Stefano Vigneri

Profile

I am a physicist with wide-ranging interests in different fields of condensed matter physics, with a focus on quantum systems of electrons and atoms. During my studies I have worked with international teams and I have had the opportunity to experience several branches of Physics. For instance, I have explored the surface science field and I worked with techniques such as Scanning Tunneling Microscopy, Scanning Tunneling Spectroscopy and X-Ray Photoelectron Spectroscopy. I have also explored the quantum simulation and ultracold atoms branches working with lasers, optical lattices and optical dipole traps. During my career I have had the chance to have experience of Python simulations as well as design and building of experimental setups. I have good social skills and I can easily integrate into new work environments. I am an enterprising and creative person and I love challenging myself engaging in new and stimulating tasks.

Personal information

Education

04/2020–03/2023 **Master degree in Condensed Matter Physics**, *University of Trieste*, Italy
Mark: *110/110 cum laude*

09/2016–04/2020 **Bachelor degree in Physics**, *University of Trieste*, Italy
Mark: *110/110 cum laude*

09/2011–07/2016 **Scientific high school diploma**, *Scientific High School "Pietro Farinato"*, Enna, Italy
Mark: *100/100 cum laude*

Experience

Master thesis

Title	*Realization of an accordion optical lattice for trapping ytterbium atoms in two dimensions*
Supervisor	Prof. Francesco Scazza
Facility	ArQuS (Artificial Quantum Systems) Laboratory, CNR-INO, Trieste, Italy
Techniques	Optical tweezers, Optical lattices, Dipole trapping, Python programming

TRIESTE 04/06/2023

Main activities
- Design and Python simulations of the optical setup necessary to realize an accordion optical 1D lattice useful for trapping and squeezing ytterbium ultracold atoms by laser radiation
- Building of the designed optical setup and laser beams shaping
- Characterization of the realized optical accordion stability and of laser intensity noise
- Design of some experimental setup's components

Timeline 06/2022-03/2023

Internship at ArQuS Laboratory

Title *Design and characterization of a movable cold atom vacuum setup*

Supervisor Prof. Francesco Scazza

Main activities
- Individuation of the optimal system able to make a cold atom vacuum setup movable and characterization of its positioning repeatability

Timeline 06/2022-07/2022

Project for Condensed Matter Laboratory

Title *Vibrational features of carbon monoxide adsorbed on Ir(111) surface*

Supervisor Prof. Alessandro Baraldi

Facility SuperESCA beamline, Elettra Sincrotrone Trieste, Italy

Techniques HR-XPS

Main activities
- Determination of the adsorption sites of carbon monoxide on Ir(111) surface and study of its molecular vibrational structure by High-Resolution X-Ray Photoelectron Spectroscopy

Timeline 04/2020-05/2020

Bachelor thesis

Title *Study of CO adsorption at low temperature on nitrogen-doped graphene using scanning tunneling microscopy*

Supervisors Prof. Giovanni Comelli, Dr. Alessandro Sala

Facility STRAS (Surface sTructure and Reactivity at the Atomic Scale) Laboratory, CNR– IOM, Trieste, Italy

Techniques STM, STS

Main activities
- Acquisition and analysis of Scanning Tunneling Microscopy and Spectroscopy data for the adsorption of carbon monoxide on nitrogen-doped graphene under low temperature and low pressure conditions

Timeline 11/2019-04/2020

TRIESTE 04/06/2023

Publications

[1] Stefania Baronio, Valeria De Leo, Ginevra Lautizi, Paola Mantegazza, Eleonora Natale, Manuel Tuniz, Stefano Vigneri, Luca Bignardi, Paolo Lacovig, Silvano Lizzit, and Alessandro Baraldi. Vibrational Fine Structure in C 1s High-Resolution Core-Level Spectra of CO Chemisorbed on Ir(111). *The Journal of Physical Chemistry C*, 126(3):1411–1419, 2022.

Honours and awards

AY 2018/2019 **Scholarship** for academic merit
University scholarship for children of members of the "Gestione unitaria delle prestazioni creditizie e sociali" - INPS

AY 2016/2017 - AY 2017/2018 **Scholarships** for academic merit
University scholarships for fiscally dependent children of INPS' employees - INPS

Attended conferences, seminars and schools

09 – 12/05/2023 **Quantum-NEST School**, *International School on Quantum Science and Technology*
International Centre for Theoretical Physics (ICTP), Trieste, Italy

Languages

Italian Native
English Fluent

Computer skills

Platforms Windows, UNIX (Linux)
Languages Python, Fortran 90
Software Igor Pro, Gwyddion, Office programs, Autodesk Inventor (CAD), ROOT, LaTeX

Other hard skills

- Data interpretation and analysis
- Scientific writing and scientific presentation

Soft skills

Research experience in multi-language team:

- Teamwork
- Networking
- Communication skills
- Problem solving
- Capacity to plan and organise
- Adaptability
- Creativity

TRIESTE 04/06/2023

- Attention to detail

Personal interests

Music Clarinet advanced pre-AFAM certification at the Istituto Superiore di Studi Musicali "Vincenzo Bellini" di Caltanissetta (2015)

Sports Bodybuilding, Volleyball

References

Prof. Francesco Scazza

Position Associate Professor, Department of Physics, University of Trieste, Italy

Research Area Condensed Matter Physics

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E-mail

Dr. Alessandro Sala

Position Staff Researcher, Level III, CNR-IOM, Trieste, Italy

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FIRMA

TRIESTE 04/06/2023