europass

Cinzia Di Giorgio

Work : Strada Statale 14 km 163.5, MM Building - Area Science Park, 34149 , Basovizza (TS), Italy

Email: digiorgio@iom.cnr.it

Gender: Female **Date of birth:** [redacted] **Nationality:** Italian

WORK EXPERIENCE

[12/12/2022 - Current] **Research Staff**

CNR-IOM (National Research Council - Materials Foundry Institute)

City: Trieste
Country: Italy
Member of STRAS (Surface sTructure and Reactivity at the Atomic Scale) laboratory.
Study of material structure, electronic properties and catalytic processes at the atomic scale, via low temperature Scanning Tunneling Microscopy and Spectroscopy.

[01/08/2019 - 31/07/2022] **Research Fellow**

University of Salerno

City: Salerno
Country: Italy
Member of SPnM (Scanning Probe Microscopy and nano-Matter) laboratory.
Study of material structure, electronic and mechano-elastic properties, via Scanning Probe Microscopy.

[01/01/2020 - 28/02/2020] **Adjunct Research Assistant Professor**

Temple University

City: Philadelphia
Country: United States
Member of SPM (Scanning Probe Microscopy) laboratory.
Study of material topology, electronic and magnetic properties, via low temperature Scanning Tunneling Microscopy and Spectroscopy.

[01/07/2016 - 31/07/2019] **Post-Doc Researcher**

University of Salerno

City: Salerno
Country: Italy
Member of SPnM (Scanning Probe Microscopy and nano-Matter) laboratory.
Study of material structure, electronic and mechano-elastic properties, via Scanning Probe Microscopy.

TEACHING EXPERIENCE

[2021 - 2022] **Solid States Physics class - Experimental**

Bachelor's degree in Physics, Physics Department, University of Salerno

[2021 - 2022] **Mechanics and Thermodynamics - Experimental**

Bachelor's degree in Mathematics, Department of Mathematics and Computer Science, University of Salerno.

[2020 - 2021] **Mechanics and Thermodynamics - Experimental**

Bachelor's degree in Mathematics, Department of Mathematics and Computer Science, University of Salerno.

[2018 - 2019] **Teaching Assistant, Laboratory of Electromagnetism**

Bachelor's degree in Mathematics, Department of Mathematics and Computer Science, University of Salerno

[2013 - 2014] **Teaching Assistant, Calculus I**

Bachelor's degree in Physics, Physics Department, University of Salerno

[2013 - 2014] **Teaching Assistant, Newtonian Physics**

Bachelor's degree in Biology, Department of Chemistry and Biology, University of Salerno

PROFESSIONAL EXPERIENCE

[03/2021] **Technical committee member - INFN (Sezione di Napoli) (C.I.G. 8385462E23)**

Purchase of a mechanical interface for cryogenic test of a superconducting quadrupole

[12/2019] **Technical committee member - INFN (Sezione di Napoli) (C.I.G. ZC92A2D0F6)**

Purchase of a cryogenic pipeline.

[2018] **Supporting staff for "Tunneling Through Nanoscience 2018" International Conference**

[2018]

Scientific committee member for the "9Th Young Researcher Meeting" International Conference

EDUCATION AND TRAINING

[01/01/2013 - 31/12/2015] **Doctorate (Ph.D.)**

University of Salerno

City: Salerno
Country: Italy
Field(s) of study: Physics
Thesis: Superconductivity in S/F hybrids: a scanning probe microscopy study of orbital interaction.
Scientific achievements: study of the effect of magnetic topology on the confinement of superconducting vortices; technical advancement toward the exploitation of quantitative low temperature magnetic force microscopy; study of superconductivity and vortex matter in new generation Fe-based superconductors; study of the electronic properties of mono and few-layers MoS_2.

Developed technical skills: knowledge of advanced scanning probe microscopies.

Abroad experience: SPM (Scanning Probe Microscopy) laboratory, led by Prof. M. Iavarone, at the Physics Department of Temple University (Philadelphia, USA), from 1/10/2014 to 31/11/2015.

[2012] **Master of Science**

University of Salerno

City: Salerno
Country: Italy
Field(s) of study: Physics
Final grade: 110/110 cum laude
Thesis: Studio della dinamica dei vortici in ibridi Superconduttore/Ferromagnete attraverso l'uso della Magnetic Force Microscopy

[2010] **Bachelor**

University of Salerno

City: Salerno
Country: Italy
Field(s) of study: Physics
Final grade: 110/110 cum laude

Thesis: Applicazioni del metodo tight binfing ad orbitali di tipo p.

ABROAD EXPERIENCES

Nanostructures@Nanoseconds laboratory (contact person: Dr. M. Aprili) at Laboratoire de Physique des Solides (LPS, Solid State Laboratory), Paris (Fr)

Investigation of strain-induced changes in 2D materials' electronic properties, via scanning probe microscopy and spectroscopy.

01/06/2021 - 31/07/2021

01/10/2021 - 31/12/2021

01/05/2022 - 31/07/2022

Scanning Probe Microscopy laboratory (contact person: Prof. M. Iavarone) at the Phys. Dept. of Temple University, Philadelphia (USA)

Investigation of superconductor/ferromagnet hybrids, Fe-based superconductors, and novel topological magnets via low temperature scanning probe microscopy and spectroscopy.

01/10/2014 - 31/11/2025

01/01/2020 - 28/02/2020

[12/2019]

Nanoscience laboratory (contact person: Prof. Oleg Kolosov), Lancaster University, Lancaster (UK)

Investigation of thermal conduction of 2D materials at the nanoscale, through scanning thermal force microscopy.

[09/2019]

HYBRID – Hybrid systems at low dimension laboratory, Neel Institute, Grenoble (Fr) (contact person: Nedjma Bendiab)

Investigation of optical and electronic properties of 2D materials.

PROFESSIONAL SKILLS

Scanning Probe Microscopies

Long-lasting experience with:

Scanning Tunneling Microscopy and Spectroscopy;

Atomic Force Microscopy and derived techniques: Magnetic Force Microscopy, Kelvin Probe Force Microscopy, Electrostatic Force Microscopy, Conducting-Atomic Force Microscopy, Nano-Indentation Atomic Force Microscopy, Piezo-response Force Microscopy.

Raman Spectroscopy

Experience with near-infrared laser Raman equipment on ultra-thin films.

Thin films growth techniques

Developed experience with:

DC/RF Sputtering;

Electron beam evaporation;

Ion assisted – Electron beam evaporation.

Vacuum Technology

Developed experience with ultra-high vacuum equipment.

Cryogenics

Developed experience with He4 and He3 equipment.

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C1 **READING** C2 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Microsoft Office package: Microsoft Word, Excel, PowerPoint, Access | Content creation in Wordpress

Data Processing and Analysis Software

Walfram Mathematica | OriginLab | Gwyddion | WSxM | Scanning Probe Image Processor (SPIP)

COMMUNICATION AND INTERPERSONAL SKILLS

Good communication skills and collaborative spirit, gained by working in teams.

DRIVING LICENCE

Motorbikes: A1
Cars: B

PROJECTS

[01/08/2019 – 31/07/2022] **P.O.N. – AIM (Programma Operativo Nazionale - Attraction and International Mobility - Ricerca ed Innovazione 2014-2020)**

Research Fellow (Ricercatore a tempo determinato di tipo A) with the benefit of 12-month international mobility.

[01/2021 – 03/03/2022] **Einstein Telescope-Italia**

PI of the University of Salerno/University of Sannio working unit in the Einstein Telescope-Italia project.

Aim: development of cryo-friendly material for mirror's coatings for a future cryogenic gravitational wave interferometer.

[2018 – 2022] **Virgo Scientific Collaboration**

Member of the Virgo Scientific Collaboration, on the detection of gravitational waves.

Aim: modelling, fabrication and characterization of innovative nanolayered coatings, for the gravitational waves interferometer's mirrors

HONOURS AND AWARDS

[06/2017] **Europhysics Letters prize Awarding institution:** Europhysics Letters (EPL)

Best poster presented at "Superstripes 2017" International Conference.

STUDENT SUPERVISION

[2022] **Co-tutor of MSc thesis: Nanoscale study of strain effects and electrical properties of MoS2.**

Student: Vittorio Sorrentino

Degree: Master of Science, Department of Physics, University of Salerno

[2021]

Co-tutor of Ph.D. thesis: Tailoring the structural and surface properties of TiO2 thin films and TiO2-based nanolayers, with heat treatments layer thickness, and oxide mixtures.

Student: Ofelia Durante

Degree: Ph.D., Department of Physics, University of Salerno

CONFERENCES AND SEMINARS

[03/2015] **APS March Meeting 2015** San Antonio, Texas (USA)

Oral Contribution: Vortex-Antivortex coexistence in Nb based Superconductor/Ferromagnet heterostructures

[03/2016] **APS March Meeting 2016** Baltimore, Maryland (USA)

Oral Contribution: Nanoscale investigation of mesoscopic phenomena in S/F hybrid structures using Scanning Probe Microscopy techniques

[10/2016] **Science through Scanning Probe Microscopy 2016 (StSPM'16)** Bologna, Italy

Oral Contribution: Scanning Probe Microscopy observation of superconducting vortex clusters in S/F hybrids

[03/2017] **APS March Meeting 2017** New Orleans, Louisiana (USA)

Oral Contribution: Low Temperature Scanning Tunneling Microscopy investigation of FeSe and FeSe1-xSx single crystals

[06/2017] **Superstripes 2017 - Quantum in complex matter** Ischia, Napoli, Italy

Poster: Low temperature Scanning Tunneling Microscopy investigation of FeSe single crystal

[03/2018] **APS March Meeting 2018** Los Angeles, California (USA)

Oral Contribution: Confinement of superconducting vortices in Superconductor/Ferromagnet heterostructures

[06/2019]

Properties, Fabrication and Applications of Nano-Materials and Nano-Devices (Nano-M&D 2019)

Paestum, Salerno, Italy

Oral Contribution: Elasto-mechanical study of MoS2 domes by Atomic Force Microscopy and Spectroscopy

[09/2019] **Directionally Solidified Eutectics Conference (DSEC VI)** Fisciano, Salerno, Italy

Poster: Nanoscale investigation of metal-insulator transition in Ca2RuO4 layered perovskite

[11/2019]

CARRIER DOPING IN TWO-DIMENSIONAL LAYERED MATERIALS: TOWARD NOVEL PHYSICAL PROPERTIES AND ELECTRONIC DEVICE APPLICATIONS (CA2D)

Napoli, Italy

Poster: Elasto-mechanical study of MoS2 domes by Atomic Force Microscopy and Spectrosco

[11/2019] **Science through Scanning Probe Microscopy 2019 – Extended Version (StSPM19EV)** Bologna, Italy

Oral Contribution: Elasto-mechanical study of MoS2 domes by Atomic Force Microscopy and Spectroscopy

[03/2021]

NINE2021 the 4th INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY BASED INNOVATIVE APPLICATIONS FOR THE ENVIRONMENT

Virtual Conference

Oral Contribution: H2-bulged membranes made of transition metal dichalcogenides: an AFM study

[06/2021] **2Day Physics** Roma, Italy

Oral Contribution: On the tunability of MoS2 properties: a scanning probe microscopy study

[07/2021] **14th Edoardo Amaldi Conference on Gravitational Waves (Amaldi 14)** Virtual Conference

Oral Contribution: Study of TiO2- based nanolayered optical coatings

[04/2022]

Ciclo di Seminari per Studenti a.a. 2021/2022, at the Physics Department of University of Salerno

Fisciano, Salerno, Italy

La materia alle nanoscale

[09/2019] **Invited seminar** Grenoble, France

Electronic and Elasto-Mechanical properties of chalcogenides by Scanning Probe Microscopy and Spectroscopy

[12/2021]

Journal club sur les matériaux 2D 2021, organized by the Laboratoire de Physiques des Solides

Orsay, France

Twist Angle-Dependent Atomic Reconstruction and Moiré Patterns in Transition Metal Dichalcogenide Heterostructures.

CONTRIBUTIONS TO COL-LABORATION MEETINGS

[07/2021] **Virgo Week, Coating Workshop**

Oral Contribution: Status of fabrication/characterization of Coating prototypes down-selected from #LIGO-G1902307"

[03/2021] **LIGO-Virgo-KAGRA (LVK) Collaboration Meeting**

Oral Contribution: Deposition and characterization of nanolayered prototype films

[01/2021] **Virgo Week, Coating Workshop**

Oral Contribution: Status of fabrication/characterization of Coating prototypes down-selected from #LIGO-G1902307

[01/2019] **Virgo Week, Coating Workshop**

Oral Contribution: Progress on fabrication and characterization of dielectric oxides at UniSannio/ USalerno

PUBLICATIONS

Investigation of crystallization in nanolayered TiO2-based superlattices

Reference: Surfaces and Interfaces 41 (2023) 103309

O. Durante, V. Granata, J. Neilson, G. Carapella, F. Chiadini, R. DeSalvo, R. De Simone, V. Fiumara, V. Pierro, I.M. Pinto, A. Vecchione, R. Fittipaldi, F. Bobba, and C. Di Giorgio

Role of oxygen vacancies in the structural phase transformations of granular TiO2 thin films

Reference: Surfaces and Interfaces 37 (2023) 102698

O. Durante, V. Granata, R. Fittipaldi, J. Neilson, G. Carapella, F. Chiadini, R. DeSalvo, R. De Simone, F. Dinelli, V. Fiumara, V. Pierro, I.M. Pinto, A. Vecchione, F. Bobba, and C. Di Giorgio

Mechanical, elastic, and adhesive properties of two-dimensional materials

Reference: Adv. Mater. Interfaces 9, 2102220, 2022

C. Di Giorgio, *et al.* , Invited Review.

The influence of plasma on the morphological and structural properties of TiO2 thin films

Reference: Il nuovo cimento C 45 168, 2022

O. Durante, J. Neilson, and C. Di Giorgio

Exceptional Elasticity of Microscale Constrained MoS2 Domes

Reference: ACS Appl. Mater. Interfaces 13, 40, 2021

C. Di Giorgio, *et al.*

Bubble formation in van der Waals crystals: A platform for fundamental studies

Reference: Il nuovo cimento C 44 (4-5), 2021

Blundo E., Di Giorgio C., Pettinari G.

Emergence and Evolution of Crystallization in TiO2 Thin Films: A Structural and Morphological Study

Reference: Nanomaterials 11, 1409, 2021

Durante O., Di Giorgio C., *et al.*

Room-temperature ferromagnetism in oxidized-graphenic nanoplatelets induced by topographic defects

Reference: Journal of Magnetism and Magnetic Materials 524, 167664, 2021

Prías-Barragan, J.J., Gross, K., Ariza-Calderon, H., Prieto, P. Di Giorgio, C., *et al.*

Nanoscale Measurements of Elastic Properties and Hydrostatic Pressure in H2-Bulged MoS2 Membranes

Reference: Adv. Mater. Interfaces 7, 2001024, 2020

Di Giorgio C., *et al.*

Engineered Creation of Periodic Giant, Nonuniform Strains in MoS2 Monolayers

Reference: Adv. Mater. Interfaces 7, 2000621, 2020

Blundo E., Di Giorgio C., *et al.*

Quantitative magnetic force microscopy using calibration on superconducting flux quanta

Reference: Nanotechnology 30, 314004, 2019

Di Giorgio C., *et al.*

Effects of cobalt substitution on ZnO surface reactivity and electronic structure

Reference: Journal of materials chemistry C 7, 8364, 2019

D'Agostino D., Di Giorgio C., *et al.*

Vortex-core properties and vortex-lattice transformation in FeSe

Reference: Phys. Rev. B. 99, 144514, 2019

Putilov, A. V., Di Giorgio, C., *et al.*

On the performance limits of coatings for gravitational wave detectors made of alternating layers of two materials

Reference: Optical Materials 96, 1092691, 2019

Pierro, V., Fiumara, V., Chiadini, F., Bobba, F., Carapella, G., Di Giorgio, C., *et al.*

Evolution of Metastable Defects and Its Effect on the Electronic Properties of MoS2 Films

Reference: Scientific Reports 8, 1, 2018

Precner, M., Polaković, T., Qiao, Qiao, Trainer, D. J., Putilov, A. V., Di Giorgio, C., *et al.*

Metastable defects in monolayer and few-layer films of MoS2

Reference: AIP Conference Proceedings 2005, 020004, 2018

Precner, M., Polaković, T., Trainer, D. J., Putilov, A. V., Di Giorgio, C., *et al.*

Anisotropic Superconducting Gaps and Boson Mode in FeSe1-xSx Single Crystals

Reference: Journal of Superconductivity and Novel Magnetism 30, 763, 2017

Di Giorgio, C., *et al.*

Superconducting Vortex-Antivortex Pairs: Nucleation and Confinement in Magnetically Coupled Superconductor-Ferromagnet Hybrids

Reference: Book chapter in: "Vortex Dynamics and Optical Vortices", ISBN: 978-953-51-2929-5, 2017

Di Giorgio C., *et al.*

Piezoelectricity and charge trapping in ZnO and Co-doped ZnO thin films

Reference: AIP Advances 7, 055010, 2017

D'Agostino D., Di Giorgio C., *et al.*

Inter-Layer Coupling Induced Valence Band Edge Shift in Mono- to Few-Layer MoS2

Reference: Scientific Reports 7, 1, 2017

Trainer D.J., Putilov, A.V., Di Giorgio, C., *et al.*

Observation of superconducting vortex clusters in S/F hybrids

Reference: Scientific Reports 6, 1, 2016

Di Giorgio C., *et al.*

Ferromagnetism and Conductivity in Hydrogen Irradiated Co-Doped ZnO Thin Films

Reference: ACS Applied Materials and Interfaces 8, 12925, 2016

Di Trolio, A., Alippi, P., Bauer, E. M., Ciatto, G., Chu, M. H., Varvaro, G., Polimeni, A., Capizzi, M., Valentini, M., Bobba, F., Di Giorgio, C., *et al.*

Evolution of the superconducting properties in FeSe1-xSx.

Reference: Phys. Rev. B. 92, 235113, 2015

Moore, S. A., Curtis, J. L., Di Giorgio C., *et al.*

Vortex-antivortex coexistence in Nb-based superconductor/ferromagnet heterostructures

Reference: Phys. Rev. B. 89, 1, 2014

Bobba F., Di Giorgio C., *et al.*

Magnetic pinning in a superconducting film by a ferromagnetic layer with stripe domains

Reference: Superconductor Science and Technology 27, 125002, 2014

Mancusi D., Di Giorgio, C., *et al.*

Autorizzo il trattamento dei dati personali nelle modalità previste dal Regolamento UE 2016/679

Trieste, 29/08/2023