Curriculum Vitae

INFORMAZIONI PERSONALI

Nome ANTONINO
Cognome MARTORANA
Recapiti Dipartimento di Fisica e Chimica, viale delle Scienze, edificio 17

E-mail antonino.martorana@unipa.it

FORMAZIONE TITOLI

- Degree in Physics at the University of Padua (1979).

- Researcher at the Department of Inorganic Chemistry of the University of Padua (1983-1987).

- Associate professor at the University of Palermo (1987-2001).

- Full Professor of Inorganic Chemistry at the University of Palermo(2001-)

- Coordinator of the PHD course in "Chemical Sciences" of the University of Palermo (2006-2008)

- President of the Bachelor and Master degrees in Chemistry (2008-2013) .

- Member of the panel for the evaluation of the proposals of experiments of the Beamline BM08 of ESRF (European Synchrotron Radiation Facility).

- Member of the Scientific Board of the Meeting of the Italian Society of Synchrotron Light (SILS) (2000-2009)

- Member of the Scientific Board of the Meeting of the Italian Society of Crystallography (AIC) (2015)

- Coordinator of the Bachelor and Master degree in Chemistry (2017-)

ATTIVITA' DIDATTICA

- Teacher of:

- Chemistry (Degree in Physics)

- Chemistry 2 (Degree in Physics)

- Structural Chemistry (Master in Chemistry)

- Chemistry of Materials (Master in Chemistry)

- Solid state and inorganic materials chemistry(Master in Chemistry).

- Supervisor of thesis for the degrees in Chemistry, Physics, Chemical Engineering.

- Tutor of PHD students in Chemical Sciences.

- Tutor of PhD students in "Materials Science and Nanotechnology"

- Tutor of Post-Doc students

- lecturer at the "International School of Synchrotron Light" (years 2005-2017)

- Responsible of the project ID132 "Photophysics and Photochemistry of metal complexes: biomedicine applications" of the MIUR program "Messaggeri della conoscenza"

- Responsible of the project ID324 "Models and simulation methods in the field of renewable energy sources" of the MIUR program "Messaggeri della conoscenza"

RICERCHE FINANZIATE

- Participant to the project “Celle a Combustibile (Fuel Cells)” of the Fondo Integrativo Speciale per la ricerca (FISR)

- Responsible for the research unit UNIPA of the PRIN 2006 project "Protonic ceramics for fuel cells" with the program "Structural and computational studies on protonic conductors: Influence of the short range and long range structure on the mechanism of proton conduction"

- Responsible for the research unit UNIPA of the PRIN 2008 project "PC-SOFCs (Protonic Conductors Solid Oxide Fuel Cells)-PC-SOFCs, Protonic Conductors Solid Oxide Fuel Cells based on nanostructured proton conductors: from materials synthesis to

prototype fabrication" with the program: "PC-SOFC: analysis of chemical reactivity at electrodes e of electrolyte protonic conduction by an integrated experimental-computational approach"

- Responsible for the research unit UNIPA of the PRIN 2010-2011 project "Solid oxide Fuel Cells at Intermediate Temperatures Fuelled with Biofuels (BIOITSOFC).

- Responsible for the research unit of UNIPA of the PON02001532939517 project “High Efficiency Technologies for On-board Enviromental and Sustainable Energy Use“

- Participant to the FIRB-Futuro in ricerca project "INCYPIT - INnovative Ceramic and hYbrid materials for Proton conducting fuel cells at Intermediate Temperature"

ASSOCIAZIONI SCIENTIFICHE

- SILS (Società Italiana Luce di Sincrotrone)

- SCI (Società Chimica Italiana, Divisione di Chimica Inorganica, Divisione di Chimica Teorica e Computazionale)

PUBBLICAZIONI

Papers 2000-2017

1. F. Giannici, A. Mossuto Marculescu, A. S. Cattaneo, C. Tealdi, P. Mustarelli, A. Longo, A. Martorana (2017). Covalent and Ionic Functionalization of HLN Layered Perovskite by Sonochemical Methods. Inorganic Chemistry 56, 645–653.

2. A. Martorana, F. Giannici, A. Longo (2016). "The Local Structure of SOFC Materials Investigated by X-ray Absorption Spectroscopy", in Structural Characterization Techniques: Advances and Applications in Clean Energy, L. Malavasi (Ed.), ISBN: 978-981-4669-34-4 Pan Stanford Publishing Pte. Ltd. (Singapore).

3. C. Aliotta, L.F. Liotta, V. La Parola, A. Martorana, E.N.S Muccillo, R. Muccillo, F. Deganello (2016). Ceria-based electrolytes prepared by solution combustion synthesis: The role of fuel on the materials properties. Applied Catalysis B: Environmental 197, 14-22.

4. C Aliotta, LF Liotta, F Deganello, V La Parola, A Martorana (2016). Direct methane oxidation on $La_{1-x}Sr_xCr_{1-y}Fe_yO_3$ perovskite-type oxides as potential anode for intermediate temperature solid oxide fuel cells. Applied Catalysis B: Environmental 180, 424-433.

5. A. S. Cattaneo, C. Ferrara, A. Mossuto Marculescu, F. Giannici, A. Martorana, P. Mustarelli, C. Tealdi (2016). Solid-state NMR characterization of the structure and thermal stability of hybrid organic–inorganic compounds based on a $HLaNb_2O_7$ Dion–Jacobson layered perovskite. Physical Chemistry Chemical Physics 18, 21903-21912.

6. M. Gambino, F. Giannici, A. Longo, S. Di Tommaso, F. Labat, A. Martorana (2015). Dopant Clusterization and Oxygen Coordination in Ta-Doped Bismuth Oxide: A Structural and Computational Insight into the Mechanism of Anion Conduction. Journal of Physical Chemistry C, 119, 26367-26373.

7. F Giannici, G Canu, M Gambino, A Longo, M Salomé, M Viviani, A. Martorana (2015).Electrode–Electrolyte Compatibility in Solid-Oxide Fuel Cells: Investigation of the LSM–LNC Interface with X-ray Microspectroscopy. Chemistry of Materials 27 (8), 2763-2766.

8. A Martorana, F Giannici, A Longo (2015). Synchrotron Radiation and Chemistry: Studies of Materials for Renewable Energy Sources. in "Synchrotron Radiation" edited by S. Mobilio, F. Boscherini, C. Meneghini, pp. 697-715, Springer 2015.

9. F Giannici, G Gregori, C Aliotta, A Longo, J Maier, A Martorana (2014). Structure and oxide ion conductivity: local order, defect interactions and grain boundary effects in acceptor-doped ceria. Chemistry of Materials 26 (20), 5994-6006.

10. Alessandro Longo, Luisa Sciortino, Francesco Giannici, A. Martorana (2014). Crossing the boundary between face-centred cubic and hexagonal close packed: the structure of nanosized cobalt is unraveled by a model accounting for shape, size distribution and stacking faults, allowing simulation of XRD, XANES and EXAFS. Applied Crystallography 47 (5), 1562-1568.

11. S Di Tommaso, F Giannici, AM Marculescu, A Martorana, C Adamo, F. Labat (2014). Toward tailorable surfaces: A combined theoretical and experimental study of lanthanum niobate layered perovskites. The Journal of chemical physics 141 (2), 024704.

1-y Fe y 0.02 Pd 0.03 O 3 perovskites synthesized using a one pot citrate method. Physical chemistry chemical physics 16 (41), 22677-22686.

12. T Puleo, LF Liotta, V La Parola, D Banerjee, A Martorana, A Longo (2014). Palladium local structure of La 1-x Sr x Co

13. G Portale, L Sciortino, C Albonetti, F Giannici, A Martorana, W Bras, F. Biscarini, A. Longo (2014). Influence of metal–support interaction on the surface structure of gold nanoclusters deposited on native SiO x/Si substrates. Physical Chemistry Chemical Physics 16 (14), 6649-6656.

14. Di Bartolomeo E, D'Epifanio A, Pugnalini C, Giannici F, Longo A, Martorana A, Licoccia S (2012). Structural analysis, phase stability and electrochemical characterization of Nb doped BaCe0.9Y0.1O3-x electrolyte for IT-SOFCs. JOURNAL OF POWER SOURCES, vol. 199, 201-206.

15. Lupetin P, Giannici F, Gregori G, Martorana A, Maier J (2012). Effects of Grain Boundary Decoration on the Electrical Conduction of Nanocrystalline CeO2. JOURNAL OF THE ELECTROCHEMICAL SOCIETY, 159 (4), B417-B425

16. Longo A, Liotta LF, Pantaleo G, Giannici F, Venezia AM, Martorana A (2012). Structure of the Metal-Support Interface and Oxidation State of Gold Nanoparticles Supported on Ceria. JOURNAL OF PHYSICAL CHEMISTRY. C, NANOMATERIALS AND INTERFACES, vol. 116, p. 2960-2966.

17. Giannici, F.; Shirpour, M.; Longo, A.; Martorana, A.; Merkle, R.; Maier, J. (2011). Long-Range and Short-Range Structure of Proton-Conducting Y:BaZrO3. Chemistry of Materials 23, 2994–3002.

18. Sciortino, L.; Giannici, F.; Martorana, A.; Ruggirello, A.M.; Turco Liveri, V.; Portale, G.; Casaletto, M.P.; Longo, A. (2011). Structural Characterization of Surfactant-Coated Bimetallic Cobalt/Nickel Nanoclusters by XPS, EXAFS, WAXS, and SAXS. Journal of Physical Chemistry C, 115, 6360-6366.

19. Cammarata, A; Emanuele, A; Martorana, A; Duca, D. (2011). Cation Environment of BaCeO3-Based Protonic Conductors II: New Computational Models. Journal of physical chemistry A, 115, 1676-1685.

20. Giannici, F., Messana, D., Longo, A., Martorana, A. (2011). Crystal structure and local dynamics in tetrahedral proton-conducting $La_{1-x}Ba_{1+x}GaO_4$. Journal of Physical Chemistry C 115, 298-304.

21. Longo, A., Liotta, L.F., Carlo, G.D., Giannici, F., Venezia, A.M., Martorana, A. (2010). Structure and the metal support interaction of the Au/Mn oxide catalysts. Chemistry of Materials 22, 3952-3960.

22. Giannici, F., Longo, A., Kreuer, K.-D., Balerna, A., Martorana, A. (2010). Dopants and defects: Local structure and dynamics in barium cerates and zirconates. Solid State Ionics 181, 122-125.

23. Sciortino, L., Longo, A., Giannici, F., Martorana, A. (2009). Effect of the capping agents on cobalt nanoparticles. Journal of Physics: Conference Series 190, art. no. 012125.

24. Giannici, F., Messana, D., Longo, A., Sciortino, L., Martorana, A. (2009). Local structure of gallate proton conductors. Journal of Physics: Conference Series 190, art. no. 012077.

25. Liotta, L.F., Longo, A., Pantaleo, G., Di Carlo, G., Martorana, A., Cimino, S., Russo, G., Deganello, G. (2009). Alumina supported Pt(1%)/$Ce_{0.6}Zr_{0.4}O_2$ monolith: Remarkable stabilization of ceria-zirconia solution towards $CeAlO_3$ formation operated by Pt under redox conditions. Applied Catalysis B: Environmental 90, 470-477.

26. Giannici, F., Longo, A., Balerna, A., Kreuer, K.-D., Martorana, A. (2009). Proton Dynamics in In:$BaZrO_3$: Insights on the atomic and electronic structure from X-ray absorption spectroscopy. Chemistry of Materials 21, 2641-2649.

27. Longo, A., Giordano, F., Giannici, F., Martorana, A., Portale, G., Ruggirello, A., Turco Liveri, V. (2009). Combined small-angle x-ray scattering/extended x-ray absorption fine structure study of coated Co nanoclusters in bis(2-ethylhexyl)sulfosuccinate. Journal of Applied Physics 105, art. no. 114308.

28. Prestianni, A., Martorana, A., Labat, F., Ciofini, I., Adamo, C. (2009). A DFT investigation of CO oxidation over neutral and cationic gold clusters. Journal of Molecular Structure: THEOCHEM 903, 34-40.

29. Cammarata, A., Martorana, A., Duca, D. (2009). Cation environment of $BaCeO_3$-based protonic conductors: A computational study. Journal of Physical Chemistry A 113, 6381-6390.

30. Giannici, F., Longo, A., Balerna, A., Martorana, A. (2009). Dopant - Host oxide interaction and proton mobility in Gd:$BaCeO_3$. Chemistry of Materials 21, 597-603.

31. Prestianni, A., Martorana, A., Ciofini, I., Labat, F., Adamo, C. (2008). CO oxidation on cationic gold clusters: A theoretical study. Journal of Physical Chemistry C 112, 18061-18066.

32. Longo, A., Martorana, A. (2008). Distorted f.c.c. arrangement of gold nanoclusters: A model of spherical particles with microstrains and stacking faults. Journal of Applied Crystallography 41, 446-455.

33. Giannici, F., Longo, A., Balerna, A., Kreuer, K.-D., Martorana, A. (2007). Indium doping in barium cerate: The relation between local symmetry and the formation and mobility of protonic defects. Chemistry of Materials 19, 5714-5720.

34. Giannici, F., Longo, A., Deganello, F., Balerna, A., Arico, A.S., Martorana, A. (2007). Local environment of Barium, Cerium and Yttrium in $BaCe_{1-x}Y_xO_{3-}$ ceramic protonic conductors. Solid State Ionics 178, 587-591.

35. Longo, A., Giannici, F., Balerna, A., Ingrao, C., Deganello, F., Martorana, A. (2006). Local environment of yttrium in Y-doped barium cerate compounds. Chemistry of Materials 18, 5782-5788.

36. Saccà, A., Carbone, A., Pedicini, R., Portale, G., D'Ilario, L., Longo, A., Martorana, A., Passalacqua, E. (2006). Structural and electrochemical investigation on re-cast Nafion membranes for polymer electrolyte fuel cells (PEFCs) application. Journal of Membrane Science 278, 105-113.

37. Prestianni, A., Martorana, A., Labat, F., Ciofini, I., Adamo, C. (2006). Theoretical insights on O_2 and CO adsorption on neutral and positively charged gold clusters. Journal of Physical Chemistry B 110, 12240-12248.

38. Deganello, G., Giannici, F., Martorana, A., Pantaleo, G., Prestianni, A., Balerna, A., Liotta, L.F., Longo, A. (2006). Metal - Support interaction and redox behavior of Pt(1 wt %)/Ce 0.6Zr0.4O2. Journal of Physical Chemistry B 110, 8731-8739.

39. Casaletto, M.P., Longo, A., Venezia, A.M., Martorana, A., Prestianni, A. (2006). Metal-support and preparation influence on the structural and electronic properties of gold catalysts. Applied Catalysis A: General 302, 309-316.

40. Casaletto, M.P., Longo, A., Martorana, A., Prestianni, A., Venezia, A.M. (2006). XPS study of supported gold catalysts:

The role of Au0 and Au+ species as active sites. Surface and Interface Analysis 38, 215-218.

41. Longo, A., Balerna, A., D'Acapito, F., D'Anca, F., Giannici, F., Liotta, L.F., Pantaleo, G., Martorana, A. (2005). A new cell for the study of in situ chemical reactions using X-ray absorption spectroscopy. Journal of Synchrotron Radiation 12, 499-505.

42. Liotta, L.F., Di Carlo, G., Longo, A., Pantaleo, G., Deganello, G., Marcì, G., Martorana, A. (2004). Structural and morphological properties of Co-La catalysts supported on alumina/lanthana for hydrocarbon oxidation. Journal of Non-Crystalline Solids 345-346, 620-623.

43. D'Acapito, F., Maurizio, C., Gonella, F., Cattaruzza, E., Mattei, G., Mondelli, C., Longo, A., Martorana, A. (2004). On the use of grazing-incidence small-angle X-ray scattering (GISAXS) in the morphological study of ion-implanted materials. Journal of Synchrotron Radiation 11, 272-277.

44. Martorana, A., Deganello, G., Longo, A., Prestianni, A., Liotta, L., Macaluso, A., Pantaleo, G., Balerna, A., Mobilio, S. (2004). Structural evolution of Pt/ceria-zirconia TWC catalysts during the oxidation of carbon monoxide. Journal of Solid State Chemistry 177, 1268-1275.

45. Liotta, L.F., Longo, A., Macaluso, A., Martorana, A., Pantaleo, G., Venezia, A.M., Deganello, G. (2004). Influence of the SMSI effect on the catalytic activity of a Pt(1%)/Ce 0.6Zr0.4O2 catalyst: SAXS, XRD, XPS and TPR investigations Applied Catalysis B: Environmental 48, 133-149.

46. Deganello, F., Longo, A., Martorana, A. (2003). EXAFS study of ceria-lanthana-based TWC promoters prepared by sol-gel routes. Journal of Solid State Chemistry 175, 289-298.

47. Maurizio, C., Longo, A., Martorana, A., Cattaruzza, E., D'Acapito, F., Gonella, F., De Julian, C., Boesecke, P. (2003). Grazing-incidence small-angle X-ray scattering and X-ray diffraction from magnetic clusters obtained by Co + Ni sequential ion implantation in silica. Journal of Applied Crystallography 36 (3 I), pp. 732-735.

48. Martorana, A., Deganello, G., Longo, A., Deganello, F., Liotta, L., Macaluso, A., Pantaleo, G., Mobilio, S. (2003). Time-resolved X-ray powder diffraction on a three-way catalyst at the GILDA beamline. Journal of Synchrotron Radiation 10, 177-182.

49. Liotta, L.F., Macaluso, A., Longo, A., Pantaleo, G., Martorana, A., Deganello, G. (2003). Effects of redox treatments on the structural composition of a ceria-zirconia oxide for application in the three-way catalysis. Applied Catalysis A: General 240, 295-307.

50. Liotta, L.F., Macaluso, A., Pantaleo, G., Longo, A., Martorana, A., Deganello, G., Marcì, G., Gialanella, S. (2003). Structural and morphological investigation of Ce0.6Zr0.4O2 oxides synthesized by sol-gel method: Influence of calcination and redox treatments. Journal of Sol-Gel Science and Technology 26, 235-240.

51. Cammarata, M., Levantino, M., Cupane, A., Longo, A., Martorana, A., & Bruni, F. (2003). Structure and dynamics of water confined in silica hydrogels: X-ray scattering and dielectric spectroscopy studies. The European Physical Journal. E, Soft Matter 12, 63-66.

52. Deganello, F., Martorana, A. (2002). Phase analysis and oxygen storage capacity of ceria-lanthana-based TWC promoters prepared by sol-gel routes. Journal of Solid State Chemistry 163 (2), pp. 527-533.

53. Venezia, A.M., La Parola, V., Longo, A., Martorana, A. (2001). Effect of alkali ions on the amorphous to crystalline phase transition of silica. Journal of Solid State Chemistry 161, 373-378.

54. Balerna, A., Deganello, G., Liotta, L., Longo, A., Martorana, A., Meneghini, C., Mobilio, S., Venezia, A.M. (2001). EXAFS and XRD study of Pd-Ag bimetallic catalysts supported on pumice from organometallic precursors. Journal of Non-Crystalline Solids 293-295, 682-687.

55. Martorana, A., Longo, A., D'Acapito, F., Maurizio, C., Cattaruzza, E., Gonella, F. (2001). Treatment of grazing-incidence small-angle X-ray scattering data taken above the critical angle. Journal of Applied Crystallography 34, 152-156.

56. Liotta, L.F., Venezia, A.M., Deganello, G., Longo, A., Martorana, A., Schay, Z., Guczi, L. (2001). Liquid phase selective oxidation of benzyl alcohol over Pd-Ag catalysts supported on pumice. Catalysis Today 66, 271-276.

57. Gonella, F., Cattaruzza, E., Battaglin, G., D'Acapito, F., Sada, C., Mazzoldi, P., Maurizio, C., G. Mattei, A. Martorana, A. Longo, Zontone, F. (2001). Double implantation in silica glass for metal cluster composite formation: A study by synchrotron radiation techniques. Journal of Non-Crystalline Solids 280, 241-248.

58. Sapoundjieva, D., Piccarolo, S., Martorana, A. (2000). Structural and morphological rearrangements in quenched poly(ethylene) by simultaneous SAXS/WAXS. Macromolecular Chemistry and Physics 201, 2747-2750.

59. Cattaruzza, E., D'Acapito, F., Gonella, F., Longo, A., Martorana, A., Mattei, G., Maurizio, C., Thiaudière, D. (2000). GISAXS study of Cu-Ni alloy clusters obtained by double ion implantation in silicate glasses. Journal of Applied Crystallography 33, 740-743.

60. Longo, A., Balerna, A., Deganello, F., Liotta, L.F., Meneghini, C., Martorana, A., Venezia, A.M. (2000). Structural characterization of Pd-Ag and Pd-Cu bimetallic catalysts by means of EXAFS, WAXS and XPS. Studies in Surface Science and Catalysis 130 D, 3207-3212.

AMBITI DI RICERCA

- Chimica dei materiali

- Materiali per celle a combustibile

  Ossidi solidi

  Ibridi inorganico-organici

- Catalisi eterogenea

- Disordine strutturale nei solidi

- Tecniche sperimentali basate sull'utilizzo della radiazione di sincrotrone

    Spettroscopia di assorbimento dei raggi X

    Microspettroscopia a raggi X

    Diffrazione dei raggi X ad alta risoluzione