

# FEDERICO BISTI

## Curriculum Vitae



### EDUCATION AND RESEARCH EXPERIENCE

- Since 01/03/2021
 

<p><b>Tenure Track Assistant Professor in Physics</b> at Dipartimento di Scienze Fisiche e Chimiche, University of L'Aquila, Via Giovanni Di Vincenzo 16/B, 67100 L'Aquila, Italia.  <u>Role:</u> Teaching and research in condensed matter physics.  <u>Description:</u> Teaching General Physics I and II in 2021/2022. Research activity on electronic band structure of quantum materials.</p>
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- 01/05/2016 – 28/02/2021
 

<p><b>Beamline scientist</b> at LOREA beamline of the ALBA Synchrotron Light Source, Carrer de la Llum, 2-26, 08290 Cerdanyola del Vallès, Barcelona, Spain.  <u>Role:</u> Design, develop and maintenance of the LOREA beamline and its ARPES end station.  <u>Description:</u> develop a preliminary design for the LOREA ARPES beamline (<a href="https://www.cells.es/en/beamlines/bl20-lorea">https://www.cells.es/en/beamlines/bl20-lorea</a>), prepare all the official documents for the tendering procedures, supervise the contractors (winners of the tenders) in the design, production, testing and installation phases. This work has been done in constant collaboration with the other beamline scientist (dr. Dedora Pierucci) and the beamline manager (dr. Massimo Tallarida). In addition, I have contributed to the develop of the beamline monochromator and infrastructure. I am the developer of the software interface between the ARPES analyzer software and the "Tango control system" of the beamline. I have been developing a python package for the ARPES data analysis, which includes a graphical user interface for a rapid data exploration during the ARPES experiments (the code is available under GPL license at <a href="https://gitlab.com/fbisti/navarp">https://gitlab.com/fbisti/navarp</a>). Apart from the tasks strictly related to the LOREA beamline, I have been involved in many research projects with the role of exploring and analyzing the electronic band structure of: VO<sub>2</sub>, VI<sub>3</sub>, CrI<sub>3</sub>, InSe, As<sub>2</sub>Te<sub>3</sub> and ternary alloys MXY (M = Mo, W; X ≠ Y = S, Se or Te). Finally, I co-supervised the master thesis entitled "An ARPES investigation via <sup>13</sup>C-<sup>12</sup>C isotopic substitution" of Fabio Priante, Università degli studi dell'Aquila, Italy (defended on 27/07/2019, final mark of 110/110 <i>cum laude</i>).</p>
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- 01/12/2013 – 30/04/2016
 

<p><b>Post-doc fellow</b> at Swiss Light Source, Paul Scherrer Institute, 5232 Villigen-PSI, Switzerland.  <u>Supervisor:</u> dr. Vladimir N. Strocov.  <u>Description:</u> I have investigated the electronic structure using soft-X-ray ARPES. The most relevant materials investigated under my participation or supervision are: EuO/Si interface, TaAs and TaP Weil semimetals, Al-Ni-Co quasi-crystal, ZrT<sub>5</sub> topological insulator, GeTe ferroelectric Rashba semiconductor, GeMn<sub>x</sub>Te<sub>1-x</sub> multiferroic, LaAlO<sub>3</sub>/SrTiO<sub>3</sub> interface, Cr(100) metallic surface, CrO<sub>2</sub> half-metal, Fe-pnictides.  <u>Grants information:</u> agreement n. 200021_146890, Swiss National Science Foundation, "Electronic Structure of Three-Dimensional Correlated Systems by Soft-X-Ray ARPES"; agreement n. 290605 (PSI-FELLOW/COFUND), European Community's Seventh Framework Programme (FP7/2007-2013), "Soft-X-ray ARPES investigation of three-dimensional correlated materials Cr and CrO<sub>2</sub>".</p>
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- 30/11/2012 - 31/10/2013
 

<p><b>Research fellow</b> at Università degli studi dell'Aquila, Via Giovanni Di Vincenzo 16/B, 67100 L'Aquila, Italy.  <u>Project Title:</u> <i>Electronic properties of nanoscale systems</i>.  <u>Supervisor:</u> prof. Luca Ottaviano.  <u>Description:</u> ARPES investigation of the electron-phonon interaction under isotopic substitution of the quasi-free-standing graphene on Au/Ni substrate.</p>
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- 26/03/2013 **PhD in Physics** (funded by Elettra Sincrotrone Trieste S.p.A.), Università degli studi dell'Aquila, Via Giovanni Di Vincenzo 16/B, 67100 L'Aquila, Italy.  
Thesis Title: *Ab-initio and photoelectron spectroscopy studies of carbon based materials.*  
Supervisor: prof. Luca Ottaviano.  
Description: Electronic structure investigation of organic molecules in condensed (at the laboratories of the University of L'Aquila) and gaseous phase (at the GAPH beamline of Elettra synchrotron) using photoemission spectroscopy (XPS, UPS, PES). Interpretation supported by DFT theoretical calculation.
- 01/01/2012 - 30/04/2012 **Visiting student** at the Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany.  
Subject: Lithium electronic states after intercalation on SiC buffer layer.  
Supervisor: prof. Karsten Horn.  
Description: ARPES and core level photoemission spectroscopy study, with the theoretical support of DFT calculations, of the lithium intercalation through the SiC buffer layer and consequentially graphene formation.
- 22/07/2009 **Master Degree in Physics** (Final mark: 110/110 *cum laude*), Università degli studi dell'Aquila, Via Giovanni Di Vincenzo 16/B, 67100 L'Aquila, Italy.  
Thesis Title: *Study of interaction between carbon nanotubes and organic molecules.*  
Supervisor: prof. Luca Lozzi.  
Description: Charge transfer and band alignment between multilayer carbon nanotubes and CuPc organic molecule investigated using XPS and UPS for organic photovoltaic application.
- 10/10/2006 **Bachelor Degree in Physics** (Final mark: 110/110 *cum laude*), Università degli studi dell'Aquila, Via Giovanni Di Vincenzo 16/B, 67100 L'Aquila, Italy.  
Thesis Title: *X-ray photoemission spectroscopy investigation of SnO<sub>2</sub> thin film.*  
Supervisor: prof. Luca Ottaviano.  
Description: XPS investigation of the SnO<sub>2</sub> thin film oxidation.

**HABILITATION**

27/07/2017 – 27/07/2023

Habilitation for associate professor in the scientific sectors 02/B1, experimental matter physics, awarded by Italian Ministry of Education, Universities and Research.  
*Translated in Italian: "Abilitazione Scientifica Nazionale, professore di II Fascia nel settore concorsuale 02/B1, Fisica Sperimentale della Materia, assegnato dal Ministero dell'istruzione, dell'università e della ricerca italiano".*

**LANGUAGE SKILLS**

other tongue  
Other languages

ITALIAN  
ENGLISH: Advanced level  
SPANISH: Beginner level

**SCIENTIFIC PUBLICATIONS**

Unique identifiers  
Reviewer for

[orcid.org/0000-0002-7562-5182](https://orcid.org/0000-0002-7562-5182) , [Scopus Author ID: 27367508200](#)

*"Nature Communication", "Physical Review Letter", "Physical Review B", "Applied Physical Letters", "New Journal of Physics", "Journal of Chemical Physics" and "Surface Science".*

**CONFERENCES, WORKSHOPS  
AND SCHOOLS**

## Oral contributions

- **Photoelectron Spectroscopy at the SLS 2.0** (2018, Villigen, Switzerland), “*Weakly-correlated nature of ferromagnetism in CrO<sub>2</sub> revealed by bulk-sensitive soft-X-ray ARPES*”, F. Bisti, V. A. Rogalev, M. Karalak, S. Paul, A. Gupta, T. Schmitt, G. Güntherodt, V. Eyert, G. Sangiovanni, G. Profeta, V. N. Strocov.
- **VIII AUSE Congress and III ALBA User’s Meeting** (2017, Madrid, Spain), “*LOREA: the ARPES beamline under construction at ALBA*”, F. Bisti, D. Pierucci, M. Tallarida, E. Pellegrin, L. Aballe, S. Ferrer and J. Nicolas.
- **CORPES17** conference (2017, Hiroshima, Japan), “*On-site electron correlation nature of ferromagnetism in non-symmorphic CrO<sub>2</sub> revealed by bulk-sensitive soft-X-ray ARPES*”, F. Bisti, V. A. Rogalev, M. Karalak, S. Paul, A. Gupta, T. Schmitt, G. Güntherodt, V. Eyert, G. Sangiovanni, G. Profeta, V. N. Strocov.
- **ICISS-2015** conference (2015, Stony Brook NY, U. S.), “*Soft-x-ray ARPES investigation of Chromium dioxide: more insight into the electronic correlation.*”, F. Bisti, V. A. Rogalev, S. Paul, A. Gupta, G. Güntherodt, G. Profeta, V. N. Strocov.
- **CORPES15** conference (2015, Paris, France), “*Soft-x-ray ARPES investigation of CrO<sub>2</sub>: more insight into the electronic correlation.*”, F. Bisti, V. A. Rogalev, S. Paul, A. Gupta, G. Güntherodt, V. N. Strocov.
- **FISMAT2013** conference (2013, Milan, Italy), “*Lithium electronic states after intercalation on SiC buffer layer.*”, F. Bisti, G. Profeta, H. Vita, F. Perrozzi, M. Donarelli, P. Moras, T. Seyller, K. Horn, L. Ottaviano.
- **EPIGRAPHIC** workshop (2012, Catania, Italy), “*Lithium electronic states after intercalation on SiC buffer layer.*”, F. Bisti, G. Profeta, H. Vita, F. Perrozzi, M. Donarelli, P. Moras, T. Seyller, K. Horn, L. Ottaviano.
- **XCVII Congresso Nazionale SIF** (2011, L’Aquila, Italy), “*Fingerprints of the hydrogen bond in the photoemission spectra of Croconic Acid condensed and gas phase: a PES and ab-initio study.*”, F. Bisti, A. Stroppa, S. Picozzi, F. Ruggieri, F. Perrozzi, M. Donarelli and L. Ottaviano.

## Poster contributions

- **CORPES19** conference (2019, Oxford, UK), “*The LOREA ARPES beamline at the ALBA synchrotron*”, F. Bisti, D. Pierucci, M. Tallarida.
- **X GEFES meeting** (2018, Valencia, Spain), “*Weakly-correlated nature of ferromagnetism in CrO<sub>2</sub> revealed by bulk-sensitive soft-X-ray ARPES*”, F. Bisti, V. A. Rogalev, M. Karalak, S. Paul, A. Gupta, T. Schmitt, G. Güntherodt, V. Eyert, G. Sangiovanni, G. Profeta, V. N. Strocov.
- **CORPES15** conference (2015, Paris, France), “*Antiferromagnetic order and spin density waves in bulk Chromium explored by soft-X-ray ARPES*”, F. Bisti, V. A. Rogalev, M. Shi, J. Minar, and V. N. Strocov.
- **NGSCES 2014** conference (2014, Nice, France), “*Antiferromagnetic order and spin density waves in bulk Chromium explored by soft-X-ray ARPES*”, F. Bisti, V. A. Rogalev, M. Shi and V. N. Strocov.
- **FISMAT 2013** conference (2013, Milan, Italy), “*Electronic structure of AlQ<sub>3</sub> and ErQ<sub>3</sub> revisited using the Heyd-Scuseria-Ernzerhof hybrid functional: theory and experiments*”, F. Bisti, A. Stroppa, M. Donarelli, F. Anemone, F. Perrozzi, S. Picozzi, L. Ottaviano.
- **DMD-TeoC** workshop (2011, Rome, Italy), “*Electronic structure of an organic ferroelectric compound: an XPS and DFT study*”, F. Bisti, A. Stroppa, S. Picozzi and L. Ottaviano.
- **NANO2010** conference (2010, Rome, Italy), “*Morphological and electronic properties of thin film of a novel organic ferroelectric material: the Croconic Acid.*”, F. Bisti, A. Stroppa, M. Passacantando, P. De Marco, S. Prezioso, M. Donarelli, S. Picozzi and L. Ottaviano.

## Committee member

Member of local organizing committee of **ESMF2010** international school (2010, L’Aquila) and **GrahITA** international conference (2010, L’Aquila).

**COMPUTER SKILLS**

Data analysis software  
 Programming language  
 Document markup language  
 Office suite  
 Operating system

Jupyter Notebook, Matlab, Octave, Gnuplot, Igor Pro

Python (<https://gitlab.com/fbisti>), C, Fortran, Bash

Latex, Markdown

Microsoft Office, LibreOffice

Windows, Linux

**TECHNICAL SKILLS**

Photoemission spectroscopy using laboratory sources and synchrotron radiation (XPS, UPS, ARPES).

Expert synchrotron user having done several beamtimes at Elettra (APE-LE, GasPhase, VUV Photoemission and BaDEIPh), Bessy II (UE 56/2-PGM-1 and RGLB), MaxLab II (D1011), SLS-PSI (SXARPES-ADRESS), ALBA (PEEM-CIRCE).

Vacuum technology (UHV).

Sputtering and annealing processes for cleaning metal surfaces.

Low Energy Electron Diffraction (LEED).

Deposition of organic molecules and metals by thermal evaporation.

Chemical vapor deposition for graphene growth.

Scanning electron microscopy.

Atomic force microscopy.

Density functional theory calculations (using VASP and Wien2k codes).