CURRICULUM VITAE

Alfio Lorenzo Torrisi

PERSONAL INFO:

Birth date: September 1st, 1983, Catania, Italy

Nationality: Italian

LinkedIn: https://www.linkedin.com/in/atorrisi/

Website: https://atorrisi83.wixsite.com/thescientist

EDUCATION:

From September 4, 2014 to April 10, 2017:

Ph.D. in Technical Sciences, in the discipline of Electronics, specialty in Optoelectronics, at the Institute of Optoelectronics, Military University of Technology (IOE - MUT), Warsaw, Poland

Ph.D. in Applications of Natural Sciences, in the study field of Physical Engineering at the faculty of Nuclear Sciences and Physical Engineering, Czech Technical University of Prague (CTU), Prague, Czech Republic.

Joint Agreement between MUT and CTU under the EXTATIC (Extreme-ultraviolet and X-ray Training in Advanced Technologies for Interdisciplinary Cooperation) ERASMUS MUNDUS PROGRAMME.

Title of the Thesis: "*SXR and EUV nanoscale imaging using compact laser plasma light sources and Fresnel optics*". Supervisor: Prof. P. W. Wachulak (MUT); Co-Supervisor: Prof. L. Pina (CTU).

From July 1, 2013 to October 16, 2014:

Postgraduate Master's degree (2nd Level) - Dept. of hygiene and public health, University of Catania, Italy.

"*Environmental Monitoring and mutagenic, carcinogenic and teratogenic risk assessment*".

Title of the Project: "*Monitoring and evaluation of greenhouse gases and heavy metals in the industrial pole of Priolo (Syracuse, Sicily, Italy)".*

From October 1, 2009 to March 27, 2013:

M.Sc. in Physics – Dept. of Physics and Astronomy, University of Catania, Italy.

Title of the Thesis: "*Characterization and Analysis of Artistic-Cultural artifacts for their provenance and dating*". Advisor: Prof. O. Troja and Prof. A. Gueli.

From October 1, 2002 to July 15, 2009:

B.Sc. in Physics – Dept. of Physics and Astronomy, University of Catania, Italy.

Title of the Thesis: "*Laser ablation and mass spectrometry (LAMQS) for application in the field of Cultural Heritage*". Advisor: Prof. O. Troja.

SCIENTIFIC/ACADEMIC CAREER:

From July 16, 2023 – present:

Senior Researcher – Lecturer** (RTD-B) **at the "Kore" University of Enna– Department of Medicine and Surgery

From July 3, 2023 to October 15, 2023:

Researcher at the Italian National Research Council, Institute for Microelectronics and Microsystems (CNR-IMM), Catania (Italy).

- Design and development of power devices and radiation detectors.

From February 27, 2023 to June 02, 2023:

Junior Researcher (RTD-A) at University of Bari – Dept. of Physics "M. Merlin".

- Design and implementation of a new generation of quantum-enhanced imaging devices based on quantum optical correlations.

From September 16, 2022 to March 27, 2023:

Research Fellow at the University of Bari "Aldo Moro" (Bari, Italy), Dept. of Physics "M. Merlin", Quantum Optics Technologies Lab. (https://www.quotlab.uniba.it). Title of the Project: "INTERGLIO - Interdisciplinary approach for a multiscale study of the neurophysiology of brain gliomas".
Referent: Prof. M. D'Angelo.

- Imaging with incoherent sources.
- Correlation Plenoptic Imaging (CPI).
- Correlation Plenoptic Microscopy (CPM).
- Correlation and autocorrelation measurements.
- Imaging elaboration and Optical Simulation by software *Mathematica* and *Python* programming.

From December 30, 2020 to April 26, 2022:

Junior Researcher (RTD-A) at University of Salento – Dept. of Mathematics and Physics "E. De Giorgi" and CEDAD (CEnter of applied physics DAting and Diagnostics).

- AMS (Accelerator Mass Spectrometry) for ^{14}C analysis.
- Stable isotope ratios analysis by IRMS (Isotopic Ratio Mass Spectrometry).
- Chemical treatments of organic samples for investigation by AMS and IRMS.
- Excimer Laser ablation and deposition of thin films of different materials at LEAS laboratory (Laboratory of Applied Electronics and Instrumentation).
- Characterization analyses by Scan Electron Microscope (SEM), Transmission Electron Microscopy (TEM), X-ray Diffraction (XRD) and Raman spectroscopy.

From April 1, 2018 to December 30, 2020:

Postdoc Researcher at Ústav jaderné fyziky AV ČR - Nuclear Physics Institute of the Czech Academy of Sciences, Řež, Hlavní Město, Czech Republic **(Referent: Dr. J. Vacík).**

- Material Sciences applications;
- Nanoparticle productions by laser ablation and their characterization;
- Plasma produced by Laser-target and by Particle beams-target interactions;
- Characterization of Silicon Carbide (SiC) detectors;
- Cultural heritage investigations;
- UV-VIS-IR spectrophotometric measurements;
- Chemosensor preparation and characterization;
- Neutron sources controlled by high-intensity pulsed laser generating plasma;
- Ion Beam Analyses (IBA): PIXE (Particle-induced X-ray emission), PIGE (Particle-induced gamma-ray emission), RBS (Rutherford Back Scattering) and ERDA (Electron Recoil Detection Analysis) at the NPI-Tandetron laboratory of the CANAM infrastructure.

From September 4, 2017 to March 16, 2018:

Research Associate (appointed at Grade 7), AXIm (Advances X-ray Imaging) group for X-ray Phase Contrast Imaging experiments - UCL University College of London, Dept. of Medical Physics & Biomedical Engineering, London, United Kingdom **(Referent: Prof. S. Olivo).**

- Development of a micrometric phase-contrast microscope equipment investigating oesophageal human tumors.

From June 26 2017 to August 31, 2017:

Scientific consultant for the CNR-IOM (Italian National Research Council - Istituto Officina dei Materiali), TASC laboratory, Science Park Elettra Sychrotron, Basovizza (Trieste), Italy (Referent: Dr. M. Coreno, Dr. M. De Simone).

- Project: "*Feasibility and design of a table-top source in the XUV, based on gaseous plasma induced by IR laser radiation*".

NATIONAL SCIENTIFIC HABILITATIONS

- **National Scientific Qualification for Full Professor**
  Academic Discipline: **Applied Physics, Teaching and History of Physics** (02/D1)
  Awarded on: March 4, 2025 – Valid until: March 4, 2037
  Official Result: **https://asn23.cineca.it/pubblico/miur/esito-abilitato/02%252FD1/1/3**

- **National Scientific Qualification for Associate Professor**
  Academic Discipline: **Applied Physics, Teaching and History of Physics** (02/D1)
  Awarded on: May 23, 2023 – Valid until: May 23, 2035
  Official Result: **https://asn21.cineca.it/pubblico/miur/esito-abilitato/02%252FD1/2/5**

- **National Scientific Qualification for Associate Professor**
  Academic Discipline: **Experimental Physics of Matter** (02/B1)
  Awarded on: May 30, 2022 – Valid until: May 30, 2034
  Official Result: **https://asn21.cineca.it/pubblico/miur/esito-abilitato/02%252FB1/2/2**

TRAINING ACTIVITIES

From January 20, 2014 to May 31, 2014:

Internship at the Industrial Consortium Environmental Protection (Consorzio Industriale Protezione Ambiente, C.I.P.A., Ex S.S.114 Km. 139 c.p. 102 96010 Priolo (SR), Italy).

- Monitoring of environmental pollution by Radio acoustic sounding system (RASS) and Sound detection and raging (SODAR).
- Detection of chemical compounds emitted to the ground and study of the relative atmospheric parameters.
- SKYNET simulation - predictive models of the pollutants distribution.

From 2012 to 2013:

University Internship:

Laser-Plasma Physics Laboratory, Dept. of Physics and Earth Sciences, University of Messina, Messina, Italy.

- LAMQS investigations (Laser Ablation coupled with a Mass Quadrupole Spectrometry).

- Analysis of Characteristic X-Ray using compact X-ray Fluorescence instrumentation (XRF).
- Optical microscopy and Scan Electron Miscroscope (SEM).

From 2011 to 2013:

University Internship:

PH3DRA Laboratory (PHysics for Dating Diagnostic Dosimetry Research and Applications), Dept. of Physics and Astronomy, University of Catania, Catania, Italy (Referent: Prof. A. M. Gueli).

- Characterization measurements using Raman, XRF and Colorimetry technique.
- Advanced study of Scan Electron Microscope (SEM).

NATIONAL and INTERNATIONAL JOINT EXPERIMENTS:

From January 01, 2024 – Present

Collaboration with the University of Messina, Department of Biomedical, Dental and Morphological Imaging Sciences (BIOMORF – Prof. A.M. Roszkowska) and Department of Mathematics, Computer Science, Physics and Earth Sciences (MIFT – Prof. L. Torrisi).

Scientific Activity:

- Study of biocompatible materials for intraocular implants

From December 01, 2023 – Present

National research collaboration between University of Salento, Department of Mathematics and Physics (Prof. A. Serra),***University of Bari***, Department of Basic Medical Sciences, Neurosciences and Sense Organs (Prof. A. Signorile),***University of Messina***, Departments MIFT and BIOMORF (Prof. L. Torrisi)

Project: CAR-BIO-MED – Carbon Dots for Advanced Bio-Medical Imaging and Beyond

Scientific Activity:

- Synthesis and characterization of carbon dots

From January 01, 2020 to December 31, 2022:

International collaboration between INFN Group V (Catania, Lecce, L'Aquila) and the Nuclear Physics Institute (NPI) of the Czech Academy of Sciences (Řež, Czech Republic – Dr. A. Mackova)

Project: C.I.M.A. – Carbon-Based Innovative Materials for Nuclear Physics Applications

Scientific Activities:

- Production of thin films and study of graphene oxide (GO) and reduced graphene oxide (rGO)
- Characterization techniques: Raman spectroscopy, SEM/EDX, Ion Beam Analysis (PIGE, PIXE, RBS, ERDA)

From January 01, 2019 to December 31, 2021

Joint international collaboration between University of Messina, Department MIFT (Profs. L. Silipigni and L. Torrisi) and Department of Engineering (Prof. E. Proverbio), **and the *Nuclear Physics Institute (NPI)***, Czech Academy of Sciences (Řež – Dr. A. Mackova)

Scientific Activities:

- FT-IR analysis
- Application of physical techniques to cultural heritage using Ion Beam Analysis (IBA)

From January 01, 2013 to December 31, 2020

International collaboration between Czech Academy of Sciences*,* Nuclear Physics Institute and Department of Radiation Dosimetry (Prague – Profs. A. Mackova and M. Davidkovà) **and *University of Messina,*** Department MIFT and Department of Chemical, Biological, Pharmaceutical and Environmental Sciences (Prof. S. Guglielmino)

Scientific Activities:

- Laser-based synthesis of biocompatible metallic nanoparticles
- Microscopy measurements and experimental data processing
- Use of proton beams for proton therapy studies

From September, 2014 to December 2021:

Scientific collaboration with Military University of Technology (MUT), Institute of Optoelectronics, Laser Matter Interaction Laboratories (LMI), Warsaw, Poland **(Referent: Prof. H. Fiedorowicz, Prof. P.W. Wachulak).**

Scientific Activities:

- Development and optimizazion of a monochromatic soft X-rays (SXR) microscope, operating at 2.88 nm wavelength.
- Soft X-ray (SXR) microscopy in the “water window” spectral range using a ns laser plasma SXR source based on a double stream nitrogen/helium gas-puff target and Fresnel zone plate optics with spatial resolution of 60nm.
- Development and optimizazion of a quasi-monochromatic, compact, table-top extreme ultraviolet (EUV) microscope operating at 13.8nm wavelength: optimization and characterization.

- High resolution imaging (sub-50nm spatial resolution) employing EUV radiation and diffractive optics.
- Investigations of influence of object thickness and source emission bandwidth on spatial resolution in EUV microscopy based on Fresnel zone plates.
- Development of a method based on Signal-to-Noise Ratio (SNR) measurements for optimization and characterization of SXR microscopy images and for characterization and benchmarking of various SXR imaging systems.
- SXR/EUV optical simulation.
- Collaboration with several International Institutes for the preparation of biological samples to observe: Faculty of Biomedical Engineering, Czech Tecnical University of Prague (Prof. Šárka Vondrová and Prof. Miroslava Vrbová), PSI (Paul Scherrer Institute) Villigen, Switzerland (Dr. Michal Ostrčil), Università degli Studi di Messina (Prof. M. Maesano e Prof. A.M. Sciortino), Università Tor Vergata di Roma e AlgaRes srl (dr. E. Viaggiu).
- Characterization of laser-plasma sources employing Silicon detectors and Silicon Carbide detectors.
- Tomography experiments in the SXR range.
- Near edge X-ray absorption fine structure (NEXAFS) spectroscopy.

2016 – 2020:

Scientific collaboration between University of Messina (Messina, Italy) *– Dept. MIFT (Dept. of Mathematics and Computer Sciences, Phisical Sciences and Earth Sciences, Referent: Prof. L. Torrisi)) and Dept. of Biology and Earth Sciences (Referent: Prof. S. Guglielmino)* ***and Nuclear Physics Institute of the Czech Academy of Sciences*** *(Řež, Czech Republic, Referent: Prof. A. Mackova).*

Scientific Activity:

- Biocompatible nanoparticle production, irradiation, and characterization by laser ablation, for biomedical applications.

2014– 2020:

IPPLM (Instute of Plasma Physics, Laser and Microofusion) (Referent. Dr. M. Rosinski).

Scientific Activities:

- Protons acceleration in the TNSA (target normal sheath acceleration) regime by fs laser
- Study of laser-matter interaction employing new materials (hybrid-graphene based, carbon foils with gold films and nanoparticles, reduced graphene oxide targets).

From January 01, 2013 to December 31, 2020

Joint international collaboration between *University of Catania*, Department of Physics and Astronomy (Prof. L. Calcagno), ***Nuclear Physics Institute (NPI)*, Czech Academy of Sciences** (Řež, Czech Republic – Dr. A. Mackova), ***Institute of Plasma Physics and Laser Microfusion (IPPLM)***, Warsaw, Poland (Dr. J. Wolowski and Dr. M. Rosinski) **and *Prague Asterix Laser System (PALS)*,** Prague, Czech Republic (Dr. J. Ullschmied)

Scientific Activities:

- Characterization of silicon carbide (SiC) detectors using high-energy ion beams (at NPI) and femtosecond lasers (at IPPLM)
- Study of laser-produced plasmas in TNSA (Target Normal Sheath Acceleration) regime
- Acquisition and processing of experimental measurements
- Preparation of irradiation targets (hybrid graphene-based materials, reduced graphene oxide targets)

PRACTICES, STUDIES, EXCHANGES, and VISITING RESEARCH ACTIVITIES:

From May 26, 2025 to May 29, 2025:

Visiting Professor – Erasmus+ Teaching Mobility at the Military University of Technology, Warsaw, Poland

Awarded Erasmus+ teaching mobility grant to deliver a series of academic seminars as Visiting Professor. Activities included four 2-hour seminars for undergraduate, PhD students, and research staff.

Seminar Titles:

1. "Development of Compact SXR and EUV Microscopes for Material Sciences and Biomedical Applications employing a Gas-Puff Target Source", Lecture for bachelor students of the course "Fundamentals of Image Registration and Processing in Medicine" at the Military University of Technology of Warsaw (Poland) – May 26th 2025
2. "Laser-Synthesized Nanoparticles for Biomedical Applications", Lecture for bachelor students of the course "Fundamentals of Lasers" at the Military University of Technology of Warsaw (Poland) – May 27th 2025
3. "Employment of Graphene Oxide for Biomedical and Material Sciences Applications", seminar for PhD students and research staff at the Institute of Optoelectronics of the Military University of Technology of Warsaw (Poland) – May 28th 2025
4. "Carbon Dots Luminescence via Carbon Laser Ablation in Biocompatible Solutions" , seminar for PhD students and research staff at the Institute of Optoelectronics of the Military University of Technology of Warsaw (Poland) – May 29th 2025

From December 20, 2022 to December 22, 2022:

Visiting Scientist at the Microcity of the École Polytechnique Fédérale de Lausanne (EPFL) / Advanced Quantum Architecture Lab – Neuchâtel (Switzerland).

Scientific Activity:

Characterization, Synchronization and Calibration of SPADs (Silicon Photon Avalanche Diodes) for correlation imaging.

From April 01, 2016 to June 30, 2016:

Visiting Scientist at the Ia Czech Technical University (CTU), Faculty of Nuclear Science and Physical Engineering (Prague, Czech Republic), and Faculty of Biomedical Engineering (Kladno, Czech Republic). (Scientific Referents: Profs. Šárka Vondrová and Miroslava Vrbová).

Scientific Activity:

Biological sample preparation for SXR/EUV imaging

From May 01, 2015 to October 31, 2015:

Visiting Scientist at the Ia Czech Technical University (CTU), Faculty of Nuclear Science and Physical Engineering, Prague, Czech Republic. (Scientific Referent: Prof. A. Jancarek).

Scientific Activity:

Testing of the capillary discharge microscope setup and preliminary image acquisition.

From February 16, 2013 to March 01, 2013:

Intensive Erasmus Programme "*Safe Applications of Radiation and Radionuclides – SARA 2014*" (2 weeks) in Belgium - Cooperation in Higher Education on Radiological and Nuclear Engineering (CHERNE) Network.

Project coordinators: Czech Technical University of Prague (Czech Republic), SCK-CEN (Belgian Nuclear Research Centre, Mol, Belgium), JRC-IMM (Joint Research Centre Institute for Reference Materials and Measurements, Geel - Belgium), Hasselt University (Diepenbeek - Belgium).

SCIENTIFIC PROJECTS FUNDED BY INTERNATIONAL AND NATIONAL AGENCIES:

1. ***PNRR CAR-BIO-MED – Carbon Dots for Advanced bio-medical imaging and beyond***, funded by the Italian Ministry of Education, 2023-2025.
   Role: Research Collaborator from December 2023 (up to now).
   Scientific Referent: Prof. A. Serra, Dept of Math and Physics, Salento University (Lecce, Italy).

2. ***PNRR SAMOTHRACE – SiciliAn MicronanOTecH Research And Innovation CEnter****,* funded by the Italian Ministry of Education.
   Role: Member of the Research Team from July to September 2023.
   Scientific Referent: Dr. F. La Via, Italian National Research Council, Instutute for Microelectronics and Microsystems (CNR-IMM) of Catania (Italy).

3. ***PNRR PE NQSTI - National Quantum Science and Technology Institute****,* funded by the Italian Ministry of Education. Coordinator: Thales, 2023-2025.
   Role: Member of the Research Team from March to June 2023 (3 months).
   Scientific Referent: Prof. M. D'Angelo, Università di Bari (Bari, Italy).

4. ***QUISS - Quantum Imaging with novel sources and sensors****,* funded by INFN group V (Bari section), 2023-2025.
   Role: Member of the Research Team from January to June 2023 (6 months).
   Scientific Referent: Prof. M. D'Angelo, Università di Bari (Bari, Italy).

5. ***Qu3D – Quantum 3D imaging at high speed and resolution***, (grant 20QT21) under the QuantERA program, funded by the European Union's Horizon 2020 research and innovation program, 2021-2023.
   Role: Member of the Research Team from September 2022 to June 2023 (9 months).
   Scientific Referent: Prof. M. D'Angelo, Università di Bari (Bari, Italy).

6. ***INTERGLIO - Interdisciplinary approach for a multiscale study of the neurophysiology of brain gliomas***, funded by European Union – NextGenerationEU Programma MUR- Fondo promozione e sviluppo-DM 737/2021- CUP: H99J21017480006, 2021-2023.
   Role: Co-investigator from September 2022 to February 2023 (6 months).
   Scientific Referent: Prof. M. D'Angelo, Università di Bari (Bari, Italy).

7. ***C.I.M.A. – Carbon-Base Innovative Materials for Nuclear Physics Applications***, funded by INFN Group V, 2020-2022. Role: Co-investigator from January 2021 – December 2022 (36 months)
   National Referent: Prof. L. Torrisi, INFN Catania (Catania, Italy).

8. ***ITHACA – Isotopes for THe Apulian CulturAl heritage*** - POR PUGLIA FESR-FSE 2014/2020 European Social Fund approved with decision C(2015)5854 on 13/08/2015 Asse X – Azione 10.4. "Research for Innovation – REFIN", 2021-2023.
   Role: Principal Investigator from January 2021 to April 2022 (16 months)
   Scientific Referent: Prof. L. Calcagnile, University of Salento (Lecce, Italy).

9. ***HASPIDE – HAmorphous Silicon Pixel Detector for ionizing radiation***, funded by INFN Group V, 2022-2025. Role: Co-investigator from January to April 2022 (4 months).
   National Referent: Prof. L. Servoli, INFN Perugia (Perugia, Italy).

10. ***FTM-NEXT – Fast Timing Micro-Pattern Gas Detectors***, funded by INFN Group V, 2021-2022.
    Role: Co-investigator from January 2021 to April 2022 (16 months).
    National Referent: Dr. Piet Verwilligen, INFN Bari (Bari, Italy).

11. ***Nanostructured heteroprocesses for chemiresistors***, funded by GAČR (Grant National Agency of the Czech Republic), grant number *19-02804S*, 2019-2021.
    Role: Member of the Research Team from January 2019 to December 2020 (24 months).
    Principal Investigator: Prof. M. Vrňata, Czech Academy of Sciences, University of Chemistry and Technology, Prague (Czech Republic).

12. ***Janus nanoparticles for catalysis and membrane processes**,* funded by GAČR (Grant National Agency of the Czech Republic), grant number *18-07619S*, 2018-2020:
    Role: Member of the Research Team from April 2018 to December 2020 (33 months).
    Principal Investigator: Dr. J. Vacík, Czech Academy of Sciences, Nuclear Physics Institute, Řež (Czech Republic).

13. ***Preparation, modification and characterization of materials by radiation**,* funded by GAČR (Grant National Agency of the Czech Republic), grant number *P108/12/G108*, 2012-2018.
    Role: Member of the Research Team from June to December 2018 (8 months).
    Principal Investigator: Prof. A. Mackova, Czech Academy of Sciences, Nuclear Physics Institute, Řež (Czech Republic).

14. ***Improving the outcomes of oesophageal interventions through novel x-ray based imaging methods***, funded by *EPSRC* (*Engineering and Physical Science Research Council, UK*), Grant N. EP/P023231/1, 2017 – 2021.
    Role: Co-investigator from September 2017 to March 2018 (7 months).
    Principal Investigator: Prof. A. Olivo, UCL, University College of London, London (United Kingdom).

15. ***X-ray and EUV nanoscale imaging using compact laser plasma light sources and Fresnel optics***, funded by the *European Union*, under the framework *EXTATIC* (Extreme-ultraviolet and X-ray Training in Advanced Technologies for Interdisciplinary Cooperation) - Erasmus Mundus PhD Programme, 501-125/AT. Role: Executor, i.e. Principal Investigator as PhD candidate, 2014-2017 (36 months).
    Supervisor: Prof. P.W. Wachulak, WAT, Warsaw (Poland);
    Co-supervisor: Prof. L. Pina, Czech Technical University, Prague (Czech Republic).

16. ***"Water window" radiation for nanoimaging of biological objects and three-dimensional electron density reconstruction in bioengineering and material science applications***, funded by the Polish National Centre for Science (Narodowe Centrum Badań i Rozwoju) *OPUS 9* framework, funding number UMO-2015/17/B/ST7/03718, 2015-2017.
    Role: Co-investigator from January 2015 to December 2017 (36 months).
    Principal Investigator: Prof. P. W. Wachulak, Military University of Technology, Warsaw (Poland).

17. ***LASERLAB-EUROPE IV – The Integrated Initiative of European Laser Research Infrastructures**.* Grant agreement number 654148, PRUE 31-375, European Union's Horizon 2020 research and innovation program, EU Framework Programme, 2015-2017.
    Role: Co-investigator from from January 2015 to December 2017 (36 months).
    Principal Investigator: Prof. P. W. Wachulak, Military University of Technology, Warsaw (Poland).

18. ***Extreme ultraviolet (EUV) Microscope with nanometer spatial resolution for applications in modern science and technology***, funded by the Polish National Centre for Research and Development (Narodowe Centrum Badań i Rozwoju) *LIDER*, 4th edition programme – Award number LIDER/004/410/L-4/12/NCBR/2013, 36 months, 2013-2016.
    Role: Co-investigator from September 2014 to November 2016 (26 months).
    Principal Investigator: Prof. P. W. Wachulak, Military University of Technology, Warsaw (Poland).

19. ***Microscopy in the extreme ultraviolet (EUV) and soft X-ray (SXR) region***, funded by the Polish National Centre for Science (Narodowe Centrum Badań i Rozwoju), *SONATA* framework, award number DEC-2011/03/D/ST2/00296, 2012-2015.
    Role: Co-investigator from September 2014 to December 2015 (15 months).
    Principal Investigator: Prof. P. W. Wachulak, Military University of Technology, Warsaw (Poland).

20. ***LASERLAB-EUROPE III – The Integrated Initiative of European Laser Research Infrastructures***. Grant agreement number 284464, PRUE 31-089, European Union, EU Framework Programme, 2012-2015.
    Role: Co-investigator from September 2014 to November 2015 (14 months).
    Principal Investigator: Prof. H. Fiedorowicz, Military University of Technology, Warsaw (Poland).

SCIENTIFIC AFFILIATIONS:

From January 01, 2023 to June 02, 2023:

INFN (National Institute of Nuclear Physics) associated, Bari Section Group. V*, on the project "QUISS - Quantum Imaging with novel sources and sensors. Referent: Prof. M. D'Angelo (University of Bari, Bari, Italy).*

From April 26, 2021 to December 31, 2021:

INFN (National Institute of Nuclear Physics) associated, Lecce Section Group. V*, on the project "Carbon-Based Innovative Materials for Nuclear Physics Applications (C.I.M.A.)". Local Referent: Prof. D. Manno (University of Salento, Lecce, Italy).*

From July 4, 2019 to March 31, 2021:

INFN (National Institute of Nuclear Physics) associated, Catania Section Group. V*, on the project project "Carbon-Based Innovative Materials for Nuclear Physics Applications (C.I.M.A.)", under the supervision of Dr. M. De Napoli.*

TEACHING ACTIVITIES:

Academic Year 2025-2026

- **Lecturer of APPLIED PHYSICS** for Nursing Science students, at the Department of Medicine and Surgery, Kore University of Enna (Enna, Italy) [20 hours of Lectures].

- **Lecturer of APPLIED PHYSICS** for Nursing Science students, at the Department of Medicine and Surgery, Kore University of Enna (Second Site, Located in Caltagirone, Italy) [20 hours of Lectures].

- **Lecturer of APPLIED PHYSICS** for Medicine students, at the Department of Medicine and Surgery, Kore University of Enna (Enna, Italy) [36 hours of lectures].

- **Lecturer of PHYSICS** for Medicine students, for the Postgraduate School of Physical Medicine and Rehabilitation, Department of Medicine and Surgery, Kore University of Enna (Enna, Italy) [7 hours of lectures].

- **Lecturer of FUNDAMENTALS OF DOSIMETRY AND RADIATION PROTECTION at the** Postgraduate School of Hygiene and Preventive Medicine, Department of Medicine and Surgery, Kore University of Enna (Enna, Italy) [7 hours of lectures].

Academic Year 2024-2025

- **Lecturer of APPLIED PHYSICS** for Nursing Science students, at the Department of Medicine and Surgery, Kore University of Enna (Enna, Italy) [20 hours of Lectures].

- **Lecturer of APPLIED PHYSICS** for Nursing Science students, at the Department of Medicine and Surgery, Kore University of Enna (Second Site, Located in Caltagirone, Italy) [20 hours of Lectures].

- **Lecturer of APPLIED PHYSICS** for Medicine students, at the Department of Medicine and Surgery, Kore University of Enna (Enna, Italy) [72 hours of Lectures].

- **Lecturer of FUNDAMENTALS OF DOSIMETRY AND RADIATION PROTECTION** for the Postgraduate School of Hygiene and Preventive Medicine, Department of Medicine and Surgery, Kore University of Enna (Enna, Italy) [7 hours of lectures].

- **Lecturer for Additional Educational Obligations in the "Logic–Mathematics–Physics" areas**, for Medicine and Surgery students, Department of Medicine and Surgery, Kore university of Enna [12 hours of lectures].

Academic Year 2023-2024

- **Lecturer of APPLIED PHYSICS for Nursing Science students**, at the Faculty of Medicine and Surgery of Kore University of Enna (Enna, Italy) [20 hours of Lectures].

- **Lecturer of APPLIED PHYSICS for Medicine students**, at the Faculty of Medicine and Surgery of Kore University of Enna (Enna, Italy) [72 hours of Lectures].

- **Lecturer of Additional Educational Obligations in the "Logic–Mathematics–Physics" areas** for Nursing Science Students and for Medicine and Surgery students at Kore University of Enna (Enna, Italy). The aim of the course was to fill the students' gaps in Mathematics, Logical and Physics principles [12 hours of Lectures].

Academic Year 2021-2022

- **Member of the examination board for the subject of PHYSICS** (SSD FIS/07), at Dipartimento di scienze e tecnologie biologiche e ambientali (Dept. of biological and environmental sciences and technologies), Salento University, for the degree courses of: "Scienze e tecnologie per l'ambiente" (Sciences and technology for the environment), "Scienze Biologiche" (Biology) and "Medicina e Chirurgia" (Medicine and Surgery).
- **Lecture for the XXXVII cycle of Ph.D. in Physics at Messina University** (Messina, Italy) "X-rays and UV detection for plasma diagnostics and nano-imaging", June 23th 2022.

Academic Year 2020-2021

- **Tutor for the subject of PHYSICS** (SSD FIS/07), at Dipartimento di scienze e tecnologie biologiche e ambientali (Dept. of biological and environmental sciences and technologies), Salento University for the degree course of Scienze e tecnologie per l'ambiente" (Sciences and technology for the environment) and "Scienze Biologiche" (Biology). (60 hours)
- **Member of the examination board for the subject of PHYSICS** (SSD FIS/07), at Dipartimento di scienze e tecnologie biologiche e ambientali (Dept. of biological and environmental sciences and technologies), Salento University, for the courses: "Scienze e tecnologie per l'ambiente" (Sciences and technology for the environment) and "Scienze Biologiche" (Biology).
- **Referee for the Bachelor** Thesis in Ottica e Optometria (Optics and Optometry) entitled: *"Abilità visive nello sport" (Visual skills in sport)*. Candidate: Mr. Dell'Anna Lorenzo, Supervisor: Prof. M. A. Gorgoni.
- **Referee for the Bachelor** Thesis in Physics entitled: *"Un sistema accoppiato di fotoni-magnoni in cavità" (A coupled photons-magnons system in cavity)*. Candidate: Mr. Cutrino Roberto Oronzo, Supervisor: Prof. L. Martina.
- **Lecture for the XXXVI cycle of Ph.D. in Physics at Messina University** (Messina, Italy) "*Microscopy techniques and plasma diagnostics in the field of Soft X-Rays and Extreme Ultraviolet radiation employing gaseous sources*", July 9th 2021.
- **Invited speaker** for the public seminar held at **CEDAD** (CEnter for applied physics, DAting and Diagnostics), University of Salento (Lecce, Italy) **"***Microscopy Techniques Based on Gas-Puff Target Sources",* May 20th, 2021.
- **Invited speaker** by the **European Physical Society (EPS)** – Catania Section **"***Innovative Transmission Microscopy Techniques by Means of Gas Sources Based on Gas-Puff Targets",* October 18th, 2020 (online event).

Academic Year 2019-2020

- **Seminars and Lectures at the NPI (Nuclear Physics Instutute) of the Czech Academy of Sciences, Řež (Czech Republic)** about investigations of innovative materials (Graphene Oxide, Multilayers sensors, dosimeters) by IBA.
- **Lecture for the XXXV cycle of Ph.D. in Physics at Messina University** (Messina, Italy) "*Nanoscale imaging employing a compact laser plasma source based on a double stream gas-puff target*", July 13th 2020.

Academic Year 2018-2019

- **Seminars and Lectures at the NPI (Nuclear Physics Instutute) of the Czech Academy of Sciences**, Řež (Czech Republic) about investigations of Cultural Heritages by IBA (Ion Beams Analysis).
- **Lecture for the XXXIV cycle of Ph.D. in Physics at Messina University (Messina, Italy)** "*Silicon Carbide detectors for Laser-Plasma Diagnostics*", October 15th 2019.

Academic Year 2017-2018

- **Seminars and Lectures at the Institute of Optoelectronics (IOE) of the Military University of Technology, Warsaw (Poland)** about short wavelengths microscopy sources and plasma detections employing double stream gas-puff targets.
- **Seminars and Lectures at the IPPLM (Institute of Plasma Physics and Laser Microfusion), Warsaw (Poland)** about Protons acceleration in the TNSA (target normal sheath acceleration) regime by fs lasers.
- **Seminar at the NPI (Nuclear Physics Instutute) of the Czech Academy of Sciences, Řež (Czech Republic)** "*SXR and EUV nanoscale imaging using compact laser plasma sources based on a double stream gas-puff target and Fresnel optics"* – May 4th, 2017.

INSTITUTIONAL ROLES AND ACADEMIC GOVERNANCE

Academic Year 2024–2025

- **Appointed Expert Evaluator** for the Italian National Research Quality Assessment (VQR 2020–2024), Area 2 – Physics Designated by ANVUR (National Agency for the Evaluation of Universities and Research Institutes) List of Evaluators.
- **Coordinator of the Integrated Course** in Physics, Statistics and Informatics Degree Program in Nursing, Kore University of Enna – Caltagirone Campus.
- **Member of the Internship Committee**
  Degree Program in Nursing (L-SNT1), Department of Medicine and Surgery, Kore University of Enna.
- **Member of the Board**
  Postgraduate School of Hygiene and Preventive Medicine, Department of Medicine and Surgery, Kore University of Enna.
- **Promoter of Erasmus+ Teaching Mobility Agreement**
  between the Department of Aerospace Engineering, Military University of Technology (Warsaw, Poland), and the Department of Engineering and Architecture, Kore University of Enna.

Academic Year 2023–2024

- **Member of the Internship Committee**
  Degree Program in Nursing (L-SNT1), Department of Medicine and Surgery, Kore University of Enna

OUTREACH, PUBLIC ENGAGEMENT & UNIVERSITY ORIENTATION ACTIVITIES

I have actively contributed to outreach and orientation initiatives aimed at bridging the gap between secondary education and higher education. My activities include delivering seminars, organizing orientation events, and supporting students in their transition to university life—particularly in the fields of medicine, physics, and scientific research. These efforts have been carried out within nationally

funded programs such as *Orienta 2026*, supported by the European Union (Next Generation EU) and the Italian Ministry of University and Research, and have involved direct engagement with high schools, academic departments, and public science fairs.

Academic Year 2024–2025

- **Lead Lecturer for the course *"Electromagnetic Radiation and Particles: Production, Interaction, Diagnostics and Therapy"*** (15 hours) Delivered as part of the national project *Orienta 2026 – School-to-University Transition Pathways*, funded by the European Union (Next Generation EU) and the Italian Ministry of University and Research. Seminars held between February and May 2025 at the "Majorana-Arcoleo" High School (Caltagirone, Sicily) and the Kore University of Enna.

- **Speaker at the *KORE Open Day 2025*** – Department of Medicine and Surgery, Kore University of Enna (April 10, 2025) Presentation of academic programs and research opportunities to prospective students.

- **Speaker** for the Seminar *Admission Test Preparation for Medical and Nursing Degree Programs* Delivered at multiple high schools and university venues (December 2024 – February 2025), as part of the *Orienta 2026* initiative (CUP: J71I23000070006).

- **Participant at the *Student Orientation Fair*** – "Le Ciminiere" Exhibition Center, Catania (October 10, 2024) Promoted academic offerings in Medicine and Nursing at the Kore University of Enna.

Academic Year 2023–2024

- **Speaker** for the Seminar *Admission Test Preparation* and *Scientific Career Awareness* Delivered at various institutions including the Kore University of Enna, "Napoleone Colajanni" Classical High School (Enna), and "Bonaventura Secusio" High School (Caltagirone). Topics included pathways to medical careers and scientific research engagement. Activities part of *Orienta 2026* (CUP: J71I23000070006), funded by the EU and Italian Ministry of University and Research.

- **Speaker at the *KORE Open Day 2024*** – Department of Medicine and Surgery, Kore University of Enna (March 12, 2024)

- **Participant at the *Student Orientation Fair*** – "Le Ciminiere" Exhibition Center, Catania (October 24, 2023)

Academic Year 2022–2023

- **Contributor fort the *Scientific Degrees Plan (Progetto Lauree Scientifiche, PLS)*** – Interuniversity Department of Physics, University of Bari Supported outreach and engagement activities aimed at promoting STEM disciplines among secondary school students (March 2 and 7, 2023)

OTHER UNIVERSITY ACTIVITIES:

- **Organizer member and Member of the Scientific Commettee for the *"Physics and Engineering Workshop"*,** organized by University of Messina (Italy), MIFT Department, 21 November 2022.

- **Organizer member of the *QUANTUM 2022* Summer School**, organized by University of Bari, Dept. of Physics and held at Trani (Italy), 18-24 September 2022.

- **External Reviewer for ANVUR (National Agency for Evaluation of the University Sistem and Research),** from September 2021 to May 2022.

- **Organizer member and co-operator for the development of the web platform of the *PPLA2017 conference*** (Plasma Physics by Laser Application 2017), held at Messina University (Italy), 5-7 July 2017.

- **Organizer member of the *ALPS workshop*** (I workshop on Application of Laser-Plasma X-ray and EUV sources) held at the Institute of Optoelectronics, Military University of Technology, Warsaw (Poland) 6-9 July 2015.

- **Organizer member of the *EXTATIC workshop*** (Extreme-ultraviolet and X-ray Training in Advanced Technologies for Interdisciplinary Cooperation) held at the Institute of Optoelectronics, Military University of Technology, Warsaw (Poland) 20-24 October 2015.

EDITORIAL EXPERIENCE:

- **Member of the Editorial Advisory Board** for the peer-reviewed – Open Acces Journal *Open Physics* (De Gruyter) I.F. 1.8 – **Associate Editor** for the Section "Plasma physics" (from June 2021). Journal Indexed on SCOPUS and Web of Sciences (WOS).
  https://www.degruyter.com/journal/key/PHYS/html

- **Member of the Editorial Advisory Board** for the peer-reviewed – Open Access Journal *Discover Applied Sciences* (Springer Nature) I.F. 2.8 – Section "Physics/Materials" (from February 2022).
  Journal Indexed on SCOPUS. https://www.springer.com/journal/42452

- **Member of the International Advisory Board and of the Editorial Board** for the peer-reviewed – Open Access *Bullettin of the Military University of Technology* ((ISSN 0366-4988) (from October 2025). https://biuletynwat.pl/

REVIEWER ACTIVITY:

I have served as a scientific reviewer for more than 25 international peer-reviewed journals published by leading academic publishers such as **Elsevier, IOPScience, Springer, Taylor & Francis, MDPI**, and others. My reviewing work has primarily focused on manuscripts in the fields of applied physics, materials science, radiation, and spectroscopic techniques.

The journals, with **Impact Factors ranging from 1.0 to 7.2**, include high-impact titles in environmental chemistry and materials science, as well as **specialized journals in applied physics, instrumentation, optics, and nanotechnology.**

Selected journals with the highest Impact Factors:

- *Journal of Environmental Chemical Engineering* (Elsevier, IF 7.2)
- *Surfaces and Interfaces* (Elsevier, IF 6.3)
- *Measurement* (Elsevier, IF 5.2)
- *Microchemical Journal* (Elsevier, IF 4.9)
- *Materials Chemistry and Physics* (Elsevier, IF 4.7)

Additionally, I have contributed as a reviewer for scientific book proposals submitted to *Elsevier*.

CERTIFICATIONS:

- **Certification of Training on Delta V + Conflo4 + Gasbench** from *TermoFisher scientific*, issued on February 2021.
- **IT Security course** – diploma Issued by INFN (Istituto Nazionale di Fisica Nucleare, National Institute of Nuclear Physics), Catania (Italy), September 2020.
- **Diploma of Intensive Erasmus Course "SARA 2014"** (Safe Applications of RAdiation and radionuclides), Hasselt University (Belgium), February 2014.
- **Training Course on Radiation Protection** - diploma issued by INFN (Instituto Nazionale di Fisica Nucleare, National Nuclear Physics Institute), Catania (Italy), November 2013.
- **Cambridge English Certificate** (*B1 Level*) – License Number: 0041673866, Oxford University, September 2013.

AWARDS:

1. **Best Poster Presentation Award** at SNAIA 2018 (Smart Nanomaterial Advances, Innovations and Applications 2018), Paris, 10-13 Dec. 2018.
   Certificate + £ 50,00 prize from the Royal Academy of Chemistry.
   https://blogs.rsc.org/nr/2019/02/12/congratulations-to-the-prize-winners-at-snaia2018/?doing_wp_cron=1550177750.7013831138610839843750

2. **Travel Grant** (€ 250,00) from the European Microscopy Society to attend the Multinational Congress on Microscopy (MCM 2015), August 23-28, 2015, Eger, Hungary.

3. **Travel Grant** to attend at TriesteNext 2013, European Exhibition of Scientific Research, 27-29 September 2013, Trieste, Italy.

PROFESSIONAL SOCIETIES ASSOCIATIONS:

- **SIF** - Italian Physics Society, from 2010.
- **PSM** - Polish Society of Microscopy, from 2015 to 2017.

- **EMS** - European Microscopy Society, from 2015.
- **E-MRS** - European Materials Research Society, from 2019 to 2021.
- **JČMF** - Union of Czech Mathematicians and Physicists, from 2020 to 2021.
- **ČFS** - Czech Physical Society, from 2020 to 2021.
- **EPS** - European Physical Society, from 2020 to 2022.
- **ANEDbc** – Italian Association for Experts in Diagnostics, Sciences and Technologies applied to Cultural Heritage, from 2021 to 2022.
- **SISM** - Italian Society for Microscopy Sciences, 2021.
- **AIF** – Associazione per l'Insegnamento della Fisica, 2024-2025.

METRICS ***(last update: 26/12/2025)***

GOOGLE SCHOLAR: 203 publications, 1857 citations, h-index 23

https://scholar.google.it/citations?hl=it&user=d-9zrLgAAAAJ

SCOPUS: 187 publications,1617 citations, h-index 20

https://www.scopus.com/authid/detail.uri?authorId=56519604100

WEB OF SCIENCES: 184 publications, 1490 citations, h-index 19

https://www.webofscience.com/wos/author/record/G-6649-2019

ORCID: https://orcid.org/0000-0003-2404-5062