Luca Tomarchio



ABOUT ME

I am a physicist with a strong background in photonics, quantum materials and technologies, nanodevice fabrication, and light-matter interactions. As a technologist, I currently contribute to the improvement of quantum space technologies for sensing and imaging.

As an academic researcher, I studied and applied novel techniques for the manipulation of THz waves in a time-domain setup and the out-of-equilibrium dynamics of advanced materials, using both laboratory and problem-solving techniques to advance the modern understanding of low-frequency waves and their interaction with matter.

In 2023 I was awarded an ICAM Sponsored QuantEmX Scientist Exchange Award for a research visit at the Department of Physics and Astronomy of Rutgers University, New Brunswick (NJ), for a project on the synthesis and characterization of (Te,Se) films over Bi2Te3, expected to support a proximity induced topological superconductivity phase.

In 2021 I was awarded a DAAD scholarship to work on a project regarding the creation of superconductors-based Van der Waals heterostructures, acquiring the material science know-how to exfoliate, stack and measure 2D crystals.

I participated as an invited speaker to 10+ international conferences and I authored 15+ research papers published in international peer-reviewed journals.

WORK EXPERIENCE **Electronics Technology and Process Engineer** [01/03/2024 – Current] Thales Alenia Space Italy **City:** L'Aquila | **Country:** Italy Qualification plans for electronics IPAC and ICU units for the IRIDE NIMBUS program R&D on optical, electro-optical, and quantum space technologies for imaging and sensing [11/2022 – 02/2024] Postdoctoral Researcher Sapienza University **City:** Rome | **Country:** Italy Research Topics: Frequency- and time-resolved spectroscopy of quantum materials (Tolopogical materials, relaxor ferroelectric, high-temperature superconductors) [10/2023 - 12/2023] Visiting Researcher **Rutgers University City:** New Brunswick, NJ | **Country:** United States Thin film epitaxial growth of quantum materials via Molecular Beam Epitaxy (MBE). Research project funded by ICAM Sponsored QuantEmX Scientist Exchange Award: "Optical properties and Time-domain Thermoreflectance of Fe(Te,Se) films over Bi2Te3 topological insulator". **Guest Researcher** [09/2021 – 07/2022] Leibniz Institute for Solid State and Materials Research

City: Dresden | **Country:** Germany



Guest researcher in collaboration with IFW-Dresden for the project: "THz Spectroscopy of high-temperature superconductors-based Van der Waals heterostructures".

The project has been funded by the DAAD institution.

[03/2020 – 12/2020] University Teaching Assitant Sapienza University **City:** Rome | **Country:** Italy Classical Physics (Mechanics, Thermodynamics, Electromagnetism) For the Information and Management Engineering bachelor's degree

EDUCATION AND TRAIN-ING

[10/2019 - 10/2022] **Ph.D. in Physics**

Sapienza University

Address: Piazzale Aldo Moro, 00185, Roma, Italy | Field(s) of study: Physics ; Optical Spectroscopy ; Material Science | **Final grade:** Full grades with Honourable mention | Level in EQF: EQF level 8 | Thesis: Terahertz and optical response of novel quantum materials

Research in condensed matter physics and optical spectroscopy at the THz Sapienza Laboratory under the supervision of prof. Stefano Lupi.

[09/2017 - 10/2019] Master's Degree in Physics

Sapienza University of Rome

Field(s) of study: Condensed Matter Physics | Final grade: 110/110 cum laude | Level **in EQF:** EQF level 7 | **Thesis:** Terahertz Optical Response of a Type-II Weyl Semimetal: WTe2

[09/2014 – 09/2017] Bachelor's Degree in Physics

Sapienza University of Rome

Field(s) of study: Physics | Final grade: 110/110 cum laude | Level in EQF: EQF level 6 | Thesis: Utilizzo di Metalli Liquidi in Frascati Tokamak Upgrade (FTU)

Google Data Analytics Professional Certificate

COURSERA https://www.credly.com/badges/c9142294a8c1-41ee-8917-2e8eee41faee?source=linked in profile

[08/2020 – 10/2020] Certified Personal Trainer (CPT)

Scuola Nazionale di Personal Trainer (SNPT)

HONOURS AND AWARDS

[06/2021] Scholarship for further Studying and Training in Germany Awarding institution: DAA D - German Academic Exchange Service

> Winner of a scholarship as a guest researcher at IFW-Dresden, defending the project: "THz Spectroscopy of high-temperature superconductors-based Van der Waals heterostructures".



[10/2019]	Excellence Program for the Master's Degree in Physics Awarding institution: Sapienz
	a University of Rome

Admission and completion of the excellence program for the master's degree in physics, reserved only to the best 10 students of the associated academic year.

[10/2017] **Excellence Program for the Bachelor's Degree in Physics Awarding institution:** Sapie nza University of Rome

Admission and completion of the excellence program for the bachelor's degree in physics, reserved only to the best 30 students of the associated academic year.

DDOIECTS	
[11/2022 – Current]	Time-resolved spectroscopy of relayor ferroelectrics
[Th2022 Current]	
	Sapienza research grant: Progetto per avvio alla ricerca - Tipo 2
[08/2021 – 08/2022]	THz Spectroscopy of high temperature superconductors-based Van der Waals heterostructures
	Sapienza research grant: Progetto per avvio alla ricerca - Tipo 1
[30/09/2021 – 30/07/2022]	THz Spectroscopy of high temperature superconductors-based Van der Waals heterostructures
	DAAD research grant: One-Year Grants for Doctoral Candidates, concerning an active collaboration with the Superpuddles lab of Dr. Nicola Poccia at the Leibniz Institute of Solid State and Materials Research in Dresden
[08/2020 – 08/2021]	Spectroscopic Study of new Topological Semimetals in the THz Frequency Gap
	Sapienza research grant: Progetto per avvio alla ricerca - Tipo 1
CREATIVE WORKS	
[01/2023]	ll Metallo, L'Isolante e il Superconduttore
	Author of the book "Il Metallo, L'Isolante e il Superconduttore", published through the editor Youcanprint.
	ISBN: 9791221457223
LANGUAGE SKILLS	
	Mother tongue(s): Italian
	Other language(s):
	English
	LISTENING C2 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 My Digital Skills Statistical Data Analysis Skills Microsoft Excel | MATLAB&Simulink | R Language and R Studio | Relational Databases: SQL | Data Science, Data Analytics, Data Visualization | LabVIEW programming **Oral and Written Presentation Skills** Microsoft Powerpoint | Microsoft Word | Latex Software **Management Skills** Analytical skills | Organizational and planning skills | Team-work oriented | Problem Analysis & Problem Solving **Physics Related Skills** Ultrafast spectroscopy | Material Characterization (Confocal, Optical and UV-Vis Spectroscopy, SEM, Raman Spectroscopy)) | nonlinear optics | Topological Materials | Material Science | Superconductivity | Quantum Materials | Terahertz spectroscopy **DRIVING LICENCE** Cars: B

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 196/2003, coordinato con il Decreto Legislativo 101/2018, e dell'art. 13 del GDPR (Regolamento UE 2016/679) ai fini della pubblicazione in Trasparenza Ateneo - Sapienza come da normativa vigente.