CURRICULUM VITAE

Matteo Marchesini

Born in Bologna, Italy

27 October 1993

email matteo.markesini@gmail.com
m.marchesini@unibo.it
address Via Nazionale 117, Pianoro, Italy
phone +39 329 129 6693

IT SKILLS

Microsoft Windows, Linux;
LaTeX, `Python`, MATLAB, LabVIEW
Origin, `C/C++`, Julia

LANGUAGES

Italian mother tongue
English C1, IELTS 8.0
French B2

EDUCATION

University of Bologna — Nov 2021–Present

Ph.D. in Physics

Topics: Experimental Physics of Cold Atoms & Photonics

Supervisors: Prof. F. Minardi, Prof. M. Prevedelli

My PhD research is part of the european project $CRYST^3$, which aims at realising innovative prototypes for trapping and cooling atoms based on Hollow Core Fieres, for quantum sensing and computation applications. In particular, I work at developing an experimental proof of concept for cooling Rb atoms and efficiently loading them in a fibre. To do so I am gaining practical experience in Ultra-High-Vacuum and Laser-Cooling techniques for alkali atoms.

University of Bologna — Oct 2016–Mar 2021

M.Sc. in Physics 109/110 · *Curriculum*: Materials Physics

Main subjects:

- Solid State Physics
- X-ray interaction with matter
- Materials Thermodynamics and Kinetics
- Magnetic properties of materials
- Material Science Laboratory

University of Bologna — Oct 2012–Mar 2016

B.Sc. in Physics 100/110

Thesis title: Temperature PID Control System, realised with LabVIEW and Arduino Board
Supervisors: Prof. L. Pasquini, Dr. F. M. Giorgi

Liceo Scientifico Statale "E. Fermi" — 2007–2012

High School Diploma 88/100

Scientific High School of Bologna, Italy

M.SC. THESIS

Title Plasmon Decay Dynamics in Hybrid Metal/Doped-semiconductor Nanostructures

Supervisors Prof. L. Pasquini, Prof. A. Baldi

Short description In this thesis I investigated the inter-band states of Vanadium-doped TiO_2 thin films, using plasmonic nanoparticles as probes. I obtained qualitative evidence of the interaction between nanoparticles and dopant states, and also hints to the possibility of using such nanostructures to improve the photocatalytic properties of wide-bandgap semiconductors.

REFERENCES

Prof. F. Minardi
University of Bologna
Ph.D. Supervisor
francesco.minardi@unibo.it

Prof. M. Prevedelli
University of Bologna
Ph.D Co-supervisor
marco.prevedelli@unibo.it

Dr. A. Bertoldi
Institut d'Optique, LP2N
Internship Supervisor
andrea.bertoldi@institutoptique.fr

Dr. F. Benabid
Xlim : Institut de Recherche
Internship Supervisor
f.benabid@xlim.fr

Dr. B. Debord
Xlim : Institut de Recherche
Internship Tutor
benoit.debord@xlim.fr

INTERNSHIPS

Institut d'Optique, LP2N — Feb 2023–Present

Internship Doctoral internship in the *cold atoms* group of Dr. Bertoldi, within the $CRYST^3$ european project. In this period I am currently working as laboratory technician, with the she scientific goal to load cold *Rb* atoms inside hollow core fibres, to perform superradiance experiments. The main focus of the internship is to provide experimental and technological expertise in ultra-high-vacuum (UHV) techniques, while gaining experience in atom trapping, cooling and loading them in a fibre using dipole traps. The internship is being carried out with the participation of the company *ALPhANOV*.

Xlim : Institut de Recherche — Jan–Feb 2023

Internship Doctoral internship in the *Gas-Phase Photonic and Microwave Materials Group (GPPMM)* of Dr. Benabid, within the $CRYST^3$ european project. In this period I gained theoretical and experimental knowledge in novel types of hollow core photonic crystal fibres (HCPCF). I focused on the theory behind the "photonic bandgap" and "inhibited coupling" light-guiding mechanisms, and gained practical experience in working with such fibres coupled with visible and IR light. The internship was carried out with the participation of the company *GLOphotonics*.

Dutch Institute For Future Energy Research (DIFFER) — Mar–Dec 2020

Internship Master thesis preparation carried out with the *Nanomaterials for Energy Applications (NEA)* research group of Prof. Baldi. During this period I gained laboratory experience in UV-VIS-IR spectroscopy, XRD and XRR, ellipsometry, and dark field microscopy. I became progressively more independent in carrying out my research project, while maintaining constant interactions and providing reciprocal help with fellow and external researchers.

REFERENCES (CONTINUES)

Prof. L. Pasquini
University of Bologna
M.Thesis Supervisor
luca.pasquini@unibo.it

Prof. A. Baldi
Vrije Universiteit Amsterdam
M.Thesis Co-supervisor
a.baldi@vu.nl

Dr. F. A. A. Nugroho
Vrije Universiteit Amsterdam
M.Thesis Tutor
f.a.a.nugroho@vu.nl

WORK EXPERIENCE

University of Bologna, DIFA — Oct–Dec 2022

Tutor Laboratory technician for the *Laboratorio di Elettromagnetismo e Ottica* (*Electromagnetism and Optics Laboratory*) B.Sc. course of Prof. L. Pasquini, performed using LabView software, National Instruments and Arduino hardware.

University of Bologna, STAT — Nov–Dec 2022

Tutor Tutor for the *Mathematics II* B.Sc. course of Prof. A. Brini, presenting and solving multivariate calculus problems to students in presence, using a blackboard.

University of Bologna, DIFA — Jan–Jun 2022

Tutor Assistant in the preparation of the *Officina Laboratorio* (*Laboratory Workshop*) summer-school project of Prof. L. Fabbri.

University of Bologna, DIN — Feb–May 2022

Tutor Assistant in the preparation of the exams of the *Fisica Generale T-B* (*General Physics - Electromagnetism*) B.Eng. course of Prof. F. Vazza.

Self-employed — May 2016–Sep 2019; May–Oct 2021

Tutor Private tutor of General Physics and Calculus for high-school and B.Eng. students.

SEMINARS & CONFERENCES

Quantum Mixtures of Ultracold Atomic Gases — Sep–Oct 2022

Les Houches School of Physics

Two-weeks-long Predoc school focused on Laser cooling and trapping, Ultra-cold collisions, Quantum gases and superfluidity, and Optical lattices. An insight on Quantum mixtures in a quite general sense was also given, through a series of lectures on topology, Fermion superfluidity and polarons, dynamics of quantum mixtures and quantum droplets, quantum molecules, and on quantum interferometry.

Quantum Sensing, Information Processing and Computing — Jul 2022

University of Bologna

Summer school on quantum technologies and their applications; acted as Tutor during workshops aimed at tackling the problematics of explaining core concepts of the Second Quantum Revolution to the general public.

CHemistry As INnovating Science (CHAINS) — Dec 2020

Dutch Research Council (NWO)

Conference on the latest and future innovations in chemistry, with focus on: chemistry of life and of materials, chemical conversion, fundamental chemistry.

Bologna International School on NANOmaterials Physics — Jun 2018

University of Bologna

Summer school on state-of-the-art experimental techniques and research concerning nanomaterials.

IPP Summer University for Plasma Physics and Fusion Research — Sep 2017

Max-Planck-Institut für Plasmaphysik

Summer school on plasma physics and its application to fusion reactors.

Italia – Romania: together for scientific excellence — Feb 2011

Liceo Scientifico Statale "E. Fermi", Bologna

High school students exchange program on cryptography & advanced mathematics.

Date: 12 May 2023