
Personal profile

I'm a first year phd student in Experimental Condensed Matter at Università di Roma La Sapienza. I'm most involved in Condensed Matter physics. I'm particularly interested in plasmonic and semiconductor nanomaterials.

Education

- Nov. 2020-Present **Phd in Physics**, *Università di Roma La Sapienza*, Department of physics.
- Sep. 2018 - Oct. 2020 **Master Degree in Physics with 110/110 cum laude**, *Università di Roma La Sapienza*, Department of Physics.
Curriculum in Condensed Matter Physics focused on Experimental condensed matter physics, Near and Far field spectroscopy.
Thesis advisors: Prof. Michele Ortolani and Prof. Leonetta Baldassarre.
Thesis Title: Near-field spectroscopy investigation of the strong coupling between an infrared nanoantenna and a semiconductor quantum well.
Thesis description: In my thesis work i have studied the strong coupling regime between a plasmonic excitation of a patch antenna and an intersubband transition in a quantum well. I have carried out this study on the single resonator using a near-field spectroscopy technique based on photothermal expansion, generated by a mid-infrared tunable quantum cascade laser focused on the tip of an atomic force microscopy probe.
- 22 Oct. 2018 **Bachelor's Degree in Physics with 108/110** , *Università di Roma La Sapienza*, Department of Physics.
Thesis Title: Formazione delle bande energetiche nei solidi: il caso del silicio esagonale. Advisor: Prof. Paolo Postorino.
- Oct. 2011- Jul. 2015 **High School**, *Liceo Scientifico Plinio Seniore*, Via Montebello, 122, 00185 Roma RM, Final grade: 100/100.

Awards

- July 2020 Winner of the grant "Borsa di studio coniugi Ernesto e Iole DE MAGGI" called by Fondazione Sapienza

Research Experience

- Nov 2020-Present **PhD project**, *Università di Roma La Sapienza, Department of Physics.*, During my PhD, in addition to continuing my master's thesis work, I am dealing with the experimental study of two-dimensional Van der Waals materials (graphene, transition metal dichalcogenides) both in their crystalline form (bulk) and in their form of single layer of atoms through near infrared Raman spectroscopy. The PhD project is supervised by Prof. Leonetta Baldassarre.
- Mar 2020 Oct 2020 **Thesis Project**, *Università di Roma La Sapienza, Department of Physics.*, I studied the strong coupling regime between light (plasmonic resonance in a nanoantenna) and matter (intersubband transition in a quantum well) using the near field spectroscopy investigation technique called photothermal induced resonance. The study was performed under the supervision of Prof. Michele Ortolani and Prof. Leonetta Baldassarre .

Apr. 2019 - Jun. 2019 **Laboratory Project**, *Università di Roma La Sapienza, Department of Physics.*, I worked in the research group led by Prof. Michele Ortolani and Prof. Leonetta Baldassarre. The aim of the project was to study the presence of nanoplastic inside the sea-water. In order to do that we tried both far field spectroscopy (FTIR) and Near-Field spectroscopy (AFM-IR) which allowed us to go beyond the diffraction limit. Supervisors: Prof. Michele Ortolani and Prof. Leonetta Baldassarre..

Conference Paper

Aug 2021 **Infrared millimeter and terahertz waves**, *Poster presentation: "Mid-infrared Nano-imaging Of Current Patterns In Patch Antenna Resonators".*

Tutor Activity

Private lessons in math and physics for both high school and university students.

Digital Skills

Knowledge of C and Matlab. Ability in using LaTeX, Scidavis (data analysis software), Analysis (topographical image, spectra), Gwyddion (a data visualization and processing tool for scanning probe microscopy and profilometry data, useful also for general image and 2D data analysis), Igor Pro, Office package.

Languages

Italian Native
English Professional level

Personal Interest

I play agonistic waterpolo since i was 8.

Simone Sotgiu Roma, 22/07/2020

Simone Sotgiu