Curriculum Vitae of Dr. Giovanni Bertoni

Research positions:

2011 (now) **Senior Researcher** at *Consiglio Nazionale delle Ricerche* (CNR)

2008 – 2011 **Team Leader Scientist** at *Istituto Italiano di Tecnologia*, (IIT) Genova, Italy

2004 – 2008 **Post-doc fellow** at *Electron Microscopy for Materials Science* (EMAT) University of Antwerpen, Belgium.

2004 **Post-doc fellow** at *Centre d'Elaboration de Matériaux et d'Etudes Structurales, Groupe Nanomatériaux* (CEMES-CNRS) Toulouse, France.

2003 **Post-doc fellow** at *Laboratorio Nazionale TASC-INFM*, Trieste, Italy and *Dipartimento di Matematica e Fisica*, Università Cattolica del Sacro Cuore, Brescia, Italy.

Education:

2003 **Ph.D. in Physics** at Università degli Studi Statale di Milano, Italy. Thesis: *Carbon Based Nanostructured Films.*

1999 **Laurea in Physics** (110/110 *cum laude*) at Università degli Studi di Modena e Reggio Emilia. Thesis: *2D Electron Gas at III-V Semiconductor Surfaces Studied by High Resolution Photoemission Spectroscopy.*

Research interests and methods:

- Presently working in scanning transmission electron imaging and spectroscopy focusing on nanostructured materials (interfaces, colloids, QDs, nanotubes...) with advanced properties.
- Study of structure and atomic defects in cathode and electrolyte materials for Li-ion batteries and solid-sate batteries.
- High Resolution transmission electron imaging (HRTEM), also with spherical aberration (Cs) corrector systems.
- Scanning transmission electron imaging and spectroscopy (STEM and STEM-EELS) and energy filtered transmission electron microscopy for chemical mapping and plasmon mapping.
- Application of model base quantification of electron energy loss spectra for the study of chemical quantification (core-loss) and plasmons resonances and inter-band transitions (low-loss).
- Theoretical calculation of electronic and structural properties of interfaces and nanostructured materials (particularly carbon based) from first principles density functional (DFT) methods. Calculation of electron energy loss spectra (EELS), using static approximations (Z+1 and coreexcited approximations).
- Past research activity in Italy was dedicated to the study of surfaces and interfaces, and nanocomposites films (fullerenes, carbon nanotubes…) by means of spectroscopy as photoemission (UPS-XPS), Auger (AES), and microscopy as STM, SEM, and AFM.

Grants/Awards:

2020 Winner of the CANADA-ITALY Innovation Award 2020 with the project "*Enhanced solid-state electrolytes for ion-batteries*" (priority sector: Living Within Earth's Carrying Capacity)

2020 Selected scientist for the Review College Panel 2021-2023 of FWO (Fonds Wetenschappelijk Onderzoek, Belgium).

2019 – 2021 Participant in the H2020-FETOPEN-1-2016-2017 Project "*QUANTUM SORTER (Q-SORT)"* (GA 766970).

2017 – 2019 Participant in the H2020-EU.2.1.3.- Industrial Leadership Project "*Anisometric permanent hybrid magnets based on inexpensive and non-critical materials (AMPHIBIAN)"* (GA 720853).

2013 – 2016 Participant in the PRIN 2010-2011 project "*Nanostrutture gerarchiche fotosintetiche per la produzione di energia* (*HI-PHUTURE)"* (MIUR n.2010N3T9M4)"

2013 Italian Ministry of Education, Universities and Research (MUR) habilitation as Associate Professor in experimental condensed matter physics (02/B1 fascia 2).

Other scientific acknowledgments:

- Presenter of oral contributions (20) and invited talks/keynotes (5) at international conferences.
- Co-author of 2 patents on synthesis and use of nanostructures:
  - US9647154B2. *Ordered superstructures of octapod-shaped nanocrystals, their process of fabrication and use thereof*
  - US20130032767A1. *Octapod shaped nanocrystals and use thereof*
- Responsible of advanced instrumentation (200 kV UHR transmission electron microscopes).
- Reviewer for the American Physical Society (APS), the American Chemical Society (ACS), the American Institute of Physics (AIS), the Royal Society of Chemistry, and Elsevier B.V.
- Author or coauthor of more than 100 scientific articles in peer-review journals.
- h-index: **39** according to ISI Web of Science (WoS) and Scopus on August 2021.

Bibliographic indices:

Source (July. 2021)	**Publications**	**h-index**	**Citations**
Scholar https://scholar.google.it/citations?user=R4T17lwAAAAJ&hl=en	**155**	**42**	**6653**
Scopus (ID: 7102316929)	**130**	**39**	**5564**
ISI-WoS (ID: J-4710-2012)	**130**	**39**	**5373**

List of 10 representative publications:

1. Paolella, A.; Zhu, W.; **Bertoni, G.**; Savoie, S.; Feng, Z.; Demers, H.; Gariepy, V.; Girard, G.; Rivard, E.; Delaporte, N.; Guerfi, A.; Lorrmann, H.; George, C.; Zaghib, K., Discovering the Influence of Lithium Loss on Garnet Li7La3Zr2O12 Electrolyte Phase Stability. *ACS Appl. Energy Mater.* 2020, 3 (4), 3415-3424.
2. Brescia, R.; Toso, S.; Ramasse, Q.; Manna, L.; Shamsi, J.; Downing, C.; Calzolari, A.; **Bertoni, G.**, Bandgap determination from individual orthorhombic thin cesium lead bromide nanosheets by electron energy-loss spectroscopy. *Nanoscale Horizons* 2020, 5 (12), 1610-1617.
3. **Bertoni, G.**; Ramasse, Q.; Brescia, R.; De Trizio, L.; De Donato, F.; Manna, L. Direct Quantification of Cu Vacancies and Spatial Localization of Surface Plasmon Resonances in Copper Phosphide Nanocrystals. *ACS Mat. Lett.* 2019, 1, 665-670.
4. Paolella, A.; Faure, C.; **Bertoni, G.**; Marras, S.; Guerfi, A.; Darwiche, A.; Hovington, P.; Commarieu, B.; Wang, Z.; Prato, M.; Colombo, M.; Monaco, S.; Zhu, W.; Feng, Z.; Vijh, A.; George, C.; Demopoulos, G. P.; Armand, M.; Zaghib, K., Light-assisted delithiation of lithium iron phosphate nanocrystals towards photo-rechargeable lithium ion batteries. *Nat. Comm.* 2017, 8 (1), 14643.
5. Gaboardi, M.; Bliersbach, A.; **Bertoni, G.**; Aramini, M.; Vlahopoulou, G.; Pontiroli, D.; Mauron, P.; Magnani, G.; Salviati, G.; Zuettel, A.; Ricco, M., Decoration of graphene with nickel nanoparticles: study of the interaction with hydrogen. *J. Mat. Chem. A* 2014, 2 (4), 10391046.
6. Paolella, A.; **Bertoni, G**.; Dilena, E.; Marras, S.; Ansaldo, A.; Manna, L.; George, C., Redox Centers Evolution in Phospho-Olivine Type (LiFe0.5Mn0.5PO4) Nanoplatelets with Uniform Cation Distribution. *Nano Lett.* 2014, 14 (3), 1477-1483.
7. **Bertoni, G.**; Grillo, V.; Brescia, R.; Ke, X.; Bals, S.; Catellani, A.; Li, H.; Manna, L., Direct Determination of Polarity, Faceting, and Core Location in Colloidal Core/Shell Wurtzite Semiconductor Nanocrystals. *ACS Nano* 2012, 6 (7), 6453-6461.
8. Miszta, K.; de Graaf, J.; **Bertoni, G.**; Dorfs, D.; Brescia, R.; Marras, S.; Ceseracciu, L.; Cingolani, R.; van Roij, R.; Dijkstra, M.; Manna, L., Hierarchical self-assembly of suspended branched colloidal nanocrystals into superlattice structures. *Nat. Mat.* 2011, 10 (11), 872-876.
9. Saghi, Z.; Holland, D. J.; Leary, R.; Falqui, A.; **Bertoni, G.**; Sederman, A. J.; Gladden, L. F.; Midgley, P. A., Three-Dimensional Morphology of Iron Oxide Nanoparticles with Reactive Concave Surfaces. A Compressed Sensing-Electron Tomography (CS-ET) Approach. *Nano Lett.* 2011, 11 (11), 4666-4673.
10. **Bertoni, G.**; Verbeeck, J., Accuracy and precision in model based EELS quantification. *Ultramicroscopy* 2008, 108 (8), 782-790.