

Curriculum Vitae

INFORMAZIONI PERSONALI

Nome FRANCESCO
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FORMAZIONE TITOLI

Francesco Di Franco was born on 27/11/1985 in Palermo. He obtained his Master degree (cum laude) in Chemical Engineering at Università di Palermo in 2009 discussing a thesis on "Electrochemical Fabrication of metal/oxide/conducting polymers junction". The success of his research resulted in the "SAIPEM Spa Prize" awarded by the Electrochemical Division of Italian Chemical Society in 2010. He started his PhD in Chemical and Materials Engineering (Electrochemical Engineering curriculum) in 2011 and he obtained his PhD degree in Chemical and Materials Engineering at Università di Palermo in 2014 discussing a thesis on "Electrochemical Fabrication of metal/oxide/conducting polymers junction for electronic devices". During his PhD studies he spent two months as guest student at the Zentrum für Elektrochemie of Ruhr-Universität Bochum (Bochum, Germany).

During his PhD he attended the following international courses: 1) GRICU PhD NATIONAL SCHOOL 2011 on Mathematical Methods for Chemical Engineering / Nanotechnologies, 2011, Santa Margherita di Pula (CA), Italy; 2) Corrosion - Aqueous Gordon Research Seminar, Corrosion Research: A Multidisciplinary Approach to Science, 2012, Colby-Sawyer College New London, USA; 3) 6th European Summer School on Electrochemical Engineering, 2012, Zadar, Croatia; 4) GRICU PhD NATIONAL SCHOOL 2013 on Free radical polymerization kinetics, statistical thermodynamics and engineering aspects and Advanced topics in sustainable chemical Engineering, 2013, Salice Terme (PV), Italy.

The success of his research resulted in the "De Nora Foundation Prize" awarded by the Electrochemical Division of Italian Chemical Society in 2014 for his PhD Thesis.

Francesco Di Franco has been a Post-Doc fellow in Electrochemical Material Science Lab, Dipartimento di Ingegneria Civile, Ambientale, Aerospaziale e dei Materiali (DICAM), Università degli Studi di Palermo, working on "Electrochemical fabrication of metal/oxide/conducting polymer junctions for electronic devices" from 21 February 2014 to 20 February 2015.

Francesco Di Franco has been a Post-Doc fellow in Electrochemical Material Science Lab, Dipartimento di Ingegneria Civile, Ambientale, Aerospaziale e dei Materiali (DICAM), Università degli Studi di Palermo, working on "Physico-chemical characterization by in situ techniques (PCS, DA, EIS) of passive films and corrosion layers on 316L SS and related metals formed in different conditions", Roche Diagnostics GmbH's Research Grant, Penzberg / Germany, from 10 July 2015 to 9 July 2016.

Francesco Di Franco has been a Post-Doc fellow in Physico-Chimie des surfaces Lab, IRCP, Institut de Recherche de Chimie Paris, Chimie ParisTech, Paris, France, in the frame of the research project "Physico-chemical characterization of passive films by Photocurrent Spectroscopy", from 1 September 2016 to 29 June 2017.

He presented the results of his work in several national and international meetings and he is author of more than 30 papers published on international journals.

ATTIVITA' DIDATTICA

He has teaching experience as teaching assistant for Chemistry, Electrochemical Energy Conversion and Storage, Applied Electrochemistry, Photoelectrochemistry, Corrosion and protection of metals in Chemical Engineering, Materials Engineering, Aerospace Engineering, Civil and Building Engineering, Energy Engineering.

ASSOCIAZIONI SCIENTIFICHE

Società Chimica Italiana, Divisione di Elettrochimica

International Society of Electrochemistry

Electrochemical Society

PUBBLICAZIONE

Publications in International Journals

1P - F. Di Franco, P. Bocchetta, M. Santamaria, F. Di Quarto

Light induced electropolymerization of poly(3,4-ethylenedioxythiophene) on niobium oxide

Electrochimica Acta, 56, (2010), 737–744.

2P - F. Di Franco, P. Bocchetta, C. Calì, M. Mosca, M. Santamaria, F. Di Quarto

Electrochemical fabrication of metal/oxide/conducting polymer junction

Journal of The Electrochemical Society, 158, (2011), H50-H54.

3P - F. Di Franco, G. Zampardi, M. Santamaria, F. Di Quarto, H. Habazaki

Characterization of the Solid State Properties of Anodic Oxides on Ta-Nb Alloys as a Function of the Anodizing Conditions

ECS Transactions, 41 (3), (2011), 293-310.

4P - F. Di Franco, G. Zampardi, M. Santamaria, F. Di Quarto, H. Habazaki

Characterization of the Solid State Properties of Anodic Oxides on Magnetron Sputtered Ta, Nb and Ta-Nb Alloys

Journal of The Electrochemical Society, 159, (2012), C33-C39.

5P - F. Di Franco, M. Santamaria, F. Di Quarto, E. Tsuji, H. Habazaki

The Influence of Nitrogen Incorporation on the Optical Properties of Anodic Ta₂O₅

Electrochimica Acta, 59, (2012), 382-386.

6P - M. Santamaria, F. Di Franco, F. Di Quarto, P. Skeldon and G.E. Thompson

Tailoring of the Solid State Properties of Al-Nb Mixed Oxides: a Photoelectrochemical Study

Journal of Physical Chemistry C, 117, (2013), 4201-4210.

7P - F. Di Quarto, F. Di Franco, C. Monarca, M. Santamaria, H. Habazaki

Photoelectrochemical Characterization of Amorphous Anodic Films on Ti-6at.%Si

Electrochimica Acta, 110, (2013), 517-525.

8P – R. Macaluso, M. Mosca, C. Cali, F. Di Franco, M. Santamaria, F. Di Quarto, [J.L. Reverchon](#),

Erroneous p-type assignment by Hall effect measurements in annealed ZnO films grown on InP substrate

Journal of Applied Physics, 113, (2013), art. no. 164508.

9P – F. Di Franco, M. Santamaria, F. Di Quarto, F. La Mantia, A. I. De Sà, C. M. Rangel, *Dielectric Properties of Al-Nb Amorphous mixed oxides*, ECS Journal of Solid State Science and Technology, 2 (11), (2013), N205-N210.

10P - M. Mosca, R. Macaluso, G. Randazzo, M. Di Bella, F. Caruso, C. Cali, F. Di Franco, M. Santamaria, F. Di Quarto, *Anodized Ti-Si alloy as gate oxide of electrochemically-fabricated organic field-effect transistors*, ECS Solid State Letters, 3, (1), (2014), P7-P9.

11P - R. Macaluso, M. Mosca, V. Costanza, A. D'Angelo, G. Lullo, F. Caruso, C. Cali, F. Di Franco, M. Santamaria, F. Di Quarto, *Resistive switching behaviour in ZnO and VO₂ memristors grown by pulsed laser deposition*, Electronics Letters, 50, (4), (2014), 262-263.

12P – M. Santamaria, G. Conigliaro, F. Di Franco, F. Di Quarto, *Photoelectrochemical Evidence of Cu₂O/TiO₂ Nanotubes Hetero-Junctions formation and their Physicochemical Characterization*, Electrochimica Acta, 144, (2014), 315-323.

13P – F. Di Franco, M. Santamaria, F. Di Quarto, R. Macaluso, M. Mosca, C. Cali, *Electrochemical fabrication and physicochemical characterization of metal/high- k insulating oxide/polymer/electrolyte junctions*, Journal of Physical Chemistry C, 118, (51), (2014), 29973-29980.

14P – M. Santamaria, F. Di Franco, F. Di Quarto, M. Pisarek, S. Zanna, P. Marcus, *Photoelectrochemical and XPS characterisation of oxide layers on 316L stainless steel grown in high-temperature water*, Journal of Solid State Electrochemistry, 19, (2015), 3511-3519.

15P – A. Zaffora, F. Di Franco, M. Santamaria, H. Habazaki, F. Di Quarto, *The influence of composition on band gap and dielectric constant of anodic Al-Ta mixed oxides*, Electrochimica Acta, 180, (2015), 666–678.

16P – A. Zaffora, M. Santamaria, F. Di Franco, H. Habazaki, F. Di Quarto *Photoelectrochemical Evidence of Nitrogen Incorporation during Anodizing of Sputtering - Deposited Al-Ta Alloys*, Physical Chemistry Chemical Physics, (2016),18, 351-360.

17P – A. Zaffora, M. Santamaria, F. Di Franco, H. Habazaki, F. Di Quarto *Photoelectrochemical evidence of inhomogeneous composition at nm length scale of anodic films on valve metals alloys*, Electrochimica Acta, 201, (2016), 333–339.

18P – M. Santamaria, C.M. Pecoraro, F. Di Franco, F. Di Quarto, I. Gatto, A. Saccà, *Improvement in the performance of low temperature H₂–O₂ fuel cell with chitosan–phosphotungstic acid composite membranes*, International Journal of Hydrogen Energy, 41, (2016), 5389.

19P – A. Zaffora, G. Tranchida, F. Di Franco, F. Di Quarto, M. Santamaria, *Physico-chemical characterization of anodic oxides on Hf as a function of the anodizing conditions*, Journal of the Electrochemical Society, 163, Issue 9, (2016), C563-C570.

20P – M. Santamaria, C. M. Pecoraro, F. Di Franco, and F. Di Quarto, *Heteropolyacids - Chitosan Membranes for H₂/O₂ Low Temperature Fuel Cells*, ECS Transactions, 75 (14), (2016), 597-605.

21P – A. Zaffora, F. Di Franco, F. Di Quarto, R. Macaluso, M. Mosca, H. Habazaki, M. Santamaria, *The Effect of Nb Incorporation on the Electronic Properties of Anodic HfO₂*, ECS Journal of Solid State Science and Technology, 6 (4), (2017), N25-N31.

22P – M. Santamaria, C. M. Pecoraro, F. Di Franco, F. Di Quarto, *Phosphomolybdic Acid and Mixed Phosphotungstic/Phosphomolybdic Acid Chitosan Membranes as Polymer Electrolyte for H₂/O₂ Fuel Cells*, International Journal of Hydrogen Energy, 42, (2017), 6211-6219.

23P – F. Di Franco, M. Santamaria, G. Massaro, F. Di Quarto, *Photoelectrochemical monitoring of rouging and de-rouging on AISI 316L*, Corrosion Science, 116, (2017), 74-87.

24P – M. Santamaria, G. Conigliaro, F. Di Franco, B. Megna and F. Di Quarto, *Electronic Properties of Thermal Oxides on Ti and Their Influence on Impedance and Photoelectrochemical Behavior of TiO₂ Nanotubes*, Journal of The Electrochemical Society, 164 (4), (2017), C113-C120.

25P – F. Di Quarto, F. Di Franco, A. Zaffora, M. Santamaria, *Photocurrent Spectroscopy in Corrosion and Passivity Studies. A Critical Assessment*, ECS Transactions, 75 (27), (2017), 33-48.

26P – F. Di Quarto, F. Di Franco, S. Miraghei, M. Santamaria, F. La Mantia, *Characterization of Thin Passive Film-Electrolyte Junctions. The Amorphous Semiconductor (a-SC) Schottky Barrier Approach*, ECS Transactions, 75 (38), (2017), 29-45.

27P – M. Santamaria, A. Zaffora, F. Di Franco, G. Tranchida, H. Habazaki, and F. Di Quarto, *Synergistic Use of Electrochemical Impedance Spectroscopy and Photoelectrochemical Measurements for Studying Solid State Properties of Anodic HfO₂*, ECS Transactions, 75 (38), (2017), 1-15.

28P – F. Di Quarto, F. Di Franco, S. Miraghaei, M. Santamaria, F. La Mantia, *The Amorphous Semiconductor Schottky Barrier Approach to Study the Electronic Properties of Anodic Films on Ti*, Journal of The Electrochemical Society, 164 (9), (2017),

C516-C525.

29P – F. Di Quarto, A. Zaffora, F. Di Franco, M. Santamaria, *Review - Photocurrent Spectroscopy in Corrosion and Passivity Studies: A Critical Assessment of the Use of Band Gap Value to Estimate the Oxide Film Composition*, Journal of The Electrochemical Society, 164 (12), (2017), C671-C681.

30P - F. Di Franco, A. Seyeux, S. Zanna, V. Maurice, P. Marcus, *Effect of High Temperature Oxidation Process on Corrosion Resistance of Bright Annealed Ferritic Stainless Steel*, Journal of The Electrochemical Society, 164 (13) C869-C880 (2017).

31P - Aglieri V., Zaffora A., Lullo G., Santamaria M., Di Franco F., Lo Cicero U., Mosca M., Macaluso R., *Resistive switching in microscale anodic titanium dioxide-based memristors*, Superlattices and Microstructures (2017) In Press.

Chapters in International Books

1B - F. Di Franco, A. Zaffora, M. Santamaria, and F. Di Quarto, *Anodization and Anodic Oxides*, In: Reedijk, J. (Ed.) Elsevier Reference Module in Chemistry, Molecular Sciences and Chemical Engineering. Waltham, MA: Elsevier. (2016).

2B – F. Di Quarto, F. Di Franco, A. Zaffora, M. Santamaria, *Photocurrent Spectroscopy in Passivity Studies*, In: Wandelt K., (Ed.) Encyclopedia of Interfacial Chemistry: Surface Science and Electrochemistry Elsevier (2017).

3B - F. Di Quarto, F. Di Franco, M. Santamaria, F. La Mantia, *Differential Capacitance Measurements on Passive Films*, In: Wandelt K., (Ed.) Encyclopedia of Interfacial Chemistry: Surface Science and Electrochemistry Elsevier (2017).

Conference Contributions

1C - M. Santamaria, P. Bocchetta, F. Di Franco, F. Di Quarto:

Room temperature electrodeposition of photoactive Cd(OH)₂ nanowires

XXIII CONGRESSO NAZIONALE DELLA SOCIETA' CHIMICA ITALIANA - SCI 2009 – Sorrento (Italy), July 5 – 10 2009. (Oral Communication)

2C - F. Di Franco (**Presenting Author**) (**AWARD LECTURE**):

Electrochemical Fabrication of metal/oxide/conducting polymer junctions

GEIERA 2010, Modena, September 5-10, 2010. (Oral Communication)

3C - M. Santamaria, F. Di Franco, F. Di Quarto, K. Nishimura, S. Ono:

Effect of ammonium hydroxide addition in the anodizing electrolyte on the electronic properties of anodic oxides on Niobium

GEIERA 2010, Modena, 5-10 Settembre 2010. (Oral Communication)

4C - M.V. Diamanti, F. Di Franco, M.P. Pedferri, M. Santamaria, F. Di Quarto:

Characterization of Anodic Oxides on Titanium by Photocurrent and Differential Admittance Techniques

GEIERA 2010, Modena, 5-10 Settembre 2010. (Oral Communication)

5C - M. Santamaria, P. Bocchetta, S. Miraghaei, F. Di Franco and F. Di Quarto:

Photocurrent Spectroscopy Applied to the Characterization of Compositionally and Structurally Graded Materials: from Thin Films to Nanostructures

E-MRS 2010 Fall Meeting September 13-17, 2010, Warsaw, Poland. (Invited Lecture)

6C - F. Di Quarto, F. Di Franco, M. Santamaria, H. Habazaki:

Characterization of Anodic Oxides on Magnetron Sputtered Ta-Nb Alloys by Photocurrent Spectroscopy and Differential Admittance Measurements

The 61st annual meeting of International Society of Electrochemistry, Nice (France) September 26th - October 1st, 2010. (Oral Communication)

7C - F. Di Franco (**Presenting Author**), M. Santamaria, P. Bocchetta, F. Di Quarto, C. Cali, M. Mosca:

Electrochemical Fabrication of Inorganic/Organic Field Effect Transistor

The 61st annual meeting of International Society of Electrochemistry, Nice (France) September 26th - October 1st, 2010. (Oral Communication)

8C - F. Di Franco (**Presenting Author**), H. Habazaki, M. Santamaria, F. Di Quarto:

The influence of electrolyte composition on the solid state properties of anodic films on Ta-Nb alloys

10th International Symposium on the Passivation of Metals and Semi-Conductors and the Properties of Thin Oxide Layers, April 10-14, 2011 - Florianopolis, Brazil. (Oral Communication)

9C - F. Di Franco (**Presenting Author**), H. Habazaki, M. Santamaria, F. Di Quarto:

Tuning of the Optical and Dielectric Properties of Anodic Films on sputtered deposited Ta-Nb Alloys

XXIV Congresso Nazionale della Società Chimica Italiana Divisione di Elettrochimica September 11th - 16st, Lecce, 2011, Italy. (Oral Communication)

10C F. Di Franco (**Presenting Author**):

Electrochemical Fabrication of Metal/Oxide/Conducting Polymer Junctions for electronic applications

GRICU PhD NATIONAL SCHOOL 2011 Mathematical Methods for Chemical Engineering / Nanotechnologies September 26th - October 1st, 2011, Santa Margherita di Pula (CA), Italy (Oral Communication)

11C - F. Di Franco, G. Zampardi, M. Santamaria, F. Di Quarto, H. Habazaki:

Characterization of the Solid State Properties of Anodic Oxides on Ta-Nb Alloys as a Function of the Anodizing Conditions

220th ECS Meeting Boston October 9 -14, Boston, USA, 2011. (Oral Communication)

12C- F. Di Quarto, M. Santamaria, F. Di Franco, P. Skeldon, G. E. Thompson, C. M. Rangel:

The Influence of Composition in Determining the Solid State Properties of Al Mixed Oxides

VI International Symposium on Aluminium Surface Science and Technology May 27th-31st 2012, Sorrento, Italy. (Oral Communication)

13C - F. Di Quarto, F. Di Franco, M. Santamaria:

A Chemical Approach to the Estimate of the Optical Band Gap and Bowing Parameter in Mixed d,d-Metal Oxides

Frontiers in Electronic Materials, Nature Conferences (Nature Materials) June 17th to 20th 2012, Aachen, Germany. (Poster Communication)

14C - F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, R. Macaluso, M. Mosca, C. Cali:

Electrochemical Fabrication of High K Niobium-Tantalum Mixed Oxides/Poly 3-4 Ethylene Dioxythiophene Junctions.

GEIERA 2012, 17 – 22 Giugno 2012, Santa Marina Salina, Messina, Italy. (Oral Communication)

15C - F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto:

Photoelectrochemical Polymerization of 3-4 Ethylene dioxythiophene on Anodic Niobium- Tantalum Mixed Oxides.

Corrosion - Aqueous Gordon Research Seminar, Corrosion Research: A Multidisciplinary Approach to Science July 7-8, 2012 Colby-Sawyer College New London, USA. (Poster Communication)

16C - F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto:

Photoelectrochemical Polymerization of 3-4 Ethylene dioxythiophene on Anodic Niobium- Tantalum Mixed Oxides.

Corrosion – Aqueous July 8-13, 2012 Colby-Sawyer College, New London, USA. (Poster Communication)

17C - F. Di Quarto, F. Di Franco, M. Santamaria, M.V. Diamanti, C. Monarca, H. Habazaki:

Amorphous to Crystalline Transition in Anodic Oxide on Ti and Ti-Si alloys: A Photoelectrochemical Study.

The 63st annual meeting of International Society of Electrochemistry, Prague (Czech Republic) August 19th -24st, 2012. (Oral Communication)

18C – F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, P. Skeldon, G.E. Thompson, C. M. Rangel:

Tuning of Solid-state Properties of Al Mixed Oxides Grown on Sputter-deposited Al Alloys.

The 63st annual meeting of International Society of Electrochemistry, Prague (Czech Republic) August 19th -24st, 2012. (Poster Communication)

19C – F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, R. Macaluso, M. Mosca, C. Cali:

Photoelectrochemical Polymerization of 3-4 Ethylenedioxythiophene on High k Niobium-Tantalum Mixed Oxides.

The 63st annual meeting of International Society of Electrochemistry, Prague (Czech Republic) August 19th -24st, 2012. (Oral Communication)

20C – F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, P. Skeldon, G.E. Thompson, C. M. Rangel:

Characterization of the Solid State Properties of Anodic Oxides Grown on Sputter-deposited Al-Nb Alloys.

6th European Summer School on Electrochemical Engineering September 16-21, 2012, Zadar, Croatia. (Poster Communication).

21C - F. Di Quarto, M. Santamaria, F. Di Franco, P. Skeldon, G.E. Thompson, C. Rangel; F. La Mantia:

Physico-chemical characterization of anodic films on sputter-deposited Al-Nb alloys.

EUROCORR 2013 1-5 September, 2013, Estoril, Portugal. (Oral Communication).

22C - F. Di Quarto, F. Di Franco, M. Santamaria:

Spettroscopia di fotocorrente e ammettenza differenziale per lo studio delle proprietà elettroniche e di stato solido di film passivi e ossidi anodici di interesse tecnologico.

Giornate Nazionali Sulla Corrosione e Protezione (GNC 2013) July 10-12, 2013, Napoli, Italia. (Oral Communication).

23C - F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, G. Randazzo, R. Macaluso, M. Mosca, C. Cali:

Electrochemical fabrication of amorphous TiO₂/Poly-3,4 Ethylenedioxythiophene (PEDOT) hybrid structures for electronic devices.

The 64st annual meeting of International Society of Electrochemistry, Queretaro (Mexico September 8th -13st, 2013. (Oral Communication).

24C - R. Macaluso, M. Mosca, C. Cali, F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, and J.-L. Reverchon:

Electrochemical methods for carrier type identification of ZnO films grown by pulsed laser deposition on InP.

The 64st annual meeting of International Society of Electrochemistry, Queretaro (Mexico September 8th -13st, 2013. (Poster Communication).

25C - G. Conigliaro, M. Santamaria, F. Di Franco (**Presenting Author**), F. Di Quarto:

Electrochemical fabrication of Cu₂O/TiO₂ nanotubes junctions with visible light photoactivity.

The 64st annual meeting of International Society of Electrochemistry, Queretaro (Mexico September 8th -13st, 2013. (Poster Communication).

26C- G. Conigliaro, M. Santamaria, F. Di Franco, F. Di Quarto:

Redshift of absorption threshold of TiO₂ Nanotubes due to Cu₂O electrodeposition

GEIERA 2013, 22 – 27 September 2013, Pavia, Italy. (Oral Communication).

27C - F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, G. Randazzo, R. Macaluso, M. Mosca, C. Cali:

Photo-Electrochemical deposition of Poly-3,4 Ethylenedioxythiophene on Anodic Films on Ti-Si Alloys.

GEIERA 2013, 22 – 27 September 2013, Pavia, Italy. (Poster Communication).

28C - F. Di Quarto, F. Di Franco, C. Monarca, M. Santamaria, M.V. Diamanti, MP. Pedferri:

Physicochemical Characterization of anodic film on Titanium prepared by Pedferri's Treatment.

Pietro Pedferri e la scuola di corrosione e protezione dei materiali al Politecnico di Milano, Milano, Italy, 26-27 Settembre 2013. (Oral Communication).

29C - F. Di Quarto, F. Di Franco, M. Santamaria:

Physico-chemical Properties of Anodic Oxide Films: from Passivity to Electronics.

2nd International Symposium on Anodizing Science and Technology (AST2014), Sapporo, Japan, June 4-6 2014. (Oral Communication).

30C - M. Santamaria, F. Di Franco, S. Miraghei, H. Habazaki, F. Di Quarto:

Effect of Incorporation of Foreign Species on the Solid State Properties of Anodic Films on Ti.

2nd International Symposium on Anodizing Science and Technology (AST2014), Sapporo, Japan June 4-6 2014. (Oral Communication).

31C - F. Di Franco (**Presenting Author**), A. Zaffora, M. Santamaria, F. Di Quarto, E. Tsuji, H. Habazaki, *Tuning of solid state properties of Al-Ta mixed oxides.*

65th Annual Meeting of the International Society of Electrochemistry 31 August - 5 September, 2014, Lausanne, Switzerland. (Oral Communication).

32C - F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, P. Marcus:

Photoelectrochemical Characterization of Oxide Layers on 316L Stainless Steel Grown in High temperature Water.

65th Annual Meeting of the International Society of Electrochemistry 31 August - 5 September, 2014, Lausanne, Switzerland. (Poster Communication).

33C - F. Di Franco (**Presenting Author**) (**AWARD LECTURE**):

Electrochemical fabrication of metal/oxide/conducting polymer junctions for electronic devices.

XXV Congresso Nazionale della Società Chimica Italiana, Arcavacata di Rende, Cosenza, Italy, 7-12 Settembre 2014. (Oral Communication).

34C - F. Di Franco (**Presenting Author**), M. Santamaria, F. Di Quarto, P. Marcus:

Physico-chemical characterization of passive films on 316L stainless steel grown in high temperature water.

XXV Congresso Nazionale della Società Chimica Italiana, Arcavacata di Rende, Cosenza, Italy, 7-12 Settembre 2014. (Poster Communication).

35C - F. Di Franco (**Presenting Author**), A. Zaffora, M. Santamaria, F. Di Quarto, E. Tsuji, H. Habazaki, *The influence of composition on the solid state properties of anodic films on Al-Ta alloys*, ASST 2015 VII Aluminium Surface Science & Technology, 17 - 21 May 2015, Madeira (Portugal). (Oral Communication).

36C - Monica Santamaria, Francesco Di Franco, Francesco Di Quarto, Hiroki Habazaki, Andrea Zaffora, *Photoelectrochemical evidence of inhomogeneous composition at nm length scale of anodic films on valve metals alloys*, 17th Topical Meeting of the International Society of Electrochemistry Multiscale Analysis of Electrochemical Systems 31 May - 3 June 2015 Saint-Malo, France (Oral Communication).

37C - Francesco Di Quarto, Francesco Di Franco, Monica Santamaria, *A Chemical Approach to the Modelling of Band Gap of Passive Films for Corrosion Studies*, 17th Topical Meeting of the International Society of Electrochemistry Multiscale Analysis of Electrochemical Systems 31 May - 3 June 2015 Saint-Malo, France. (Oral Communication).

38C - Monica Santamaria, Giorgio Conigliaro, Francesco Di Franco, Francesco Di Quarto, Roberto Macaluso, Shahab Miraghaei, Mauro Mosca, *Multiscale Approach in Studying the Influence of Annealing Conditions on Conductivity of TiO₂ Nanotubes*, 17th Topical Meeting of the International Society of Electrochemistry Multiscale Analysis of Electrochemical Systems 31 May - 3 June 2015 Saint-Malo, France. (Poster Communication).

39C – R. Macaluso, G. Lullo, M. Mosca, V. Costanza, A. D'Angelo, D. Russotto, V. Aglieri, A. Zaffora, A. Genovese, F. Caruso, C. Cali, F. Di Franco, M. Santamaria and F. Di Quarto, *Fabrication and characterization of micrometer-scale ZnO memristors* GE2015 Gruppo Italiano Elettronica Siena 24 June – 26 June, 2015. (Poster Communication).

40C – M. Santamaria, C. M. Pecoraro, F. Di Franco P. Bocchetta, F. Di Quarto, *Fabrication and Characterization of Chitosan-Heteropolyacid complex as membranes for low temperature H₂-O₂ fuel cell*, Giornate Elettrochimica Italiana GEI2015, Bertinoro 20 September-24 September, 2015. (Oral Communication).

41C – F. Di Quarto, F. Di Franco (Presenting Author), M. Santamaria, G. Massaro, S. Zanna, P. Marcus, *Photoelectrochemical and XPS Characterization of Passive films Grown on 316L Stainless Steel in High Temperature Water*, Giornate Elettrochimica Italiana GEI2015, Bertinoro 20 September-24 September, 2015. (Oral Communication).

42C – M. Santamaria, G. Conigliaro, F. Di Franco, B. Megna, F. Di Quarto, *The effect of Annealing Conditions on the Impedance and on the Photoelectrochemical behavior of TiO₂ Nanotubes*, Giornate Elettrochimica Italiana GEI2015, Bertinoro 20 September-24 September, 2015. (Oral Communication)

43C – A. Zaffora, M. Santamaria, F. Di Franco, F. Di Quarto, H. Habazaki *Photoelectrochemical evidence of Nitrogen Incorporation during Anodizing of valve metals alloys* Giornate Elettrochimica Italiana GEI2015, Bertinoro 20 September-24 September, 2015. (Oral Communication).

44C – G. Lullo R. Macaluso, V. Aglieri, M. Mosca, F. Caruso, C. Cali, F. Di Franco, M. Santamaria, F. Di Quarto, *Pulsed laser deposition of ZnO and VO₂ films for memristor fabrication*, FisMat2015 28 September-2 October Palermo 2015. (Oral Communication).

45C - Andrea Zaffora, Monica Santamaria, Francesco Di Franco, Francesco Di Quarto, Hiroki Habazaki, *Photoelectrochemical evidence of Nitrogen Incorporation during Anodizing of Sputtering-Deposited Al-Ta alloys*, Hokkaido University - University of California, Berkeley, Joint Symposium on Chemical Sciences and Engineering, January 7th, 2016, Sapporo, (Japan). (Poster Communication)

46C – ~~Monica Santamaria, Francesco Di Franco, Giuseppe Massaro, Francesco Di Quarto, Monitoring of Rouging and De-Rouging of Stainless Steel For Chemical Reactors by Photoelectrochemical and Impedance Measurements~~, The 67th Annual Meeting of the International Society of Electrochemistry Electrochemistry: from Sense to Sustainability 21-26 August, 2016 The Hague, The Netherlands. (Oral Communication)

47C – Monica Santamaria, Claudio Maria Pecoraro, Francesco Di Franco, Francesco Di Quarto

Phosphomolybdic Acid and Mixed Phosphotungstic/Phosphomolybdic Acid Chitosan Membranes for H₂/O₂ Fuel Cells, The 67th Annual Meeting of the International Society of Electrochemistry Electrochemistry: from Sense to Sustainability 21-26 August, 2016 The Hague, The Netherlands. (Poster Communication)

48C – Francesco Di Franco (**Presenting Author**), M. Santamaria, G. Massaro, F. Di Quarto, Photoelectrochemical monitoring of rouging and de-rouging process on AISI 316L for chemical reactors, EUROCORR 2016, 11-15 September, 2016 Montpellier, France. (Oral Communication)

49C – M. Santamaria, C.M. Pecoraro, F. Di Franco (**Presenting Author**), F. Di Quarto, *Influence of heteropolyacid in enhancing proton conductivity of chitosan membranes for H₂/O₂ Fuel Cells*, 2016 E-MRS Fall Meeting 19 – 22 September 2016 Warsaw University of Technology, Poland. (Oral Communication)

50C – Monica Santamaria, Andrea Zaffora, Francesco Di Franco, Hiroki Habazaki,

Francesco Di Quarto, *Solid State Properties of Anodic Hf-Nb Mixed Oxides*, GIORNATE dell'ELETTROCHIMICA ITALIANA GEI 2016, Gargnano (Lago di Garda) – Italia 11-14 Settembre 2016. (Oral Communication)

51C – Andrea Zaffora, Francesco Di Franco, Vincenzo Aglieri, Roberto Macaluso, Hiroki

Habazaki, Francesco Di Quarto, Monica Santamaria, *Anodic TiO₂ in ReRAM: Influence of Si-doping on the Resistive Switching Properties of Titanium Oxide*, GIORNATE dell'ELETTROCHIMICA ITALIANA GEI 2016 Gargnano (Lago di Garda) – Italia, 11-14 Settembre 2016. (Oral Communication)

52C – M. Santamaria, C. M. Pecoraro, F. Di Franco, and F. Di Quarto, *Heteropolyacids - Chitosan Membranes for H₂/O₂ Low Temperature Fuel Cells*, ECS Prime 2016 October 2-7 2016 Honolulu, Hawaii. (Poster Communication)

53C – F. Di Quarto, F. Di Franco, A. Zaffora, M. Santamaria, *Photocurrent Spectroscopy in Corrosion and Passivity Studies. A Critical Assessment*, ECS Prime 2016 October 2-7 2016 Honolulu, Hawaii. (Oral Communication)

54C – F. Di Quarto, F. Di Franco, S. Miraghei, M. Santamaria, F. La Mantia, *Characterization of Thin Passive Film-Electrolyte Junctions. The Amorphous Semiconductor (a-SC) Schottky Barrier Approach*, ECS Prime 2016 October 2-7 2016 Honolulu, Hawaii. (Oral Communication)

55C – M. Santamaria, A. Zaffora, F. Di Franco, G. Tranchida, H. Habazaki, and F. Di Quarto, *Synergistic Use of Electrochemical Impedance Spectroscopy and Photoelectrochemical Measurements for Studying Solid State Properties of Anodic HfO₂*, ECS Prime 2016 October 2-7 2016 Honolulu, Hawaii. (Oral Communication)

56C - R. Macaluso, S. Barcellona, A. Zaffora, U. Lo Cicero, G. Lullo, M. Mosca, C. Calì, F. Di Franco and M. Santamaria, *Fabrication and Characterization of microscale HfO₂-based memristors*, The 49th annual meeting of the Associazione Società Italiana di Elettronica SIE 2017, June 21st - 23rd, 2017, Palermo (Italy), (Poster Communication).

57C – M. Santamaria, G. Tranchida, M. Clesi, F. Di Franco, F. Di Quarto, *Electronic Properties and Corrosion Resistance of Passive Films on Austenitic and Duplex Stainless Steels*, The 68th Annual Meeting of the International Society of Electrochemistry: Electrochemistry without Borders 27 August – 1 September, 2017 Providence, RI, USA (Oral Communication).

58C – A. Zaffora, H. Habazaki, F. Di Franco, F. Di Quarto, M. Santamaria, *Growth kinetics and physicochemical characterization of Hf-Nb anodic mixed oxides*, The 68th Annual Meeting of the International Society of Electrochemistry: Electrochemistry without Borders 27 August – 1 September, 2017 Providence, RI, USA (Poster Communication).

59C – A. Zaffora, F. Di Franco, F. Di Quarto, I. Valov, H. Habazaki, M. Santamaria, *Fabrication of Hf-Nb anodic oxides and their use in resistive switching devices*, XXVI Congresso Nazionale della Società Chimica Italiana, Paestum (SA), 10-14 settembre 2017 (Oral Communication).

60C – G. Tranchida, H. Pituccio, F. Di Franco, F. Di Quarto, M. Santamaria, *Growth and characterization of atmospheric and anodic oxide films on weathering steels*, XXVI Congresso Nazionale della Società Chimica Italiana, Paestum (SA), 10-14 settembre 2017.

61C – F. Di Quarto, A. Maniscalco, F. Di Franco, F. La Mantia, M. Santamaria, *Synergistic use of impedance and photoelectrochemical measurements to study the electronic properties of anodic TiO₂*, XXVI Congresso Nazionale della

Società Chimica Italiana, Paestum (SA), 10-14 settembre 2017 (Oral Communication).

62C – F. Di Franco (**Presenting Author**), A. Seyeux, S. Zanna, V. Maurice, P. Marcus, *Physicochemical characterization and corrosion behaviour of surface oxide films on bright annealed ferritic stainless steel*, XXVI Congresso Nazionale della Società Chimica Italiana, Paestum (SA), 10-14 settembre 2017 (Oral Communication).

63C – F. Di Franco (**Presenting Author**), A. Seyeux, S. Zanna, V. Maurice, P. Marcus, *Combined XPS, ToF-SIMS and photocurrent spectroscopy physico-chemical characterization of surface oxide films on bright annealed ferritic stainless steel*, ECASIA 17 – European Conference on Applications of Surface and Interface Analysis, 24-29 September, Montpellier, France (Oral Communication).

64C – J. wiatowska, A.-I. Stoica, F. Di Franco, A. Romaine, A. Seyeux, B. Fori, P. Marcus, *Enhanced corrosion performances of post-treated Trivalent Chromium Protection (TCP) coating deposited on Aluminium Alloy 2024-T3*, 232nd ECS MEETING Oct. 1-5, 2017, National Harbor, MD, (Oral Communication).

Invited Tutorial Lecture

1TL - F. Di Franco (**Presenting Author**), *Photocurrent spectroscopy as a tool for the characterisation of oxides and passive films for technological applications*, 3 November 2016, IRCP Chimie ParisTech, (Parigi).

AMBITI DI RICERCA

His research studies include:

-Physico-chemical characterization of passive films, anodic films and corrosion layers, by non-destructive methods based on a.c. electrochemical impedance spectroscopy and photocurrent spectroscopy;

-Electrochemical fabrication and physico-chemical characterization of metal/oxide/conducting polymer junctions for advanced applications;

- Preparation and functionalization of membranes for thin film fuel cells.

