PhD Student in Physics

Viola Ferretti

+39 346 9585109

viola.ferretti4@unibo.it

I studied Physics, specializing in Condensed Matter. I am currently a PhD student in Physics at the University of Bologna, where I study metallic alloys for hydrogen storage and purification.

Education and Training

PhD in Physics *University of Bologna* — Nov. 2024 – Present

PhD focused on the study of nanomaterials for hydrogen-based energy storage. My work is partly experimental, aimed at synthesizing and characterizing new materials, and partly computational, predicting the dynamic properties of hydrogen in metals using Machine Learning methods.

Master's Degree in Condensed Matter Physics *University of Bologna* — 2022/23 – 2023/24

"Materials Physics and Nanoscience" curriculum, with courses and exams in English. Focused on the physico-chemical properties of materials and radiation-matter interaction, through both theoretical lessons and lab work. Final exam held on 20/09/2024 with the thesis "Synthesis and Characterization of TiFe(1-x)Ni(x) Intermetallic Hydrides for Hydrogen Storage", supervised by Prof. Luca Pasquini, graduating with 110/110 cum laude.

Bachelor's Degree in Physics *University of Perugia* — 2018/19 – 2020/21

The course included mathematics (analysis and geometry), physics (classical mechanics, thermodynamics, and quantum mechanics), and laboratory activities. Graduated 22/04/2022 with 110/110 cum laude, thesis "Dynamic Transition of Poly(N-isopropylacrylamide)", supervised by Prof. Andrea Orecchini.

Scientific High School *Liceo Galileo Galilei, Perugia* — 2013/14 – 2017/18

Bilingual high school with French as first foreign language and English as second. Obtained ESABAC dual diploma in 2018:

- Italian diploma: 100/100
- *Baccalauréat*: *mention très bien*

Research Experience

Internship Program *University of Bologna* — 22/01/2024 – 02/08/2024

Internship supervised by Prof. Luca Pasquini. The aim was to learn how to develop and conduct scientific research in materials physics. In particular, TiFe alloys with partial substitution of Fe by Ni were synthesized and characterized. Structure and composition were analyzed by Scanning Electron Microscopy and X-ray Diffraction, while hydrogen absorption/desorption kinetics and thermodynamics were studied with a Sieverts apparatus and Differential Scanning Calorimetry.

Schools and Conferences

Gordon Research Conference *Les Diablerets (CH)* — 21 – 27/06/2025

The conference, preceded by two days of seminar, was titled "Hydrogen-Metal Systems". The Gordon Research Seminar is dedicated to young researchers (PhD students and postdocs), offering opportunities to present their work, discuss new methodologies and innovative ideas, and build collaborations. The Gordon Research Conference on Hydrogen-Metal Systems is an international scientific conference focused on cutting-edge and unpublished research, with talks from experts worldwide and discussion of recent developments. Both events focused on fundamental aspects of hydrogen-material interactions, with particular attention to new applications. I presented my research results on Ti-Fe-Ni metallic hydrides.

International Student Summer Programme *ESRF-ILL facility, Grenoble (FR)* **3-29/09/2023**

Organized by the European Synchrotron Radiation Facility (ESRF) and the Institut Laue-Langevin (ILL). Included a 20-hour introductory course on fundamental concepts of X-rays and neutrons and their applications in science, and a supervised internship in one of the local research groups. For my project, I worked with the Large Scale Structures group at ILL, using Dynamic Light Scattering to study chitosan-surfactant solutions. Results were presented in "Physico-chemical characterization of chitosan-surfactant mixtures".

SISN Summer School *Verona* **7-15/09/2022**

Organized by the Italian Society of Neutron Spectroscopy (SISN). Divided into two parts: theory and exercises (32.5 hours) and experimental data analysis (16 hours). At the end, I presented the project "Phonons and magnons in α-phase solid oxygen", which was awarded as best presentation of the school.

Other Activities

Teaching Credits **2022**

Attended and passed the courses "Education Technologies" and "Cultural Anthropology" at the University of Perugia.

Competitive Swimming **2008-2018**

Practiced competitive swimming with the Libertas Rari Nantes team in Perugia.

Languages

Italian: Native
English: C1
French: B2

Digital Skills

Office^{TM}
C++
Python
MatLab