Luca Bignardi

Curriculum Vitæ et Studiorium

Contact Information

Department of Physics
University of Trieste
via Valerio 2
34127 Trieste, Italy

Office: (+39) 040 375 8740 - 040 558 2782
E-mail: lbignardi@units.it
ORCID: 0000-0002-9846-9100
Scopus ID: 46760925300
ResearcherID: D-9061-2013.

Employment History

11/2023–now	Ricercatore a tempo determinato-b (Assist. Prof.) GSD: 02/PHYS-03 - Fisica sperimentale della materia e applicazioni SSD: PHYS-03/A - Fisica sperimentale della materia e applicazioni. Department of Physics, University of Trieste Trieste, Italy.
11/2018–10/2023	Ricercatore a tempo determinato-a (Junior Assist. Prof.) SSD: FIS/03, SC: 02/B1. Department of Physics, University of Trieste Trieste, Italy.
07/2015–07/2018	Post-doc Research Associate SuperESCA beamline, Elettra Sincrotrone Trieste Trieste, Italy.
11/2013–07/2015	Post-doc Research Associate Physikalisches Institut, Westfälische Wilhelms-Universität Münster, Germany.
11/2008-06/2013	Assistent in Opleiding (graduate student) Zernike Institute for Advanced Materials, Rijksuniversiteit Groningen and Stichting voor Fundamenteel Onderzoek der Materie (FOM) Groningen, The Netherlands.

Education and Qualifications

10/2022	Abilitazione Scientifica Nazionale (Scientific Abilitation) Professore di seconda fascia (Associate Professor). S.C. 02/B1 (Fisica Sperimentale della Materia) Valid from 07/10/2022 until 07/10/2033.
06/2013	Ph.D., Physics Rijksuniversiteit Groningen Groningen, The Netherlands Thesis: Electronic and structural properties of graphene/metal interfaces. Adviser: Prof. Petra Rudolf
10/2008	M.Sc., Physics, cum laude Università Cattolica del Sacro Cuore, Brescia, Italy

Thesis: Time-resolved reflectivity and photoemission studies on highly-oriented pyrolytic graphite. Adviser: Dr. Gabriele Ferrini, Dr. Claudio Giannetti.

01/2007 B.Sc., Physics, cum laude
Università Cattolica del Sacro Cuore, Brescia, Italy.
Thesis: Second harmonics generation in niobiosilicate glasses.
Adviser: Dr. Gabriele Ferrini, Dr. Claudio Giannetti.

Research Interests

I am interested in conducting experimental research on the electronic and structural properties of various materials, such metallic surfaces, 2D materials (e.g. graphene and transition metal dichalcogenides), thin metallic films, oxide layers, nanoparticles, and sub-nanometer atomic clusters composed of metals and oxides. My focus is to gain a comprehensive understanding of the electronic and structural characteristics of these diverse objects, both from a fundamental standpoint and with a technological application in mind.

Exploring the fundamental relationship between the observed structure and properties of these systems will pave the way for the future development of customized low-dimensional objects, optimized to exhibit specific and relevant processes.

To investigate this extensive range of materials, I employ a wide array of surface science techniques within an ultra-high vacuum environment. These techniques include photoelectron spectroscopy for both valence band and core levels, photoelectron diffraction, scanning tunneling microscopy, low-energy electron diffraction, X-ray absorption spectroscopy, and temperature-programmed desorption. I conduct experiments in laboratory settings as well as at synchrotron-radiation facilities worldwide. Furthermore, I collaborate with numerous research groups globally to combine the interpretation of experimental outcomes with theoretical modeling of electronic structures.

Since 2011, I have been involved in the authorship of over 50 papers on these topics, which have been published in international peer-reviewed journals (see list below).

Teaching

University of Trieste, Italy

09/2024– Lecturer, Radiation-Matter Interaction part of the course Advanced Material Science, M.Sc. (Laurea magistrale) in Materials and Chemical Engineering for Nano, Bio, and Sustainable Technologies. (3 CFU).

03/2021– Lecturer, Fisica Generale
(Introductory Mechanics and Thermodynamics)
M.Sc. (Laurea ciclo unico) in Architecture. (6 CFU).

03/2025– Co-Lecturer, Introduzione alla Fisica della Materia
(Introductory Condensed Matter Physics)
B.Sc. (Laurea triennale) in Physics. (4 CFU).

03/2020– Lecturer, Communicating your research with PPT presentations.
Complementary education for graduate students.

07/2019–	Lecturer, X-ray Absorption Spectroscopies. Course for graduate students, PhD program in Nanotechnology.
03/2024–06/2024	Co-lecturer, Laboratorio I (Laboratory course about Classical Mechanics and Thermodynamics) B.Sc. (Laurea) in Physics. (4 CFU).
03/2019–06/2020	Co-lecturer, Laboratorio di Fisica della Materia (Laboratory activity with focus on surface science, specific lectures on data analysis) M.Sc. in Physics. (1 CFU), for 2 semesters.
11/2018-01/2020	Co-lecturer, Laboratorio di Fisica dello Stato Solido (Laboratory activity about optical properties of condensed matter). M.Sc. in Physics. 20 hrs/year (2 CFU), for 2 semesters.

Westfälische-Wilhelms Universität, Münster, Germany

03/2015-06/2015	Lecturer, Dynamical Processes at Surfaces, M.Sc. in Physics. 10 hrs (1 CFU), for one semester.

Rijksuniversiteit Groningen, The Netherlands

04/2010–06/2012	Teaching Assistant, Quantum Physics 2, B.Sc. Physics. 32 hrs/year, for 3 semesters.

Publications

Articles in Peer-Reviewed Journals

(A1) M. Pozzo, P. Lacovig, M. Bianchi, M. Schied, L. Bignardi, F. Zarotti, R. Felici, D. Alfè, S. Lizzit, R. Larciprete, Room temperature water splitting at the basal plane of graphene grown on nickel, Carbon 243, 120422 (2025).

(A2) K. Bertrang, T. Hinke, S. Kaiser, M. Knechtges, F. Loi, L. Sbuelz, P. Lacovig, L. Bignardi, F. Esch, A. Baraldi, S. Tosoni, A. Kartouzian, U. Heiz, Unraveling the interaction of Ta atoms with Pt(111), Surf. Interfaces 56, 105640 (2025).

(A3) F. Loi, L. Bignardi, D. Perco, A. Berti, P. Lacovig, S. Lizzit, A. Kartouzian, U. Heiz, D. Alfè, A. Baraldi, Unveiling inequality of atoms in ultrasmall Pt clusters: Oxygen adsorption limited to the uppermost atomic layer, Small Struct. 2400250 (2024).

(A4) L. Bignardi, M. Pozzo, A. Zelenika, F. Presel, P. Lacovig, S. Lizzit, D. Alfè, A. Baraldi, Determining the atomic coordination number in the structure of β_{12} borophene on Ag(111) via X-ray photoelectron diffraction analysis, Surf. Interfaces 51, 104791 (2024).

(A5) A. Berti, M. D'Alessio, M. Bianchi, L. Bignardi, P. Lacovig, C. Sanders, S. Lizzit, P. Hofmann, A. Marrazzo, and A. Baraldi, Unraveling oxygen-driven surface segregation dynamics in platinum-gold alloys, Appl. Surf. Sci. 670, 160577 (2024).

(A6) T. Zehra, A. Syari'ati, O. Ivashenko, L. Bignardi, W. F. V. Dorp, J. T. M. D. Hosson, and P. Rudolf, Graphene growth from photo-polymerized bi-phenylthiol self-assembled monolayers, Front. Nanotechnol. 6, 1366542 (2024).

(A7) D. Arribas, V. Villalobos-Vilda, E. Tosi, P. Lacovig, A. Baraldi, L. Bignardi, S. Lizzit, J. I. Martínez, P. L. de Andres, A. Gutiérrez, J. A. Martín-Gago, and P. Merino, In situ observation of the on-surface thermal dehydrogenation of n-octane on Pt(111), Nanoscale 15, 14458-14467 (2023).

(A8) D. Perco, F. Loi, L. Bignardi, L. Sbuelz, P. Lacovig, E. Tosi, S. Lizzit, A. Kartouzian, U. Heiz, A. Baraldi, The highest oxidation state observed in graphene-supported sub-nanometer Fe oxide clusters, Commun. Chem. 6, 61 (2023).

(A9) M. Pozzo, T. Turrini, L. Bignardi, P. Lacovig, D. Lizzit, E. Tosi, S. Lizzit, A. Baraldi, D. Alfè and R. Larciprete, Interplay among hydrogen chemisorption, intercalation and bulk diffusion at the graphene covered Ni(111) crystal., J. Phys. Chem. C 127, 6938 (2023).

(A10) F. Loi, M. Pozzo, L. Sbuelz, L. Bignardi, P. Lacovig, E. Tosi, S. Lizzit, A. Kartouzian, U. Heiz, R. Larciprete, D. Alfè and A. Baraldi, Breakdown of the correlation between oxidation states and core electron binding energies at the sub-nanoscale, Appl. Surf. Sci. 609, 156755 (2023).

(A11) L. Bignardi, P. Lacovig, R. Larciprete, S. Lizzit, D. Alfè, and A. Baraldi, Exploring 2D Materials at Surfaces through Synchrotron-Based Core-Level Photoelectron Spectroscopy, Surf. Sci. Rep. 78, 100586 (2023).

(A12) C. Gabellini, M. Şologan, E. Pellizzoni, D. Marson, M. Daka, P. Franchi, L. Bignardi, S. Franchi, Z. Posel, A. Baraldi, P. Pengo, M. Lucarini, L. Pasquato, and P. Posocco, Spotting Local Environments in Self-Assembled Monolayer Protected Gold Nanoparticles, ACS Nano 16, 20902 (2022).

(A13) F. Loi, M. Pozzo, L. Sbuelz, L. Bignardi, P. Lacovig, E. Tosi, S. Lizzit, A. Kartouzian, U. Heiz, D. Alfè, and A. Baraldi, Oxidation at the Sub-Nanoscale: Oxygen Adsorption on Graphene-Supported Size-Selected Ag Clusters, J. Mater. Chem. A 10, 14594 (2022).

(A14) S. Baronio, V. D. Leo, G. Lautizi, P. Mantegazza, E. Natale, M. Tuniz, S. Vigneri, L. Bignardi, P. Lacovig, S. Lizzit, and A. Baraldi, Vibrational Fine Structure in C 1s High-Resolution Core-Level Spectra of CO Chemisorbed on Ir(111), J. Phys. Chem. C 126, 1411 (2022).

(A15) E. Pellizzoni, M. Şologan, M. Daka, P. Pengo, D. Marson, Z. Posel, S. Franchi, L. Bignardi, P. Franchi, M. Lucarini, P. Posocco, and L. Pasquato. Thiolate end-group regulates ligand arrangement, hydration and affinity for small compounds in monolayer-protected gold nanoparticles. J. Colloid Interface Sci. 607, 1373–1381 (2022).

(A16) L. Bignardi, S. K. Mahatha, D. Lizzit, H. V. Bana, E. Travaglia, P. Lacovig, C. Sanders, A. Baraldi, P. Hofmann, and S. Lizzit. Anisotropic strain in epitaxial single-layer molybdenum disulfide on Ag(110). Nanoscale 13, 18789-18798 (2021).

(A17) D. Curcio, S. Pakdel, K. Volckaert, J. A. Miwa, S. Ulstrup, N. Lanatà, M. Bianchi, D. Kutnyakhov, F. Pressacco, G. Brenner, S. Dziarzhytski, H. Redlin, S. Y. Agustsson, K. Medjanik, D. Vasilyev, H.-J. Elmers, G. Schönhense, C. Tusche, Y.-J. Chen, F. Speck, T. Seyller, K. Bühlmann, R. Gort, F. Diekmann, K. Rossnagel, Y. Acremann, J. Demsar, W. Wurth, D. Lizzit, L. Bignardi, P. Lacovig, S. Lizzit, C. E. Sanders, and P. Hofmann. Ultrafast electronic linewidth broadening in the C 1s core level of graphene. Phy. Rev. B 104, L161104 (2021).

(A18) D. Curcio, E. Sierda, M. Pozzo, L. Bignardi, L. Sbuelz, P. Lacovig, S. Lizzit, D. Alfè, and A. Baraldi. Reversibility of pentacene dehydrogenation on Ir(111). Chemical Science 12, 170–178 (2021).

(A19) P. Majchrzak, K. Volckaert, A. G. Čabo, D. Biswas, M. Bianchi, S. K. Mahatha, M. Dendzik, F. Andreatta, S. S. Grønborg, I. Marković, J. M. Riley, J. C. Johannsen, D. Lizzit, L. Bignardi, S. Lizzit, C. Cacho, O. Alexander, D. Matselyukh, A. S. Wyatt, R. T. Chapman, E. Springate, J. V. Lauritsen, P. D. King, C. E. Sanders, J. A. Miwa, P. Hofmann, and S. Ulstrup. Spectroscopic view of ultrafast charge carrier dynamics in single- and bilayer transition metal dichalcogenide semiconductors. J. Elect. Spectros. Rel. Phenom. 250, 147093 (2021).

(A20) L. Sbuelz, F. Loi, M. Pozzo, L. Bignardi, E. Nicolini, P. Lacovig, E. Tosi, S. Lizzit, A. Kartouzian, U. Heiz, D. Alfé, and A. Baraldi. Atomic undercoordination in Ag islands on Ru(0001) grown via size-selected cluster deposition: an experimental and theoretical high-resolution core-level photoemission study. J. Phys. Chem. C 125, 9556–9563 (2021).

(A21) D. De Angelis, F. Presel, N. Jabeen, L. Bignardi, D. Lizzit, P. Lacovig, S. Lizzit, T. Montini, P. Fornasiero, D. Alfè, and A. Baraldi. Interfacial two-dimensional oxide enhances photocatalytic activity of graphene/titania via electronic structure modification. Carbon 157, 350 – 357 (2020).

(A22) M. Elsebach, E. Sierda, J. Goedecke, L. Bignardi, M. Hermanowicz, M. Rohde, R. Wiesendanger, and M. Bazarnik. In situ synthesis of metal-salophene complexes on intercalated graphene. J. Phys. Chem. C 124, 4279–4287 (2020).

(A23) F. Loi, L. Sbuelz, P. Lacovig, D. Lizzit, L. Bignardi, S. Lizzit, and A. Baraldi. Growth mechanism and thermal stability of a MoS_2-graphene interface: a high-resolution core-level photoelectron spectroscopy study. J. Phys. Chem. C 124, 20889–20897 (2020).

(A24) G. Avvisati, P. Gargiani, P. Mondelli, F. Presel, L. Bignardi, A. Baraldi, and M. G. Betti. Metal phtalocyanines interaction with Co mediated by a moiré graphene superlattice. J. Chem. Phys. 150, 054704 (2019).

(A25) R. Balog, A. Cassidy, J. Jørgensen, L. Kyhl, M. Andersen, A. Grubisic Cabo, F. Ravani, L. Bignardi, P. Lacovig, S. Lizzit, and L. Hornekær. Hydrogen interaction with graphene on Ir(111): a combined intercalation and functionalization study. J. Phys.: Condens. Matter 31, 085001 (2019).

(A26) H. Beyer, G. Rohde, A. Grubisíc Cabo, S. A., J. Jacobsen, L. Bignardi, D. Lizzit, P. Lacovig, C. E. Sanders, S. Lizzit, K. Rossnagel, P. Hofmann, and M. Bauer. 80% valley polarization of free carriers in singly-oriented single layer WS_2 on Au(111). Phys. Rev. Lett. 123, 236802 (2019).

(A27) L. Bignardi, D. Lizzit, H. Bana, E. Travaglia, P. Lacovig, C. E. Sanders, M. Dendzik, M. Michiardi, M. Bianchi, M. Ewert, L. Buß, J. Falta, J. I. Flege, A. Baraldi, R. Larciprete, P. Hofmann, and S. Lizzit. Growth and structure of singly oriented single-layer tungsten disulfide on Au(111). Phys. Rev. Mat. 3, 014003 (2019). Featured in Editors' Suggestions.

(A28) D. Lizzit, M. I. Trioni, L. Bignardi, P. Lacovig, S. Lizzit, R. Martinazzo, and R. Larciprete. Dual-route hydrogenation of the graphene/Ni interface. ACS Nano 13, 1828–1838 (2019).

(A29) S. K. Mahatha, A. S. Ngankeu, N. F. Hinsche, I. Mertig, K. Guilloy, P. L. Matzen, M. Bianchi, C. E. Sanders, J. A. Miwa, H. Bana, E. Travaglia, P. Lacovig, L. Bignardi, D. Lizzit, R. Larciprete, A. Baraldi, S. Lizzit, and P. Hofmann. Electron-phonon coupling in single-layer MoS_2. Surf. Sci. 681, 64 – 69 (2019).

(A30) H. Rostami, K. Volckaert, N. Lanata, S. K. Mahatha, C. E. Sanders, M. Bianchi, D. Lizzit, L. Bignardi, S. Lizzit, J. A. Miwa, A. V. Balatsky, P. Hofmann, and S. Ulstrup. Layer and orbital interference effects in photoemission from transition metal dichalcogenides. Phys. Rev. B 100, 235423 (2019).

(A31) K. Volckaert, H. Rostami, D. Biswas, I. Marković, F. Andreatta, C. E. Sanders, P. Majchrzak, C. Cacho, R. T. Chapman, A. Wyatt, E. Springate, D. Lizzit, L. Bignardi, S. Lizzit, S. K. Mahatha, M. Bianchi, N. Lanata, P. D. C. King, J. A. Miwa, A. V. Balatsky, P. Hofmann, and S. Ulstrup. Momentum-resolved linear dichroism in bilayer MoS_2. Phys. Rev. B 100, 241406 (2019).

(A32) F. Arnold, R.-M. Stan, S. K. Mahatha, H. E. Lund, D. Curcio, M. Dendzik, H. Bana, E. Travaglia, L. Bignardi, P. Lacovig, D. Lizzit, Z. Li, M. Bianchi, J. A. Miwa, M. Bremholm, S. Lizzit, P. Hofmann, and C. E. Sanders. Novel single-layer vanadium sulphide phases. 2D Mater. 5, 045009 (2018).

(A33) H. Bana, E. Travaglia, L. Bignardi, P. Lacovig, C. E. Sanders, M. Dendzik, M. Michiardi, M. Bianchi, D. Lizzit, F. Presel, D. De Angelis, N. Apostol, P. Kumar Das, J. Fujii, I. Vobornik, R. Larciprete, A. Baraldi, P. Hofmann, and S. Lizzit. Epitaxial growth of single-orientation high-quality MoS_2 monolayers. 2D Mater. 5, 035012 (2018).

(A34) P. Eickholt, C. Sanders, M. Dendzik, L. Bignardi, D. Lizzit, S. Lizzit, A. Bruix, P. Hofmann, and M. Donath. Spin Structure of K Valleys in Single-Layer WS_2 on Au(111). Phys. Rev. Lett. 121, 136402 (2018).

(A35) A. Jonayat, A. Kramer, L. Bignardi, P. Lacovig, S. Lizzit, A. C. van Duin, M. Batzill, and M. Janik. A first-principles study of stability of surface confined mixed metal oxides with corundum structure (Fe_2O_3, Cr_2O_3, V_2O_3). Phys. Chem. Chem. Phys. 20, 7073–7081 (2018).

(A36) A. Kramer, L. Bignardi, P. Lacovig, S. Lizzit, and M. Batzill. Comparison of surface structures of corundum Cr_2O_3(0001) and V_2O_3(0001) ultrathin films by x-ray photoelectron diffraction. J. Phys.: Condens. Matter 30, 074002 (2018).

(A37) L. Kyhl, R. Bisson, R. Balog, M. Groves, E. L. Kolsbjerg, A. Cassidy, J. H. Jørgensen, S. Halkjær, J. Miwa, A. Grubišić Čabo, T. Angot, P. Hofmann, M. A. Arman, S. Urpelainen, P. Lacovig, L. Bignardi, H. Bluhm, J. Knudsen, B. Hammer, and L. Hornekær. Exciting H2 Molecules for Graphene Functionalization. ACS Nano 12, 513–520 (2018).

(A38) F. Presel, H. Tetlow, L. Bignardi, P. Lacovig, C. Tache, S. Lizzit, L. Kantorovich, and A. Baraldi. Graphene growth by molecular beam epitaxy: an interplay between desorption, diffusion and intercalation of elemental C species on islands. Nanoscale 10, 7396–7406 (2018).

(A39) M. Satta, P. Lacovig, N. Apostol, M. Dalmiglio, F. Orlando, L. Bignardi, H. Bana, E. Travaglia, A. Baraldi, S. Lizzit, and R. Larciprete. The adsorption of silicon on an iridium surface ruling out silicene growth. Nanoscale 10, 7085–7094 (2018).

(A40) P. Tsaousis, J. Ontaneda, L. Bignardi, R. Bennett, R. Grau-Crespo, and G. Held. Combined Experimental and Theoretical Study of Methyl Acetoacetate Adsorption on Ni(100). J. Phys. Chem. C 122, 6186–6194 (2018).

(A41) S. Ulstrup, P. Lacovig, F. Orlando, D. Lizzit, L. Bignardi, M. Dalmiglio, M. Bianchi, F. Mazzola, A. Baraldi, R. Larciprete, P. Hofmann, and S. Lizzit. Photoemission investigation of oxygen intercalated epitaxial graphene on Ru(0001). Surf. Sci. 678, 57 – 64 (2018).

(A42) J. Bekaert, L. Bignardi, A. Aperis, P. van Abswoude, C. Mattevi, S. Gorovikov, L. Petaccia, A. Goldoni, B. Partoens, P. M. Oppeneer, F. M. Peeters, M. V. Milošević, P. Rudolf, and C. Cepek. Free surfaces recast superconductivity in few-monolayer MgB_2: Combined first-principles and ARPES demonstration. Sci. Rep. 7, 173 (2017).

(A43) L. Bignardi, P. Lacovig, M. M. Dalmiglio, F. Orlando, A. Ghafari, L. Petaccia, A. Baraldi, R. Larciprete, and S. Lizzit. Key role of rotated domains in oxygen intercalation at graphene on Ni(111). 2D Mater. 4, 025106 (2017).

(A44) P. Espeter, C. Keutner, P. Roese, K. Shamout, U. Berges, G. Wenzel, L. Bignardi, N. F. Kleimeier, H. Zacharias, and C. Westphal. Facing the interaction of adsorbed silicon nano-ribbons on silver. Nanotech. 28, 455701 (2017).

(A45) N. F. Hinsche, A. S. Ngankeu, K. Guilloy, S. K. Mahatha, A. Grubišić Çabo, M. Bianchi, M. Dendzik, C. E. Sanders, J. A. Miwa, H. Bana, E. Travaglia, P. Lacovig, L. Bignardi, R. Larciprete, A. Baraldi, S. Lizzit, K. S. Thygesen, and P. Hofmann. Spin-dependent electron-phonon coupling in the valence band of single-layer WS_2. Phys. Rev. B 96, 121402 (2017).

(A46) Y. Ma, E. Travaglia, H. Bana, L. Bignardi, P. Lacovig, S. Lizzit, and M. Batzill. Periodic Modulation of Graphene by a 2D-FeO/Ir(111) Moiré Interlayer. J. Phys. Chem. C 121, 2762–2770 (2017).

(A47) S. Halpegamage, L. Bignardi, P. Lacovig, A. Kramer, Z.-H. Wen, X.-Q. Gong, S. Lizzit, and M. Batzill. An Ordered Mixed Oxide Monolayer Formed by Iron Segregation on Rutile-TiO_2(011): Structural Determination by X-ray Photoelectron Diffraction. J. Phys. Chem. C 120, 26414–26424 (2016).

(A48) S. Tognolini, S. Pagliara, L. Bignardi, S. Ponzoni, P. Rudolf, and F. Parmigiani. Surface states resonances at the single-layer graphene/Cu(111) interface. Surf. Sci. 643, 210–213 (2016).

(A49) S. Gottardi, K. Müller, L. Bignardi, J. C. Moreno-López, T. A. Pham, O. Ivashenko, M. Yablonskikh, A. Barinov, J. Björk, P. Rudolf, and M. Stöhr. Comparing Graphene Growth on Cu(111) versus Oxidized Cu(111). Nano Lett. 15, 917–922 (2015).

(A50) E. Monazami, L. Bignardi, P. Rudolf, and P. Reinke. Strain Lattice Imprinting in Graphene by C_{60} Intercalation at the Graphene/Cu Interface. Nano Lett. 15, 7421–7430 (2015).

(A51) S. Pagliara, S. Tognolini, L. Bignardi, G. Galimberti, S. Achilli, M. I. Trioni, W. F. van Dorp, V. Ocelík, P. Rudolf, and F. Parmigiani. Nature of the surface states at the single-layer graphene/Cu(111) and graphene/polycrystalline-Cu interfaces. Phys. Rev. B 91, 195440 (2015).

(A52) L. Bignardi, T. Haarlammert, C. Winter, M. Montagnese, P. H. M. van Loosdrecht, E. Voloshina, P. Rudolf, and H. Zacharias. Dual character of excited charge carriers in graphene on Ni(111). Phys. Rev. B 89, 075405 (2014).

(A53) N. F. Kleimeier, A. Timmer, L. Bignardi, H. Mönig, X. L. Feng, K. Müllen, L. F. Chi, H. Fuchs, and H. Zacharias. Electron dynamics in unoccupied states of spatially aligned 7-a graphene nanoribbons on Au(788). Phys. Rev. B 90, 245408 (2014).

(A54) M. Pierno, L. Bignardi, M. C. Righi, L. Bruschi, S. Gottardi, M. Stöhr, O. Ivashenko, P. L. Silvestrelli, P. Rudolf, and G. Mistura. Thermolubricity of gas monolayers on graphene. Nanoscale 6, 8062 (2014).

(A55) L. Bignardi, W. F. van Dorp, S. Gottardi, O. Ivashenko, P. Dudin, A. Barinov, J. T. M. De Hosson, M. Stöhr, and P. Rudolf. Microscopic characterisation of suspended graphene grown by chemical vapour deposition. Nanoscale 5, 9057 (2013).

(A56) T. Haarlammert, L. Bignardi, C. Winter, G. Fecher, P. Rudolf, and H. Zacharias. Final-state effects in photoemission experiments from graphene on Ni(111). Eur. Phys. J. B 86, 666 (2013).

(A57) S. Parui, K. G. Rana, L. Bignardi, P. Rudolf, B. J. van Wees, and T. Banerjee. Comparison of hot-electron transmission in ferromagnetic Ni on epitaxial and polycrystalline Schottky interfaces. Phys. Rev. B 85, 235416 (2012).

(A58) A. Aronne, E. Fanelli, P. Pernice, M. Malvestuto, P. Bergese, E. Bontempi, P. Colombi, L. E. Depero, L. Bignardi, C. Giannetti, G. Ferrini, and F. Parmigiani. Local order and non-linear optical properties in bulk nanostructured niobiosilicate glasses. J. Non-Cryst. Solids 357, 1218–1222 (2011).

(A59) S. Parui, B. Wit, L. Bignardi, P. Rudolf, B. Kooi, B. J. van Wees, and T. Banerjee. Hot electron transmission in metals using epitaxial $NiSi_2$/n-Si(111) interfaces. Appl. Phys. Lett. 99, 032104 (2011).

PhD Thesis

(Th1) L. Bignardi, Electronic and structural properties of graphene/metal interfaces. Rijksuniversiteit Groningen (2013).

Contributions to Conferences and Workshops

Conferences Organization

(Or1) MiniColloquium Advanced photoemission studies of 2D and quantum materials, part of the program of the CMD30-FisMat2023 joint conference of the Condensed Matter Division of the European Physical Society. Milan, 4-8 September 2023.

Invited Contributions

(I1) Summer School Frontier Research on Next-Generation Semiconductors. Beijng, China, July 2025. Invited lecture series: Photoelectron Spectroscopy for understanding the properties of 2D materials.

(I2) Italy-Japan joint workshop on physics and electronics of 2D doped materials, Chino (Nagano), Japan, June 2024. Invited talk: Exploring 2D materials at surfaces with synchrotron-radiation experiments.

(I3) XVI International School on Synchrotron Radiation "Gilberto Vlaic": Fundamentals, Methods and Applications. Muggia (TS), 24 September 2022. Invited lecture: Analysis of XPS spectra. A tutorial..

(I4) International School on Synchrotron Radiation "Gilberto Vlaic": Fundamentals, Methods and Applications. Trieste, 16 September 2021. Invited lecture: Data Analysis of Photoemission Spectra.

(I5) Workshop Nanotechnology and nanoApplications, 5-6 February 2020, Lubiana (Slovenia). Invited oral contribution: When each atom matters. The quest for novel tailored nanomaterials.

(I6) 34th European Conference on Surface Science, 26-31 August 2018, Aarhus (Denmark). Invited oral contribution (tutorial): Photoelectron Diffraction: from theory to applications.

Oral Contributions

(C1) 38th European Conference on Surface Science, 23-29 August 2025, Braga (Portugal). Growth of Fe,N-functionalised graphene from molecular precursors.

(C2) Italian Conference of Condensed Matter Physics, 7-11 July 2025, Venice (Italy). Empty and metalated phtalocyanines for growth of Fe,N-functionalised graphene.

(C3) 68th American Vacuum Society Symposium, 6-11 November 2022, Pittsburgh, PA (USA). Oxidation of size-selected Ag clusters on graphene: bulk motifs and electronic anomalies at sub-nanoscale.

(C4) Italian Conference of Condensed Matter Physics (FisMat), 30 September–4 October 2019, Catania (Italy). Growth of highly-ordered MoS_2 monolayers on metallic surfaces.

(C5) 3rd Conference on Chemistry of 2D Materials, 2-4 September 2019, Dresden (Germany). Epitaxial growth of highly-ordered MoS_2 monolayers on anisotropic Ag(110) surfaces.

(C6) 34th European Conference on Surface Science, 26-31 August 2018, Aarhus (Denmark). Epitaxial growth of highly-ordered MoS_2 monolayers on anisotropic Ag(110) surfaces.

(C7) DPG Spring Meeting, 11-16 March 2018, Berlin (Germany). Epitaxial growth of single-orientation high-quality MoS_2 monolayers.

(C8) 64th American Vacuum Society Symposium, 29 October–3 November 2017, Tampa, FL (USA). Key role of rotated domains in oxygen intercalation at graphene on Ni(111).

(C9) Italian Conference of Condensed Matter Physics (FisMat), October 2017, Trieste (Italy). Key role of rotated domains in oxygen intercalation at graphene on Ni(111).

(C10) European Conference on Surface Crystallography and Dynamics (ECSCD-13), June 2017, San Sebastian (Spain). Key role of rotated domains in oxygen intercalation at graphene on Ni(111).

(C11) DPG Spring Meeting, 19-24 March 2017, Dresden (Germany). Oxygen intercalation through epitaxial graphene.

(C12) European Conference on Nanofilms, October 2016, Bilbao (Spain). Oxygen intercalation through epitaxial graphene.

(C13) 2nd Meeting of the Graphene Priority Project (DFG), 11-14 May 2014, Chemnitz (Germany). Time-resolved photoemission spectroscopy of graphene structures at metal surfaces.

(C14) 29th European Conference on Surface Science, 2-7 September 2012, Edinburgh (UK). Graphene growth on Cu(111): microscopic angle-resolved photoemission and scanning tunneling microscopy investigations.

(C15) FOM Dutch Graphene Network Meetings, 24 April 2012, Groningen (Netherlands). Investigation of excited electronic states dynamics at graphene/Ni(111) interface by means of time-resolved photoemission.

Trieste, September 23, 2025.