



## Pedro Quinto (UNAM)

October 13, 2025 to October 17, 2025

Instituto de Fisica, UNAM (Mexico)

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### "Structured light for optical micromanipulation"

#### **Abstract:**

In the first part of this talk, I will discuss the generation of structured laser beams. I will then present several applications for manipulating microscopic objects using tightly focused continuous laser beams, such as holographic optical tweezers and microscopic steam engines.

Then, I will describe a couple of interferometric methods for measuring tightly focused structured light fields. These fields can exhibit complex subwavelength structures in both phase and amplitude across the three polarization components. I will show measurements of vector beams and beams with topological features on spatial scales comparable to the wavelength.

Finally, I will present applications with pulsed structured laser beams that can be used to exert impulsive forces at the microscopic scale through microscopic explosions and shock waves. In particular, I will show experiments involving shock waves that carry angular momentum and their interactions with microscopic particles.

**Bio:**

Pedro A. Quinto-Su is a researcher at the Institute of Nuclear Sciences (ICN), National Autonomous University of Mexico (UNAM).

He holds a degree in Physics from UNAM and a PhD in Physics from the University of Rochester. He completed postdoctoral research at the University of California, Irvine, and at Nanyang Technological University in Singapore.

At ICN, he leads the Applied Optics Laboratory, where his research focuses on the interaction between structured light and matter. Research projects include structured laser beams, holographic optical tweezers, atom traps, light propagation through turbid media, cavitation and structured shock waves.