

Giancarlo Panaccione



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Research Director at National Research Council (CNR) Lab TASC, Istituto Officina dei Materiali, Trieste.

> 220 publications in leading international peer-reviewed journals.

h-index 44, h10-index 143 (from Google Scholar Dec 1st, 2023).

My present research interests are focused on the electronic and magnetic properties of quantum materials and nano-materials, where emerging properties arise from strong interactions between constituent particles. In particular, the activity is focused on achieving control of these properties via external tuning parameters, growth and fabrication of digital heterostructures, possibly leading to new applications in quantum electronics and spintronics. My research activity is mostly devoted to the exploitation of Synchrotron Radiation spectroscopies, following three main axes: (1) electronic and magnetic properties of low dimensional systems (2) electron confinement and topological properties, and (3) magnetism and phase transition in complex oxides and highly correlated systems.

Selected publications (last five years)

- F. Mazzola et al. Observation of termination-dependent topological connectivity in a magnetic Weyl Kagome lattice, *Nano Letters* 23 (17), 8035 (2023)
- D. Di Sante et al. Flat band separation and robust spin Berry curvature in bilayer kagome metals *Nat. Phys.* 19, 1135 (2023)
- F. Troglia et al. Evidence of a 2D electron gas in single-unit-cell of anatase TiO₂(001), *Advanced Science* 9 (16), 2105114, 2022
- G. M. Pierantozzi et al. Evidence of magnetism-induced topological protection in the axion insulator candidate EuSn₂P₂, *Proceedings of the National Academy of Sciences* 119 (4), e2116575119, 2022.
- P. D. C. King et al, Spin angle and depth resolved Photoelectron spectroscopy on quantum materials., *Chemical Reviews*, Focus Issue, 121, 5 – 2816 (2021).
- C. Bigi et al. Distinct behavior of localized and delocalized carriers in anatase (001) during reaction with O₂, *Phys. Rev. Materials* 4, 025801 (2020)
- G. Vinai et al. Proximity-induced ferromagnetism and chemical reactivity in few-layer VSe₂ heterostructures, *Phys. Rev. B* 101, 035404 (2020)
- P. K. Das et al. Electronic properties of candidate type-II Weyl semimetal WTe₂. A review perspective, *Electron. Struct.* 1 014003 (2019)
- C. Rinaldi et al. Ferroelectric control of the spin texture in GeTe, *Nano Lett.* 18, 2751 (2018)

Primary techniques and experience:

- Photoemission Spectroscopy (ARPES, spin resolved-ARPES, XPS, Hard x-ray Photoemission)
- Mott scattering experiment for the analysis of the spin polarization of electrons.
- Solid state physics and of strongly interacting systems, topological properties in solid systems, low-dimensional electronic properties, metal-insulator transitions, metal-molecular interfaces, surface magnetism, ferromagnetic and antiferromagnetic coupling, domain wall physics.
- Experience in the design and realization of ultra-high vacuum setups, laser systems
- Experience in design, realization and commissioning of beamline, electron analysers, electron optics
- Time-resolved Spectroscopies with laser and Synchrotron Radiation
- X-ray Absorption Spectroscopy, XMCD (X-rays Magnetic Circular Dichroism)