

- PRIN 2017 (Role: Member).
- 2018–2019 [Domain Manipulation in VO₂ Freestanding Nanomechanical Structures](#)
CNR–JSPS scientific cooperation agreements (Role: Member).
- 2017–2019 [Solid State Actuators for Micro/Nanorobotics](#)
Italy–Japan joint research projects of great relevance, Ministry of foreign affairs (Role: Member).
- 2013–2015 [Micromechanical devices based on Vanadium Dioxide Films](#)
Italy–Japan joint research projects, Ministry of foreign affairs (Role: Member).

Short-term Research Activities

- 10/2019 Visiting scientist at the SANKEN labs, University of Osaka - ISIR, Osaka, Japan
- 12/2018 Visiting scientist at the SANKEN labs, University of Osaka - ISIR, Osaka, Japan
- 07/2018 Visiting scientist at the SANKEN labs, University of Osaka - ISIR, Osaka, Japan
- 12/2017 Visiting scientist at the SANKEN labs, University of Osaka - ISIR, Osaka, Japan
- 02/2017 High-resolution XRD on SrIrO₃/SrTiO₃ at the Diamond Light Source, United Kingdom
- 10/2016 High-field magneto-transport studies on SrIrO₃ thin films at the HFML, The Netherlands
- 09/2016 High-resolution XRD on SrIrO₃/SrTiO₃ at the Paul Scherrer Institut, Switzerland
- 10/2015 PEEM measurements on NdNiO₃ at the Diamond Light Source, United Kingdom
- 07/2015 Visiting scientist at the SANKEN labs, University of Osaka - ISIR, Osaka, Japan
- 07/2014 Visiting scientist at the SANKEN labs, University of Osaka - ISIR, Osaka, Japan
- 09/2012 Summer school (International School on Physics and Technology of Matter), Otranto, Italy

Awards

- 06/2019 [Galileo Galilei prize for young scientists](#)
Awarded from the district 2032 of Rotary Club, Italy

TEACHING ACTIVITIES

Thesis Advisor

Master Thesis

- 2020 Enrico Ragucci (MSc in Physics) - “Trasporto termico in microstrutture cristalline in VO₂”
- 2019 Marco Ferretti (MSc in Physics) - “Studio di un microattuatore risonante a base di VO₂”

Bachelor Thesis

- 2019 Alessandro Picasso Brichetto (BSc. in Materials Science) - “Deposizione e caratterizzazioni di film sottili epitassiali di SrRuO₃ per applicazioni microelettromeccaniche”

Appointments

- 2020–ongoing [PhD School in Physics and Nanoscience](#)
CNR-SPIN representative at the professors commission of the PhD school in “Physics and Nanoscience” of the University of Genova.

Courses

- 2021– [Adjunct Professor – Università degli studi di Genova](#)
Laboratory of Advanced Thermodynamics – Master in Physics.
- 2018–2021 [Adjunct Professor – Università degli studi di Genova](#)
General Physics – Bachelor in Mechanical Engineering.
- 2016 [Teaching assistance – Delft University of Technology](#)
Advanced Solid State Physics – Master in Applied Physics.
- 2014 [Teaching assistance – Università degli studi di Genova](#)

Laboratory of Physics of Matter – Master in Physics.

DISSEMINATION

Conference organization

- 2021 [iWOE27](http://www.iwoe27.eu) – <http://www.iwoe27.eu>
- 2020 [SuperFOX2020](http://www.superfox2020.eu) – www.superfox2020.eu
- 2019 [2nd Workshop on Microactuators](http://annex.jsap.or.jp/total-biomimetics/microactuators/index.html) – annex.jsap.or.jp/total-biomimetics/microactuators/index.html
- 2018 [Workshop on Microactuators](http://www.vo2actuators.spin.cnr.it/workshop) – www.vo2actuators.spin.cnr.it/workshop

Public outreach

- 2019 [Art&Science across Italy](#)
Science dissemination for high-school student.
- 2019 [Albenga In Scienza](http://liceogbruno.gov.it/albengainscienza/home.html) – <http://liceogbruno.gov.it/albengainscienza/home.html>
Local science fair for general public where I held a seminar and supervised a laboratory of experimental physics held by high-school students.
- 2011–2019 [Stages at the Physics Department](#)
One week stages for high-school students in a research laboratory

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C2	C1	B2	C1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](#)

Digital competences

SELF-ASSESSMENT				
Information Processing	Communication	Content creation	Safety	Problem solving
Proficient user	Independent user	Proficient user	Proficient user	Proficient user

[Digital competences - Self-assessment grid](#)

- Technical skills**
- Pulsed Laser Deposition of complex oxides, sputtering, thermal evaporation.
 - Materials characterization by RHEED, X-Ray Diffraction, Raman spectroscopy, atomic force microscopy, PEEM (PhotoEmission Electron Microscopy).
 - Microfabrication techniques, including e-beam and optical lithography.
 - Characterization of micro-electro-mechanical systems by combined electrical and optical methods, magneto-transport measurements, RF measurements.
 - Development of analog electronics for data acquisition and control.

- Computer skills**
- Operative systems: Debian GNU/Linux, Windows
 - Programming language: Python, LabView®, basic knowledge of C and VERILOG HDL
 - Data Analysis: Matplotlib, ScyPy, Origin®, ROOTLib
 - Finite Elements Analysis: COMSOL Multiphysics®
 - Others: LibreCAD/QCAD, AutoCAD®, Draftsight®
 - Graphics: Gimp, Inkscape
 - Typography: L^AT_EX, Office Suites

Interests Aikido, Ancient history, Computer science, Hiking, Politics, Philosophy, Travels.

Driving licence A, B

SCIENTIFIC PRODUCTION

Oral contributions at conferences/meetings/workshops

- 2021 17th International Workshop on Nanomechanical Sensing, Calgary, Canada
 2020 SuperFOX2020, Santa Margherita Ligure, Italy
 2019 26th International Workshop on Oxide Electronics, Kyoto, Japan
 2018 Workshop on Microactuators, Genoa, Italy
 2018 15th International Workshop on Nanomechanical Sensing, Incheon, South Korea.
 2017 Invited talk, “Institut de Ciència Molecular” (ICMOL), University of Valencia, Valencia (Spain)
 2016 Towards Oxide-Based Electronics COST Action Fall Meeting 2016, Ljubljana, Slovenia
 2016 Unveiling complex phenomena in Functional OXides (UFOX), Salerno, Italy
 2015 22nd International Workshop on Oxide Electronics, Paris, France
 2015 Towards Oxide-Based Electronics COST Action Spring Meeting 2015, Aveiro, Portugal
 2014 Conference on Superconductivity and Functional Oxides, Roma, Italy.
 2013 Materials Research Society Fall Meeting & Exhibit, Boston, USA.
 2012 Conference on Superconductivity and Functional Oxides, Como, Italy.
 2011 8th International Workshop on Nanomechanical Sensing, Dublin, Ireland.
 2010 Second Christmas Workshop on Condensed Matter Physics 2010, University of Genova, Italy.

Patents

- Title **A device for sensing a magnetic field**
 Inventors L. Pellegrino; N. Manca; D. Marré, F. Remaggi; R. Bertacco; F. Maspero; W. J. Venstra; S. Della Penna; I. Hilschenz; A. Kalaboukhov; F. Lombardi
 Applicants Consiglio Nazionale delle Ricerche, Università Chieti-Pescara, Quantified Air
 Data European application No. EP20169544.2 – Filing date: 15/04/2020
- Title **Sensore di campo magnetico**
 Inventors F. Maspero; R. Bertacco; L. Pellegrino; N. Manca; D. Marré, S. Cucurullo
 Applicants Consiglio Nazionale delle Ricerche
 Data Ufficio Italiano Brevetti e Marchi No. 102020000007978 – Filing date: 15/04/2020

Research Articles

- 2022 **Proton irradiation effects on the superconducting properties of Fe(Se,Te) thin films**
 D. Torsello, M. Fracasso, R. Gerbaldo, G. Ghigo, F. Laviano, A. Napolitano, M. Iebole, M. Cialone, N. Manca, A. Martinelli, L. Piperno, V. Braccini, A. Leo, G. Grimaldi, A. Vannozzi, G. Celentano, M. Putti, and L. Gozzelino
 IEEE Trans. Appl. Supercond. 32, 1 (2021) – DOI:10.1109/TASC.2021.3136135
- 2021 **The role of etching anisotropy in the fabrication of freestanding oxide microstructures on SrTiO₃(100), SrTiO₃(110), and SrTiO₃(111) substrates**
 A. E. Plaza, N. Manca, C. Bernini, D. Marré, and L. Pellegrino
 Appl. Phys. Lett. 119, 033504 (2021) – DOI:10.1063/5.0056524
- Anisotropic Temperature-Driven Strain Dynamics in VO₂ Solid-State Microactuators**
N. Manca, T. Kanki, F. Endo, E. Ragucci, L. Pellegrino, and D. Marré
 ACS Appl. Electron. Mater., 3, 1, 211–218 – DOI:10.1021/acsaelm.0c00776
- 2020 **Planar Nanoactuators Based on VO₂ Phase Transition**
N. Manca, T. Kanki, F. Endo, D. Marré, and L. Pellegrino
 Nano Lett., 20, 10, 7251 – DOI:10.1021/acs.nanolett.0c02638
- The Role of Texturing and Thickness of Oxide Buffer Layers in the Superconducting Properties of Fe(Se,Te) Coated Conductors.**
 G. Sylva, E. Bellingeri, C. Bernini, G. Celentano, C. Ferdeghini, A. Leveratto, M. Lisitskiy, A. Malagoli, A. Mancini, N. Manca, P. Manfrinetti, I. Pallecchi, A. Provino, M. Putti, A. Vannozzi, and V. Braccini
 Supercond. Sci. Technol. 33, 11, 114002 – DOI:10.1088/1361-6668/abb35d
- Anisotropic Magnetoresistance in Spin–Orbit Semimetal SrIrO₃**

D. J. Groenendijk, N. Manca, J. de Bruijkere, A. M. R. V. L. Monteiro, R. Gaudenzi, H. S. J. van der Zant, and A. D. Caviglia
Eur. Phys. J. Plus, 135, 8, 627 – DOI:10.1140/epjp/s13360-020-00613-3

Review on thermoelectric properties of transition metal dichalcogenides

I. Pallecchi, N. Manca, B. Patil, L. Pellegrino and D. Marré
Nano Futures, 4, 3, 032008 – DOI:10.1088/2399-1984/ab92f4

Macroscopic Versus Microscopic Schottky Barrier Determination at (Au/Pt)/Ge(100): Interfacial Local Modulation

A. Gerbi, R. Buzio, C. Gonzalez, N. Manca, D. Marré, S. Marras, M. Prato, L. Bell, S. Di Matteo, F. Flores, and P. L. de Andres
ACS Appl. Mater. Interfaces 2020, 12, 25, 28894 – DOI:10.1021/acsami.0c07252

Coupling Lattice Instabilities Across the Interface in Ultrathin Oxide Heterostructures

T. C. van Thiel, J. Fowlie, C. Autieri, N. Manca, M. Šiškins, D. Afanasiev, S. Gariglio, and A. D. Caviglia
ACS Materials Lett., 2, 389-394 (2020) – DOI:10.1021/acsmaterialslett.9b00540

2019 **Large tunability of strain in WO₃ single-crystal microresonators controlled by exposure to H₂ gas**

N. Manca, G. Mattoni, M. Pelassa, W. J. Venstra, H. S. J. van der Zant, A. D. Caviglia
ACS Appl. Mater. Interfaces, 11, 47, 44438 – DOI:10.1021/acsami.9b14501

Sensing of the Molecular Spin in Spin-Crossover Nanoparticles with Micromechanical Resonators

J. Dugay, M. Giménez-Marqués, W. J. Venstra, R. Torres-Cavanillas, U. N. Sheombarsing, N. Manca, E. Coronado, and H. S. J. van der Zant
J. Phys. Chem. C. 123 (11), 6778 – DOI:10.1021/acs.jpcc.8b10096

Bimodal Phase Diagram of the Superfluid Density in LaAlO₃/SrTiO₃ Revealed by an Interfacial Waveguide Resonator

N. Manca, D. Bothner, A. M. R. V. L. Monteiro, D. Davidovikj, Y. G. Saĭlam, M. Jenkins, M. Gabay, G. A. Steele, and A. D. Caviglia
Phys. Rev. Lett. 122, 036801 – DOI:10.1103/PhysRevLett.122.036801

2018 **Accurate determination of ballistic electron emission spectroscopy: Application to Au/Ge**

A. Gerbi, C. González, R. Buzio, N. Manca, D. Marré, L. D. Bell, D. G. Trabada, S. Di Matteo, P. L. de Andres, and F. Flores
Phys. Rev. B 98, 205416 – DOI:10.1103/PhysRevB.98.205416

Light control of the nanoscale phase separation in heteroepitaxial nickelates

G. Mattoni, N. Manca, M. Hadjimichael, P. Zubko, A. J. H. van der Torren, C. Yin, S. Catalano, M. Gibert, F. Maccherozzi, Y. Liu, S. S. Dhesi, and A. D. Caviglia
Phys. Rev. Mater. 2, 085002 – DOI:10.1103/PhysRevMaterials.2.085002

Single-Crystal Pt-Decorated WO₃ Ultrathin Films: A Platform for Sub-ppm Hydrogen Sensing at Room Temperature

G. Mattoni, B. de Jong, N. Manca, M. Tomellini, and A. D. Caviglia
ACS Appl. Nano Mater. 1, 3446 – DOI:10.1021/acsanm.8b00627

Transport regimes of a split gate superconducting quantum point contact in the two-dimensional LaAlO₃/SrTiO₃ superfluid

H. Thierschmann, E. Mulazimoglu, N. Manca, S. Goswami, T. M. Klapwijk, and A. D. Caviglia
Nat. Commun. 9, 2276 – DOI:10.1038/s41467-018-04657-z

Charge doping and large lattice expansion in oxygen-deficient heteroepitaxial WO₃

G. Mattoni, A. Filippetti, N. Manca, P. Zubko, and A. D. Caviglia
Phys. Rev. Mater. 2, 053402 – DOI:10.1103/PhysRevMaterials.2.053402

Balanced electron-hole transport in spin-orbit semimetal SrIrO₃ heterostructures

N. Manca, D. J. Groenendijk, I. Pallecchi, C. Autieri, L. M. K. Tang, F. Telesio, G. Mattoni, A. McCollam, S. Picozzi, and A. D. Caviglia

- Phys. Rev. B, 97, 81105(R) – DOI:10.1103/PhysRevB.97.081105
- 2017 **Spin-orbit semimetal SrIrO₃ in the two-dimensional limit**
 D. J. Groenendijk, C. Autieri, J. Girovsky, M. C. Martinez-Velarte, N. Manca, G. Mattoni, A. M. R. V. L. Monteiro, N. Gauquelin, J. Verbeeck, A. F. Otte, M. Gabay, S. Picozzi, and A. D. Caviglia
 Phys. Rev. Lett., 119(25), 256403 – DOI:10.1103/PhysRevLett.119.256403
- Insulator to metal transition at oxide interfaces induced by WO₃ overlayers**
 G. Mattoni, D. J. Baek, N. Manca, N. Verhagen, D. Groenendijk, L. F. Kourkoutis, A. Filippetti, A. D. Caviglia
 ACS Appl. Mater. Interfaces, 9(48), 42336–42343 – DOI:10.1021/acsami.7b13202
- Selective High-Frequency Mechanical Actuation Driven by the VO₂ Electronic Instability**
N. Manca, L. Pellegrino, T. Kanki, W. J. Venstra, G. Mattoni, Y. Higuchi, H. Tanaka, A. D. Caviglia, D. Marré
 Advanced Materials, 29(35), 1701618 – DOI:10.1002/adma.201701618
- Side Gate Tunable Josephson Junctions at the LaAlO₃/SrTiO₃ Interface**
 A. M. R. V. L. Monteiro, D. J. Groenendijk, N. Manca, E. Mulazimoglu, S. Goswami, Ya. Blanter, L. M. K. Vandersypen, A. D. Caviglia
 Nano Lett. 17, 2, 715–720 – DOI:10.1021/acs.nanolett.6b03820
- Quantum paraelectricity probed by superconducting resonators**
 D. Davidovikj, N. Manca, A. D. Caviglia, G. Steele
 Phys. Rev. B 95, 214513 – DOI:10.1103/PhysRevB.95.214513
- 2016 **Striped nanoscale phase separation at the metal-insulator transition of heteroepitaxial nickelates**
 G. Mattoni, P. Zubko, F. Maccherozzi, A. J. H. van der Torren, D.B. Boltje, M. Hadjimichael, N. Manca, S. Catalano, M. Gibert, Y. Liu, J. Aarts, J.-M. Triscone, S. S. Dhesi, A. D. Caviglia
 Nat. Commun. 7, 13141 – DOI:10.1038/ncomms13141
- Epitaxial growth and thermodynamic stability of SrIrO₃/SrTiO₃ heterostructures**
 D. J. Groenendijk, N. Manca, G. Mattoni, L. Kootstra, S. Gariglio, Y. Huang, E. van Heumen, A. D. Caviglia
 Appl. Phys. Lett., 109, 041906 – DOI:10.1063/1.4960101
- 2015 **Influence of thermal boundary conditions on the current-driven resistive transition in VO₂ microbridges**
N. Manca, T. Kanki, H. Tanaka, D. Marré and L. Pellegrino
 Appl. Phys. Lett., 107, 143509 – DOI:10.1063/1.4933014
- Reversible oxygen vacancies doping in (La_{0.7}Sr_{0.3})MnO₃ microbridges by combined self-heating and electromigration**
N. Manca, L. Pellegrino, D. Marré
 Appl. Phys. Lett., 106, 203502 – DOI:10.1063/1.4921342
- 2014 **Fe_{3-δ}O₄/MgO/Co magnetic tunnel junctions synthesized by full in-situ atomic layer and chemical vapor deposition**
 R. Mantovan, S. Vangelista, B. Kutrzeba-Kotowska, A. Lamperti, N. Manca, L. Pellegrino, M. Fanciulli
 J. Phys. D: Appl. Phys. 115, 054511, 2014 – DOI:10.1088/0022-3727/47/10/102002
- Electro-thermal bistability in (La_{0.7}Sr_{0.3})MnO₃ suspended microbridges: thermal characterization and transient analysis**
 V. Ceriale, L. Pellegrino, N. Manca, D. Marré
 J. Appl. Phys. 115, 054511 – DOI:10.1063/1.4864222
- Metal-insulator transition driven by low power Joule heating in free-standing VO₂/TiO₂ microstructures**
 S. Yamasaki, T. Kanki, N. Manca, L. Pellegrino, D. Marré, and H. Tanaka
 Appl. Phys. Exp., 7, 023201 – DOI:10.7567/APEX.7.023201

- 2013 **Programmable Mechanical Resonances in MEMS by Localized Joule Heating of Phase Change Materials**
N. Manca, L. Pellegrino, T. Kanki, S. Yamasaki, H. Tanaka, A. S. Siri, and D. Marré
Adv. Mater., 25, 6430-6435 – DOI:10.1002/adma.201302087
- 2012 **Multistate Memory Devices Based on Free-standing VO₂/TiO₂ Microstructures Driven by Joule Self-Heating**
L. Pellegrino, N. Manca, T. Kanki, H. Tanaka, M. Biasotti, E. Bellingeri, A. S. Siri, and D. Marré
Adv. Mater., 24, 2929–2934 – DOI:10.1002/adma.201104669
- 2010 **Strain response of La_{0.7}Sr_{0.3}CoO₃ epitaxial thin films probed by SrTiO₃ crystalline microcantilevers**
M. Biasotti, L. Pellegrino, E. Bellingeri, N. Manca, A. S. Siri, and D. Marré
Appl. Phys. Lett., 97, 223503 – DOI:10.1063/1.3519478

Conference proceedings

- 2020 **Bringing GNU Emacs to Native Code**
A. Corallo, L. Nassi, N. Manca
Proceedings of the 13th European Lisp Symposium (ELS'20). – DOI:10.5281/zenodo.3736363
- 2017 **VO₂: A Phase Change Material for Micromechanics**
N. Manca, L. Pellegrino, T. Kanki, W. Venstra, G. Mattoni, Y. Higuchi, H. Tanaka, A. Caviglia, D. Marré
Proceedings 1, 294 – DOI:10.3390/proceedings1040294
- Mechanical Characterization of (La,Sr)MnO₃ Microbridges for Thermometric Applications**
F. Remaggi, L. Pellegrino, N. Manca, C. Bernini, D. Marré
Proceedings 1, 365 – DOI:10.3390/proceedings1040365
- 2016 **Towards Micromechanical Sensors with (La,Sr)MnO₃ Epitaxial Films**
F. Remaggi, L. Pellegrino, N. Manca, C. Bernini, D. Marré
Procedia Eng. 168, 818–821 – DOI:10.1016/j.proeng.2016.11.281
- 2013 **All-oxide microcantilevers: Perspectives for device applications**
L. Pellegrino, N. Manca, T. Kanki, S. Yamasaki, H. Tanaka, M. Biasotti, R. Buzio, E. Bellingeri, V. Ceriale, A. S. Siri, D. Marre
2013 Transducers and Eurosensors XXVII: The 17th International Conference on Solid-State Sensors, Actuators and Microsystems – DOI:10.1109/Transducers.2013.6626935
- 2012 **Frontiers in Electronic Materials – A Collection of Extended Abstracts of the Nature Conference Frontiers in Electronic Materials, June 17 to 20 2012, Aachen, Germany**
DOI:10.1002/9783527667703.ch67

Books

- 2012 **Fisica e Realtà** (Claudio Romeni), Zanichelli Editore
Book for physics classes in italian high-school