Juan Reyes Herrera

Curriculum Vitae

Language skills: English (Professional proficiency), French (Elementary proficiency), Spanish (Native)

Skills and expertise

X-ray optics simulations
Synchrotron radiation
X-ray spectroscopy techniques such as XRF, PIXE and XAS
Data analysis and programming
Basics on particle accelerator physics

Education

Ph.D., Physics	2015	Postgraduate program in Physics Sciences from the Physics Institute of the National Autonomous University of Mexico (UNAM). Mexico City, Mexico.
M.Sc., Physics	2008	Postgraduate program in Physics Sciences from the Physics Institute of the National Autonomous University of Mexico (UNAM). Mexico City, Mexico.
B. Sc. Physics	2003	Physics Faculty of the Autonomous University of Zacatecas (UAZ). Zacatecas, Mexico.

Latest science courses

Material Science at European Large-Scale Infrastructures using Open and FAIR Data	Sep, 2022	Szeged, Hungary
XV School on Synchrotron Radiation: Fundamentals, Methods and Applications	June, 2019	Muggia, Italy

Relevant employment

- Beamline Scientist of the XRF and XAFS beamlines at ELETTRA, from November 13, 2024 to the present. One year contract. Providing beamline user support for XRF and collaborating on the μ-XRF and XAS-mW beamlines development. Contributing to the design of the experimental stations of μ-XRF and XAS-mW beamlines in order to meet the high expectations of the user community. Trieste, Italy.

- Junior scientist position at the Mechanical Engineering Group of the ESRF, from November 1, 2019 to October 31, 2024. Performing synchrotron radiation and x-ray optics simulations to asses power load management, photon and coherence transport thought front-end and beamlines, in particular for the EBS upgrade. Software development contribution on a popular x-ray optics modelling suite package: OASYS. Grenoble, France.

- Post-doc at ID21 beamline of the ESRF, from 2 November 2017 to 1 November 2019. Two years post-doc granted by the National Council of Science and Technology of Mexico (CONACYT). Performing data analysis and experiments for the beamline and x-ray optics simulations for the x-ray microscope refurbishment. Grenoble, France.

- Member of the team in charge of the Mexican synchrotron project, principally researching about industrial applications of the synchrotron light. FOMIX Morelos-CONACYT (February 2015 – March 2016). Mexico City, Mexico.

- Guest researcher at the Spanish light source ALBA, developing several activities such as basic training in x-ray optics, introduction to the operation of beamlines, and research on carbon contamination and plasma cleaning of optical components. (September 2012 – December 2013). Barcelona, Spain.

Recent publications

1. *SHADOW4: the popular ray tracing revived for evolving synchrotron sources in fourth-generation storage rings*, M. Sánchez del Río et al. J. Phys.: Conf. Ser. 3010 012071 (2025) https://doi.org/10.1088/1742-6596/3010/1/012071
2. *Front End absorbers review and upgrade with Copper-Zirconium CuCr1Zr apertures for ESRF-EBS*, Philipp Brumund et al. J. Phys.: Conf. Ser. 3010 012004 (2025) https://doi.org/10.1088/1742-6596/3010/1/012004
3. *Modelling undulators in ray tracing simulations,* M. Sánchez del Río and J. Reyes-Herrera, J. Synchrotron Rad. 32 (2025) https://doi.org/10.1107/S1600577525000190
4. *X-ray lens aberrations retrieved by deep learning from several beam intensity images*, M. Sánchez del Río et al., J. Synchrotron Rad. 31 (2024) https://doi.org/10.1107/S1600577524004958
5. *Titanium dioxide nanoparticles (TiO2-NPs) effect on germination and morphological parameters in alfalfa, tomato, and pepper,* D. Acosta-Slane et al. Notulae Botanicae Horti Agrobotanici Cluj-Napoca 52 (2), 13634-13634 (2024) doi.org/10.15835/nbha52213634
6. *Synchrotron x-ray spectra characterisation for radiation therapy applications at the ESRF - ID17 Biomedical beamline*, I. Di Manici et al., Phys. Scr. 99 065021 (2024). doi.org/10.1088/1402-4896/ad4428
7. *BEATS: BEAmline for synchrotron X-ray microTomography at SESAME,* G. Iori et al. J. Synchrotron Rad. 31 (2024) https://doi.org/10.1107/S1600577524005277
8. *High Heat Load Transfocator for the New ID14 ESRF Beamline,* L. Eybert et al. 12th MEDSI Conference, 2023, Beijing, China. https://doi.org/10.18429/JACoW-MEDSI2023-WEPPP004
9. *X-ray beam quality after a mirror reflection: Experimental and simulated results for a toroidal mirror in a 4th generation storage-ring beamline*, J. Reyes-Herrera et al., Open Res Eur., (2023) 10.12688/openreseurope.16211.1
10. *Beam focus modifications by cropping partially coherent X-ray beams*, M. Sánchez del Río et al., EPL 140 55001, (2022) 10.1209/0295-5075/aca4ef
11. *A fast and lightweight tool for partially coherent beamline simulations in fourth-generation storage rings based on coherent mode decomposition*, M. Sánchez del Río et al., J. Synchrotron Radiation 29, (2022) 10.1107/S1600577522008736

Latest conferences

- *New opportunities and challenges of a micro-XRF/XAS beamline in Elettra 2.0*, High Precision X-ray Measurements 2025, Jun 16-20, 2025. Laboratori Nazionali di Frascati INFN, Italy. Invited talk

- *Undulator Models for Ray-Tracing Simulations*, SRI2024, Aug 26-30, 2024. Hamburg, Germany. Contribution talk

- *X-ray lens aberrations retrieved by deep learning from several beam intensity images*, PhotonMEADOW2023, Sep 12-14, 2023. Trieste, Italy Contribution poster

- *Modelling techniques for insertion device power management, photon transport and coherence propagation for ESRF beamlines*, XOPT2023, International Conference on X-ray Optics and Applications, April 18-20, Yokohama, Japan (Talk). Final program

Teaching experience

- HERCULES European School tutorial (2023, 2022 and 2020): *Modelling synchrotron radiation beamlines with OASYS*.
- Assistant professor. Laboratory of general physics, Faculty of sciences of UNAM. Semester 2015-1.
- Assistant professor. Laboratory of experimental techniques, Faculty of sciences of UNAM. Semester 2014-2.

Professional Memberships

Active member of the Mexican Community of Particle Accelerators (CMAP)