

Curriculum Vitae

INFORMAZIONI PERSONALI

Nome FRANCESCO
Cognome GIANNICI
E-mail francesco.giannici@unipa.it

FORMAZIONE TITOLI

2009: PhD in Chemical Sciences, Università di Palermo. Title of the thesis: *Dopants and defects: the local structure and dynamics of proton-conducting perovskites*

2007-2008: research internships and Max-Planck-Society scholarship with Dr. Klaus-Dieter Kreuer at the Max-Planck-Institute for Solid-State Research, Stuttgart, in the department of Prof. Joachim Maier.

2007: Young scientist prize at the XV meeting of the Italian Synchrotron Radiation Society

2006: XII National School on Materials Science (Università di Padova, Scuola Normale Superiore and INSTM).

2006: Hercules Specialized Course 3: "Surfaces, Interfaces and Nanostructures in the light of Synchrotron Radiation and Neutrons" (Université Joseph Fourier, ESRF and ILL, Grenoble).

2006: XVII Tutorial on Neutron Scattering (Hahn-Meitner Institut, Berlin).

2005: VIII National School on Synchrotron Radiation (Istituto Nazionale di Fisica Nucleare, Frascati).

2005: *Laurea* (MSc) in Chemistry *cum laude*, Università di Palermo. Title of the thesis: *Study of metal-support interaction in Pt/Ce_{0.6}Zr_{0.4}O₂ three-way catalysts*

2004: INFM scholarship (3 months) at European Synchrotron Radiation Facility for the development of a cell for XAFS *in situ* measurements.

ATTIVITA' DIDATTICA

Titolare dei corsi di Chimica dello stato solido e dei materiali inorganici (LM Chimica) e Chimica generale ed inorganica (L Scienze e Tecnologie Agrarie).

In passato, è stato titolare dei corsi di: Chimica (L Scienze Fisiche), Chimica generale ed inorganica (L Agroingegneria), Elementi di strutturistica chimica (L Chimica).

RICERCHE FINANZIATE

Principal investigator for MUR project PRIN2022 "SU-PER" (215 k€)

Principal investigator for MUR project PRIN2022PNRR "OxCellEnT" (242 k€)

Principal investigator for PON I&C 2014-2020 project "Bilge water separator" (3.4 M€) and PON I&C 2014-2020 project "SICAM: Sicilian Innovation Chemical Agrifood Manufacturing" (2.4 M€)

Principal investigator for MIUR project PRIN2017 "HY-TEC" (300 k€)

Principal investigator for MIUR project Futuro in Ricerca (FIRB) 2012 "INCYPIT" (900 k€)

Principal investigator for CINECA parallel computing projects: ProTIC, DoPe, 1HyPe, DoC

Participant in other MIUR projects: PRIN2006, PRIN2008, PRIN2010, PON 2007-2013 TESEO, PON 2014-2020 NAUSICA

PUBBLICAZIONE

h-index = 24 (as of 2024)

Complete list of papers and book chapters: <https://www.scopus.com/authid/detail.uri?authorId=9036306000>

Main Papers:

Ion conduction in oxides

- A. Chiara, G. Raimondi, R. Merkle, J. Maier, C. Ventura, C. Pipitone, A. Longo, F. Giannici- "Interface Diffusion and Compatibility of (Ba,La)FeO_{3-δ} Perovskite Electrodes in Contact with Barium Zirconate and Ceria" - *ACS Applied Materials and Interfaces* **15** (2023) 50225 - 50236
- G. Raimondi, R. Merkle, A. Longo, F. Giannici, O. Mathon, C.J. Sahle, J. Maier - "Interplay of Chemical, Electronic, and Structural Effects in the Triple-Conducting BaFeO₃-Ba(Zr,Y)O₃ Solid Solution" - *Chemistry of Materials*, **35** (2023) 8945 - 8957
- G. Raimondi, A. Longo, F. Giannici, R. Merkle, M. Hoedl, A. Chiara, C. Sahle, J. Maier - "Electronic modifications in (Ba,La)(Fe,Zn,Y)O₃ unveiled by oxygen K-edge X-ray Raman scattering" - *Journal of Materials Chemistry A*, **10** (2022) 8866
- A. Chiara, F. Giannici, C. Pipitone, A. Longo, C. Aliotta, M. Gambino, A. Martorana - "Solid-Solid Interfaces in Protonic Ceramic Devices: A Critical Review" - *ACS Applied Materials and Interfaces* **12** (2020) 55537 - 55553
- G. Raimondi, F. Giannici, A. Longo, R. Merkle, A. Chiara, M. Hoedl, A. Martorana, J. Maier - "X-ray Spectroscopy of (Ba,Sr,La)(Fe,Zn,Y)O₃ Identifies Structural and Electronic Features Favoring Proton Uptake" - *Chemistry of Materials*, **32** (2020) 8502 - 8511
- F. Giannici, A. Chiara, G. Canu, A. Longo, A. Martorana - "Interface Solid-State Reactions in La_{0.8}Sr_{0.2}MnO₃/Ce_{0.8}Sm_{0.2}O₂ and La_{0.8}Sr_{0.2}MnO₃/BaCe_{0.9}Y_{0.1}O₃ Disclosed by X-ray Microspectroscopy" - *ACS Applied Energy Materials* **2** (2019) 3204-3210

Thermoelectric materials

- K. Konidaris, M. Zambra, F. Giannici, A. Guagliardi, N. Masciocchi - "Forcing Twisted 1,7-Dibromoperylene Diimides to Flatten in the Solid State: What a Difference an Atom Makes" - *Angewandte Chemie Intl Ed*, **62** (2023), 10445
- C. Pipitone, S. Carlotto, M. Casarin, A. Longo, A. Martorana, F. Giannici - "Bi3+doping in 1D ((CH₃)₃SO)PbI₃: A model for defect interactions in halide perovskites" - *Journal of Materials Chemistry C*, **10** (2022), 1458-1469
- V.M. Abbinante, G. Garcia, G. Calabrese, S. Milita, L. Barba, D. Marini, C. Pipitone, F. Giannici, A. Guagliardi, N. Masciocchi - "Conformationally rigid molecular and polymeric naphthalene-diimides containing C₆H₆N₂ constitutional isomers" - *Journal of Materials Chemistry C*, **9** (2021), 10875 - 10888

C. Piperno, S. Boldrin, A. Ferraro, C. Garino, A. Guagliardo, A. Masciocchi, A. Martorana, F. Giannici - "Thermal conductivity in 1D and 2D imidazolium-based lead halide perovskites" - *Applied Physics Letters* **119** (2021), 101104

Structure of metal clusters and metal-support interaction

A. Longo, A. Mirone, E. de Clermont Gallerande, C.J. Sahle, M.P. Casaletto, L. Amidani, S.A. Theofanidis, F. Giannici - "Oxygen vacancy clusters in bulk cerium oxide and the impact of gold atoms" - *Cell Reports Physical Science* **4** (2023) 101699

A. Longo, F. Giannici, M.P. Casaletto, M. Rovezzi, C. Sahle, P. Glatzel, Y. Joly, A. Martorana - "Dynamic Role of Gold d-Orbitals during CO Oxidation under Aerobic Conditions" - *ACS Catalysis* **12** (2022) 3615-3627

E. Groppo, G. Agostini, E. Borfecchia, A. Lazzarini, W. Liu, F. Giannici, G. Portale, A. Longo - "The Pyridyl Functional Groups Guide the Formation of Pd Nanoparticles Inside A Porous Poly(4-Vinyl-Pyridine)" - *ChemCatChem* **7** (2015) 2188-2195

Other applications of X-ray absorption spectroscopy

A. Kostomitsopoulou Marketou, F. Giannici, S. Handberg, W. De Nolf, M. Cotte, F. Caruso - "Synchrotron Radiation-Based Micro-XANES and Micro-XRF Study of Unsuccessfully Produced Egyptian Blue from the Late Hellenistic Production Site of Kos (Dodecanese, Greece)" - *Analytical Chemistry*, **93** (2021), 11557-11567

ATTIVITA' SCIENTIFICHE

Reviewer for: *Journal of the American Chemical Society*, *Chemistry of Materials*, *Nature Communications*, *Advanced Functional Materials*, *Advanced Energy Materials*, *Journal of Materials Chemistry*, etc.

Reviewer for project grants: *Petroleum Research Fund of the American Chemical Society*, *Czech Science Foundation*, *ANVUR*.

Chairperson of ESRF Beamtime assignment panel C07 (X-ray Microscopy) 2016-2020

Papers selected for **ESRF Highlights**, issues 2011, 2020, 2022

AMBITI DI RICERCA

Structure-property relations in functional materials

1. Proton-conducting oxides for fuel cell applications
2. Thermoelectric hybrid materials
3. Applications of synchrotron X-ray spectroscopy to energy materials

Expertise in: *in situ* and *in operando* X-ray structural characterization with synchrotron radiation and neutrons; modeling of X-ray absorption spectroscopy data; electrochemical characterization of ion conductors with impedance spectroscopy; solid-state chemistry of ion-conducting oxides, cements and mortars; modeling of X-ray and neutron scattering data (elastic and quasielastic); solid-state synthesis and ceramic processing; scanning electron microscopy and X-ray microanalysis.