Simone Sotgiu

Email address: simone.sotgiu@uniroma1.it

ABOUT ME

I'm a research fellow in Experimental Condensed Matter at Università di Roma La Sapienza, where i have joined the group led by prof. Leonetta Baldassarre. I'm particularly interested in the opitcal response semiconductor nanomaterials, especially in the infrared regime. During my PhD i have studied two-dimensional materials by means of Raman and photoluminescence spectroscopy. In particular, I have developed a micro-Raman set-up working at 1550 nm (0.8 eV) excitation energy to probe the resonance Raman response of infrared bandgap materials. Moreover, I have customized an external micro-Raman/PL set-up working at 1064 nm excitation energy (1.16 eV) allowing helicity-resolved measurements in the infrared, to probe the valley degree of freedon of low energy bandgap semiconductors.

EDUCATION AND TRAINING

01/02/2024 – 31/10/2024 Rome, Italy
POST DOC Sapienza, University of Rome

01/11/2020 – 31/01/2024 Roma, Italy
PHD STUDENT Sapienza, University of Rome

Field of study Field unknown │ **Final grade** Cum Laude │

Thesis To the Infrared and Beyond: Resonance Raman Spectroscopy with Infrared Excita- tion Energy to Study Scattering Processes in Layered Materials

01/09/2018 – 23/10/2020 Roma, Italy
MASTER DEGREE IN PHYSICS (M.SC) Sapienza, University of Rome

- Near field spectroscopy
- Plasmonic antennas
- Semiconductors quantum wells
- Far field infrared spectroscopy (FT-IR)

Final grade 110/110 cum Laude │

Thesis Near-field spectroscopy investigation of the strong coupling between an infrared nanoantenna and a semiconductor quantum well.

09/2015 – 11/2018 Roma, Italy
BACHELOR DEGREE IN PHYSICS Sapienza, University of Rome

09/2011 – 07/2015 Roma, Italy
HIGH SCHOOL DIPLOMA Liceo scientifico Plinio Seniore

WORK EXPERIENCE

03/2022 – 06/2022 Roma, Italy
CLASSROOM TUTOR

Tutor for Classical Mechanics Classes, Università di Roma La Sapienza, Faculty of Civil and Industrial Engineering

LANGUAGE SKILLS

Mother tongue(s):   **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	B2	B2	B2	B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Matlab/Simulik │ LaTeX (very good) │ Microsoft Office package: Microsoft Word, Excel, PowerPoint, Access

PUBLICATIONS

2024
Polarization-resolved surface-enhanced infrared spectra with nanosensors based on self-organized gold nanorods

R. Polito, S. Sotgiu,...,and MC Giordano. JEOS-RP , 20(1), 15 (2024)

2024
Infrared Resonance Raman of Bilayer Graphene: Signatures of Massive Fermions and Band Structure on the 2D Peak

L. Graziotto,..,S. Sotgiu,...,and L. Baldassarre.Nano Letters 2024, 24, 6, 1867–1873 (2024)

2023
Mid-infrared photocurrent nano-spectroscopy exploiting the thermoelectric effect in graphene.

T. Venanzi,..,S. Sotgiu,.. and Ortolani, M. (2023). Applied Physics Letters, 123(15).

2023
Probing enhanced electron-phonon coupling in graphene by infrared resonance Raman spectroscopy.

T. Venanzi,..,S. Sotgiu,.. and Baldassarre, L. (2023). Physical Review Letters, 130(25), 256901.

2022
Raman scattering with infrared excitation resonant with the MoSe2 indirect band gap.

S. Sotgiu et al. (2022). Physical Review B, 106(8), 085204.

2022
Detection of Strong Light–Matter Interaction in a Single Nanocavity with a Thermal Transducer.

Malerba, M., Sotgiu, S.,... and Colombelli, R. (2022).ACS Nano 2022.

CONFERENCES AND SEMINARS

09/2024 – 09/2024 Heidelberg (Germany)
Wonton 2024

Oral Presentation:"Probing Enhanced ElectronPhonon Coupling in Graphene by Infrared Resonance Raman Spectroscopy"

05/2024 – 05/2024 Aachen (Germany)
Seminar Talk

Seminar Talk:"To the infrared and beyond: Resonance Raman Spectroscopy with infrared excitation energy to study scattering processes in layered materials".

09/2023 Rome
Nanoinnovation 2023

Oral Presentation:"Probing enhanced electron-phonon coupling in graphene by infrared resonance Raman spectroscopy

05/2023 St. Poltzen
Low-Energy Electrodynamics in Solids 2023

Poster presentation (two contributions): "Raman scattering with infrared excitation resonant with the $MoSe_2$ and $MoTe_2$ indirect band gap" and "Detection of Strong Light–Matter Interaction in a Single Nanocavity with a Thermal Transducer".

09/2022 Rome
Nanoinnovation 2022

Oral Presentation:"Near-Field spectroscopy investigation of the strong coupling between an infrared nanoantenna and a semiconductor quantum-well".

07/2022 Vancouver Island
Near Field Optics (NFO16)

Oral presentation:"Photothermal expansion nanoscopy of the strong coupling between a patch antenna and a semiconductor quantum well".

07/2022 Turin
Plasmonica

Poster presentation:"Raman Scattering with infrared excitation resonant with $MoSe_2$ indirect band gap".

06/2022 Trento
Italian Conference in Optics and Photonics (ICOP),

Pitch Talk and Poster presentation:"Near-Field Spectroscopy investigation of the strong coupling between an infrared nanoantenna and semiconductor quantum well".

09/2021 Rome
Nanoinnovation 2021

Oral Presentation :" Raman Scattering at Infrared Energies of Extremely Thin Semiconductors".

- ● **PROJECTS**

2022 – 2023
Studio Raman risonante delle proprietà elettroniche e vibrazionali di materiali bidimensionali con energia di eccitazione nel regime infrarosso

---

Studio Raman risonante delle proprietà elettroniche e vibrazionali di materiali bidimensionali con energia di eccitazione nel regime infrarosso, "Avvio alla Ricerca 2022", 2000 euros

- ● **HONOURS AND AWARDS**

06/2022
Best Poster – Italian Conference on Optics and Photonics (ICOP2022)

Best Poster presentation in the topic of Nano and Quantum Science

03/2022
Best undergraduate master thesis – SIOF

Winner of SIOF (Società Italiana di Ottica e Fotonica) award for best undergraduate master
thesis on plasmonics and nanoptics

07/2020
Grant "Borsa di studio Ernesto e Iole De Maggi" – Fondazione Sapienza

---

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

Autorizzo il trattamento dei dati personali nel CV secondo D. Lgs. 196/2003 e Regolamento UE 2016/679

Roma , 11/11/2024