

CV Antonino Martorana

- Antonino Martorana was born in Palmanova (UD) on 24 September 1952.
- Degree in Physics at the University of Padua, 110/110 (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-).
- 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
- 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)
- Invited speaker at research institutes in Italy and abroad
- Invited speaker at national and international meetings
- lecturer at the "VIII Scuola Nazionale Luce di Sincrotrone", Frascati, October 2005,
- lecturer at the "IX International School of Synchrotron Light", Duino (TS), September 2007.
- lecturer at the "X International School of Synchrotron Light", Duino (TS), September 2009.
- lecturer at the "XI International School of Synchrotron Light", Duino (TS), September 2011.
- lecturer at the "XII International School of Synchrotron Light", Grado (GO), September 2013.
- lecturer at the "XIII International School of Synchrotron Light", Grado (GO), September 2015
- Referee of research projects: FIRB, SIR, PRIN, Local University research projects
- Referee CIVR, VQR
- Referee for international journals:
 - "Journal of Synchrotron Radiation"
 - "Journal of Applied Crystallography"
 - "Acta Crystallographica A"
 - "Journal of Solid State Chemistry"
 - "Solid State Ionics"
 - "Journal of Solid State Electrochemistry"
 - "Applied Catalysis A"
 - "Applied Catalysis B"
 - "Journal of Physical Chemistry B"
 - "Journal of Physical Chemistry C"
 - "Chemistry of Materials"
 - "Inorganic Chemistry"
- Main proposer and participant to several experiments at large facilities: NSLS Brookhaven, ESRF Grenoble, DESY Hamburg, ELETTRA Trieste, PSI Villigen (CH).
- 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 PON02_00153_2939517 project "High Efficiency Technologies for On-board Environmental 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"
- 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"

Skills and research activity in:

Structural characterization and structure-properties correlations in heterogeneous catalysts. Structural characterization of nanomaterials. Structural disorder in finely dispersed solids. Structure of polymeric materials. Oxide and polymeric electrolyte and electrode materials for fuel cells. Wide-Angle and Small-Angle X-ray Scattering. Simulation and fitting of WAXS and SAXS patterns. Use of synchrotron light: X-ray absorption spectroscopy, X-ray diffraction, grazing-incidence small-angle scattering, anomalous scattering, time-resolved experiments for x-ray absorption and x-ray scattering techniques.

Papers 2000-2015

1. C Aliotta, LF Liotta, F Deganello, V La Parola, A Martorana (2015). Direct methane oxidation on $\text{La}_{1-x}\text{Sr}_x\text{Cr}_{1-y}\text{Fe}_y\text{O}_{3-\delta}$ perovskite-type oxides as potential anode for intermediate temperature solid oxide fuel cells. *Applied Catalysis B: Environmental* 180, 424-433.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
 7. F Puleo, LF Liotta, V La Parola, D Banerjee, A Martorana, A Longo (2014). Palladium local structure of $\text{La}_{1-x}\text{Sr}_x\text{Co}_{1-y}\text{Fe}_{y-0.03}\text{Pd}_{0.03}\text{O}_{3-\delta}$ perovskites synthesized using a one pot citrate method. *Physical chemistry chemical physics* 16 (41), 22677-22686.
 8. 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.
 9. Di Bartolomeo E, D'Epifanio A, Pugnolini C, Giannici F, Longo A, Martorana A, Licoccia S (2012). Structural analysis, phase stability and electrochemical characterization of Nb doped $\text{BaCe}_{0.9}\text{Y}_{0.1}\text{O}_{3-x}$ electrolyte for IT-SOFCs. *JOURNAL OF POWER SOURCES*, vol. 199, 201-206.
 10. Lupetin P, Giannici F, Gregori G, Martorana A, Maier J (2012). Effects of Grain Boundary Decoration on the Electrical Conduction of Nanocrystalline CeO_2 . *JOURNAL OF THE ELECTROCHEMICAL SOCIETY*, 159 (4), B417-B425
 11. 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.
 12. Giannici, F.; Shirpour, M.; Longo, A.; Martorana, A.; Merkle, R.; Maier, J. (2011). Long-Range and Short-Range Structure of Proton-Conducting $\text{Y}:\text{BaZrO}_3$. *Chemistry of Materials* 23, 2994–3002.
 13. 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.
 14. Cammarata, A; Emanuele, A; Martorana, A; Duca, D. (2011). Cation Environment of BaCeO_3 -Based Protonic Conductors II: New Computational Models. *Journal of physical chemistry A*, 115, 1676-1685.
 15. Giannici, F., Messana, D., Longo, A., Martorana, A. (2011). Crystal structure and local dynamics in tetrahedral proton-conducting $\text{La}_{1-x}\text{Ba}_{1+x}\text{GaO}_4$. *Journal of Physical Chemistry C* 115, 298-304.
 16. 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.

17. 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.
18. 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.
19. Giannici, F., Messina, D., Longo, A., Sciortino, L., Martorana, A. (2009). Local structure of gallate proton conductors. *Journal of Physics: Conference Series* 190, art. no. 012077.
20. 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}O₂ monolith: Remarkable stabilization of ceria-zirconia solution towards CeAlO₃ formation operated by Pt under redox conditions. *Applied Catalysis B: Environmental* 90, 470-477.
21. Giannici, F., Longo, A., Balerna, A., Kreuer, K.-D., Martorana, A. (2009). Proton Dynamics in In:BaZrO₃: Insights on the atomic and electronic structure from X-ray absorption spectroscopy. *Chemistry of Materials* 21, 2641-2649.
22. 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.
23. 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.
24. Cammarata, A., Martorana, A., Duca, D. (2009). Cation environment of BaCeO₃-based protonic conductors: A computational study. *Journal of Physical Chemistry A* 113, 6381-6390.
25. Giannici, F., Longo, A., Balerna, A., Martorana, A. (2009). Dopant - Host oxide interaction and proton mobility in Gd:BaCeO₃. *Chemistry of Materials* 21, 597-603.
26. 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.
27. 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.
28. 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.
29. 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-δ} ceramic protonic conductors. *Solid State Ionics* 178, 587-591.

30. Longo, A., Giannici, F., Balerna, A., Ingraio, C., Deganello, F., Martorana, A. (2006). Local environment of yttrium in Y-doped barium cerate compounds. *Chemistry of Materials* 18, 5782-5788.
31. 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.
32. Prestianni, A., Martorana, A., Labat, F., Ciofini, I., Adamo, C. (2006). Theoretical insights on O₂ and CO adsorption on neutral and positively charged gold clusters. *Journal of Physical Chemistry B* 110, 12240-12248.
33. 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.
34. 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.
35. 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^{+δ} species as active sites. *Surface and Interface Analysis* 38, 215-218.
36. 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.
37. Liotta, L.F., Di Carlo, G., Longo, A., Pantaleo, G., Deganello, G., Marci, 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.
38. 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.
39. 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.
40. 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.
41. 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.

42. 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.
43. 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.
44. 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.
45. Liotta, L.F., Macaluso, A., Pantaleo, G., Longo, A., Martorana, A., Deganello, G., Marci, G., Gialanella, S. (2003). Structural and morphological investigation of Ce_{0.6}Zr_{0.4}O₂ oxides synthesized by sol-gel method: Influence of calcination and redox treatments. *Journal of Sol-Gel Science and Technology* 26, 235-240.
46. 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.
47. 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.
48. 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.
49. 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.
50. 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.
51. Liotta, L.F., Venezia, A.M., Deganello, G., Longo, A., Martorana, A., Schay, Z., Gucci, L. (2001). Liquid phase selective oxidation of benzyl alcohol over Pd-Ag catalysts supported on pumice. *Catalysis Today* 66, 271-276.
52. 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.

53. 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.
54. 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.
55. 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.