CURRICULUM VITAE

Mara Lozano

PHYSICIST / Condensed Matter Theory

I am a physicist with a strong interest in learning skills needed to conduct research in Condensed Matter Physics. My goal is to gain experience in theoretical research and contribute in collaborative projects. I enjoy challenges and approach problems with creativity to find the best solutions.

CHOOSE A SECTION



PERSONAL DATA / CONTACT

27 years old, Mexican • Languages: Spanish/English
mara.lozano@ou.edu • University of Oklahoma. Department of Physics and Astronomy • ORCID:0009-0009-5103-4909

Academic foundation

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01 EDUCATION

PhD candidate / University of Oklahoma / 2022–current

I am pursuing a PhD degree in Physics with the aim of becoming a professional researcher on modern physics topics, specifically in the area of Condensed Matter Physics with special interest in topological materials and strongly correlated electron systems.

Masters of Science degree in Physics / University of Oklahoma / 2022–2025

I was awarded the degree of Master of Science in Physics

Bachelor of Science degree in Physics / Universidad de las Americas Puebla / 2017–2021

I finished the Bachelor's Degree in physics and was acknowledged as Magna Cum Laude. With a dissertation thesis: *Multi-level system of an entangled bi-photon under a spontaneous parametric down conversion process*, supervised by Wanderson Maia Pimenta

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02 RESEARCH

Exciton interferometry in Transition Metal Dichalchogenide heterobilayers / University of Oklahoma/Current research

In collaboration with Dr. Bruno Uchoa and Dr. Hong-Yi Xie we investigate the magnetic dipole moment of excitons through interferometry.

Interface exciton in Transition Metal Dichalchogenide heterojunctions / University of Oklahoma/Current research

In collaboration with Dr. Bruno Uchoa, Dr. Hong-Yi Xie, Dr. Prasana K Sahoo, and Dr. Thirumalai Venkatesan, we investigate the presence of excitons at the interface of a Transition Metal Dichalchogenide (TMDs) heterojunction.

Optical selection rules of topological excitons in flat bands / University of Oklahoma/Previous research

In collaboration with Dr. Bruno Uchoa and Dr. Hong-Yi Xie we investigated the optical selection rules of topological excitons.

Spatial correlation of twins photons / Universidad de las Americas Puebla/Previous research

In collaboration with Dr. Wanderson Maia Pimenta, I made a research in the area of classical optics and quantum optics. We investigated the spatial correlation of an entangled pair of photons produced by spontaneous parametric down-conversion (SPDC).

Dynamic Systems and Chaos / Centro de investigaciones en Optica/Previous research

In collaboration with Dr. Vicente Aboites I worked with dynamic systems. We investigated a ring phase conjugated laser described by means of a Van der Pol bidimensional dynamic map.

Activity & recognition

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03 TEACHING EXPERIENCE

General Physics Laboratory I: Mechanics / Graduate Teaching Assistant/University of Oklahoma/2022–2024

In this course I taught a series of laboratory experiments and exercises which cover basic mechanics.

Grader / Graduate Teaching Assistant/University of Oklahoma/2024–current

I have been grader of the following courses: Classical Mechanics, Statistical Mechanics, Solid State Physics and Advanced Solid State Physics.

Graduate Student Mentor / Mentor/University of Oklahoma/2024

I mentored two first year graduate students, Aditi J. Shahani and Lilly Damron

STEM UDLAP program / Educator / Universidad de las Americas Puebla/ Sep 2020–Mar 2021

In collaboration with colleagues, we made a manual of easy experiments for children to teach them their physical principles.

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04 CONFERENCES & PRESENTATIONS

Optical selection rules for topological excitons in flat Chern bands / Anaheim Convention Center / 2025

I gave an oral presentation in the APS Global Physics Summit

Proposal for exciton interferometry in transition metal dichalchogenide heterobilayers / Colorado Convention Center / 2026

I gave an oral presentation in the APS Global Physics Summit

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05 AWARDS & HONORS

Research Travel Grant / University of Oklahoma/2025 & 2026

I was awarded the Physics and Astronomy Graduate Research Travel Grant that allowed me to be part of the APS Global Physics Summit.

Avenir Fellowship / University of Oklahoma/2025

I was awarded the Avenir Fellowship that allowed me to continue doing research in my field.

National contest of physics devices and experiments / Leon, Gto. Mexico/2017

I was awarded the second place at state level. The experiment consisted of a Ruben's tube, where I exposed the physical principle of standing waves.

Tools & publications

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06 SKILLS

Theoretical physics / Research domains

Berry formalism, Quantum Geometry, Excitons in low dimensions, Topological Excitons, Flat Band Systems.

Computational / Programming languages

MATLAB, Wolfram Mathematica, Fortran, C++

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07 PUBLICATIONS

[1] Optical selection rules of topological excitons in flat bands / 2025

Mara Lozano, Hong-Yi Xie, and Bruno Uchoa. ”Optical selection rules of topological excitons in flat bands”. **Phys. Rev. B, 112:235417**, Dec 2025.

[2] Laser Cavity with Van der Pol dynamics / 2021

M. Lozano, A. Kir’yanov, A. Pisarchik, and V. Aboites, ”Laser cavity with a Van der Pol dynamics”, **Rev. Mex. Fis., vol. 67, no. 1** Jan-Feb, pp. 154–161, Jan. 2021.