

Francisco Salces-Cárcoba

Country of citizenship: Mexico

3413 Purdue St
Hyattsville, MD 20783
(301) 222-3170
pacosalces@gmail.com

EDUCATION

PhD, Physics

University of Maryland College Park, College Park, MD, expected May 2020
Dissertation: Quantum simulation with ultracold bosonic gases

BSc, Physics

Universidad Autónoma de San Luis Potosí, San Luis Potosí, S.L.P., Mexico, 2013

SKILLS AND EXPERTISE

Expertise: Atomic, molecular and optical physics, quantum physics.

Hardware: Optical design in the NIR and visible spectrum, high and ultra-high vacuum manifold design down to 10^{-12} mbar, electronic design in applications up to 10 GHz.

Software: Solidworks, Zeemax, Eagle, Python, L^AT_EX, Labview, Matlab, VHDL.

RESEARCH EXPERIENCE

Graduate research assistant

2017-present

Holographic microscopy of ultracold ⁸⁷Rb, Joint Quantum Institute, MD

- Implemented off-axis holographic microscope for ⁸⁷Rb gases.

Graduate research assistant

2016-2018

New apparatus for quantum degenerate Bose gases, Joint Quantum Institute, MD

- Designed and assembled an ultra-high vacuum manifold.
- Designed a magnetic quadrupole based transport assembly.
- Designed supporting structure and layout for new apparatus.

Graduate research assistant

2015-2017

Thermodynamics of one-dimensional Bose gases, Joint Quantum Institute, MD

- Designed, built and characterized high-aspect ratio, crossed optical dipole trap.
- Designed, built and characterized compound microscope objective (NA = 0.31).
- Calibrated optimal signal-to-noise ratio to probe dilute $\sim 1 \mu\text{m}^{-1}$ linear objects.
- Analyzed *in-situ* density distributions with a numerically exact model.

Graduate research assistant

2014-2015

Digital control loop for magnetic field stabilization, Joint Quantum Institute, MD

- Designed and tested a 20-bit, FPGA-based current servo.

Undergraduate research intern

2011-2013

Passive thermal stabilization of optical cavities, UASLP, Mexico

- Designed and assembled composite mirror spacers for confocal cavity.
- Measured thermally driven frequency drift of the cavity transmission.
- Analyzed thermal expansion with numerically implemented finite-element model.

Undergraduate research intern

Summer 2012

Soft X-ray calorimetry from ion electronic recapture, ORNL, TN.

- Operated the keV molecular ion beam accelerator for data acquisition.
- Operated high resolution X-ray cryogenic (0.1K) calorimeter.

Publications

- 1.
- 2.