expert in the sector S.S.D. Chim/07 - “Chemical Foundations of Technologies ” at the Faculty of Engineering - Univ. of Messina ( three-year title from 09/11/2006 to a.y. 2007/8).

#### EDUCATION AND TRAINING

02/07/1993

Degree in Chemistry with the mark of 110/110 *cum laudae* and special mention of the Commission discussing the thesis entitled " Reactivity of aliphatic amines towards platinum(II) complexes", supervisor Prof. R. Romeo (experimental thesis in the disciplinary scientific sector Inorganic Chemistry, Chim/03).

University of Messina, Messina (Italia)

11/1993

Qualification at the profession of Chemist.

University of Messina, Messina (Italia)

1993–1996

PhD in Chemical Sciences at the Department of Inorganic Chemistry, Analytical Chemistry and Physical Chemistry of the University of Messina (doctoral thesis disciplinary scientific sector Inorganic Chemistry, Chim/03).

In 09/09/1997 she discusses the PhD thesis entitled " Mechanistic aspects of the reactivity of coordination and organometallic compounds of platinum(II)", obtaining the title of PhD.

1996–1998

In March 1996 is the winner, within 45 candidates, of an EU scholarship (Human Capital and Mobility, contract number Contract ERBCHBGCT940586) of 24 months duration funded by the European Community. In November 1996, the two-year post-doctoral scholarship begins at the Department of Inorganic Chemistry 1 of Chemical Center of University of Lund, in Sweden (disciplinary scientific sector Inorganic Chem., Chim/03), under the supervision of Prof. L. I. Elding, head of the aforementioned Department.

#### PERSONAL SKILLS

Native language

Italian

Foreign languages

English

Swedish

UNDERSTANDING		SPOKEN		WRITTEN PRODUCTION
Listening	Reading	Interaction	Oral production	
B1	B1	B1	B1	B1
A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Advanced user  
Common European Framework of Reference for Languages

**Communication skills**

- good communication acquired during my experience as relator in regional, national and international congresses.

- good relationship acquired during tutor experiences of undergraduated students for the M.Sc degree dissertation in Chemical Sciences and CTF (Dept. ChiBioFarAm, UniMe), undergraduated students of the short degree course in Chemical Sciences (Dip. ChiBioFarAm, UniMe), for training credits at ISMN-CNR and scholarship host.

**Organizational and management skills**

- Team leader of the start-up project Arginare ([www.arginare.eu](http://www.arginare.eu)) and Co-Founder, Chairman and Scientific Manager of ATHENA Green Solutions S.r.l innovative start-up and spin-off, joint and not participated by UniMe-CNR.

-Head of the laboratory for the "Design, synthesis and characterization of functional nanohybrid and nanocomposite materials" of ISMN-CNR (Palermo c/o Dept. ChiBioFarAm, Univ. of Messina).

**Professional skills****PATENTS**

CNR Referent person of n.2 patents filed, with EUIPO deposited trademark (ArgiNaRe® n. trademark 018241590)

**Awards/START UP Competition/SPIN OFF**

Team leader of the Team that gained first place in the final of the "Start Cup of the University of Messina 2018" (<https://www.unime.it/it/informa/notizie/il-progetto-arginare-si-aggiudica-la-start-cup-unime-competition-2018%C2%A0>), with the project ARGINARE (patent application sent for evaluation). At the Start Cup Sicily 2018 seconds ex-aequo the project has earned access to the National Award for Innovation PNI 2018 (<https://www.unime.it/it/informa/notizie/start-cup-sicilia-2018-arginare-e-safe-spring-box-ammesse-alla-fase-finale>), which was held in Verona on 29 and 30 November, where they ranked among the four finalists in the category "CLEAN TECH & ENERGY". The ARGINARE project was included among the 16 semifinalists (chosen out of 91 participating teams) for the GSVC Italy 2019. The ARGINARE project was awarded one of the 5 BdR Awards, sponsored by Meta Ventures, on the 2019 "Borsa della Ricerca", and one of the 31 mentoring awards as part of the 9th edition of the Gaetano Marzotto Award.

Co-Founder, Chairperson and Scientific Manager of "ATHENA Green Solutions" S.r.l., an Innovative Start-Up, and Joint and not attended Spin-off by the National Research Council (CNR) and by the Univ. of Messina. The basis of the Innovative Start-up is the Arginare entrepreneurial/patent idea (<http://www.arginare.eu/>), which has participated in various local, regional and national business competitions, achieving excellent placements and receiving awards and prizes.

**CONSULTANCY**

09/2019-01/2020

Consultancy contract of Dept. of Engineering and Applied Sciences (Univ. of Bergamo, Prof. G. Barigozzi) "Design and development of eco-sustainable products and processes for the textile supply chain" (i.e. synthesis and characterization of bio-polymeric materials, and development of eco-friendly strategies for the synthesis of functional coatings for textiles), DDUO N. 3169/2016 – CUP: E48116000160002.

11/2017-01/2018

Responsible for ISMN of the consulting contract of Dept. of Engineering and Applied Sciences (Univ. of Bergamo, Dr. G. Rosace) for characterization tests within the Project "MULTIFUN – Announcement Smart Fashion and Disegn, DDUO N. 3169/2016 – CUP: E48116000160002.

**TEACHING ACTIVITY**

12/2006-02/2007

Was tutor for the course of "General and Inorganic Chemistry and laboratory of General and Inorganic Chemistry" held by Prof. F. Faraone - Degree Course of Chemistry - Univ. of Messina (date: 23/09/2009, protocol N.125, released by: Dept. of General Chem., Physical Chem. and Analytical Chem. - University of Messina. Signed by Prof.F. Faraone, course owner).

30/09/2004

Held a seminar entitled "NMR techniques for measuring the exchange rate of ligands", PhD in Chemical Sciences, A.Y. 2003/2004 (date: 16/09/2009; protocol: 122; released by: Dept. of Inorganic Chem. Analytical Chem. and Physical Chem., Department of Science-Univ. of Messina; Signed by Prof. L. Monsù Scolaro, coordinator of PhD in Chemical Sciences).

A.Y. 2010-2011

Professor on Contract of a supplementary course in Inorganic Chemistry (S.S.D. Chim/03), I semester/II year at the Degree Course in Industrial Chemistry.

A.Y. 2013-2014

Professor on Contract of for the teaching of "Nanostructured Inorganic Materials", degree course in Industrial Chemistry, at the Department of Electronic Engineering, Chemistry and industrial engineering.

## TRAINING / MENTORING ACTIVITIES

A.Y. 2010-2011

"*Sulfenic Acids in the Synthesis of Tripodal Binders*", Elisa Strumiolo (co-supervisor of master's thesis in Chemistry, supervisor Dr.ssa A. Barattucci).

"*Reactivity of planar complexes of platinum(II) with porphyrins and phthalocyanines in organic solvents: a new synthetic route to the insertion of platinum(II)*", Maria Pia Gullo (co-supervisor of master's thesis in Chemistry, supervisor Prof. L. Monsù Scolaro).

A.Y. 2013-2014

"*Functionalization of gold nanoparticles with tripod disulfides*", Aurora Mancuso (co-supervisor for the three-year degree thesis in Chemistry, supervisor Dr.ssa A. Barattucci).

A.Y. 2014-2015

"*Synthesis and characterization of gold nanoparticles stabilized with thio-carbazole ligands*", Ivana Bernava (co-supervisor for a three-year degree thesis in Pharmaceutical Sciences Applied to Health Products, supervisor Prof.ssa G. De Luca).

"*Synthesis and characterization of new Glucosidic OPEs*", Francesco Bertolami (co-supervisor for the three-year degree thesis in Chemistry, supervisor Dr.ssa A. Barattucci).

"*Colloidal gold nanoparticles stabilized by thiol binders: synthesis and characterization*", Serena Todaro (co-supervisor for the three-year degree thesis in Chemistry, supervisor Prof. L. Monsù Scolaro).

"*Design and synthesis of functionalized nanofibers and nanotubes for smart textiles*", Francesco Esposito (co-supervisor of master's thesis in Industrial Chemistry, supervisor Prof. S. Cavallaro).

A.Y. 2016-2017

"*Design and synthesis of functional hybrid coatings containing pillar[5]arene receptor for the development of smart textiles*" Serena Todaro (co-supervisor of master's thesis in Chemistry, supervisor Prof. A. Notti).

"*Evaluation of eco-sustainable antifouling products*" Eleonora Guzzetti (co-supervisor for the master's degree thesis in Biology, supervisor Prof. C. Urzi).

A.Y. 2017-2018

"*Evaluation of the applicability of natural and / or modified aluminosilicates as absorbers of hydrocarbon contaminants in the marine environment*" Giulia Rando (co-supervisor for the three-year degree thesis in Chemistry, supervisor Prof. P. Cardiano).

"*Modification of PIMs (Polymer Inclusion Membranes) for the sequestration of the Sn(II) cation in aqueous solution*" Alice D'Andrea (co-supervisor of master's thesis in Chemistry, supervisor Prof. P. Cardiano).

From 28/09/2009

"*Modification of PIMs (Polymer Inclusion Membranes) for the sequestration of the Sn(II) cation in aqueous solution*" Alice D'Andrea (co-supervisor of master's thesis in Chemistry, supervisor Prof. P. Cardiano).

From 28/09/2009

She is involved in the training and orientation internship agreement between the ISMN Institute and

Univ. of Messina, with annual renewal (date:15/06/2015, protocol: 0001903)

"Modification of PIMs (Polymer Inclusion Membranes) for the sequestration of the Sn(II) cation in aqueous solution" Alice D'Andrea (co-supervisor of master's thesis in Chemistry, supervisor Prof. P. Cardiano).

From 28/09/2009

From 2010 to 2017 and from 2019 Belongs to the College of Doctoral Professors in Chemical Sciences.

#### OTHER

Over the years has carried out activities in support of the preparation of master's degree thesis in Chemistry and PhD thesis in Chemical Sciences for Prof. R. Romeo and Prof. L. Monsù Scolaro.

Also carried out tutorial activities in the three-year and master's degree course in Chemistry for Prof. L. Monsù Scolaro, for the acquisition of M.Sc. credits.

#### INSTITUTIONAL CNR ACTIVITIES

2006

Internship activity of Dr. E. Guido, student of the Master's Degree in Chemistry of the Univ. of Messina, for a total of 300 hours, at the Messina research unit (sec. Palermo) of ISMN with period of activity 10/2006 (date: 05/10/2006; protocol: 0001406; released by: ISMN-CNR, sec. Palermo; Signed by Prof. G. Deganello, responsible for the section of Palermo of ISMN-CNR).

06/2007-06/2010

Project manager "Self-organized systems based on platinum and porphyrin complexes for application in catalysis" within the scientific convention ISMN (CNR)-Dept. of Inorg. Chem, Anal. Chem. and Phys. Chem. (Univ. of Messina).

In this period, Dr. Plutino contributed to the commission 5, project 3 "New catalysts for the abatement of pollutants emitted into the atmosphere" of the Molecular Design Department of Functionalities (conferment date 12/06/2007; protocol: 0001140).

07/2010-07/2015

Project manager "Multifunctional organometallic nanostructured systems: synthesis, characterization and applications", within the operational agreement between the Institute ISMN and Dept. of Chemical Sciences, Univ. of Messina.

Dr. Plutino contributed to the commission PM.P05.004 "Synthesis and growth of nanostructured films and surfaces", following the guidelines of the Molecular Design Department (conferment date 23/07/2010; protocol: 0002032).

10/2014

Member of the selection board for the selection of candidates for training grants "Nanomaterials and nanotechnologies for sustainable development and cultural heritage" (CUP: G78B14000100006, 1/2012 of Sicilian region), announcement n. ISMN/001/2014 (date: 13/10/2014, protocol: 0003488).

2014-2015

Tutor of Dr. V. Trovato for the training grant spin-off NMA-4 "Nanomaterials and nanotechnologies for sustainable development and cultural heritage" (CUP: G78B14000100006, 1/2012 of Sicilian region), announcement n. ISMN/001/2014 (date: 27/10/2014, protocol: 0003790).

12/2014

Member of the selection board for the selection of candidates for research grant Quentrel, announcement n. ISMN/009/2014/PA (date: 01/12/2014; protocol: 0004477).

06/2015

Project manager under the collaboration agreement for research activities in the field of surface modifications of textile substrates between from ISMN and Univ. di Bergamo – Dept. of Engineering and Applied Sciences, with a three-year duration (date: 04/06/2015; protocol: 0001994).

07/2015

As part of the strategic lines of the Institute of affiliation ISMN, it carries out research activities within the operational agreement between the Institute ISMN and Dept. of Chemical Sciences (later named ChiBioFarAm, see addendum), Univ. of Messina (date: 20/07/2007; protocol: 0002607).

Addendum to the operational agreement of the agreement between ISMN-CNR and the Department of Chemical Sciences of the University of Messina (date:14/06/2016; protocol: 0001893).

03/2018

Project manager under the collaboration agreement for research activities in the sector of functional hybrid nanomaterials between ISMN and Dept. of Engineering (Univ. of Messina) with a three-year duration.

Member of the Commission for the comparative examination relating to the Training Grants of Announcement N. ISMN/001/2018/PA/BORFOR – Thematic code: E1; E4; SV4 referred to in the public notice n. 11/2017 Strengthen employability in R & D system and the birth of Research Spin off in Sicily, Project “MatISSE” Innovative and Sustainable Materials for Health and Energy CIP N°2014.IT.05. SFOP.014/3/10.4/9.2.10/0005, CUP N° G77B170001800004/2018

04/2018

Tutor of Dr. Ileana Ielo SV4 “Design and implementation of smart and multifunctional systems in the bio-medical field” (Public notice n. 11/2017 Strengthen employability in R & D system and the birth of Research Spin off in Sicily, Project “MatISSE” Innovative and Sustainable Materials for Health and Energy CIP N°2014.IT.05. SFOP.014/3/10.4/9.2.10/0005, CUP N° G77B170001800004/2018), duration 18 months.

03/2019

CNR Responsible of an industrial PhD scholarship for XXXV Cycle financed by Confindustria and NoxorSokem Srl with a project entitled "Study of chromium-free anticorrosive nanotechnological systems in surface pre-treatment in aqueous phase", accredited at the Department of Engineering, in the PhD course in "Engineering and Chemistry of Materials and Constructions", of Univ. of Messina.

03/2020

Member of the Council of Institute (ISMN-CNR, for 5 years).

07/2020

Member of the Commission for the comparative examination relating to the Training Grants of Announcement N. ISMN/001/2018/PA/BORFOR – Thematic research activity:, Project “AGMforCuHe” Innovative and Sustainable Materials for Health and Energy CIP

08/2020

Tutor of Dr.ssa I.Ielo for the training grant spin-off NMA-4 “Nanomaterials and nanotechnologies for sustainable development and cultural heritage” (CUP: G78B14000100006, 1/2012 of Sicilian region), announcement n. ISMN/001/2014 (date: 27/10/2014, protocol: 0003790).

09/2020

Member of the Commission for the comparative examination relating to the Training Grants of Announcement N. ISMN/001/2018/PA/BORFOR – Thematic research activity:, Project “AGMforCuHe” Innovative and Sustainable Materials for Health and Energy CIP

## TECHNICAL SKILLS

**Laboratory experience.** High experience in high vacuum anaerobic syntheses or in inert atmosphere, conducted through the use of vacuum/nitrogen lines, glove-boxes, and Schlenk glassware. Excellent knowledge of column chromatography or TLC techniques for the separation of synthesis products.

Experience in: 1) design, synthesis and structural study of supramolecular systems obtained from complexes of transition metals with functional multitopic organic ligands, also in solution or supported on solid matrix; 2) synthesis of nanocomposites or hybrid nanomaterials based on sol-gel or resins, containing nanotubes and nanofibers based on carbon or silica (CNT, imogolite, halloysite, sepiolite); 3) synthesis of colloidal metal nanoparticles (Au, Ag, Pt), core-shell and double-core shell systems and graphene quantum dots; 4) design and implementation of smart and multifunctional systems for applications in the biomedical field, through appropriate functionalization and modification of the surface properties of flexible polymeric substrates (plastics, natural and synthetic textiles, cellulose nanofibers).

**Characterization techniques.** Excellent knowledge of different chemical-physical characterization techniques such as Uv-Vis spectroscopy, Fluorescence and FT-IR, mono and two-dimensional, homo and heteronuclear NMR spectrometry, with resolution of molecular structures in solution.

### SCIENTIFIC ACTIVITY

The research activity of Dr. Plutino is documented by about 50 papers published in international journals. Part of the research outcomes are the result of numerous scientific collaborations and are included in various research projects; they were also presented at national and international congresses in the form of oral communications and / or posters.

In particular, the scientific production of Dr. Plutino essentially concerns three aspects of Chemistry:

- Molecular chemistry: synthesis, characterization and mechanistic aspects of the reactivity of platinum(II) complexes or other transition metals.
- Supramolecular chemistry: synthesis and structural study of functional, nano- and mesostructured supramolecular systems, obtained by spontaneous organization of basic molecular components, such as complexes of transition metals and polyfunctional organic ligands, in solution or supported on solid organic / inorganic matrices.
- Chemistry of functional hybrid nanomaterials: design, synthesis and structural characterization of colloidal metallic nanoparticles (Au, Ag, Pt), core-shell or double-core-shell systems, and graphene oxide quantum dots; realization of nanocomposites that include silica or carbon based nanotubes or nanofibers (CNTs, imogolite, halloysite), dispersed in sol-gel matrices and resins, and / or supported on textile fibers.

Part of the results obtained are the result of numerous national and international scientific collaborations, and are included in various research projects admitted for funding or under evaluation ("Blue Growth" and "Cultural Heritage" thematic lines within PO FESR 2014-2020, PON 2017-202; First EU call, BRIC2018-2019, FISR 2019, LIFE H2020, BBI-JU, INPS2020); they were also presented at national and international congresses in the form of oral communications and/or posters. In particular, Dr. Plutino's research activity is aimed at the development of new, innovative and advanced, multicomponent and multifunctional hybrid nanostructured hybrid systems (nanohybrids and nanocomposites), obtained thanks to the use of sol-gel and polymerization techniques conducted in the presence of organic / inorganic hybrid silane precursors and functional organic and inorganic nanofillers, which have implemented and modified chemical-physical and surface properties, and which may present potential applications in various sectors such as construction, naval, textile, environmental, cultural-heritage, biomedical, sensorial, catalytic. Recently, Dr. Plutino has tried to develop completely green and eco-friendly synthesis protocols starting from natural substances or waste, which lead to the obtainment of functional recyclable materials. This research activity falls within several strategic lines, including "Nanomaterials and enabling processes for sustainable manufacturing" and "Green Chemistry", of the Institute for the Study of Nanostructured Materials (ISMN-CNR), of the Department of Chemical Sciences and Technologies of Materials (DSCTM). Research projects, publications and other professional information can be consulted at the following links:

GoogleScholar: [https://scholar.google.it/citations?hl=it&user=FZFrZJEAAAAJ&view\\_op=list\\_works](https://scholar.google.it/citations?hl=it&user=FZFrZJEAAAAJ&view_op=list_works)

ResearchGate: [https://www.researchgate.net/profile/Maria\\_Plutino](https://www.researchgate.net/profile/Maria_Plutino)

LinkedIn: <https://www.linkedin.com/in/maria-rosaria-plutino-370729b0/>

### REVIEW/EDITORIAL BOARD ACTIVITY

Referee for International Journal of Chemical Kinetics (Wiley), Inorganic Chemistry (ACS), Sensors and Actuators B (Elsevier), Materials and Fibers (MDPI), Materials C (RSC), Cellulose (Springer).

Guest Editor of special issue "[Functional Materials for Healthcare](#)" (JFB, MDPI), and "[Structural Study and Synthesis of Hybrid Multifunctional Nanomaterials](#)" (Materials, MDPI).

### CONFERENCE ORGANIZATION

Was a member of the Organizing Committee of the following Congresses:

- 4<sup>th</sup> National Conference CD.TE.C., 9-11 May 2013, Giardini Naxos (Italia).
- XII Congresso Nazionale di Chimica Supramolecolare, Supramol2015, 27-30 September 2015, Giardini Naxos.
- Workshop "Fun4Health", 17-Aprile-2017, Cosenza.
- Workshop "Fun4heritage", 5-6 Settembre-2019, Matera.

## PARTICIPATION IN FINANCED PROJECTS

1999-2000

*Organometallic compounds of platinum (II), porphyrins and metalloporphyrins in the design of supramolecular structures. Structural and kinetic investigations and use in catalytic processes (PRA 1999, CONO99MR5M, Year 1999; protocol not available, issued by the University of Messina). Has the role of participant in the project.*

1999-2000

*Organometallic compounds of platinum (II), porphyrins and metalloporphyrins in the design of supramolecular structures. Structural and kinetic investigations and use in catalytic processes (PRA 1999, CONO99MR5M, Year 1999, protocol not available, issued by: University of Messina). Has the role of participant in the project.*

2000

*Organometallic compounds of platinum (II), porphyrins and metalloporphyrins in the design of supramolecular structures. Structural and kinetic investigations and use in catalytic processes (PRA 2000, CONO00ZF7T, Year 2000, protocol not available, issued by: University of Messina). Has the role of participant in the project.*

2001-2002

*New strategies for the control of reactions: interaction of molecular fragments with metal sites in unconventional species (PRIN 2000, Act of conferment date: 01/01/2000, protocol: MM03248583\_004). Has the role of participant to the operational unit.*

2001

*Supramolecular systems containing porphyrins and organometallic compounds of platinum (II) (PRA 2001, CONO01N1SK, deed of conferral date: 08/04/2002, protocol: 0015548, issued by the University of Messina). Has the role of participant in the project.*

2002

*Structural and kinetic investigations on organometallic compounds of platinum (II), porphyrins and platinized porphyrins (PRA 2002, ORME020549; Provisioning deed date: 20/06/2003, protocol: 0025734, issued by the University of Messina). Has the role of participant in the project.*

2003

*Mechanistic and structural studies on organometallic compounds of platinum (II) and on porphyrins as a guide to the synthesis of supramolecular systems (PRA2003, code: ORME034032, Act of conferment date: 27/07/2004, protocol: 0036470, issued by the University of Messina). Has the role of participant in the project.*

2003-2004

*In: Supramolecular organization of natural and synthetic porphyrins. Structure and dynamics of supramoleculal complexes of porphyrins on biopolymers: models for the interaction between soluble porphyrins and proteins (PRIN 2002, Act of conferment date: 01/01/2002, protocol: 2002033817\_002). Has the role of participant in the operational unit.*

2003-2004

*Unusual intermediates in Platinum chemistry (II): mechanistic studies as a guide to the synthesis of complex systems with other planar species (PRIN 2002, Year 2002, protocol: 2002031332\_010). Has the role of participant in the operational unit.*

2003-2005

*Functionalization of nanostructured surfaces with biomolecules for biomedical applications (date and protocol not present in the administrative offices; certificate of participation signed by the Director of the ISMN, Dr. G. Padeletti, available at the request of the Commission, issued by the National Research Council).*

2004

*Mechanical Studies on Platinum Complexes (II) As a Guide to the Activation of the CH Bond and to the Synthesis of Complex Molecular Systems (PRA 2004, ORME043190, Act of conferment date: 24/05/2006, protocol: 24306, issued by: University of Studies of Messina). Has the role of participant in the project.*

2005-2006



In: New strategies for the control of reactions: interaction of molecular fragments with metal sites in non-conventional species. Coordinative Unsaturation in Platinum Chemistry (II): Mechanical Studies as a Guide to the Activation of the C-H Bond and the Synthesis of Complex Molecular Systems (PRIN 2004, Act of conferral date: 01/01/2004, protocol: 2004030719\_008). Has the role of participant in the operational unit.

2005

*Mechanistic Studies on Platinum Complexes (II) Aimed at Activating the C-H Bond and Synthesis of New Complexes with Extended Flatness (PRA 2005, ORME053887, protocol: 50328, issued by the University of Messina). Has the role of participant in the project.*

2006-2007

*Kinetic studies on the activation of the C-H bond by means of platinum (II) complexes (PRA 2006/2007, ORME07LPEE, Act of conferment date: 27/09/2009, protocol: 29870, issued by the University of Messina). Has the role of participant in the project.*

2007-2009

Self-organized porphyrin complexes at the nanoscale: properties and technological applications. Supramolecular aggregates and complexes of porphyrins with biopolymers and cyclodextrins: investigations on optical, photophysical and bio-transport properties (PRIN 2006, Act of conferment date: 01/01/2006, protocol: 2006031909\_004). Has the role of participant in the operational unit. Has the role of participant in the operational unit.

2010-2011

*Chirality in supramolecular porphyrin systems (PRA 2008-2009, ORME09SB5H, Act of conferment date: 20/10/2010, Resolution of the Academic Senate and the Board of Directors with letter 70455 of 10/12/2010). Has the role of participant in the project.*

2010-2011

*Functional organization at the nanoscopic level of (bio) molecules and hybrids for applications in the field of sensors, medicine and biotechnology (PRIN 2010/2011, Year 2010\_2011, Protocol: 2010C4R8M8\_003). Has the role of participant in the operational unit.*

2018-2021

*MUR-PON (IT)-AGMforCuHe.. CNR Manager of the PON Research and Innovation project "New generation materials for the restoration of Cultural Heritage: new approach to fruition", approved with D.D. MIUR n. 2296 of 12.09.2018 as part of the Notice for the presentation of industrial research and experimental development projects in the 12 areas of specialization identified by the 2015-2020 NRP, announced with D.D. MIUR n. 1735 of 13.07.2017. Request: ARS01\_00697. The project aims at developing new strategies for the conservation and fruition of Cultural Heritages by the production, testing and introduction in the market of eco-friendly and smart materials and technologies for the restoration of monumental buildings. The terms eco-friendly and smart are referred to the use of waste recycled raw materials and tuneable products, respectively. The context in which the project will be developed is characterised by a high density of Cultural Heritages, also listed in the UNESCO Heritage List, representing relevant touristic attractions. In order to meet these requirements, the project will focus on the development and testing of the development of geopolymers by using industrial procedures and raw materials (as inertized and recycled industrial waste) able to reduce CO2 emission, and the synthesis of nanoparticle-based consolidants and protective biofilms with improved durability and efficacy performance.*

2019-2021

*MUR-PON (IT)-THALASSA. Coordinator activities within the PON Research and Innovation project "Technology And materials for safe Low consumption And low life cycle cost veSSels And crafts-THALASSA". The aim of the project is to study and to develop innovative and advanced materials technologies that can be used in the shipbuilding process in order to meet the needs of companies involved in the project and the challenges posed by national, regional programs concerning smart, green and integrated maritime transport. The approach is based on two key points: sustainability, related to performances, and life cycle. Within the project output there is the eco-friendly and bio-sustainable composite and the formulation of hydrophobic and antifouling coatings with biocidal action to be used on components and on boats of different nature and use, and thick coatings also for flame-protection and acoustic/thermal isolation.*

2019-2022

*PO-FESR Sicilia 2014-2020-SETI. CNR Manager of the " SETI (Sicilia Eco Tecnologie Innovative)" project. It aims to boost the birth of industry and R&D of geopolymeric materials in Sicily, thus including the sustainable construction industry sector (eg industrial waste,), from the design and implementation*

of solutions that make the most of the peculiar properties of geopolymeric materials, to the mining sector, for the extraction of raw materials to be used (eg clays,). The project will focus on the design of experimental formulations for the realization of Sicilian geopolymers, in order to identify the best blends, In particular, prototypes of a "brick" with high thermal insulation capacity and eco-friendly sol-gel based protective paints will be tested which can improve the insulating and mechanical geopolymeric quality, including the aesthetic qualities of products.

2014-2020

*PO-FESR Sicilia 2014-2020-SI-MARE: CNR Manager of the "SI-MARE - Soluzioni Innovative per Mezzi navali ad Alto Risparmio Energetico" project. The general objective of the project is to protect the sea resource, as not only an environmental and landscape heritage but above all an opportunity for economic development for the strengthening and birth of shipbuilding activities. This objective will be achieved through the improvement of the energy performance of vessels, the consequent reduction of the environmental impact in terms of climate-altering emissions into the atmosphere, through the study and development of advanced composite materials and of low-friction functional coatings for hulls. The recent trend is to develop innovative sustainable coatings which, in addition to exhibiting an effective antifouling action, can preserve and protect the marine environment. Among the examples of non-toxic and eco-friendly coatings, the development of micro- and nano-engineered smart and bio-hybrid coated surfaces, with anti-fouling activity or that emulate the mechanisms of organisms in their defense against bioadhesion, is of particular interest for the creation of "fouling release coatings", based on sol-gel based polymers, which allow a low surface adhesion of microorganisms and their removal during navigation or for simple mechanical cleaning.*

## Digital skills

### SELF EVALUATION

Information processing	Communication	Content Creation	Security	Problem solving
Independent user	Independent user	Independent user	Independent user	Independent user

#### Digital skills - Self-assessment form

Excellent command of the programs of:

- 1) writing, data processing and presentation (Microsoft Office Word, Excel, Powerpoint); 2) retouching and processing of images and graphics (Canvas, Paint, Adobe Photoshop); 3) data processing (Origin, Scientist); 4) programs for designing and fitting molecules (ChemOffice); 5) NMR data processing (MestreNova, Bruker Topspin, gNMR) and minimization of molecular structures / semiempirical calculations (Spartan); 6) website management (Wix, Wordpress).

## PUBLICATION LISTS (2015-2020)

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