

Paola Perion

Address: [REDACTED]

Place and Date of birth: [REDACTED]

Current position: PhD student in Physics

Institution: University of Trieste

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Education

2022 – Present

PhD in Physics

University of Trieste, Trieste, Italy

Supervisors: Prof. Fulvia Arfelli, Prof. Ralf H. Menk

Conducting research on spectral and phase-contrast X-ray imaging techniques, as part of the SPHERE-X (Spectral PHase REtrieval X-ray imaging) project funded by INFN (section of Trieste). The work focuses on the development and integration of a novel experimental setup at the SYRMEP beamline of Elettra synchrotron in Trieste. This includes hardware configuration of the detection system, and synchronization of the experimental instrumentation for image acquisition. In addition, the project involves image data analysis, simulation-based performance studies, and optimization of image reconstruction and analysis algorithms.

May 2024 –
October 2024

Visiting PhD Student

University of Grenoble Alpes, Grenoble, France

6-month research period at the STROBE laboratory, under the supervision of Research Director Emmanuel Brun. Conducted work on speckle-based phase contrast X-ray imaging, investigating the impact of membrane movement modalities on imaging performance through both numerical simulations and experimental measurements conducted at Xenocs SAS.

- 2020 – 2022 **Master's degree in Physics**
University of Trieste, Trieste, Italy
Master's degree in physics, curriculum of Nuclear and Subnuclear Physics
Thesis title: "Multiple energy absorption edge computed tomography studies with diffraction and detector based spectroscopic systems". Grade: 110/110 cum laude
- 2017 – 2020 **Bachelor's degree in Physics**
University of Trieste, Trieste, Italy
Thesis title: "Valutazione della qualità di immagini in imaging spettrale con radiazione di sincrotrone per la visualizzazione di mezzi di contrasto"
- 2017 **High school Diploma**
Liceo classico e linguistico Francesco Petrarca – Trieste, Italy
Italian-french double diploma (ESABAC)

Other academic activities

Doctoral schools

- February 2023 **Doctoral school on X-ray tomography image processing with deep learning**
Ghent University, Ghent, Belgium
Awarded the *Best Poster Award* for the poster "Development of X-ray spectral systems for functional imaging with synchrotron radiation"
- January 2023 **School on Synchrotron Light Sources and their Applications**
International Centre for Theoretical Physics, Trieste, Italy

Teaching or tutoring activity

- 2023 - 2025 **Supplementary teaching activity for the course 145SM “Radioprotezione nel campo ambientale e lavorativo” (S.S.D. FIS/07) - 3rd year - 2nd semester - Physics bachelor’s degree course**
University of Trieste
Academic Year 2022/2023: 25 hours
Academic Year 2023/2024: 50 hours
Academic Year 2024/2025: 50 hours

Funding

3700 Euro for the Erasmus+ Traineeship program for the six months spent in Grenoble, France as a visiting PhD student

Conferences

- March 2023 “Development of X-ray spectral systems for functional imaging with synchrotron radiation” Poster presentation
18th European Molecular Imaging Meeting (EMIM 2023) – Salzburg, Austria
- September 2023 “Development and comparison of spectral X-ray imaging systems using synchrotron radiation” Speaker
109° Congresso Nazionale SIF – Salerno, Italy
- September 2023 “Spectral micro-CT for simultaneous gold and iodine detection, and multi-material identification” Poster presentation
IMAGING 2023 – Varenna, Italy
- October 2023 Participation to the *Beyond Bones. Applying Innovative Scientific Approaches to Paleontology and Archaeology* symposium in Trieste, Italy
- June 2024 “Spectral phase contrast X-ray imaging with high-resolution detectors” Speaker
International Workshop on Radiation Imaging Detectors (iWoRiD) 2024
- July 2024 Participation to the *Laboratory-based X-ray Phase Contrast Imaging Workshop* in London, UK

- March 2025 "Spectral X-ray μ CT of a CA4+ loaded Osteochondral Sample with a Dual-Detector Imaging System" Speaker
20th European Molecular Imaging Meeting (EMIM 2025) – Bilbao, Spain
- May 2025 Participation to the *12th AAMP Meeting & EFOMP School* in Trieste, Italy
- July 2025 Participation to the *Advancements in High-Resolution Imaging Using Next-Generation Light Sources* symposium in Trieste, Italy
- September 2025 Accepted as speaker with "A Dual-Detector X-ray Micro-Tomography System for simultaneous Spectral and Phase contrast Imaging"
IMAGING 2025 – Varenna, Italy

Publications

Perion, P., et al. "Spectral micro-CT for simultaneous gold and iodine detection, and multi-material identification." *Journal of Instrumentation* 19.04 (2024): C04023.

Brombal, L., et al. "Edge-illumination spectral phase-contrast tomography." *Physics in Medicine & Biology* 69.7 (2024): 075027.

Perion, P., et al. "A high sensitivity wide bandwidth spectral system for multiple K-edge imaging." *Journal of Physics D: Applied Physics* (2024).

Perion, P., et al. "Spectral phase-contrast X-ray imaging with high-resolution detectors." *Journal of Instrumentation* 20.06 (2025): C06056.

Skills

Programming & Software

MATLAB, Python, ImageJ (extensive use)

LabVIEW, Mathematica, C++, Geant4 (previous experience)

Data Analysis & Image Processing

Spectral and phase contrast X-ray image processing, numerical simulations

Instrumentation & Experimental Techniques

Detector and experimental instrumentation for imaging setups, data acquisition coordination, experimental control

Knowledge of NIM and VME electronics from the university course *Laboratorio di Fisica Nucleare e Subnucleare*, part of the Master's degree in Physics

Languages

Italian (mother tongue)

English (advanced)

French (intermediate)

Spanish (intermediate)

Place and date:

Trieste, 15/07/2025

Firma

