



Oscar Ruiz-Cigarrillo

Ph.D. Photonics



July 13th 1993



San Luis Potosí, México



+52 4442384382



Oscar's Web



ruizoscar.1393@gmail.com

Skills

Linux, MacOS

DFT packages

Python

Fortran

L^AT_EX

C++

Julia

C

Mathematica

MATLAB

Languages

English

Spanish

Education

- 2017-2021 **PhD in Applied Science (Photonics Physics)**
Universidad Autónoma de San Luis Potosí, México
“Coupled Quantum Wells as a Novel Source of Optical Anisotropies in Nanostructured Systems”
- 2015-2017 **Master degree in Applied Science (Photonics)**
Universidad Autónoma de San Luis Potosí, México
“Growth and Characterization of Semiconductor Optical Microcavities”
- 2011-2015 **Bachelor degree in physics engineering**
Universidad Autónoma de San Luis Potosí, México

Publications

- 2017 **Optical detection of graphene nanoribbons synthesized on stepped SiC surfaces**
L.F. Lastras-Martínez, J. Almendarez-Rodríguez, G. Flores-Rangel, N.A. Ulloa-Castillo, **O. Ruiz-Cigarrillo**, C.A. Ibarra-Becerra, R. Castro-García, RE Balderas-Navarro, M.H. Oliveira, JMJ Lopes.
Journal of Applied Physics, 122(3), 035701, 2017.
- 2017 **Microscopic optical anisotropy of exciton-polaritons in a GaAs-based semiconductor microcavity**
L.F. Lastras-Martínez, E. Cerda-Méndez, N. Ulloa-Castillo, R. Herrera-Jasso, L.E. Rodríguez-Tapia, **O. Ruiz-Cigarrillo**, R. Castro-García, K. Biermann, P.V. Santos.
Physical Review B, 96(23), 235306, 2017.
- 2019 **Differential reflectance contrast technique in near field limit: Application to graphene**
L.F. Lastras-Martínez, D. Medina-Escobedo, G. Flores-Rangel, R.E. Balderas-Navarro, **O. Ruiz-Cigarrillo**, R. Castro-García, M. del P. Morales-Morelos, J. Ortega-Gallegos, M. Losurdo.
AIP Advances, 9(4), 045309, 2019.
- 2021 **Optical contrast in the near-field limit for structural characterization of graphene nanoribbons**
G. Flores-Rangel, L.F. Lastras-Martínez, R. Castro-García, **O. Ruiz-Cigarrillo**, R.E. Balderas-Navarro, L.D. Espinosa-Cuellar, A. Lastras-Martínez, J.M.J. Lopes.
Applied Surface Science, 536, 147710, 2021.
- 2021 **Optical anisotropies of asymmetric double GaAs (001) quantum wells**
O. Ruiz-Cigarrillo, L.F. Lastras-Martínez, E.A. Cerda-Méndez, G. Flores-Rangel, C.A. Bravo-Velázquez, R.E. Balderas-Navarro, A. Lastras-Martínez, N.A. Ulloa-Castillo, K. Biermann, P.V. Santos.
Physical Review B, 103(3), 035309, 2021.
- 2022 **Photoluminescence of Double Quantum Wells: Asymmetry and Excitation Laser Wavelength Effects**
Carlos Alberto Bravo-Velázquez, Luis Felipe Lastras-Martínez, **Oscar Ruiz-Cigarrillo**, Gabriela Flores-Rangel, Lucy Estefanía Tapia-Rodríguez, Klaus Biermann, Paulo Ventura Santos.
physica status solidi (b), 259(4), 2100612, 2022.
- 2023 **Spin relaxation of conduction electrons in coupled quantum wells**
C. A. Bravo-Velázquez, L.F. Lastras-Martínez, **O. Ruiz-Cigarrillo**, G. Flores-Rangel, L. E. Tapia-Rodríguez, K. Biermann, P. V. Santos.
Phys. Rev. B, 108(4), 045306, 2023.



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Awards

- 2015 Master Degree, CONACYT fellowship
- 2017 Ph.D. Degree, CONACYT fellowship
- 2017 Third place, Research level in the poster competition Teaching and Research 2017 "Fis. Candelario Pérez Rosales", XVII Week
- 2018 Third place, Research level in the poster competition Teaching and Research 2018 "Fis. Candelario Perez Rosales", XVIII Semana.
- 2022 Second place, Teaching level in the poster competition Teaching and Research 2018 "Fis. Candelario Perez Rosales", XXII Semana.

Projects

- 2024-2025 [Advanced Analysis of Optical and Magnetic Properties in Nanostructures](#)
Laboratorio Nacional de Supercómputo del Sureste de México (LNS)
100,000 core-hours

Academic Experience

- 2017 [Complex Variable, Electromagnetism](#)
UASLP
Assistant Professor
- 2017 [Creating and Editing Scientific Documents in LaTeX: Basic Course Complex Variable, Electromagnetism](#)
UASLP
Course
- 2017 [Physics](#)
Secondary Education
Professor
- 2019-present [Physics Introduction, Physics 1, Thermodynamics](#)
Universidad Politécnica de San Luis Potosí
Professor

Programming Experience

Experienced in software development with a focus on two key areas. Firstly, proficient in using DFT (Density Functional Theory) code calculators to investigate semiconductor properties like electronic, magnetic, and optical characteristics. Skilled in *Python*, *Julia*, and *Fortran* to create efficient computational tools.

Secondly, adept at developing codes for experimental projects, including instrumentation interfaces and data analysis. Successfully bridging the gap between theoretical simulations and practical laboratory work.

I also take pride in being the creator of an institutional repository for the [Nanophotonics group](#) at the Instituto de Investigación en Comunicación Óptica, Universidad Autónoma de San Luis Potosí .

- 2018 [cqws-codes](#)
Solution of 1D Schrodinger equation in Coupled Quantum Wells
<https://github.com/NanophotonIIC0s/cqws-codes>
- 2018 [bash-scripts](#)
This repo holds the bash scripts tools used in this research group
<https://github.com/NanophotonIIC0s/bash-scripts>
- 2022 [bash-scripts](#)
This repository contains O. Ruiz-Cigarrillo's PhD Thesis
<https://github.com/RUC013/ruco-phd-project>
- 2022 [atomistiico](#)
Repository to analyzing atomistic simulations from DFTs and many-body quantum models. This repository is developed as Aislinn's bachelor thesis.
<https://github.com/NanophotonIIC0s/atomistiico>



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2022

[iico-spectra](https://github.com/NanophotonIIC0s/iico-spectra)

This repository provides a Graphical User Interface (GUI) for conducting spectroscopy experiments using an Ocean Optics spectrometer. The GUI is designed to be user-friendly and intuitive, allowing researchers to easily interact with the spectrometer.

<https://github.com/NanophotonIIC0s/iico-spectra>

Conference Participation

2016

[National Physics Congress](#)

Growth and Characterization of Optical Microcavities of (Al,Ga)As.

Poster

2017

[X Annual Meeting of the Quantum Information Division](#)

Advances in III-V microcavity growth for solid-state quantum condensates

Poster

2017

[National Physics Congress](#)

In-situ and real-time optical growth and characterization of (Al,Ga)As microcavities. National Physics Congress

Talk

2018

[Solid State Division Annual Meeting](#)

Detection of Indirect Excitons in Coupled Quantum Wells Using Photoreflectance

Talk

2019

[Solid State Division Annual Meeting](#)

Study of Indirect Excitons and Trions in coupled asymmetric quantum wells

Poster

2020

[IOP QUANTUM 2020](#)

A virtual Conference

Attendance

Science Communication

2017

[Open Doors 2017, Engineering Postgraduate Programs Within Your Reach](#)

Event Organizer

Universidad Autónoma de San Luis Potosí

2022

[Evaluator of the Presented Works at the 10th Meeting of Young Researchers in the State of San Luis Potosí](#)

Scientific and Technological Fair

Universidad Autónoma de San Luis Potosí

2023

[The Importance of Computational Physics in Information Technologies](#)

Conference-Research Forum 2023

Universidad Politécnica de San Luis Potosí

Courses and Certifications

2014

[Advanced Summer School 2014 of the Physics Department, Center for Research and Advanced Studies of the National Polytechnic Institute](#)

Summer School

CINVESTAV-IPN

2014

[XI Summer School in Mathematics](#)

Summer School

Unidad Cuernavaca del Instituto de Matemáticas UNAM

2015

[Ellipsometry School](#)

Summer School

IICO-UASLP

2021

[Development of Teaching Competencies: Didactic Planning and Instructional Design](#)

Course

Universidad Politécnica de San Luis Potosí



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2021 [Hands-On Start to Wolfram Mathematica](#)

Course

Wolfram Research inc

2022 [Updating Scenarios for the Return to Hybrid Classes](#)

Course

MICROSOFT MEXICO S.A. DE C.V

2023 [Python 101 for Data Science](#)

A course on cognitiveclass.ai

IBM Developer Skills Network

Interests

In my research, I am deeply passionate about exploring the fascinating realm of solid-state physics and condensed matter. My primary focus encompasses both experimental investigations and the creation of open-source code to perform intricate numerical calculations. A key area of interest is the exploration of various spectroscopic techniques to delve into the intricate optical properties of semiconductors. Through these spectroscopies, I seek to unravel the underlying phenomena and gain profound insights into the behavior of materials at the quantum level.

As a dedicated researcher, I am driven to push the boundaries of knowledge and understanding in the field. One of my key contributions lies in the development of innovative code that enables advanced analysis and the creation of numerical models. These tools are crucial in deciphering the complex data obtained from experimental studies, helping to extract meaningful physical interpretations and enriching our understanding of condensed matter systems.

Furthermore, my passion for scientific computing and my expertise in programming languages like Python, Julia, and Fortran allow me to create robust and efficient computational tools for conducting in-depth simulations. I take immense pride in my ability to bridge the gap between theoretical concepts and practical experimentation, as this synergy fosters groundbreaking research and enhances the overall progress in the field.

With each research endeavor, I aim to uncover new discoveries that not only advance the fundamental understanding of solid-state physics but also hold immense potential for real-world applications in the realm of information technologies and material science. By staying at the forefront of scientific developments and continuously honing my skills, I aspire to make significant contributions to the ever-evolving landscape of solid-state physics and condensed matter research.