PERSONAL INFORMATION

Luciano Colombo

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Sex male | Date of birth 06/08/1960 | Nationality Italian

PhD date January 27, 1989	☐ **<10 years** from the date of the first PhD	■ **>10 years** from the date of the first PhD

Enterprise	University	EPR
☐ Management Level	■ Full professor	☐ Research Director and 1st level Technologist / First Researcher and 2nd level Technologist / Principal Investigator
☐ Mid-Management Level	☐ Associate Professor	☐ Level III Researcher and Technologist
☐ Employee / worker level	☐ Researcher	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

EMPLOYMENTS

Current position(s)

- Full professor of theoretical condensed matter physics
- Pro-rector for Research, University of Cagliari (Italy)
- Fellow of the "Istituto Lombardo – Accademia di Scienze e Lettere" (Milano, Italy)

Previous positions(s)

- 2002-current: full professor, University of Cagliari (Italy)
- 1999-2002: associate professor, University of Cagliari (Italy)
- 1996-1999: assistant professor, University of Milano-Bicocca (Italy)
- 1990-1996: assistant professor, University of Milano (Italy)

EDUCATION AND ACADEMIC DEGREES

- 1990: post-doc research associate, International School for Advanced Studies (Trieste, Italy)
- 1989-1990: post-doc research fellow, École Polytechnique Fédérale de Lausanne (CH)
- 1985-1989: Ph.D. student in physics, University of Pavia (Italy)
- 1979-1984: M.Sc. student in physics, University of Pavia (Italy)
- 1979-1983: alumnus Almo Collegio Borromeo (Pavia, Italy)

ACHIEVEMENTS AND AWARD

Awards

- 2015: Fellow of the "Istituto Lombardo – Accademia di Scienze e Lettere"
- 2013: "Excellent Researcher Grant (REG)" awarded by the European Metrology Research Project (EMRP-kNOW) under the initiative "Towards a new definition of the kilogram"
- 1995: "Advanced Research Grant" awarded by NATO
- 1994 Gordon-Bell prize of the IEEE Computer Society (co-recipient with S. Goedecker of the Cornell Theory Center) with the motivation: "In recognition of their effort in practical parallel processing research" [See paper: S. Goedecker, L. Colombo, Efficient linear scaling algorithm for tight-biding molecular dynamics, Phys. Rev. Lett. **73**, 122 (1994)]

PUBLICATIONS

Bibliometric parameters

- Total number of publications in peer-review journals: 295 (source: Scopus)
- Total number of citations: 6774 (source: Scopus) – 9459 (Google Scholar)
- H index: 42 (source: Scopus) - 49 (Google Scholar)

Highlight publications (last 10 years)

1. "*Observation of second sound in a rapidly varying temperature field*", **Science Advances 2021** (DOI: 10.1126/sciadv.abg4677)
2. "Intrinsic thermoelectric figure of merit of bulk compositional SiGe alloys - A first-principles study", **Physical Review Materials 2021** (DOI: 10.1103/PhysRevMaterials.5.065403)
3. "*Non-ohmic behavior and resistive switching of Au cluster-assembled films beyond the percolation threshold*", **Nanoscale Advances 2019** (DOI: 10.1039/c9na00256a)
4. "*Electrical and Thermal Transport in Coplanar Polycrystalline Graphene−hBN Heterostructures*", **Nano Letters 2017** (DOI: 10.1021/acs.nanolett.6b04936)
5. "*Scaling properties of polycrystalline graphene - a review*", **2D Materials 2017** (DOI: 10.1088/2053-1583/aa5147)
6. "*Thermal conductivity of MoS2 polycrystalline nanomembranes*", **2D Materials 2016** (DOI: 10.1088/2053-1583/3/3/035016)
7. "*Stretchable nanocomposite electrodes with tunable mechanical properties by supersonic cluster beam implantation in elastomers*", **Applied Physics Letters 2015** (DOI: 10.1063/1.4916350)
8. "*Lattice Thermal Conductivity of SiGe Nanocomposites*", **Physical Review Letters 2014** (DOI: 10.1103/PhysRevLett.112.065901)
9. "*Heat transport across a SiGe nanowire axial junction - Interface thermal resistance and thermal rectification*", **Physical Review B – Rapid Communication 2014**, (DOI: 10.1103/PhysRevB.90.041408)
10. "*Folded Graphene Membranes- Mapping Curvature at the Nanoscale*", **Nano Letters 2012** (DOI: 10.1021/nl3023737)

Book chapters and monographs

- 6 authored books
- 4 edited books

RESEARCH

Research interests

My research is mainly focused on novel (nano)materials and addressed at improving our fundamental understanding of their structural, transport, functional, and mechanical properties for energy production & harvesting, biomedical applications, advanced functional and structural applications, information technology.
I am also interested in developing/applying new theoretical and computational methods and algorithms for large scale atomistic simulations.
Highlights of my research include:

- thermal and electronic transport in nanostructured materials for thermoelectric applications
- nanostructured semiconductor and hybrid systems for solar energy harvesting and photovoltaic conversion
- thermal, transport, and mechanical properties of 2-dimensional atomic sheets (in particular, graphene and related materials)
- physical properties of granular materials for neuromorphic computing
- porous nanomaterials
- organic glasses: growth, stability, and transport properties
- methods for atomistic simulations in condensed matter systems
- algorithms for large-scale atomistic simulations in materials physics.

Project leadership

- 2023-present: PNNR call for Extended Partnership, project "Network 4 Energy Sustainable Transition" (PE-NEST) Spoke 2 WP "Energy harvesting" – role: group leader at the University of Cagliari
- 2023-present: PNRR call for Ecosystems of Innovation, project "Ecosystem of Innovation for Next generation Sardinia" (e.INS) Spoke 7 WP "New materials for photovoltaics" – role: group leader at the University of Cagliari
- 2021-2022: PNRR call for Research Infrastructures, project "Einstein Telescope Infrastructure Consortium" – role: leader of the research unity at the University of Cagliari
- 2019-2022: PON 2014-2020 call, project Attraction&International Mobility "Theoretical design of SiGe nano-structures for efficient thermoelectric conversion" – role: project leader
- 2019-2022: "Brains to South" call, project "GRAnular matter for NEuromorphic Computing" (GRANECO) – role: project supervisor for University of Cagliari
- 2019-2022: call "Progetti ricerca di base - Fondazione di Sardegna", project "ADVAnced Nanoporous materials for Cutting-edge engineerING" (ADVANCING) - role: leader of a research unit.
- 2018-2021: EU FLAG-ERA call, project "MECHANIC" (P.I. A. Isaacson) – role: leader of a research unit

- 2015-2018: “Progetti ricerca di base – Regione Autonoma Sardegna”, project “Porous silicon for energy applications” – role: project leader
- 2012-2015: MiUR-PRIN project “Frontiers in Graphene Research: understanding and controlling Advanced Functionalities” – role: leader of a research unit
- 2012-2014: “Progetti ricerca industriale – Regione Autonoma Sardegna”, project “Stretchable electronics for biomedical applications” – role: leader of a research unit
- 2010-2013: “Progetti ricerca di base – Regione Autonoma Sardegna”, project “Multiscale Modeling of Mechanical properties of Materials” – role: project leader
- 2005-2009: EU-PON project “A cyberinfrastructure for science and technology” – leader of the activity “Computational hard- and soft-matter physics”
- 2004-2008: EU-STREP FP-6 project “Nanocrystalline silicon for photovoltaic and optoelectronic applications” – role: leader of a research unit
- 2003-2006: MiUR-FIRB project “Modeling and structural characterization of ion radiation induced defects in crystalline silicon” – role: leader of a research unit
- 2002-2006: MiUR-FIST project “Design, processing, and modeling of novel ceramic composites and coatings” – role: leader of a research unit
- 2002-2004: MiUR-PRIN project “Bridging molecular dynamics to continuum mechanics: a multiscale description of mechanical properties of materials” – role: leader of a research unit
- 2000-2002: INFM project “An hybrid classical/quantum simulation scheme for modeling silicon bulk processing” – role: project leader
- 2000-2002: MiUR-PRIN project “Multiscale approach to the unification of micro- and macro-mechanics of linear and nonlinear materials” – role: leader of a research unit
- 1998-1999: MiUR-PRIN project “Ion-induced microstructural evolution: a computational approach” – role: leader of a research unit
- 1995-1998: NATO-CRG project “Molecular dynamics studies of defect properties and dopant diffusion in silicon” – role: project leader

ADDITIONAL INFORMATION

Institutional responsibilities

- 2021-present: Pro-rector for Research of University of Cagliari
- 2020-2021: Member of the Committee for the evaluation of the seniority shooting records for professors and researchers enrolled at the University of Cagliari
- 2020-present: member of the Scientific Steering Committee of the University college “S. Efisio College”
- 2018-2021: Member of the Disciplinary Board of the University of Cagliari
- 2017-2019: Member of the Committee for the evaluation of the seniority shooting records for professors and researchers enrolled at the University of Cagliari
- 2011-2015: Head of the Department of Physics of University of Cagliari
- 2009-2011: Coordinator of the “Physics and Mathematics Section” of the Faculty of Engineering at the University of Cagliari
- 2009-2010: Director of the “Sardinian Laboratory for Computational Materials Science” (CNR-SLACS)
- 2003-2007: Coordinator of the Ph.D. Program in Physics of University of Cagliari

Commission of trust

- 2023-present: member of the Scientific and technical Committee of the PNRR NEST Partnership
- 2022-present: Member of Monitoring Committee of the PNRR National Center for Gene Therapy
- 2006-2011: Member of the Scientific Board of the CYBERSAR supercomputing center, Cagliari
- 2005-2010: Member of the Scientific Board of the CASPUR supercomputing center, Rome
- 2002-2004: Chair of the Steering Committee for High Performance computing of the National Institute for the Physics of Matter

Member of scientific societies

- Member of the Italian Physical Society

Mentorship of students/young researchers/fellows

- 85+ master and Ph. D. Theses in Physics and Engineering
- 18 post-doc and tenure-track research associates

Organisation of conferences/scientific meetings

- MRS Symposium “Advances in materials theory – bridging over multiple length and time scales” (April 16-20, 2001, San Francisco, USA)
- MRS Symposium “Tight-binding approach to computational materials science” (Dec. 1-3, 1997, Boston, USA)

Major invited presentations

- 75+ at international conferences, workshops, and schools (including, but not limited to:

March Meeting of the American Physical Society; General Conference of the Condensed Matter Division of the European Physical Society; workshops at the Centre Européen de Calcul Atomique et Moléculaire; International Centre for Theoretical Physics; European Materials Research Society)

Editorial and Reviewing activities

- 2021-present: Managing Editor of "The European Physical Journal Plus", the "open access" official journal of the European Physical Society (EPS)
- 2019-2021: Member of the Editorial Board of the "Rivista del Nuovo Cimento" (Italian Physical Society)
- 2018-present: Member of the Steering Committee of the "Cagliari University Press" (the official publisher of the University of Cagliari)
- 2012-2015: Colloquia&Reviews Editor of the "European Physical Journal B – Condensed matter physics and complex systems" (EPJ-B) of the European Physical Society (EPS)
- 2008-2012: Editor-in-Chief of the "European Physical Journal B – Condensed matter physics and complex systems" (EPJ-B) of the European Physical Society (EPS)
- 2006-2008: co-Editor of "Applied Physics A"

"According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV "

Date and signature

Luciano Colombo
Cagliari, 09/03/2023 – digitally signed