

Jose Emmanuel Paredes Rocha

Curriculum Vitae

Status: February 2022

+52 466 121 4341

✉ eparedes@icf.unam.mx



Personal information

Date of birth	July 21st, 1996
Place of birth	Guanajuato, Mexico
Occupation	Teacher Assistant at Faculty of Sciences UNAM
Address	Instituto de Ciencias Físicas, Universidad Nacional Autónoma de México, Cuernavaca, Mexico

Education

- 06/2019 **Master of Science (Physics) Degree**, *Institute of Physical Sciences*, National Autonomous University of Mexico, Thesis: "Transporte en grafeno: Analogías de la óptica de gradiente de índice y uniones pn con defectos" (Graphene transport: Analogies of gradient-index optics and pn junctions with defects). Advisor: Dr. Thomas Stegmann. Qualification: Honor Mention. (Abstract in english)
- 2019 – 2021 **Master studies in physics**, *Institute of Physical Sciences (ICF)*, National Autonomous University of Mexico.
- 06/2019 **Bachelor degree in physics**, *Faculty of Science*, National Autonomous University of Mexico, Thesis: "Óptica electrónica en heterouniones de grafeno" (Electron optics in graphene hetero-junctions). Advisor: Dr. Thomas Stegmann. Qualification: Honor Mention. (Abstract in english)
- 2014–2019 **Physics studies**, *Faculty of Science*, National Autonomous University of Mexico (UNAM).

Skills

Languages	Spanish (mother tongue), English (intermediate) and German (beginner).
Operative systems	Windows, Linux (Ubuntu).
Programming abilities	Mathematica (Wolfram Lang), Python, Julia, SQL (PostgreSQL/mysql), Matlab/Octave, Arduino (and similar boards) and LabVIEW.
Software and packages	ZEMAX, Origin, Gaussian, Quantum Espresso, Excel, Microsoft Office, Latex.

Experimental techniques	Raman spectroscopy, Sputtering, Basics of electron microscopy.
Experimental experiences	Fourth-order interference, Testing photomultiplier for ALICE experiment, Instrumentation with Arduino and similar boards, Optical design of a confocal microscopy, Measurement of spectral extinction.

Publications

2) Gradient-index electron optics in graphene pn junctions

E. Paredes-Rocha, Y. Betancur-Ocampo, N. Szpak and T. Stegmann
Phys. Rev. B 103, 045404 (2021). DOI:10.1103/PhysRevB.103.045404

1) Phosphorene pnp junctions as perfect electron waveguides

Y. Betancur-Ocampo, E. Paredes-Rocha and T. Stegmann
J. Appl. Phys. 128, 114303 (2020). DOI:10.1063/5.0019215

Awards, Grants and Fellowships

- 10/2021 **First Place Poster Competition** on the Poster Competition "Carlos Graef Fernández" 2021 in the División de Estado Sólido. This competitions was within the LXIV Conference of the Mexican Society of Physics. Poster: "Gradient-index optics in graphene pn junctions" (*spanish*)
- 12/2019 – 01/2020 **Research Fellowship PAECI-UNAM** at the University of Duisburg-Essen, Germany. Project about semiclassical trajectories in graphene pn junctions. Advisors: Dr. Nikodem Szpak and Prof. Dr. Dietrich Wolf.
- 06 – 08/2018 **Summer Research Fellowship of the Mexican Academy of Science (AMC)**. Realization of the project "Design proposal for the astronomical telescope of the Astronomical Observatory Guillermo Haro" (*spanish*) at the National Institute of Astrophysics, Optics and Electronics (INAOE), Puebla, Mexico. Advisor: Dr. Fermín Granados-Agustín.

Contributions to conferences and workshops

- 01/2022 **Conference Topological quantum matter: foundations and applications**, *Online*.
Poster: "Gradient-index electron optics in graphene pn junctions"
- 10/2021 **LXIV Conference of the Mexican Society of Physics**, *Online*.
Poster: "Gradient-index electron optics in graphene pn junctions" (*spanish*)
- 06/2021 **NT21: International Conference on the Science and Application of Nanotubes and Low-Dimensional Materials 2021**, *Online*.
Poster: "Gradient-index electron optics in graphene pn junctions"
- 05/2021 **Annual Meeting of Solid State Division of the Mexican Society of Physics 2021**, *Online*.
Talk: "Gradient-index electron optics in graphene pn junctions"
- 03/2021 **Gathering: Classical and Quantum Dynamics of Complex Systems and Applications**, *Online*.
Talk: "Gradient-index electron optics in graphene pn junctions"
- 10/2020 **Graphene conference 2020**, *Online*.
Poster: "Gradient-index electron optics in graphene pn junctions"

- 10/2020 **Conference Transport at the Nanoscale 2020**, *Online*.
Poster: "Gradient-index electron optics in graphene pn junctions"
- 10/2020 **LXIII Conference of the Mexican Society of Physics**, *Online*.
Talk: "Electron optics in straight and circular pn junctions" (*spanish*)
- 08/2019 **XXVIII International Material Research Congress**, Cancun, Mexico.
Poster: "Electron optics in graphene heterojunctions"
- 05/2019 **8th Meeting of Solid State Division of the Mexican Society of Physics**, Papantla, Mexico.
Talk: "Electron optics in graphene heterojunctions" (*spanish*)
- 11/2018 **OPUMA Conference 2018**, Mexico City, Mexico.
Poster: "Electron optics in graphene pn junctions"
- 11/2018 **Gathering on Transport at the Nanoscale**, CIC, Cuernavaca, Mexico.
Talk: "Electron optics in graphene heterojunctions" with E. Mendoza-Sandoval
- 10/2018 **LXI Conference of the Mexican Society of Physics**, Puebla, Mexico.
Poster: "Electron optics in graphene pn junctions" (*spanish*) with E. Mendoza-Sandoval

Participation in conferences and workshops

- 10/2021 **V School of Data Science**, *Campus Cuernavaca Institute of Mathematics UNAM*, *Online*.
- 08/2021 **International Meeting on Artificial Intelligence and its Applications (RIIA) 2021**, *Online*.
- 05/2021 **Course: Remote Operation for Scientific Equipment**, *Online*.
by SMM
- 04/2021 **Course: Update on Fluorescence and Cofocal Laser Microscopy**, *Online*.
by SMM
- 03/2021 **Course: Electron Microscopy applied to semiconductors materials**, *Online*.
by Mexican Society of Microscopy (SMM)
- 12/2020 **Basic course of Electron Microscopy on Biological and Material Sciences**, *Online*.
by Mexican Society of Microscopy and INAOE
- 08/2020 **International Meeting on Artificial Intelligence and its Applications (RIIA) 2020**, *Online*.
- 08/2019 **VIII School of Experimental Physics**, *Institute of Physical Sciences UNAM (ICF-UNAM)*, Cuernavaca, Mexico.
- 11/2018 **School-Workshop of Physics at Nanoscale**, *Institute of Physics (IF) UNAM*, Mexico City, Mexico.
- 05/2018 **1st Symposium of Materials and Nanotechnology**, *Queretaro University of Technology*, Queretaro, Mexico.
- 06/2017 **XXV Summer School of Physics**, *IF-UNAM/ICF-UNAM*, Mexico City/Cuernavaca, Mexico.

Popular Science

03/2020 Event: Night Science Morelos 2020

08/2018 6th Fest of Sciences and Humanities UNAM 2018

Memberships

Since 05/2017 Member of the Mexican Society of Physics (SMF).

08/2018 – 08/2019 Member of the SPIE UNAM student Chapter.